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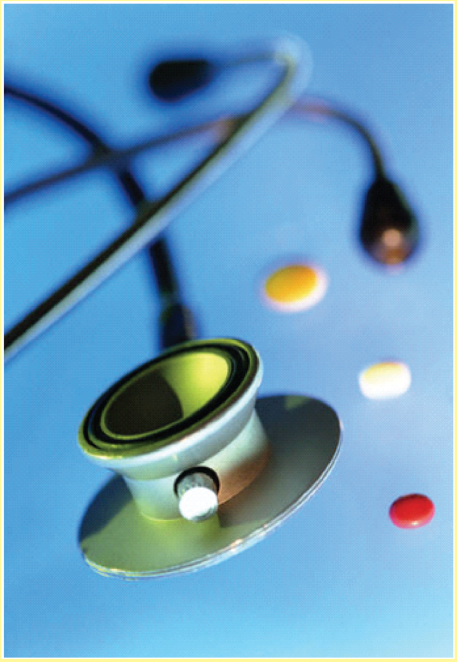

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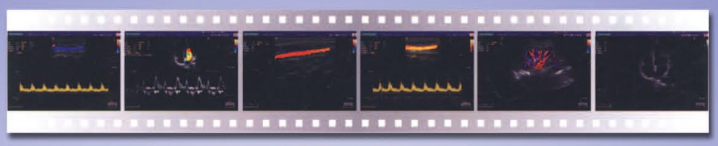

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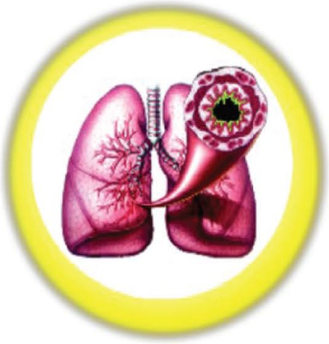

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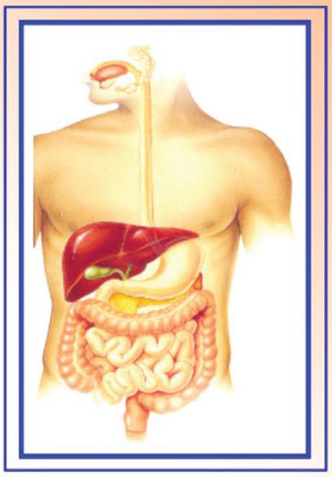

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A Systemic Care Division of DJPL

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Editorial:

Spare the rod and spoil the child – is there any truth?

– Digvijay S T

Learning of medicine is difficult. A 12 grader needs to be trained for extremely difficult situations and decision making as critical as a general in active war duty. The time frame needed is about 10 years. We need to create extremely ethical social leaders and competent professionals at the same time. Teaching paradigms are changing and from the extremely authoritarian, anecdotal modes we are converting to more structured and protocol based modes. Rationality is preceding heuristics and experience. Evidence based medicine is in.

Reading and writing may not be natural practices for most human beings. Swimming is not a `natural' practice either but you'd better be able to do it if you wish to play water polo. So learning as you are required to should have become second nature to people wishing to profit from tertiary education and specially medicine. When someone wants to take medicine as a career, routine and accepted practices will not work. You are required to work in depressing, hopeless, extraordinary circumstances all the time. Extraordinary decisions and efforts will be needed. We can safely forget the luxuries of labor laws, basic human rights in term of work hours. We cannot claim all the rights of the general population. I absolutely believe that old teaching methods have some uses and need not be discarded just because they are old.

If teachers bear the onus of teaching, then learners bear that of learning. Respective onuses, like all moral duties, are not transferable. This acquisition is more inherent and voluntary. Training can hardly ever achieve morality. Good teaching is an ethical ideal, like speaking the truth, being honest, caring for others etc. This should be strived for regardless of whether it can lead to tangible results. If our teaching methods were valid whether religious, political, or any other subject, how can we explain rampant corruption, crime and unfair practices. It is equally true that some winners of Excellence in Teaching Award are not excellent. Failure can be attributed factors totally outside the teacher control. The idea that if we improve our teaching improved learning would automatically follow will not hold true. Both the students and the teachers need to change. We should accept that some of the thoughts occupied by today's young people are distressing. Education is the foundation for society's future. Its discussion should occupy the arguments of all educators. If we accept supinely all the shortcomings of our society and the self-serving dictates of short-sighted politicians as if they were the only foundations on which we can build. We risk building on sand.

Professor Digvijay S Timilsina
Principal and Executive Director, Gandaki Medical College.

Note: This article has been heavily influenced by the write up of Professor Giovani Carsaniga Director of Frederick May Foundation for Italian Studies

Apology

In volume 1 Issue 2 the author of the article "Assessment of level of awareness of oral hygiene practice among patient of Kaski district of Nepal" should be Prakash Poudel et al. instead of Prakash Bastola at el.

Lead Articles:

How Often Do Physicians Review Medication Charts on Ward Rounds?

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Abstract

Background

Prescribing errors are common in hospital settings. Regular review of medication charts is recommended as a way to reduce errors but it is not clear how often this happens. The aim of this study was to determine the frequency with which specialist physicians reviewed medication charts during ward rounds.

Methods:

An observer noted how often consultant physicians at Auckland City Hospital reviewed medication charts during ward rounds. The physicians were not aware that they were being observed.

Results:

Twenty-one physicians were observed over a 26 week period. The general physicians reviewed the medication charts on 77% of occasions (range: 45% - 100%) during routine ward rounds and 65% of the time (range: 41% - 80%) on post admission rounds. Subspecialty physicians who did not see more than 8 patients on their rounds reviewed medication charts more frequently (88%) than those specialties where more than 8 patients were seen on average (61%).

Conclusion:

The physicians did not review medication charts on all ward rounds and there was considerable variation in how often they did this. There is some evidence that the frequency with which charts are reviewed decreases as the number of patients seen increases. More efforts should be made to encourage regular review of medication charts.

Background

Prescribing errors are common in the hospital. In different studies adverse drug events have been reported to occur in 0.7% to 6.5% of hospital admissions.[1] 28% to 56% of these adverse drug events were thought to be preventable.[2] Bates et al estimated that each preventable adverse event leads to an additional cost of US $4,685 and increase in the length of stay of 4.6 days.[3] A number of interventions have been proposed to reduce medication errors including regular review of medication charts by doctors on ward rounds.[2] A case can be made for consultant staff to review all of the medication charts on every ward round that they go on. There is evidence that consultants make fewer prescribing errors than their junior medical staff[4,5] and they are well placed to detect errors made by the junior medical staff. If they review medication charts on each ward round it also emphasizes the importance of doing this to the junior medical staff. However we are not aware of any previous studies that document how often consultants review medication charts on ward rounds.

Methods

We determined the frequency with which consultant physicians at Auckland City Hospital (ACH) (Auckland, New Zealand) reviewed medication charts during their

ward rounds. The study was undertaken by a medical relief registrar (KLL) who was assigned to cover other registrars who were on leave. From 26th June 2006 till 10th December 2006 (26 weeks) she rotated through general medicine and a number of subspecialties. Most attachments were for 1-2 weeks. At ACH, most of the patients presenting with acute medical problems are admitted to the General Medical Service with only a minority presenting directly to the medical subspecialties. A proportion of these patients will be subsequently transferred to a subspecialty although the majority remain under the care of General Medicine. Patients admitted to the General Medical Service are seen by a consultant physician on a post admission round within 24 hours of arriving in hospital. On routine ward rounds the patients have been in hospital for more than 24 hours and have been seen by a consultant physician at least once before. The medication charts at ACH are completed manually by the junior medical staff when the patient is admitted. Staff pharmacists are not present on the ward rounds. Although they see most of the medication charts of patients admitted to hospital they only talk to the patient and take a medication history on about 10% of occasions. On consultant ward rounds KLL recorded how often the consultant reviewed the medication chart i.e. how often the consultant looked at the medication chart and where appropriate suggested changes. The consultant needed to scrutinise the medication chart for 15 seconds or more before they were recorded as having reviewed the medication chart. None of the consultants were aware of the study. This was not felt to pose a problem because this was an audit and did not involve any intervention or any change to routine practice. Because this was an audit and did not involve an intervention we were not required to seek Ethics Committee approval. The consultants were not prompted to review the medication chart by the registrar. The study was carried out for a period of 26 weeks. The results were expressed as mean ± SD and range. Comparisons were performed using an unpaired Student's t-test.

Results

Twenty-one consultants were observed during the course of the study. Eight were general physicians. The remainders were from gastroenterology (3), the liver transplant service (5), haematology (2), cardiology (2) and renal medicine (1). In general medicine each consultant was observed twice i.e. on a routine ward round and on a post-admission round. The subspecialty physicians were observed on either one or two occasions. All the patients cared for by these services were over the age of 16 years. In general medicine the frequency of with which the physicians reviewed medication charts on routine ward rounds (Table 1) ranged from 45 to 100% (mean = 77 ± 16%). Between 6 and 15 patients were seen on these wards rounds. In contrast on the post admission rounds between 11 and 21 patients were seen. The medication charts were reviewed less frequently on the post admission rounds (range = 41 - 80%, mean = 65 ± 14%) although this difference was not statistically significant ($p = 0.14$). The average number of patients seen in the haematology and liver transplant services (Table 2) was five with no more than 8 patients seen on any round. On these services the medication charts were reviewed more frequently (range 75% - 100%, mean = 88 ± 12%). In the other subspecialties (Table 2) more patients were seen (mean = 9, range = 4 - 16) and the medication charts were reviewed less frequently (mean = 61 ± 18%, $p = 0.003$). On most ward rounds only one consultant was present. The exception was the liver transplant service where several consultants took part in each round but only one took responsibility for reviewing the medication chart.

Table 1. Frequency of Review of Medication Charts on General Medicine Rounds

	No. of Patients Seen on Ward Round	Frequency of Medication Chart Review
Routine Ward Rounds		
A	7	100%
B	15	87%
C	8	87%
D	11	82%
E	6	67%
F	8	75%
G	11	73%
H	11	45%
Mean	10	77%
Post Admission Rounds		
A	15	80%
B	12	67%
C	17	41%
D	17	76%
E	11	64%
F	17	76%
G	12	50%
H	21	67%
Mean	15	65%

Each letter (from A to H) represents an individual physician. Each physician was observed on both a routine ward round and on a post admission round.

Table 2. Frequency of Review of Medication Charts on Subspecialty Ward Rounds

Specialty	No. of Patients Seen on Ward Round	Frequency of Medication Chart Review
Haematology		
A	6	83%
	3	100%
B	3	100%
	8	75%
Mean	5	90%
Liver Transplant		
A	5	100%
B	5	100%
C	4	75%
D	5	80%
E	5	80%
Mean	5	87%
Gastroenterology		
A	11	45%
B	7	43%
	5	80%
C	10	50%
	9	44%
Mean	8	52%
Cardiology		
A	13	61%
B	4	75%
Mean	8	68%
Renal Medicine		
A	16	87%

In each specialty each of the physicians who were observed is represented by a separate letter. Each physician was observed on either one or two occasions.

Discussion

We found that a significant proportion of medication charts were not reviewed by physicians on their ward rounds. We are not aware of other studies that have looked at this. This may reflect the difficulty of conducting this type of study. If physicians know that they are being observed their behaviour may change. McHugh found that when doctors were informed that their prescribing was being audited the number of errors decreased significantly.[4] Our study was only possible because there are medical registrars in our hospital who provide leave cover and who work on a different team every one or two weeks. This provided the opportunity to observe a range of physicians without them being aware of the study. A number of strategies have been proposed to reduce the frequency of prescribing errors including computerised physician order entry and pharmacist participation in ward rounds. The presence of a pharmacist on a ward round is associated with a lower rate of prescribing errors.[6] The review of medication charts by pharmacists demonstrates the value of having another individual check for errors. At ACH pharmacists do not usually participate in ward rounds. However consultant physicians are well placed to detect errors. Senior physicians are more

experienced that junior medical staff and a number of studies have found that they make fewer errors when they prescribe medicines.[4,5] We believe that if consultants review most, if not all, of the medication charts on ward rounds it will increase the chance of detecting errors. We are not aware of any studies that examine how often consultant physicians detect medication errors on ward rounds but our experience is that this occurs not infrequently. At the time of writing computerised prescribing has not been implemented at Auckland City Hospital. Numerous studies have shown that computerised prescribing can reduce medication errors.[7,8] However, these systems still have some shortcomings[8] and they do not supplant the need for physicians to review the medication charts closely. The charts were more likely to be reviewed in subspecialties with eight or fewer patients. This is not altogether surprising. As the workload increases the time available to review the medication chart will decrease. This may explain why medication charts were reviewed less often in General Medicine on the post admitting rounds when more patients were seen than on routine ward rounds. This difference was not statistically significant but may well have been if the study had been larger. Prescribing chemotherapy for cancer patients and immunosuppressive medication for transplant patients can be complex and there is the risk of significant toxicity. This could also explain why the consultants in haematology and on the liver transplant service were careful to examine the medication charts on most rounds.

This study has some limitations. Only twenty-one physicians were studied and each physician was only observed on one or two occasions. The need to conduct the study without the physicians being aware that they were observed limited our ability to do a larger study. The study was only conducted in a single hospital and we are not certain that the findings can be generalised to other hospitals but we suspect that this is the case. When Davis et al studied the frequency and type of adverse events in New Zealand hospitals their findings paralleled those from Australia and the United Kingdom.[9] Another limitation is that we did not count the number of prescription errors on the medication charts and we do not know if there was a relation between the frequency with which charts were reviewed and the number of errors. It would be of interest to study this although anyone doing this would face the same challenges that we did in conducting a study without physicians being aware that they were observed.

Conclusion

In summary we found that physicians only reviewed medication charts about two thirds of the time and the frequency decreased as the number of patients increased. Although there is no direct evidence that consultant review of medication charts reduces prescribing errors there is good reason to believe that this is the case and we would advocate reviewing all the medication charts on every ward round.

Acknowledgements

The authors would like to thank all of the physicians at Auckland City Hospital who were observed during the course of this study.

Authors' Contributions:
PNB conceived the idea for the study. PNB and KLL were jointly responsible for the study design. KLL carried out the study. Both authors shared responsibility for analysing the data and writing the manuscript and both authors have approved the final manuscript.

Competing Interests:
The authors declare that they have no competing interests.

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Posted 12/10/2008

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Lead Articles:

The Last Hours of Living: Practical Advice for Clinicians

Emanuel LL, Ferris FD, von Gunten CF & Von Roenn J

Introduction

Clinical competence, willingness to educate, and calm and empathic reassurance are critical to helping patients and families in the last hours of living. Clinical issues that commonly arise in the last hours of living include the management of feeding and hydration, changes in consciousness, delirium, pain, breathlessness, and secretions. Management principles are the same at home or in a healthcare institution. However, death in an institution requires accommodations to assure privacy, cultural observances, and communication that may not be customary. In anticipation of the event, inform the family and other professionals about what to do and what to expect. Care does not end until the family has been supported with their grief reactions and those with complicated grief have been helped to get care.

Case Study: A.F. Is Dying at Home

A.F. is a 79-year-old woman with metastatic breast cancer who is in her own home, cared for by her daughter with the help of the home hospice program. She developed aspiration pneumonia, and it was treated with oral antibiotics. Advance care planning indicates she does not want to go to the hospital under any circumstances, and oral antibiotics were an intermediate level of care.

The patient and daughter agree that if she gets better, she may have some quality of time left. But if she doesn't, A.F. says she is ready to go. Her physician makes a joint home visit with the home hospice nurse in order to assess changes in mental status and because it sounds like her daughter panicked and considered calling 911.

Of all patients who die, only a few (< 10%) die suddenly and unexpectedly. Most people (> 90%) die after a long period of illness, with gradual deterioration until an active dying phase at the end. [1] Care provided during those last hours and days can have profound effects, not just on the patient, but on all who participate. At the very end of life, there is no second chance to get it right.

Most clinicians have little or no formal training in managing the dying process or death. Many have neither watched someone die nor provided direct care during the last hours of life. Families usually have even less experience or knowledge about death and dying. Based on media dramatization and vivid imaginations, most people have developed an exaggerated sense of what dying and death are like. However, with appropriate management, it is possible to provide smooth passage and comfort for the patient and all those who watch.

Preparing for the Last Hours of Life

During the last hours of their lives, most patients require continuous skilled care. This can be provided in any setting as long as the professional, family, and volunteer caregivers are appropriately prepared and supported throughout the process. The environment must allow family and friends access to their loved one around the clock without disturbing

others and should be conducive to privacy and intimacy. Medications, equipment, and supplies need to be available in anticipation of problems, whether the patient is at home or in a healthcare institution. As the patient's condition and the family's ability to cope can change frequently, both must be reassessed regularly and the plan of care modified as needed. Changes in the patient's condition can occur suddenly and unexpectedly, so caregivers must be able to respond quickly. This is particularly important when the patient is at home, if unnecessary readmission is to be avoided.

If the last hours of a person's life are to be as positive as possible, advance preparation and education of professional, family, and volunteer caregivers are essential, whether the patient is at home, in an acute care or skilled nursing facility, a hospice or palliative care unit, prison, or other setting. Everyone who participates must be aware of the patient's health status, his or her goals for care (and the parents' goals if the patient is a child), advance directives, and proxy for decision making. They should also be knowledgeable about the potential time course, signs, and symptoms of the dying process, and their potential management. Help families to understand that what they see may be very different from the patient's experience. If family members and caregivers feel confident, the experience can be a time of final gift giving.

For example, when parents feel confident about providing for the needs of their dying child, their sense that they are practicing good parenting skills is reinforced. If they are left unprepared and unsupported, they may spend excessive energy worrying about how to handle the next event. If things do not go as hoped for, family members may live with frustration, worry, fear, or guilt that they did something wrong or caused the patient's death. Establish in advance whether potential caregivers, including professionals who work in institutions, are skilled in caring for patients in the last hours of life. Do not assume that anyone, even a professional, knows how to perform basic tasks. Those who are inexperienced in this particular area will need specific training in areas such as body fluid precautions. Written materials can provide additional support to caregivers when experts are not present.

Although we often sense that death will either come quickly over minutes or be protracted over days to weeks, it is not possible to predict when death will occur with precision. Some patients may appear to wait for someone to visit, or for an important event such as a birthday or a special holiday, and then die soon afterward. Others experience unexplained improvements and live longer than expected. A few seem to decide to die and do so very quickly, sometimes within minutes. While it is possible to give families or professional caregivers a general idea of how long the patient might live, always advise them about the inherent unpredictability of the moment of death.

Physiologic Changes and Symptom Management

There are a variety of physiologic changes that occur in the last hours and days of life, and when the patient is actually dying. Each can be alarming if it is not understood. The most common issues are summarized here. To effectively manage each syndrome or symptom, physicians, nurses, and other caregivers need to have an understanding of its cause, underlying pathophysiology, and the appropriate pharmacology to use (Table 1. continued..).

Table 1. Changes During the Dying Process

Change	Manifest by/Signs
Fatigue, weakness	Decreasing function, hygiene Inability to move around bed Inability to lift head off pillow
Cutaneous ischemia	Erythema over bony prominences Skin breakdown, wounds
Decreasing appetite/ food intake, wasting	Anorexia Poor intake Aspiration, asphyxiation Weight loss, loss of muscle and fat, notable in temples

Decreasing fluid intake, dehydration	Poor intake Aspiration Peripheral edema due to hypoalbuminemia Dehydration, dry mucous membranes/ conjunctiva
Cardiac dysfunction, renal failure	Tachycardia Hypertension followed by hypotension Peripheral cooling Peripheral and central cyanosis (bluing of extremities) Mottling of the skin (livedo reticularis) Venous pooling along dependent skin surfaces Dark urine Oliguria, anuria
Neurologic dysfunction, including:	
Decreasing level of consciousness	Increasing drowsiness Difficulty awakening Unresponsive to verbal or tactile stimuli
Decreasing ability to communicate	Difficulty finding words Monosyllabic words, short sentences Delayed or inappropriate responses Verbally unresponsive
Terminal delirium	Early signs of cognitive failure (eg, day-night reversal) Agitation, restlessness Purposeless, repetitious movements Moaning, groaning
Respiratory dysfunction	Change in ventilatory rate -- increasing first, then slowing Decreasing tidal volume Abnormal breathing patterns -- apnea, Cheyne- Stokes respirations, agonal breaths
Loss of ability to swallow	Dysphagia Coughing, choking Loss of gag reflex Buildup of oral and tracheal secretions Gurgling
Loss of sphincter control	Incontinence of urine or bowels Maceration of skin Perineal candidiasis
Pain	Facial grimacing Tension in forehead, between eyebrows
Loss of ability to close eyes	Eyelids not closed Whites of eyes showing (with or without pupils visible)
Rare, unexpected events:	
Bursts of energy just before death occurs, the "golden glow"	
Aspiration, asphyxiation	

Fatigue and weakness.

Weakness and fatigue usually increase as the patient approaches the time of death. It is likely that the patient will not be able to move around in the bed or raise his or her head.[2] Joints may become uncomfortable if they are not moved.[3] Continuous pressure on the same area of skin, particularly over bony prominences, will increase the risk of skin ischemia and pain.[4] As the patient approaches death, providing adequate cushioning on the bed will lessen the need for uncomfortable turning.

Cutaneous ischemia.

At the end of life, fatigue need not be resisted and most treatment to alleviate it can be discontinued. Patients who are too fatigued to move and have joint position fatigue may require passive movement of their joints every 1 to 2 hours. To minimize the risk of pressure ulcer formation, turn the patient from side to side every 1 to 1.5 hours and protect areas of bony prominence with hydrocolloid dressings and special supports. Do not use "donut-shaped" pillows or cushions, as they paradoxically worsen areas of breakdown by compressing blood flow circumferentially around the compromised area. A draw sheet can assist caregivers to turn the patient and minimize pain and shearing forces to the skin. If turning is painful,

consider a pressure-reducing surface (eg, air mattress or airbed). As the patient approaches death, the need for turning lessens as the risk of skin breakdown becomes less important. Intermittent massage before and after turning, particularly to areas of contact, can both be comforting and reduce the risk of skin breakdown by improving circulation and shifting edema. Avoid massaging areas of non blanching erythema or actual skin breakdown.

Decreasing appetite and food intake.

Most dying patients lose their appetite.[5] Unfortunately, families and professional caregivers may interpret cessation of eating as "giving in" or "starving to death." Yet, studies demonstrate that parenteral or enteral feeding of patients near death neither improves symptom control nor lengthens life.[6-10] Anorexia may be helpful as the resulting ketosis can lead to a sense of well-being and diminish discomfort. Clinicians can help families understand that loss of appetite is normal at this stage. Remind them that the patient is not hungry, that food either is not appealing or may be nauseating, that the patient would likely eat if he or she could, that the patient's body is unable to absorb and use nutrients, and that clenching of teeth may be the only way for the patient to express his/her desire not to eat. Whatever the degree of acceptance of these facts, it is important for professionals to help families and caregivers realize that food pushed upon the unwilling patient may cause problems such as aspiration and increased tension. Above all, help them to find alternative ways to nurture the patient so that they can continue to participate and feel valued during the dying process.

Decreasing fluid intake and dehydration.

Most dying patients stop drinking.[11] This may heighten onlookers' distress as they worry that the dehydrated patient will suffer, particularly if he or she becomes thirsty. Most experts feel that dehydration in the last hours of living does not cause distress and may stimulate endorphin release that promotes the patient's sense of wellbeing.[12-14] Low blood pressure or weak pulse is part of the dying process and not an indication of dehydration. Patients who are not able to be upright do not get light-headed or dizzy. Patients with peripheral edema or ascites have excess body water and salt and are not dehydrated. Parenteral fluids, given either intravenously or subcutaneously using hypodermoclysis, are sometimes considered, particularly when the goal is to reverse delirium.[15] However, parenteral fluids may have adverse effects that are not commonly considered. Intravenous lines can be cumbersome and difficult to maintain. Changing the site of the angiocatheter can be painful, particularly when the patient is cachectic or has no discernible veins. Excess parenteral fluids can lead to fluid overload with consequent peripheral or pulmonary edema, worsened breathlessness, cough, and orotracheobronchial secretions, particularly if there is significant hypoalbuminemia. Mucosal and conjunctival care. To maintain patient comfort and minimize the sense of thirst, even in the face of dehydration, maintain moisture on mucosal membrane surfaces with meticulous oral, nasal, and conjunctival hygiene.[16] Moisten and clean oral mucosa every 15 to 30 minutes with either baking soda mouthwash (1 teaspoon salt, 1 teaspoon baking soda, 1 quart tepid water) or an artificial saliva preparation to minimize the sense of thirst and avoid bad odors or tastes and painful cracking. Treat oral candidiasis with topical nystatin or systemic fluconazole if the patient is able to swallow. Coat the lips and anterior nasal mucosa hourly with a thin layer of petroleum jelly to reduce evaporation. If the patient is using oxygen, use an alternative nonpetroleum-based lubricant. Avoid perfumed lip balms and swabs containing lemon and glycerin, as these can be both desiccating and irritating, particularly on open sores. If eyelids are not closed, moisten conjunctiva with an ophthalmic lubricating gel every 3 to 4 hours or artificial tears or physiologic saline solution every 15 to 30 minutes to avoid painful dry eyes.

Cardiac dysfunction and renal failure.

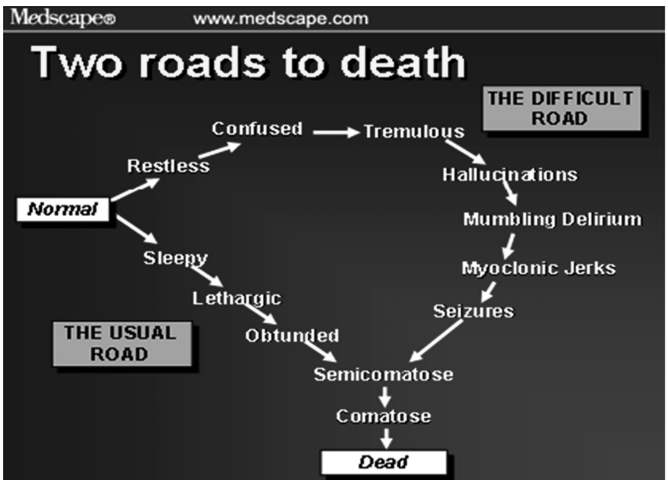
As cardiac output and intravascular volume decrease at the end of life, there will be evidence of diminished

peripheral blood perfusion. Tachycardia, hypotension, peripheral cooling, peripheral and central cyanosis, and mottling of the skin (livedo reticularis) are expected. Venous blood may pool along dependent skin surfaces. Urine output falls as perfusion of the kidneys diminishes. Oliguria or anuria usually ensue. Parenteral fluids will not reverse this circulatory shut down.[17]

Neurologic dysfunction.

The neurologic changes associated with the dying process are the result of multiple concurrent irreversible factors. These changes may manifest themselves in 2 different patterns that have been described as the "2 roads to death" (Figure). [18] Most patients follow the "usual road" that presents as a decreasing level of consciousness that leads to coma and death.

Figure. Two roads to death.



Decreasing Level of Consciousness.

The majority of patients traverse the "usual road to death." They experience increasing drowsiness, sleep most if not all of the time, and eventually become unarousable. Absence of eyelash reflexes on physical examination indicates a profound level of coma equivalent to full anesthesia.

Communication with the unconscious patient.

Families will frequently find that their decreasing ability to communicate is distressing. The last hours of life are the time when they most want to communicate with their loved one. As many clinicians have observed, the degree of family distress seems to be inversely related to the extent to which advance planning and preparation occurred. The time spent preparing families is likely to be very worthwhile. While we do not know what unconscious patients can actually hear, extrapolation from data from the operating room and "near death" experiences suggests that at times their awareness may be greater than their ability to respond. Given our inability to assess a dying patient's comprehension and the distress that talking "over" the patient may cause, it is prudent to presume that the unconscious patient hears everything. Advise families and professional caregivers to talk to the patient as if he or she were conscious. Encourage families to create an environment that is familiar and pleasant. Surround the patient with the people, children, pets, objects, music, and sounds that he or she would like. Include the patient in everyday conversations. Encourage family members to say the things they need to say. At times, it may seem that a patient may be waiting for permission to die. If this is the case, encourage family members to give the patient permission to "let go" and die in a manner that feels most comfortable. The physician, nurse, social worker, chaplain, or other caregivers might suggest to family members other words like:

"I know that you are dying; please do so when you are ready."

"I love you. I will miss you. I will never forget you. Please do what you need to do when you are ready."

"Mommy and Daddy love you. We will miss you, but we will be okay."

As touch can heighten communication, encourage family members to show affection in ways they are used to. Let them know that it is okay to lie beside the patient in privacy to maintain as much intimacy as they feel comfortable with.

Terminal delirium.

An agitated delirium may be the first sign to herald the "difficult road to death." It frequently presents

as confusion, restlessness, and/or agitation, with or without day-night reversal.[19] To the family and professional caregivers who do not understand it, agitated terminal delirium can be very distressing. Although previous care may have been excellent, if the delirium goes misdiagnosed or unmanaged, family members will likely remember a horrible death, "in terrible pain," and cognitively impaired "because of the drugs," and they may worry that their own death will be the same. In anticipation of the possibility of terminal delirium, educate and support family and professional caregivers to understand its causes, the finality and irreversibility of the situation, and approaches to its management. It is particularly important that all onlookers understand that what the patient experiences may be very different from what they see.

If the patient is not assessed to be imminently dying, it may be appropriate to evaluate and try to reverse treatable contributing factors. However, if the patient is in the last hours of his or her life, the condition is by definition irreversible. Focus on the management of the symptoms associated with the terminal delirium in order to settle the patient and the family.[20] When moaning, groaning, and grimacing accompany the agitation and restlessness, these symptoms are frequently misinterpreted as physical pain.[21] However, it is a myth that uncontrollable pain suddenly develops during the last hours of life when it has not previously been a problem. While a trial of opioids may be beneficial in the unconscious patient who is difficult to assess, clinicians must remember that opioids may accumulate and add to delirium when renal clearance is poor.[22,23] If the trial of increased opioids does not relieve the agitation or makes the delirium worse by increasing agitation or precipitating myoclonic jerks or seizures (rare), then pursue alternative therapies directed at suppressing the symptoms associated with delirium.

Although not the drug class of first choice for treating reversible, nonterminal delirium, benzodiazepines are used widely by palliative experts to treat terminal delirium as they are anxiolytics, amnestics, skeletal muscle relaxants, and antiepileptics.[24]

Common starting doses are:

Lorazepam, 1-2 mg as an elixir, or a tablet predissolved in 0.5-1.0 mL of water and administered against the buccal mucosa every hour as needed until agitation subsides.

Most patients will be controlled with 2-10 mg/24 hours. It can then be given in divided doses, every 3-4 hours, to keep the patient settled. For a few extremely agitated patients, high doses of lorazepam, 20-50+ mg/24 hours, may be required.

Midazolam 1-5 mg/hour subcutaneously or intravenously by continuous infusion, preceded by repeated loading boluses of 0.5 mg every 15 minutes to effect, may be a rapidly effective alternative.

Benzodiazepines may paradoxically excite some patients.[25] These patients require neuroleptic medications to control their delirium.

Haloperidol 0.5-2.0 mg intravenously, subcutaneously, or rectally every hour until agitation is controlled (titrate to effect, then give the summed dose nightly to every 6 hours to maintain control).[26]

Chlorpromazine 10-25 mg orally, rectally, intramuscularly, or intravenously nightly to every 6 hours and titrated to effect is a more sedating alternative.[27]

Barbiturates or propofol have been suggested as alternatives.[28,29]

Seizures may be managed with high doses of benzodiazepines.

Other antiepileptics such as intravenous phenytoin, subcutaneous fosphenytoin, or phenobarbital 60-120 mg rectally, intravenously, or intramuscularly every 10-20 minutes as needed may become necessary until control is established. Alternatively,

Carbamazepine 200 mg rectally 3-4 times per day can be used.

Respiratory dysfunction.

Changes in a dying patient's breathing pattern may be indicative of significant neurologic compromise.[30-32] Breaths may become very shallow and frequent with a diminishing tidal volume. Periods of apnea and/or Cheyne-Stokes pattern respirations may develop. (Cheyne-Stokes is a disorder characterized by recurrent central apneas during sleep, alternating with a crescendo-decrescendo pattern of tidal volume.[33]) Accessory respiratory muscle use may also become prominent. A few (or many) last reflex breaths may signal death. Families and professional caregivers frequently find changes in breathing patterns to be one of the most distressing signs of impending death. Many fear that the comatose patient will experience a sense of suffocation. Knowledge that the unresponsive patient may not be experiencing breathlessness or "suffocating," and may not benefit from oxygen (which may actually prolong the dying process) can be very comforting. Low doses of opioids or benzodiazepines are appropriate to manage any perception of breathlessness. Some clinicians express concern that the use of opioids or benzodiazepines for symptom control near the end of life will hasten death. Consequently, they feel they must invoke the ethical principle of "double effect" to justify treatment. The principle of double effect applies in situations where there is a difference in the effects of an intended action (alleviating suffering) and the unintended possible consequences of the same action (hastening death). To be acceptable, the action must comply with the following requirements:
The treatment proposed must be beneficial or at least neutral (relief of intolerable symptoms); the clinician must intend only the good effect (relieving pain or symptoms), although some untoward effects might be foreseen (hastening death or loss of consciousness); the untoward effect must not be a means (not necessary) to bring about the good effect; and the good result (relief of suffering) must outweigh the untoward outcome (hastening death).[34]

While it is true that patients are more likely to receive higher doses of both opioids and sedatives as they get closer to death, there is no evidence that initiation of treatment or increases in dose of opioids or sedatives is associated with precipitation of death. In fact, the evidence suggests the opposite. [35]

Loss of ability to swallow.

Weakness and decreased neurologic function frequently combine to impair the patient's ability to swallow. The gag reflex and reflexive clearing of the oropharynx decline and secretions from the tracheobronchial tree accumulate. These conditions may become more prominent as the patient loses consciousness. Buildup of saliva and oropharyngeal secretions may lead to gurgling, crackling, or rattling sounds with each breath.[36] Some have called this the "death rattle" (a term that should be avoided, as it is frequently disconcerting to families and caregivers). Once the patient is unable to swallow, cease oral intake. Warn families and professional caregivers of the risk of aspiration. Scopolamine or glycopyrrolate will effectively reduce the production of saliva and other secretions.[37,38]
Common starting doses of these medications are:

Scopolamine, 0.2-0.4 mg subcutaneously every 4 hours, or Scopolamine, 1-3 transdermal patches every 72 hours, or Scopolamine, 0.1-1.0 mg/hr by continuous intravenous or subcutaneous infusion.

Glycopyrrolate, 0.2 mg subcutaneously every 4-6 hours, or Glycopyrrolate, 0.4-1.2 mg daily by continuous intravenous or subcutaneous infusion.
These drugs will minimize or eliminate the gurgling and crackling sounds and may be used prophylactically in the unconscious dying patient.

Anecdotal evidence suggests that the earlier treatment is initiated, the better it works, as larger amounts of secretions in the upper aerodigestive tract are more difficult to eliminate. However, premature use in the patient who is still alert may lead to unacceptable drying of oral and pharyngeal mucosa. While atropine may be equally effective, it has an increased risk of producing undesired cardiac and/or central

nervous system excitation.[39]

If excessive fluid accumulates in the back of the throat and upper airways, it may need to be cleared by repositioning of the patient or postural drainage. Turning the patient onto one side or into a semiprone position may reduce gurgling. Lowering the head of the bed and raising the foot of the bed while the patient is in a semiprone position may cause fluids to move into the oropharynx, from which they can be easily removed. Do not maintain this position for more than a few minutes at a time, as stomach contents may also move unexpectedly.

Oropharyngeal suctioning is not recommended. Suctioning is frequently ineffective, as fluids are beyond the reach of the catheter, and may only stimulate an otherwise peaceful patient and distress family members who are watching.

Loss of sphincter control.

Fatigue and loss of sphincter control in the last hours of life may lead to incontinence of urine and/or stool. Both can be very distressing to patients and family members, particularly if they are not warned in advance that these problems may arise. If they occur, attention needs to be paid to cleaning and skin care. A urinary catheter may minimize the need for frequent changing and cleaning, prevent skin breakdown, and reduce the demand on caregivers. However, it is not always necessary if urine flow is minimal and can be managed with absorbent pads or surfaces. If diarrhea is considerable and relentless, a rectal tube may be similarly effective.

Pain.

While many people fear that pain will suddenly increase as the patient dies, there is no evidence to suggest that this occurs. Though difficult to assess, continuous pain in the semiconscious or obtunded patient may be associated with grimacing and continuous facial tension, particularly across the forehead and between the eyebrows. The possibility of pain must also be considered when physiologic signs occur, such as transitory tachycardia that may signal distress. However, do not over diagnose pain when fleeting forehead tension comes and goes with movement or mental activity (e.g., dreams or hallucinations). Do not confuse pain with the restlessness, agitation, moaning, and groaning that accompany terminal delirium. If the diagnosis is unclear, a trial of a higher dose of opioid may be necessary to judge whether pain is driving the observed behaviors.

Knowledge of opioid pharmacology becomes critical during the last hours of life. The liver conjugates codeine, morphine, oxycodone, and hydromorphone into glucuronides. Some of their metabolites remain active as analgesics until they are renally cleared, particularly those of morphine. As dying patients experience diminished hepatic function and renal perfusion, and usually become oliguric or anuric, routine dosing or continuous infusions of morphine may lead to increased serum concentrations of active metabolites, toxicity, and an increased risk of terminal delirium. To minimize this risk, discontinue routine dosing or continuous infusions of morphine when urine output and renal clearance stop. Titrate morphine breakthrough (rescue) doses to manage expressions suggestive of continuous pain. Consider the use of alternative opioids with inactive metabolites such as fentanyl or hydromorphone.

Loss of ability to close eyes.

Eyes that remain open can be distressing to onlookers unless the condition is understood. Advanced wasting leads to loss of the retro-orbital fat pad, and the orbit falls posteriorly within the orbital socket.[40] As eyelids are of insufficient length to both extend the additional distance backward and cover the conjunctiva, they may not be able to fully appose. This may leave some conjunctiva exposed even when the patient is sleeping. If conjunctiva remains exposed, maintain moisture by using ophthalmic lubricants, artificial tears, or physiologic saline.[41]

Medications. As patients approach death, reassess the need for each medication and minimize the number

of drugs that the patient is taking. Continue only those medications needed to manage symptoms such as pain, breathlessness, excess secretions, and terminal delirium and to reduce the risk of seizures. Choose the least invasive route of administration: the buccal mucosa or oral routes first, the transcutaneous route if appropriate, the subcutaneous or intravenous routes only if necessary, and the intramuscular route almost never. Rectal administration can also be considered, especially if the oral route is not possible.

Dying in Institutions.

The preceding discussion is relevant to patients dying in any setting (eg, at home, in hospitals, in nursing homes, other extended care facilities, prisons, etc.). However, there are particular challenges to ensuring a comfortable death in an institution whose culture is not focused on end-of-life care.[42]

When death is imminent, it is appropriate that patients remain with caregivers they know rather than be transferred to another facility. Institutions can help by making the environment as homelike as possible. It is appropriate for the physician, nurse practitioner, or physician assistant to order a private room where family can be present continuously and be undisturbed with the patient if they so choose. The clinician will want to talk with the professional staff and encourage continuity of care plans across nursing shifts and changes in house staff. Priorities and care plans at the end of life differ considerably from priorities and plans focusing on life prolongation and cure. It is frequently challenging for physicians, nurses, and other healthcare professionals to incorporate both kinds of care into a busy hospital or skilled nursing facility. For this reason, specialized units where patients and families can be assured of the environment and the skilled care they need have been developed in many institutions.[43,44]

When Death Occurs No matter how well families and professional caregivers are prepared, they may find the time of death to be challenging. Families, including children, and caregivers may have specific questions for health professionals.

Basic information about death may be appropriate (e.g., the heart stops beating; breathing stops; pupils become fixed; body color becomes pale and waxen as blood settles; body temperature drops; muscles and sphincters relax, and urine and stool may be released; eyes may remain open; the jaw can fall open; and observers may hear the trickling of fluids internally) (Table 2). [45, 46]

Table 2. Signs That Death Has Occurred

The heart stops beating
Breathing stops
Pupils become fixed and dilated
Body color becomes pale and waxen as blood settles
Body temperature drops
Muscles and sphincters relax (muscles stiffen 4-6 hours after death as rigor mortis sets in)
Urine and stool may be released
Eyes may remain open
The jaw can fall open
Observers may hear the trickling of fluids internally, even after death

There are no universally applicable rules that govern what happens when the patient dies (in any setting). If the patient dies an expected death at home, there is no need to call for emergency assistance. If a hospice program is involved, have the family call the hospice. If a hospice program is not involved, determine in advance who should be notified. Unless death is unexpected, or malice is suspected, involvement of the coroner's office is usually not required (State and local regulations vary. Healthcare professionals will need to familiarize themselves with the regulations in the areas in which they practice.)

When an expected death occurs, the focus of care should shift from the patient to the family and those who provided care. Even though the loss has been anticipated for some time, no one will know what it feels like until it actually occurs, and indeed it may take hours to days to weeks or even months for each person to realize the full effect. Many experts assert that the time spent with the body immediately after death will help people deal with acute grief.[47-49] Those present, including caregivers, may need the clinician's permission to spend the time to come to terms with the event and say their good-byes. There is no need to rush, even in the hospital or other care facility. Encourage those who need to touch, hold, and even kiss the person's body as they feel most comfortable (while maintaining universal body fluid precautions).

As a visually peaceful and accessible environment may facilitate the acute grieving process, a health professional, usually the nurse, should spend a few moments alone in the room positioning the patient's body, disconnecting any lines and machinery, removing catheters, and cleaning up any mess, to allow the family closer access to the patient's body. [50,51]

Notifying Others of the Death

Spiritual advisors or other interdisciplinary team members may be instrumental in orchestrating events to facilitate the experience of those present. Those who have not been present for the death may benefit from listening to a recounting of how things went leading up to the death and afterward. Grief reactions beyond cultural norms may suggest a risk of significant ongoing or delayed grief reactions.

When letting people know about the death, follow the guidelines for communicating bad news (Table 3). Try to avoid breaking unexpected news by telephone, as communicating in person provides much greater opportunity for assessment and support. If additional visitors arrive, spend a few moments to prepare them for what they are likely to see.

Table 3. Guidelines for Communicating Bad News

1.	Get the setting right
2.	Ask what the person understands
3.	Provide a "warning shot"
4.	Tell the news
5.	Respond to emotions with empathy
6.	Conclude with a plan

Once family members have had the time they need to deal with their acute grief reactions and observe their customs and traditions, then preparations for burial or cremation and a funeral or memorial service(s) can begin. Some family members may find it therapeutic to help bathe and prepare the person's body for transfer to the funeral home or the hospital morgue. For many, such rituals will be their final act of direct caring.

Depending on local regulations and arrangements, some funeral directors will insist on the completed death certificate being present before they pick up the body. All will require a completed death certificate to proceed with any body preparation and registration of the death. To avoid delaying the process, ensure that the clinician who will complete the certificate has ample warning that one will be required.

For many, moving the body is a major confrontation with the reality of the death. Some family members will wish to witness the removal. Others will find it very difficult and will prefer to be elsewhere. Once the body has been removed and family members are settled, professional caregivers can offer to assist them with some of their immediate tasks. They may notify other clinicians and caregivers that the death has occurred so that services can be stopped and equipment removed. Local regulations governing the handling of medications and waste disposal after a death vary. When family members are ready, professional caregivers can let the family know how to reach them, and then leave them to have some privacy together.

Pronouncing Death

In teaching hospitals, medical students and residents are typically called to "pronounce" death.[52] In non-teaching settings, the attending physician or nursing staff may be the professionals to do this task. When a patient dies at home with hospice care, it is usually a nurse who confirms the absence of vital signs. Although local regulations differ, if an expected death occurs at home without hospice care and the patient has a physician or other clinician willing to sign a death certificate, then transportation to a hospital for a physician to confirm death may not be needed.

The telephone call. The process often begins with a telephone call: "Please come; I think the patient has died."

Begin by asking a few key questions:

Find out the circumstances of the death -- expected or sudden?
Is the family present?
What is the patient's age?

Before entering the room.

Confirm the details on the circumstances of death with other health professionals or caregivers.
Review the chart for important medical (length of illness, cause of death) and family issues. (Who is family? What faith? Is there a clergy contact?)
Find out who has been called. Other physicians or NP/PA? The attending?
Has an autopsy ever been requested? Do you see a value in requesting an autopsy?
Has the subject of organ donation been broached? Has the Organ Donor Network been contacted?

In the room.

I You may want to ask the nurse, social worker or chaplain to accompany you; he/she can give you support and introduce you to the family.
Introduce yourself (including your relationship to the patient) to the family if they are present. Ask each person their name and relationship to the patient. Shake hands with each.
Say something empathic: "I'm sorry for your loss..." or "This must be very difficult for you..."
Explain what you are there to do. Tell the family they are welcome to stay, if they wish, while you examine their loved one.
Ask what questions the family has. If you cannot answer, contact someone who can.

The pronouncement of death.

Identify the patient. Use the hospital ID tag if available.
Note the general appearance of the body.
Test for response to verbal or tactile stimuli. Overtly painful stimuli are not required. Nipple or testicle twisting, or deep sternal pressure, are inappropriate and unnecessary.
Listen for the absence of heart sounds; feel for the absence of carotid pulse.
Look and listen for the absence of spontaneous respirations.
Record the position of the pupils and the absence of pupillary light reflex.
Record the time at which your assessment was completed.

Documentation in the medical record.

Note that you were called to pronounce (name); chart findings of physical examination.
Note date and time of death; distinguish time family or others noted death from the time you confirmed the absence of vital signs. Note whether family and attending physician were notified.
Document whether family declines or accepts autopsy; document whether the coroner was notified.

Telephone Notification

There will be situations in which the people who need to know about the death are not present.[53-57] In some cases, you may choose to tell someone by telephone that the patient's condition has "changed," and wait for them to come to the bedside in order to tell the news.

Factors to consider in weighing whether to break the news over the telephone include: whether death was

expected, what the anticipated emotional reaction of the person may be, whether the person is alone, whether the person is able to understand, how far away the person is, the availability of transportation for the person, and the time of day (or night).

Inevitably, there are times when notification of death by telephone is unavoidable. If this is anticipated, prepare for it. Determine who should be called and in what fashion. Some families will prefer not to be awakened at night if there is an expected death.

Get the setting right.

Determine the facts before you call. Find a quiet or private area with a telephone. Identify yourself and ask the identity of the person to whom you are talking and their relationship to the patient. Ask to speak to the person closest to the patient (ideally, the healthcare proxy or the contact person indicated in the chart). Avoid responding to direct questions until you have verified the identity of the person to whom you are speaking. Ask whether the contact person is alone. Do not give death notification to minor children. Ask what the person understands. Ask what the person understands about the patient's condition with a phrase like, "What have you been told about M's condition?" Provide a "warning shot." One approach may be to begin with a sentence such as "I'm afraid I have some bad news." Tell the news. Use clear, direct language without jargon. For example, you could say, "I'm sorry to have to give you this news, but M just died." Avoid words like "expired," "passed away," and "passed on." They are easily misinterpreted.

Respond to emotions with empathy.

Most importantly, listen quietly to the person and allow enough time for the information to sink in. Elicit questions with a phrase like, "What questions do you have?" Ascertain what support the person has. Ask if you can contact anyone for them. Consider other support through the person's church, Red Cross, local police, or other service agencies if it is needed.

Conclude with a plan.

If the family chooses to come to see the body, arrange to meet them personally. Provide contact information for the physician, nurse, or other professional who can meet with them and/or make arrangements. Immediately after the death, those who survive will need time to recover. A bereavement card from the physician, nurse, or healthcare professional and attendance at the patient's funeral may be appropriate.[58] Many members of the professional team consider it a part of their professional duty of care to encourage follow-up visits from bereaved family members in order to assess the severity of their grief reactions and the effectiveness of their coping strategies, and to provide emotional support. Professional members of the interdisciplinary team can also offer to assist family members in dealing with outstanding practical matters, such as helping to secure documents necessary to redeem insurance, find legal counsel to execute the will and close the estate, find resources to meet financial obligations, etc. Bereavement care for the family is a standard part of hospice care in the United States.

Summary of Take-Home Lessons

Clinical competence, willingness to educate and calm, and empathic reassurance are critical to helping patients and families in the last hours of living. For the majority of dying patients, predictable physiologic changes occur. Management principles are the same at home or in a healthcare institution. However, death in an institution requires accommodations that include ensuring privacy, cultural observances, and communication that may not be customary. In anticipation of the event, it helps to inform the family and other professionals about what to do and what to expect, including matters such as when rigor mortis sets in, and how to call the funeral home, say goodbye, and move the body. Care does not end until the clinician has helped the family with their grief reactions and helped those with complicated grief to get care. Care at the end

of life is an important responsibility for every health professional, and there is a body of knowledge to guide care.[2,59,60]

In summary, keep these key points in mind:

- There is only one chance to get management of the last hours right.
- Patients in the last hours of life usually need skilled care around the clock.
- The environment must allow family and friends ready access to their loved one in a setting that is conducive to privacy and intimacy.
- Advance preparation and education of professional, family, and volunteer caregivers are essential.
- They should also be knowledgeable about the potential time course, signs and symptoms of the dying process, and their potential management.
- The physician or nurse needs to help family members understand that what they see may be very different from what the patient is experiencing.
- The physiologic changes of dying are complex. To control each symptom effectively, clinicians need to have an understanding of its cause, underlying pathophysiology, and the appropriate pharmacology to use.
- When death is imminent, fatigue is an expected part of the dying process and should not be treated medically in most cases.
- Most patients lose their appetite and reduce food intake long before they reach the last hours of their lives. Anorexia may be protective, and the resulting ketosis can lead to a greater sense of well-being and diminish pain.
- Most patients also reduce their fluid intake, or stop drinking entirely, long before they die. Dehydration in the last hours of living does not cause distress and may stimulate endorphin release that adds to the patient's sense of well-being.
- Moisture should be maintained in mucosal membranes with meticulous oral, lip, nasal, and conjunctival hygiene and lubrication.
- The majority of patients experience increasing drowsiness and sleep much of the time, eventually becoming unarousable. Absence of eyelash reflexes indicates a profound level of coma equivalent to full anesthesia.
- It should be presumed that the unconscious patient hears everything.
- Moaning, groaning, and grimacing accompanying agitation and restlessness are frequently misinterpreted as pain. Terminal delirium may be occurring. While a trial of opioids may be beneficial in the unconscious patient who is difficult to assess, benzodiazepines or sedating neuroleptics may be needed to manage terminal delirium. Benzodiazepines may cause paradoxical exciting effects; these patients require neuroleptic medications to control their delirium.
- Diminished hepatic function and renal perfusion may change the pharmacology of chronically administered medications.
- Secretions from the tracheobronchial tree frequently accumulate. Scopolamine or glycopyrrolate will effectively reduce the production of saliva and other secretions.
- Dying in an institution presents particular challenges. Priorities and care plans at the very end of life differ from those priorities and plans focused on life prolongation and cure.
- Planning discussions should cover personal, cultural, and religious traditions, rites, and rituals that may dictate how prayers are to be conducted, how a person's body is to be handled after death, and when/how the body can be moved.
- When an expected death occurs, the focus of care shifts to the family and those who provided care.
- Acute grief reactions should be addressed, especially when the body is moved.

Pearls and Pitfalls

Pearls for quality care include:

Use only essential medications. Stop routine dosing and continue to offer opioids as needed. Accumulating serum concentrations of active drug and metabolites

may lead to toxicity and terminal delirium. Know the signs of the dying process. Make a partnership with the patient and the family caregiver(s); draw them into the interdisciplinary team and foster their active participation in the care plan.

Common pitfalls include:

Maintaining parenteral fluids. Continuing fluids may have adverse effects that are not commonly considered. Oropharyngeal suctioning. While suctioning is likely to be ineffective at clearing secretions, it may be very effective at stimulating a gag, cough, or vomiting. Removing the body insensitively or too soon. This can be more distressing for families than the moment of death.

Editor's Note:

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कर्मण्येवाधिकारस्ते
My right is to my work

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Review article:

Initial resuscitation of hemorrhagic shock

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Abstract

The primary treatment of hemorrhagic shock is control of the source of bleeding as soon as possible and fluid replacement. In controlled hemorrhagic shock (CHS) where the source of bleeding has been occluded fluid replacement is aimed toward normalization of hemodynamic parameters. In uncontrolled hemorrhagic shock (UCHS) in which bleeding has temporarily stopped because of hypotension, vasoconstriction, and clot formation, fluid treatment is aimed at restoration of radial pulse, or restoration of sensorium or obtaining a blood pressure of 80 mmHg by aliquots of 250 ml of lactated Ringer's solution (hypotensive resuscitation). When evacuation time is shorter than one hour (usually urban trauma) immediate evacuation to a surgical facility is indicated after airway and breathing (A, B) have been secured ("scoop and run"). Precious time is not wasted by introducing an intravenous line. When expected evacuation time exceeds one hour an intravenous line is introduced and fluid treatment started before evacuation. Crystalloid solutions and blood transfusion are the mainstays of pre-hospital and in-hospital treatment of hemorrhagic shock. In the pre-hospital setting four types of fluid are presently recommended: crystalloid solutions, colloid solutions, hypertonic saline and oxygen-carrying blood substitutes. In unstable or unresponsive hemorrhagic shock surgical treatment is mandatory as soon as possible to control the source of bleeding.

Introduction

Hemorrhagic shock is defined as a condition of reduced perfusion of vital organs leading to inadequate delivery of oxygen and nutrients necessary for normal tissue and cellular function. The understanding of the Pathophysiology of shock has made significant progress only in the late 19th and early 20th centuries. Claude Bernard suggested that the organism attempts to maintain constancy of its milieu interie despite external forces that attempt to disrupt it [1].

Walter B. Cannon introduced the term homeostasis to describe the equilibrium maintained in the internal environment, and is credited for the first proposal to cause deliberate hypotension in order to reduce internal hemorrhage in uncontrolled hemorrhage before control of bleeding vessels [2].

Alfred Blalock proposed in 1934 four categories of shock: hypovolemic, vasogenic (septic), cardiogenic and neurogenic shock [3]. Hypovolemic shock the most common type results from loss of circulating blood volume due to loss of whole blood (hemorrhagic shock), plasma, interstitial fluid or a combination.

In 1947 Wiggers developed an animal model of graded controlled hemorrhagic shock by uptake of shed blood into a reservoir to maintain a predetermined level of hypotension[4].

This classic model was used by G. Tom Shires in

the 1960s and 1970s to demonstrate that a large extracellular fluid (ECF) deficit occurred in prolonged severe hemorrhagic shock which was greater than could be attributed to vascular refill alone [5]. Only the infusion of both shed blood and lactated Ringer's solution to replace the ECF deficit, replaced the red cell mass, plasma volume, and ECF. Based on this data, the advocates of early aggressive resuscitation argued that the need for increasing cardiac output and oxygen delivery to maintain microvascular perfusion and oxygenation, exceeds any risk of accentuating hemorrhage and therefore trauma victims in hypotensive hemorrhage should receive large volumes of fluids as early as possible.

Aggressive fluid resuscitation during the Vietnam War with red blood cells, plasma, and crystalloid solutions allowed patients who previously would have succumbed to hemorrhagic shock to survive. Renal failure became a less frequent clinical problem, vital organ function was better sustained, but fulminant pulmonary failure termed "DaNang lung" or "Acute Respiratory Distress Syndrome (ARDS)" appeared as an early cause of death after severe hemorrhage.
Additional studies by this group demonstrated that this prolonged period of hemorrhagic hypotension was associated with the development of microvascular injury with marked ECF deficit which could be corrected only by the administration of isotonic crystalloids in volumes 2 to 3 times the estimated blood loss to achieve survival. This was the basis of the current well known dogma "3 to 1 rule" for the treatment of hemorrhagic shock, which was adopted by the ATLS for the treatment of trauma casualties [6]. It was recommended that the early treatment of hemorrhagic shock includes primarily the control of external bleeding and early intravenous administration of 2000 ml of crystalloids through a large bore-hole catheter.

This practice however, has recently been challenged in clinical trials [7,8] and experimental animal models [9-12] of uncontrolled hemorrhagic shock. It was observed that attempting to increase blood pressure to normal by aggressive fluid resuscitation in uncontrolled hemorrhagic shock resulted in increased bleeding from injured vessels, hemodynamic decompensation, and increased mortality, when compared to no fluid resuscitation [8,13,14] or hypotensive resuscitation (permissive hypotension)[15,16]. This fundamental dissimilarity in the hemodynamic response between controlled hemorrhagic shock (CHS) in which the bleeding source has been occluded, and uncontrolled hemorrhagic shock (UCHS) in which bleeding has temporarily stopped because of hypotension, vasoconstriction, and thrombus formation, constitutes the basis
for our guidelines of fluid resuscitation in civilian as well as military trauma [17].

In CHS where the external bleeding source has been occluded as well as in UCHS where bleeding has temporarily stopped due to hypotension, when evacuation time is estimated to be shorter than one hour (usually urban trauma), immediate evacuation to a surgical facility is indicated after the airway and breathing (A, B) have been secured ("scoop and run"). Precious time is not wasted by introducing an intravenous line before evacuation, but infusion can be started en route to the medical facility.

When evacuation time is expected to be longer than one hour, an intravenous line is introduced and fluid resuscitation is started before evacuation.

Fluid resuscitation in CHS is aimed toward normalization of hemodynamic parameters, in contrast to UCHS, where hemostasis cannot be safely achieved, and early rapid evacuation to a surgical facility is considered the most important step of management after the airway and breathing have been secured. If transportation means are readily available fluid treatment can be started during evacuation.

According to the guidelines of the Israeli Defense Forces (IDF) fluid resuscitation of CHS is aimed toward normalization of hemodynamic parameters, in contrast to UCHS where the principles of hypotensive

resuscitation are operative and treatment is started when one of the three parameters is documented [18]:

a. Altered sensorium

b. Radial pulse cannot be palpated

c. Systolic blood pressure dropped below 80 mmHg.

Fluid treatment does not include the automatic early administration of 2000 ml of lactated Ringer's solution as recommended by the ATLS guidelines, but repeated aliquots of 250 ml are administered with continuous monitoring, aiming at a systolic blood pressure of 80 mmHg, appearance of a radial pulse, or regained consciousness. In several studies it has been demonstrated that the prognosis of brain injuries is primarily dependent on cerebral perfusion [19]. Therefore, it was recommended that in central nervous system injuries with hemorrhagic shock fluid treatment is aimed toward a systolic blood pressure of 100 mmHg.

Aggressive fluid infusion to achieve normal hemodynamic parameters is prohibited in UCHS because it may renew internal bleeding ("pop the clot"). Massive fluid resuscitation is withheld until the time of the surgical intervention. When the expected transportation time to the medical facility exceeds one hour, hemodynamic evaluation is repeated every 15 minutes, and if systolic blood pressure drops below 80 mmHg, radial pulse cannot be palpated or the sensorium deteriorates, aliquots of 250 ml of Ringer's lactate solution are infused in order to maintain this blood pressure.

Type of infused fluids

Infusions of crystalloid solutions and blood transfusions are the mainstays for the pre-hospital and in-hospital treatment of severe hemorrhagic shock. Blood is required for repletion of oxygen-carrying capacity, but it is usually not readily available in the prehospital settings because it requires refrigeration and typing. In the pre-hospital setting there are 4 types of fluids that are presently recommended for treatment of hemorrhagic shock:

1. Crystalloids

Lactated Ringer's solution is the most widely available and frequently used balanced salt solution for fluid resuscitation in hemorrhagic shock. It is safe and inexpensive, and it equilibrates rapidly throughout the extracellular compartment, restoring the extracellular fluid deficit associated with blood loss. Because of the rapid equilibration of balanced salt solutions into the extracellular space, larger volumes may be required for adequate resuscitation, resulting in decreased intravascular oncotic pressure. Although the use of crystalloids has been routine for resuscitation of patients with acute blood loss, several studies have raised questions regarding the effects of resuscitation regimens on aspects of the immune response to hemorrhagic shock. It was observed by Rhee et al. [20] that lactated Ringer's solution exacerbated neutrophil superoxide burst activity and increased neutrophil adherence. Also, it has been shown that aggressive crystalloid resuscitation was followed by increased cytokine activation including IL-1, IL-6, and TNF. [21]. The significant advantage of the currently available lactated Ringer's solution is that it provides a source of bicarbonate as a result of the metabolism of lactate to CO2 and H2O; and unlike bicarbonate, lactated Ringer's solution does not precipitate calcium when it is added to intravenous fluids.

2. Colloid solutions

The use of colloid solutions that tend to remain in the intravascular compartment has been advocated for treatment of hemorrhagic shock. Several colloid solutions were studied in clinical practice including human albumin, hydroxyl ethyl starch (HES), and dextran. Because colloid solutions remain briefly in the intravascular compartment, a lower total volume of resuscitative fluid is required to attain hemodynamic stability compared to crystalloid solutions. However, colloid solutions are more expensive, may bind and decrease serum ionized calcium, decrease circulating

levels of immunoglobulines, and may further compromise the extracellular fluid volume deficit rather than restoring it. Numerous experimental and clinical studies have compared crystalloid and colloid fluid resuscitation [22,23]. There is no clinical evidence that appropriate resuscitation with balanced salt solution is associated with any harmful effects on pulmonary function when guided by hemodynamic parameters [24]. No protective effect of colloid solutions on post-resuscitation pulmonary function was demonstrated, even though colloid solutions do produce transiently greater intravascular expansion per unit compared to crystalloid solutions. Colloid solutions are recommended in military scenarios because of a major concern with regard to resuscitation of hemorrhage in the military setting where considerable weight and volume of crystalloid solutions must be transported in the field sometimes on the back of the medical professionals. This results in an inadequate bulk of the Ringer's lactate solution that is transported to the frontline and thus compromises the resuscitation phase in forward areas of deployment. In addition, patients in hemorrhagic shock in a combat area are frequently dehydrated, presenting an additional problem for successful resuscitation.

3. Hypertonic solutions

Clinical and experimental studies have demonstrated that a small volume of hypertonic saline (5 ml/kg NaCl 7.5%) with or without dextran can be an effective initial resuscitation solution. Hypertonic solutions improve microvascular flow, control intracranial pressure, stabilize arterial pressure and cardiac output with small-volume infusion, with no deleterious effects on immune functions [25-27]. Based on the safety and efficacy of hypertonic saline, with the need for simplicity, limited volume that can be carried in the field particularly in military scenarios, and the relative low cost, the Committee on Fluid Resuscitation for Combat Casualties of the Institute of Medicine [28] concluded that the initial fluid resuscitation of the hemorrhaging battlefield casualty should be a 250 ml bolus of 7.5% saline delivered by a rapid infusion system. Systemic access would be achieved via an intraosseous needle or by intravenous access. This practice, however, has been recently challenged in clinical trials as well as laboratory studies of UCHS. Meta-analysis of clinical studies of hypertonic saline treatment of traumatic hemorrhagic shock showed an increase in blood pressure and cardiac output but there was no significant improvement in survival [24]. In animal studies hypertonic saline treatment of UCHS secondary to large-vessel injury resulted in increased bleeding from injured blood vessels, hemodynamic decompensation and increased mortality [9-11]. In UCHS secondary to solid organ injury (massive splenic injury) hypertonic saline infusion improved hemodynamics but did not increase bleeding from the injured solid organ [12].

4. Oxygen-carrying blood substitutes

hold promise as effective resuscitation fluids that may improve oxygen carrying capacity without problems of storage, compatibility, and disease transmission that are associated with standard blood transfusion. Oxygen-carrying blood substitutes can be generally divided into two types: fluorocarbon-based synthetic oxygen carriers and stroma-free cross linked human or non-human hemoglobin products. The fluorocarbon emulsions are easy to produce, have a long shelf life, and have minimal infectious or immunogenic effects. Potential disadvantages include the requirement of a high FiO2, and rapid plasma clearance. Hemoglobin-based oxygen carriers are notable for high oxygen carrying capacity, an appreciable oncotic effect, and prolonged shelf life. Disadvantages include short plasma half life, potential renal toxicity, hypertensive effects, and the potential of immunogenic effects. Further clinical trials to establish the optimal dosage, efficacy, safety, and the effect on outcome are indicated before oxygen-carrying blood substitutes are implemented in routine clinical practice.

Once oxygenation and circulating volume have been restored, re-evaluation of the clinical situation is in order. Vital signs, mental status, urinary output, and

capillary refill should be assessed regularly throughout the resuscitation. Initiation of central monitoring may be indicated at this time, if the response to initial resuscitation has been less than expected, or if blood loss is ongoing. Blood should be drawn to assess hematological, coagulation, electrolyte and metabolic status. Electrolyte and metabolic disorders as well as coagulation deficiencies should be corrected. Arterial blood gases should be obtained to determine the adequacy of oxygenation. Management of alternations in oxygenation, ventilation, pH, fluid and electrolyte balance should now be based on clinical evaluation and laboratory measurement. Blood components may also be used at this stage to replace identified deficiencies.

Most cases of unresponsive hemorrhagic shock to fluid management in the trauma patient are due to ongoing losses of blood volume or myocardial dysfunction. While initial stabilization is taking place, attention should be directed to prompt arrest of bleeding. Aggressive restoration of normal blood pressure without arrest of internal hemorrhage will enhance further losses of blood volume by increasing flow and impeding coagulation at the site of injury. Mild to moderate hypotension allows for clot formation and slows bleeding from injured blood vessels (hypotensive resuscitation). The hemodynamically unstable injured victim should be brought to surgery as soon as possible and the source of bleeding promptly identified and arrested.

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Clinical Trials in Medical Research

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Abstract

In current medical practice and in medical research, most prophylactic, diagnostic and therapeutic procedures involve risks and burdens. An outdated, inefficient development process threatens timely delivery of new medicines. In medical research, considerations related to the well-being of the human subject should take precedence over the interests of science and society. All pharmacy clinical trials procedures must comply with the relevant guidelines and regulations. Randomized clinical trials scientifically examine and evaluate the safety and efficacy of new drugs or therapeutic procedures using human subjects. The results of these studies are considered to be the most valued data in the era of evidence-based medicine. Good quality Randomized Controlled Trials are considered the Gold Standard in research designs to study the effects of interventions as they minimize the effects of chance or coincidence, biases, and balance confounders. Since the 1950s, the clinical trials have been successfully employed virtually in all the medicines in use today. To determine if a clinical trial is right for you, talk with the concerned health care provider and gather the information you need to make a choice.

KEYWORDS: *Bias, Clinical Trial, Randomised control Trial*

Introduction

Today's pharmaceutical pipeline has more than 9,200 new drugs, [1] but an outdated, inefficient development process threatens timely delivery of new medicines. Drug development is increasingly complex and expensive, with the total capitalized cost of a new drug, from discovery to market approval, approaching $900 million[2]. From 1995 to 2000, every eight compounds entering Phase I produced one approved drug; a 13 percent success rate. From 2000 to 2003, it took 13 entering compounds to get one approval; a success rate of only 8 percent [3, 4]. In 2004, the Food and Drug Administration issued its "Critical Path" report on the need to advance the drug development process. In subsequent updates, the initiative called for a collaborative industry wide effort to implement new tools and methodologies in clinical trials. Clinical trials are medical research studies in which people enrolled as participants to help doctors to find out whether a new treatment or procedure is safe and effective. Clinical trials are used to test all types of medical interventions. New tests and procedures are tested to find out if they are safe and effective for diagnosing disease. New drugs, treatment schedules, and surgical procedures are tested to determine whether they are safe and effective treatments for specific diseases. Dietary regimens, nutritional supplements, exercise programs, and other interventions are tested to discover if they are able to prevent disease safely and effectively. Most new medical interventions are tested in clinical trials before being made available to the general public. A properly planned and executed clinical trial is a powerful experimental technique for assessing the effectiveness of an intervention. Objective of research is to increase understanding of causal associations: etiological agents and risk factors improve methods of diagnosis and optimise therapy and management of the sick. Analytic studies can be classified into Experimental studies and Non-experimental studies. In experimental studies (intervention studies) investigator intentionally alters one or more factors to study the effects of so doing. Non-experimental (observational studies) does not involve intervention; investigator observes without intervention other than to record, count, and analyze results. Experimental studies can be sub classified into uncontrolled trials and controlled trials. Uncontrolled trials are experimental trials without control or comparison groups (e.g. phase I/II clinical trials). Controlled trials are trials with control groups (e.g. phase III trials). Controlled trials can be clinical trials (unit of randomization is an individual) or community trials (unit of randomization is a community or cluster). Non-experimental studies can be sub classify into cohort (retrospective and prospective), case control, cross sectional, ecological.

Controlled trials

Controlled trials can be classified into randomized control trials (RCTs), quasi-randomized, non-randomized. In randomized interventions allocated randomly (all participants or clusters have the same chance of being allocated to each of the study groups). In quasi randomized allocations done using schemes such as: according to date of birth (odd or even), number of the hospital record, date at which they are invited to participate in the study (odd or even), or alternatively into the different study groups. In non-randomized allocations to different groups done arbitrarily (without any underlying random process). The strength of the evidence depends on the method used to evaluate efficacy. Strength is ranging from weakest to strongest according to the method as case series, case control study, cohort study, and RCTs.

Controlled clinical trials

The control group consists of people: with the same disease characteristics as those in the intervention groups, who are not given the experimental intervention, they may be on placebo, or may be on other treatment. There can be more than one control group. Controls are chosen to provide an estimate of: what would happen if the intervention did not occur (natural course of illness), effects of personal expectations on the outcome (placebo effects), whether the experimental intervention is superior to the currently accepted 'gold standard' intervention.

Randomised Control Trial

Randomised Control Trial is a trial where the intervention is completely under the control of the investigator, the treatment and control group identical in their characteristics and the outcome assessment objective.

Choice of control population & control intervention

Control intervention: Placebo/sham intervention, treatment as usual, active intervention (the gold standard). Control population: Hospital based/ Community based, Should match intervention group in important disease and demographic variables (Berksonian Bias).

Problems with non-randomized controlled trials

It does not fully eliminate bias; selection of subjects, need to ensure that subjects are all matched for important baseline variables. It does not fully eliminate confounders; one group may have a better prognosis, need to ensure that subjects are all matched for important baseline variables.

Advantages of randomization

Concealment of randomized allocation ensures that the physician running the trial is not consciously or unconsciously allocating certain patients to a particular group. It produces comparable groups; measured and unknown prognostic factors will be on an average evenly balanced between the two groups. Validity of statistical tests of significance are guaranteed. It minimizes selection bias, ensures that all participants have 50% chance of being in either group. It minimizes confounding, ensures that confounders are equally distributed in both arms of the trial. Others are Stratified randomization and Blocking[6].

Cross over trials

It is a special case of randomized control design in which each patient serves as his own control. Each patient gets both drugs; the order in which the patient gets each drug is randomized. It avoids between participant variations in estimating the intervention effect and requires a small sample size.

Assumptions: The effects of intervention during the first period do not carry over into the second period. Internal and external factors are constant over time.

Advantages of cross over trials

The within patients' treatment differences can be measured rather than between patients. The variance within patients is typically less than the variance between patients. Small sample sizes are required. Treatment effects are adjusted for period differences.

Limitations of cross over design

There should not be treatment carry over effects from period 1 to 2.Treatment cannot change patients' state i.e. patients should return to period 1 (baseline).Time may affect treatment difference (e.g. Environment factors).

Factorial Designs

It attempts to evaluate two interventions with a control in a single experiment.

Incomplete factorial designs - when it is inappropriate, infeasible or unethical to address every possible treatment combination.

Advantages of factorial design

It allows effects of one intervention to be estimated at all the levels of the other intervention and also allows studying the interactive effects of two interventions.

Disadvantages of factorial design

The basic concern in a factorial design is the existence of possible *interaction* and its impact on the sample size. When there are two separate outcomes, (e.g.: heart disease and cancer) but one of the interventions has an effect on both, then data monitoring becomes complicated or sometimes impossible.

Phase I trials

Phase I trials are the first studies conducted in humans to evaluate a new drug. Phase I trials are conducted once the safety and potential efficacy of the new

drug have been documented in animals. Phase I trials tend to focus primarily on safety. It is conducted on healthy volunteers or on people with terminal illnesses with no cure. It is usually not randomized and not controlled. The purpose of this trial is, to study how often should the drug be given, to determine the highest, safe dose that can be administered, and to discover if, there are any negative side effects from the drug. In phase I trials the sample size is in the range of 10-20.

Phase II trials

A phase II trial is conducted on new drug or drug combination that appeared safe in a phase I trial. Often, the phase II trials are not randomised, particularly when the therapeutic effects of the new drug can be measured objectively. The purposes of a phase II treatment trial is to evaluate the safety of the drug, to study how the body *metabolizes* and eliminates the drug (this is known as pharmacokinetic data), and to collect preliminary data about the effectiveness of the drug for a specific condition

Phase I/II trials

Phase I/II trials are having some of the features of Phase I and II trials; designed to provide preliminary information on safety and efficacy.

Phase III trials

Phase III trials are designed and conducted once a new drug has been shown to be reasonably effective and safe in phase II trials. Phase III trials are typically effectiveness trials, because they seek to compare the new drug with an existing drug or intervention known to be effective (the current standard treatment). Most phase III trials are RCTs.

Phase II/III trials

Phase II/III trials are having some of the features of Phase II and III trials; designed to provide information on safety and efficacy.

Phase IV trials

Phase IV trials are large studies that seek to monitor adverse effects of a new drug after it has been approved for marketing (post marketing surveillance studies). They are mostly surveys and seldom include comparisons among interventions. Phase IV trials are not RCTs.

Mega-trials

'Mega-trial' is a term that is being used increasingly to describe RCTs with a simple design (usually very pragmatic) which include thousands of patients and limited data collection. Usually, these trials require the participation of many investigators (sometimes hundreds of them) from multiple centres and from different countries.

The main purpose of these large simple trials is to obtain 'increased statistical power' and to achieve wider generalisability. This means that their aim is to increase the chances of finding a difference between two or more interventions, if such a difference exists.

Sequential trial

A sequential trial is a study with parallel design in which the number of participants is not specified by the investigators beforehand. Instead, the investigators continue recruiting participants until a clear benefit of one of the interventions is observed, or until they are convinced that there are no important differences between the interventions. These trials allow a more efficient use of resources than trials with fixed numbers of participants, but they depend on the principal outcome being measured relatively soon after trial entry.

Preference trials

There are at least three types of RCTs that take into account the preferences of eligible individuals, whether they take part in the trial or not. These trials are called preference trials, because they include at least one group in which the participants are allowed to choose their own preferred treatment from among several options offered. These trials can have Zelen's design, a comprehensive cohort design, or Wennberg's design.

Zelen's design

Eligible individuals are randomised before they give consent to participate in the trial, to receive either a standard treatment or an experimental intervention. Those who are allocated to standard treatment are given the standard treatment and are not told that they are part of a trial, whereas those who are allocated to the experimental intervention are offered the experimental intervention and told that they are part of a trial. If they refuse to participate in the trial, they are given the standard intervention but are analysed as if they had received the experimental intervention. The main advantages of Zelen's design are that almost all eligible individuals are included in the trial and that the design allows the evaluation of the true effect of offering experimental interventions to patients. The main disadvantages are that they have to be open trials and that the statistical power of the study may be affected if a high proportion of participants choose to have the standard treatment.

Double randomised consent design

Modifcation of Zelen's design, Modified by informing participants of the group to which they have been allocated and by offering them the opportunity to switch to the other group. Even though this modified design overcomes the ethical concerns of the original Zelen's design, it does not solve the problems associated with lack of blinding and potential loss of statistical power.

Comprehensive cohort design

A comprehensive cohort trial is a study in which all participants are followed up, regardless of their randomisation status. In these trials, if a person agrees to take part in an RCT, he or she is randomised to one of the study interventions. If the person does not agree to be randomised because he or she has a strong preference for one of the interventions, that person will be given the preferred intervention and followed up as if he or she were part of a cohort study. At the end, the outcomes of people who participated in the RCT can be compared with those who participated in the cohort studies to assess their similarities and differences. This type of design is ideal for trials in which a large proportion of eligible individuals are likely to refuse to be randomised because they (or their clinicians) have a strong preference for one of the study interventions. Really a prospective cohort study with a small proportion of participants taking part in an RCT. One of the main limitations of this type of design is that any differences in outcomes may be explained by differences in the baseline characteristics of the participants in the randomised and non-randomised groups.

Wennberg's design

In a trial with Wennberg's design, eligible individuals are randomised to a 'preference group' or an 'RCT group'. Those individuals in the preference group are given the opportunity to receive the intervention that they choose, whereas those in the RCT group are allocated randomly to receive any of the study interventions, regardless of their preference. At the end of the study, the outcomes associated with each of the interventions in each of the groups are compared and used to estimate the impact of the participants' preferences on the outcomes.

Bias

Bias is inevitable in clinical research as it difficult for researchers to assume 'clinical equipoise'.

Selection bias

It is systematic differences in comparison groups in terms of demographic or illness variables. It may occur by chance or due to selective application of inclusion and exclusion criteria. It leads to confounders that can influence outcome independently or through interactive effects.

Performance bias

It is systematic differences in care provided apart from the intervention. In contamination subjects from either group get the other groups intervention. Co-intervention is additional interventions given that influence outcome. In differential intervention one group gets special treatment.

Attrition bias

This is the systematic differences in withdrawals from trials, inadequate reporting of withdrawals, drop-outs, protocol deviations. Reasons for drop-out can include improvement, no improvement, worsening, loss of interest, others. Not accounting for drop –outs in analysis elevates estimates of good outcome.

Detection bias

This is the systematic differences in outcome assessment between groups. There will be sometimes more contact with the treatment group than the control group. Selective reporting bias reports only favorable outcomes or positive outcomes, not reporting outcomes such as side effects, mortality, and quality of life ect.

Methods to reduce bias

1. Selection Bias: Randomization, allocation concealment, stratification and block randomization, and statistical adjustment of differences in prognostic factors in analyses.
2. Performance bias: Blinding (and masking), use of objective outcome measures (e.g.: mortality), documentation and statistical adjustment of treatment differences.
3. Attrition bias: Complete description of all trial participants, ensuring complete follow up, 'Intention to treat' principle in analysis, comparison of 'intention to treat' versus completers.
4. Detection Bias: Blinding, objective outcomes. Others: Use of a structured protocol in designing trials, peer review of protocol, and ensuring uniform methods[7].

Blinding

Masking is the purposeful concealment of some fact or condition and is done to keep knowledge of that fact or condition from influencing the behavior, observation, or reporting of persons so masked. Masking, in the context of trials, is imposed to reduce the likelihood of a treatment-related bias due to knowledge of treatment assignment.

Single blind: Participant is blind to treatment (placebo).

Double blind: Participants and outcome assessors blinded to treatment allocation.

Triple blind: Participants, outcome assessors, and those analyzing data are blinded.

Clinical Trial Protocol

The action plan for a clinical trial is called the trial protocol. The protocol outlines the purpose of the trial and the research questions being investigated. The protocol also describes the trial design and study procedures. This includes specific medical criteria for determining who will be enrolled in the trial, what drugs will be administered and their dosing schedule, testing and follow-up procedures, and other study details.

Improving the quality of RCTs

1. A list of random numbers may be used to randomise participants to reduce over estimation of treatment effect.
2. Use adequate methods of allocation concealment like centralised randomisation schemes; randomisation schemes controlled by a pharmacy etc.
3. Avoid improper blinding.
4. Sample size should be estimated before trial[6].

Ethical issues in RCTs

According to declaration of Helsinki some research populations are vulnerable and need special protection. The particular needs of the economically and medically disadvantaged must be recognized. Special attention is also required for those who cannot give or refuse consent for themselves, for those who may be subject to giving consent under duress, for those who will not benefit personally from the research, and for those for whom the research is combined with care. Appropriate caution must be exercised in the conduct of research which may affect the environment, and the welfare of animals used for research must be respected. The protocol should be submitted for consideration, comment, guidance, and where appropriate, approval to a specially appointed ethical review committee, which must be

independent of the investigator, the sponsor or any other kind of undue influence. The responsibility for the human subject must always rest with a medically qualified person and never rest on the subject of the research, even though the subject has given consent. Physicians should cease any investigation if the risks are found to outweigh the potential benefits or if there is conclusive proof of positive and beneficial results. Medical research is only justified if there is a reasonable likelihood that the populations in which the research is carried out stand to benefit from the results of the research. Both authors and publishers have ethical obligations. In publication of the results of research, the investigators are obliged to preserve the accuracy of the results. Negative as well as positive results should be published or otherwise publicly available. Sources of funding, institutional affiliations and any possible conflicts of interest should be declared in the publication. Reports of experimentation not in accordance with the principles laid down in this Declaration should not be accepted for publication[8-13].

Role of pharmacy

The role of the pharmacy in relation to clinical research is:

a) To safeguard subjects, health care professionals and the Trust by ensuring that INVESTIGATIONAL MEDICINAL PRODUCTS (IMPs) that is a pharmaceutical form of an active substance or placebo being tested or used as a reference in a clinical trial are appropriate for use and are procured, handled stored and used safely and correctly[15,18,19,20].

b) To ensure that IMPs are managed and dispensed to patients in accordance with the protocol.

c) To ensure that all pharmacy clinical trials procedures comply with relevant guidelines and regulations[14,16,17,20].

It is good practice to issue a policy document covering the safe handling of medicines used in clinical trials, including a statement of the responsibilities those the clinical trial investigator will delegate to the pharmacy department. The pharmacy department must ensure input into this policy document and its regular review and renewal are ensured [18,20].

Suggestions for statistical analysis

1. Provide a detailed description of the primary and secondary endpoints (***Binary*** (whether or not an event has occurred), ***Count*** (the frequency of an event in a set time period), ***Time to event*** (how long it takes to observe the outcome of interest), ***Measurement on a continuous scale***, etc. and how they are to be measured.
2. Provide details of the statistical methods and tests that will be used to analyse the endpoints. The analysis of the primary outcome must follow the principle of intention-to-treat.
3. Describe the strategy to be used (eg, alternative statistical procedures) if the distributional or test assumptions are not satisfied.
4. Detail whether comparisons will be one-tailed or two-tailed (with appropriate justification if necessary) and specify the level of significance to be used.
5. Identify whether any adjustment to the significance level or the final *P* values will be made to account for any planned or unplanned multiple testing or subgroup analyses.

In a clinical trial, substantial amounts of data are collected on each subject at randomization, such as the patient's demographic characteristics, disease-related risk factors, medical history, biochemical markers, and medical therapies, as well as outcome or endpoint data at various time points. These data can be quantitative or qualitative. Understanding the types of data is important as they determine which method of data analysis to use and how to report the results. The primary objective of a clinical trial is to provide a reliable estimate of the true treatment effect regarding the efficacy and/or safety of an investigational medicine or therapeutic procedure. Three major factors can influence the observed in treatment difference away from the true treatment effect. These are bias, confounding, and chance/

random error. Assuming no bias or confounding exists, statistical analysis deals with chance; by providing statistical estimation and testing (inference), it assesses whether random variation could reasonably explain the differences seen. While statistical estimates summarize the distribution of a measured outcome variable in terms of point estimate (e.g. mean or proportion) and measure of precision (e.g. confidence intervals), statistical testing involves an assessment of the probability of obtaining an observed treatment difference or more extreme difference in the outcome variable, assuming there is no difference in the population. Clinical trial data are almost invariably displayed in statistical tables. Familiarity with the structure of these tables, therefore,
allow a quick and logical appreciation of results. Use of a standardized column and row format, as well as informative headings, enables tables to stand alone and convey information in a concise manner. Such tables also allow a rapid comparison between treatment effects.

Conclusion

Randomized clinical trials need major investments in terms of patient and personnel involvement, and the funding to undertake the trial for the progress of medical care. This paper provided a short overview on the various types of clinical trials, and the main types of errors that can arise and can seriously compromise our ability to draw valid conclusions from clinical trials. Many of the concepts mentioned in this paper deal with minimizing bias and maximizing precision. An appropriate design requires a clear definition of the primary and secondary hypotheses in terms of measured outcomes and an explicit definition of the study population in order to avoid systematic errors. Statistical analyses deal with random errors due to sampling or random variation in the outcome variables. Interpretation of these statistical measures of treatment effect and comparisons should consider the potential contribution of bias or confounding. Finally, it is ethically imperative that a trial is conducted and monitored in such a way as to minimize harm to patients, while looking for the answer to the initial questions posed by the trial; whether the new treatment is better, worse, or similar to the comparison group. The medicines that will change healthcare delivery in the next 50 years to promise advances like personalized medicine, regenerative medicine and gene therapy that provide treatments for cancer, Alzheimer's and a host of other diseases.

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Review article:

A Study on Oral Hygiene Practice Among School Children of Pokhara Municipality

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Abstract:

Oral health status is an important part of health in general. Oral hygiene directly links with oral health. Oral hygiene practice is an important step towards good oral health. The survey study has been carried out to obtain information on methods of brushing, frequency of brushing and the material that the school children use for brushing. Result shows that majority children (60%) brush once a day. Lack of oral hygiene awareness is the key factor for poor oral hygiene and poor oral health.

Key Words:

Oral health, Oral hygiene, Oral hygiene practice, Oral hygiene awareness.

Introduction:

Oral health is an important part of general health of body. Oral hygiene determines oral health status. Thus oral hygiene is most important for good health in general. Poor oral hygiene can be source of many diseases. By maintaining the good oral hygiene, we can prevent occurrence of many disease. Unfortunately oral hygiene practice is very low in our society. Dental carries and periodontal problems are due to poor oral hygiene practices [1, 2, 3]. A survey has been carried out to assess the oral hygiene practice among school children attending community wellbeing dental care centre, Pokhara over a period of 2½years.

Methodology:

A total of 200 school children of age 3.5-16 years were surveyed randomly. They were asked three questions like:

1. How often do you brush in a day?
2. What materials do you use for brushing?

3. How will you brush your teeth?
Data were collected and analyzed.

Result:

1. Frequency of brushing.

Table1. The frequency of brushing and the proportion of children.

Frequency of brushing	No. of children	%
No brushing	20	10%
Occasionally	58	29%
Once a day	120	60%
Twice a day	2	1%
Total	200	100%

2. Material used for brushing:

Table 2. The various materials used for brushing and proportion of children using them.

Brushing materials	No. of children	%
Brush +Tooth powder	70	35%
Brush +Tooth paste	50	25%
Finger +Tooth Powder	60	30%
Dattiwon and Others	0	0%
Not any	20	10%
Total	200	100

3. Method of brushing:

Table 3: Various methods of brushing used by the school children and their proportion.

Brushing Method	No. of children	Percentage
Horizontal	72	40%
Vertical	27	15%
Mixed (random)	81	45%
Total	180	100

Discussion:

In table 1, the study has shown that major portion of school children population (60%) is brushing teeth only one time daily, 10% not brushing at all, 29% brushing occasionally and only 1% brushing twice daily. It may be due to lack of knowledge that they should brush twice daily. As seen in table 2, greater percentages of children (30%+10%=40%) do not use the brush for brushing the teeth. They use fingers or not anything. It may be due to inability to afford the toothbrush and also lack of awareness that they should brush with toothbrush. Table 3, shows that large number of children (45%) brush randomly, 15% brush vertically and 40% horizontally. These are all improper brushing techniques. They are not well aware about the proper brushing technique. They need to be educated properly.

Conclusion:

The study shows that very large numbers of children are not exercising proper oral hygiene practice. It is concluded that Oral hygiene awareness education and motivation are the basic steps for improving the oral hygiene practices among the school children.

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Original article:

Clinico Epidemiological Study on Pediatric Fractures At Narayani Sub Regional Hospital, Birganj

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Abstract

The purpose of this study is to identify the epidemiology of pediatric fractures in rural along with sub urban areas of this sub regional hospital and to formulate preventive measures to decrease such traumas.

Methods:

Between 2065, Baisakh to Asoj; all the pediatric fracture cases attending this hospital were prospectively studied. They were registered and information was recorded in a pre designed proforma. This study excluded those cases having soft tissue injuries without obvious fracture of any limb bone.

Results:

Total number of cases registered in this duration was 455. The age included from birth to 15 yrs. The number of boys was significantly larger than the girls (3:1). Most of the patients belonged to 4 to 9 yrs of age group (n=247). About 50% of the children were found involved in school going activities. The commonest mode of injury was fall during playing (n=416) especially in the domestic environment. The number of patients attending from Parsa district far outnumbered those attending from neighboring districts (n=263). The upper limb fractures were significantly higher than lower limb fractures (n=365). Similarly the left limb involvement was more than the right limb. Fractures around elbow, shaft radius/ulna, and distal radius were the most frequently encountered types in that order. Maximum number of cases reported in the month of Asadh (n=120). Most of the cases reported within 1-2 days after the injuries. Around 90% of the cases were managed in out patient clinic (n=399). The patients attending this hospital belonged either from mid socio economic group or from low socio economic group (>99%).

Conclusion:

The study shows that pediatric fractures are more common in mid and low socio economic groups. This is also very high in school going age groups. Maximum number of fractures takes place in the month of Ashadh, the month of school holydays. If more children are involved in school going activities, the number of fractures can be significantly reduced especially those caused by fall from trees and walls and other peridomestic activities. Moreover, this hospital should be better equipped and more staffed with trained manpower for effective trauma care service since it is the centre of care for patients of low and mid socio economic groups of this region.

Key words: *Close, fall, Pediatric fractures, peridomestic, radius/ulna, supra condylar*

Introduction:

Pediatric fracture is a leading social problem in Nepal like in other developing countries. It affects the livelihood of the poor and middle class community because of involvement of the working family members in treatment and hospital/ home care of the affected children. In USA, trauma is a leading cause of death in children after first year of life accounting for almost 50% of the mortality[1], but the picture and the result is different in rural scenario of developing countries like Nepal. There are some epidemiological studies about this burning problem in urban scenario in other countries but hardly any; in the rural society of our country.[2,3,4] We present a prospective clinico-epidemiological study of six months; the period from 1st Baisakh to 30th Asoj 2065 BS. We aimed to identify, how & how often, when & why such fractures occur in our rural society. We also aimed to come with some suggestions to reduce the incidence of such fractures and improve the existing problems in management of such fractures in a peripheral sub regional hospital.

Materials and methods:

Narayani sub regional hospital is a major public hospital in this region with encatchment areas from Parsa, Bara, Rautahat and Sarlahi districts besides the neighboring Indian villages. The study includes all the pediatric fracture cases up to 15 years of age attending this hospital and also in private clinics of the Orthopedic Surgeons attached to this hospital. A proforma was developed and all those cases falling in the inclusion criteria were enrolled at different entry points with some specific measures to avoid doubling of enrollments. On duty doctors completed the forms and made the diagnosis. Cases were managed primarily in out patient plaster clinic or admitted for in patient treatment if needed. They were followed up at 1st month and 3rd month after discharge from hospital.

Results

Table I: shows the incidence of fractures in different age groups. It also shows the number and percentage of fracture cases in boys and girls separately. The number of patients presenting with fractures increased with age until 12 yrs and then decreased. Out of 455 patients enrolled in six months period, 342 (75.16%) were boys and remaining 113 (24.83%) were girls with boys to girls' ratio 3:1. Maximum number of patients was found in age group of 4-6 yrs (n=137) followed by 7-9 yrs group (n=110). Combined together, they make it 54.27%.

365(80.22%) cases involved upper limb while 87(19.12%) cases involved lower limb. Rest 3 cases involved both upper and lower limbs. The most commonly encountered fracture was fractures around elbow region (n=97 cases), shaft of radius/ulna (n=96), followed closely by fracture of distal radius with or without ulna (n=77) in upper limb. Among the fractures around elbow, 76.28% (n=74) cases were supra condylar fracture of humerus; others being lateral condyle, medial condyle and capitullum fractures. Fracture shaft tibia with or without fibula and fracture shaft femur were almost equally common in lower limb fractures (46 and 36 cases respectively). 84.54% (n=82) cases of fractures around elbow were found in children of 5-10 yrs age group. The wrist and fore arm shaft fractures together were more common in 7-12 yrs age group (n=76{43.93%}).186 cases (50.95%) involved the left side and 179 cases (49.05%) involved right side in upper limb fractures. Similarly, in lower extremity also, left and right side involvement was 47 (54.02%) and 40 (41.24%) cases respectively. 3 cases which had both upper and lower limb involvement; had mixed type of presentation. 263 cases (57.80%) reported from Parsa district alone. Next to this; almost half the number (n=130) was from Bara district. Other neighboring districts like Sarlahi, Rautahat and villages from adjoining Indian border had lesser number of representations in that descending order. Almost half of the children were found not going to schools (n=224).The number of physeal injuries, open fractures, multiple fractures, non-accidental fractures, joint-dislocations and fractures associated with other injuries have not been very significant and are grouped as complex type of fractures in a separate table (Table:3).

Environmental factors have great impact as mode of injury promoting these fractures. Fall injuries in play grounds and fights/scuffles among siblings and friends are more frequent (n=153) than any other factors. Fall from trees, roof & walls, cots/ chairs, vehicles (bicycles) & back of pets are other modes of fall injuries in that descending order. Fall from cots and beds; and tripping over furniture was common etiology in neonates and toddlers in home environment. Overall number of cases having "fall" as mode of injury is 416 (92.41%). Pediatric fractures due to road traffic accidents are not very significant in number (n=25) in contrast to such fractures in urban areas[14]. Road traffic accident cases are few in number because of lack of transportation facilities in villages. A few cases of RTA are mainly from town areas. Fractures due to fall from trees (n=140) is second most common and accounts for one third of the total number of cases due to fall injuries. Cases due to fall from vehicles are 4.61% (n=21). Such cases are mainly due to fall from bicycle during playing or learning to ride.

Only 16 cases are found open fractures as compared to closed fractures (n=439) in this series. The patients attending this hospital belonged either from low socio economic or mid socio-economic communities (>99%). Hardly four patients belonged to high socio-economic community.

Regarding fracture incidence month wise, maximum number of cases (26.37%) reported in the month of Asadh (n=120), while minimum number (6.37%) of cases reported in the month of Shrawan (n=29). A separate table shows the month wise distribution (Table: 6). 85.27% cases reported primarily to this clinic within 0-2 days of the accident. Few cases reported 5-10 days later. Three cases of mal united lateral humeral condylar fractures reported even a month after the injuries. 399 cases (87.69%) were treated in out patient plaster clinic itself. Only (12.31%) cases needed in-patient care especially those having femoral shaft fractures or open fractures or operable fractures. Out of total 56 in-patients, only 30 (53.57%) cases needed operative management.

Most of the cases were followed up to three months after removal of the cast. 15 cases were found having significant early complications in form of wound infection in operative cases or open fractures; mal union of type III supra condyler fractures of humerus treated conservatively. In one of the monteggia fracture dislocation the radial head was detected unreduced after six weeks. Two of the cases developed myositis ossificans in brachialis muscle. Another four cases of supracondylar humerus fractures had early stiffness of their elbows due to poor physiotherapy. A separate table lists the early complications detected (Table: 7). The 3rd month follow up was not very satisfactory in number. Mostly the patients with some sort of mild to moderate complications reported for 2nd follow up. Those not turned up for 2nd follow up were calculated as having no major complications.

Discussion:

The knowledge base of fracture healing in children was developed in early 40s and 50s[5,6]. The effects of cultural differences on fracture among Indians, Swedish and Malay children were compared[4]. The epidemiological data on limb fracture patterns were analyzed and preventive programs set up[7]. The predominance of boys in pediatric fractures in this series is common like in all other series[2, 6, 8, 9] presumably due to their higher level of exposure and active behavior. A bi-modal peak is found in children at 5 & 8 yrs of age, contrary to other studies which mention 11-12 yr as unimodal peak age group[2, 7]. Among the fractures around elbow, supracondylar fracture of humerus is far more common than lateral condyle or medial condyle humerus fractures. Most of the supracondylar fractures can be managed conservatively contrary to the series in western countries which recommend operative management for all type III supracondylar fractures[15]. Most of the lateral condylar fractures of humerus are misdiagnosed and maltreated by quacks in sub urban areas. This is the main reason for late presentation of lateral condyle fractures in maluniting position.

The predominance of fracture of left upper extremity is statistically not significant yet; it is more than right side. It is likely that left upper extremity assumes the protective role during injury while the right upper limb is in use; regardless of the hand dominance. The less mature neuromuscular co-ordination in non dominant limb may also be responsible[10].

The usual fracture sites vary with age. Fractures around elbow are more common in 5-10 yrs age while wrist and fore arm fractures are common in little older children of 10-14 yrs age. These findings are consistent with studies in India[14,] Malaysia[2,] Sweden and USA[8.] Incidence of physeal injuries in upper limb varied from 15%-28%[4, 12.]in most of the abroad series. In our series, it accounts to 7.91% only, mostly in adolescents and predominantly involved the distal radius and distal humeral physis.. The incidence of open fractures was consistent with most of the other series ranging from 1.5-2.8%, while it is 3.51% in our series[6, 7.] Non accidental injuries accounted to 3.08% (n=14), which are mainly due to physical assault. One case of osteogenesis imperfecta has also been found.

The second largest group of fall injuries due to fall from trees occur mostly in the month of Asadh. These cases have been found due to fall from trees in day time especially from mango, guava and black berry trees in summer season. This group involves either the children who do not go to school or the school-going children off from schools during summer vacation. This is the month, when most of the children in rural areas spend their day time in gardens of fruits.

Understanding environmental etiology causing these fractures may be the first step in formulating preventive measures[11]. As most fractures occurred in home environment, efforts should be directed at reducing childhood injuries at home. In low socio-economic group, most parents go to work in day time and leave their small children & toddlers at home under care of their senior siblings. This is one of the main reasons of domestic fractures occurring due to fall during playing unattended by responsible seniors. Illiteracy and ignorance are the other causes of peridomestic pediatric fractures. Supervised environment at school is the main cause of less number of fractures in play ground in sub-urban villages and towns. In developed countries, implementation of guidelines on use of play grounds has led to reduction of injuries associated with play ground equipments[13]. Smaller children do not have access to the equipments meant for senior children in schools, indirectly reducing the number of fracture in smaller children.

Conclusion:

Pediatric fractures are major problems of low to mid socio-economic group of families in this region. Poverty and illiteracy are the root cause of the problem. Mass campaign for schooling in rural villages can help in reducing the number of children fractures in peridomestic environment. School going children need more parental supervision during summer vacations to cut short the excessive number of fall injuries from trees and roofs. Small kids should not be left alone at home without responsible supervision. Similarly, the children at school should also be supervised by teachers or care takers during play time.

The influence of quacks in villages is another cause of mismanagement of the cases. To reduce the burden of delay reporting of mal uniting fractures, public in villages should be mobilized against going to quacks. There should be good understanding between sub regional hospital and sub health posts of villages for better referral system. It will discourage the people going to quacks complicating their problems.

This hospital should be more staffed with trained manpower and better equipped for quick and efficient services. This is the centre not only for patients of four districts but for the patients of neighboring Indian villages as well. A large series with one year data will provide more detailed information regarding seasonal distribution of the cases. Similarly, minimum one year follow up is desirable to find out late complications as well.

TABLE: 1 Age & Sex distribution.

Age group (in yrs)	N	M:F	Percentage
0-3	84	59:25	18.46%
4-6	137	93:44	30.10%
7-9	110	92:18	24.17%
10-12	93	73:20	20.43%
13-15	31	28:3	6.81%
Total	455	342:113	100 % M:F 75.16%:24.83%

TABLE: 2 Types of fractures in Upper & Lower limbs.

UPPER LIMB		
Type of fracture	**Number (n=455)**	**Percentage**
Distal Radius	77	16.92
Shaft Rad/ulna	96	21.09
Distal Humerus (Around Elbow)	97	21.31
Shaft Humerus	14	3.07
Clavicle	26	5.71
Physeal Injuries a) distal Radius b)distal humerus	36 (29) (7)	7.91
Others	19	4.17
Total:	**365**	**80.18%**

LOWER LIMB		
Type of fracture	**Number (n=455)**	**Percentage**
Shaft Tibia & Fibula	46	10.10
Shaft Femur	36	7.91
Pelvis	2	0.43
Foot	2	0.43
Both U/L limb	3	0.65
Others	1	0.20
Total	**90**	**19.72%**

TABLE: 3 List of Complex types of Fractures.

Complex types of injuries	Number (percentage)
Physical injuries	36 (7.91%)
Open fractures	16 (3.51%)
Multiple fractures	11 (2.41%)
Joint dislocation	4 (0.87%)
Non accidental fractures	14 (3.07%)
With associated injuries	3 (0.65%)
Total Number	84 (n=455)

TABLE: 4 Mode of Injury

Causes	Number (n=455)	Percentage
1. Fall	416	91.42%
a. Playing	(153)	(33.62)
b. Tree	(140)	(30.76)
c. Roof/wall	(54)	(11.86)
d. Animals	(11)	(2.41)
e. Cots/chairs	(31)	(6.81)
f. Vehicles	(21)	(4.61)
g. Others	(6)	(1.31)
2. RTA	25	5.50%
3. Non Accidental	14	3.08%

TABLE: 5 Regional distributions.

District	Number(n=455)	Percentage
1. Parsa	263	57.80%
2. Bara	130	28.58%
3. Rautahat	21	4.61%
4. Sarlahi	27	5.93%
5. India	13	2.86%
6. Others	01	0.22%

TABLE: 6 Month wise distributions.

Month of injury	Number(n=455)	Percentage
1. Baisakh	90	19.78%
2. Jesth	93	20.44%
3. Asadh	**120**	**26.37%**
4. Shrawan	29	6.37%
5. Bhadra	67	14.73%
6. Asoj	56	12.31%

TABLE: 7 Early Complications.

SN	Complications	Number(n=455)
1	Mal union	6
2	Wound infection	2
3	Myositis Ossificans	2
4	Elbow Stiffness	4
5	Ulnar N palsy	1
6	Total	15 (3.30%)

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Original article:

Psychiatric Morbidity In Foreign Job Holders

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Abstract

Hypothesis: *A change in place of residence with its socio-cultural differences plays a role as stressor in precipitating psychiatric illnesses.*

Methodology: *Hospital-based, descriptive, cross-sectional study of 30 subjects receiving psychiatric services at BPKIHS, a tertiary care centre in eastern Nepal. Final diagnosis was approved by the consultant psychiatrist, based on ICD-10 criteria. After all ethical considerations, data were collected and analyzed by using SPSS 12.0 software.*

Results: *Mean age of the subjects was 27.97± SD 6.97 years with majority represented by married and unemployed adult male from rural areas of Nepal working as laborers in Arabian (Gulf) countries. All the subjects presented with one or more of the neuro-vegetative symptoms while 73.3% had anxiety, 70% had mood, 50% had psychotic and 50% had other symptoms in the form of headache, multiple physical complaints etc. Twenty percent had history of substance abuse while 16.7% presented with intentional self harm. Majority had primary mood disorders, depressive episode being the foremost presentation while 70% had more than one psychiatric diagnosis.*

Conclusion: *Though the relationship may be spurious, foreign job may cause or precipitate mental illness. Our findings emphasize the need for sensitivity to the special risks of psychiatric morbidity among foreign job holders.*

Key words: *Unemployed adult, foreign job, socio-cultural differences, psychiatric morbidity.*

Introduction:

It is no secret that migration has for many years been regarded as a cause of psychopathology and psychiatric disorders. The movement of individuals from a cultural context in which they have been surrounded by family, friends, and familiar institutions to a different geographic area that distances these people from their usual support systems has generally been seen as seriously stressful[6].

The current medical literature supports the notion of psychiatric disorders to be caused by the interaction of biopsychosocial factors. Migration is established as a factor related to psychiatric illness, along with other variables like age, sex, and marital status.[16] In spite of the fact that considerable literature exists concerning the relationships between migration and mental illness, this body of work is characterized by inconclusive results[10]. Moreover, the relationship between stressful events such as foreign job and the etiology and course of psychiatric illnesses has not been much considered.

Foreign job seeking is a profoundly troubling global phenomenon that has not received the attention it warrants, especially in the health field. This is true for Western countries but even more so for poor countries like ours[15].

According to Katon, Kleinman et al. in 1982, throughout the world, patients suffering emotional distress place a substantial burden of demand on systems of primary health care[9].

In a government report in Philippines it is stated that most domestic helpers on death row abroad had mental illness. Hence, the Philippine government's Foreign Service wants domestic helpers to take mandatory psychiatric evaluation before going overseas to work, amid concerns that most of the country's maids on death rows abroad have had a history of mental problems[12].

In an examination of all the cases of domestic workers under death sentence overseas there was an element of mental disorders in most of them[4]. Though such data about Nepalese workers overseas are unavailable, we do come across such incidents happening in News.

Studies have demonstrated that a large percentage of patients in primary care clinics suffer from emotional problems. Many of the patients who suffer from these problems are not diagnosed properly, and do not receive appropriate treatment by the medical staff. The problem is especially severe for patients who migrate[20]. Although any psychiatric tests are no guaranteeing that they will predict or pick all cases of mental illness. Nonetheless, using a valid and standardized tool will be a useful aid to medical examiners who routinely certify foreign job seekers to pick any potentially doubtful cases. Hence, to develop a psychiatric screening instrument which would be valid and culturally sensitive to Nepalese seeking foreign job could be an indisputable answer to prevent such incidents to some extent.

As of now in Nepal we do not have mandatory psychiatric evaluation before going overseas to work. Whatever medical evaluation that person seeking foreign job undertake is often merely a formality. Moreover, ongoing economic disadvantage – predominantly in resource-poor regions like Nepal – is causing many to migrate to industrialised countries. As there is a dearth of study in Nepal concerning the mental health condition among the individuals working abroad, this study was undertaken to explore this issue.

Objective

This study aims to evaluate the morbidity profile of patients presenting with the stressors related to foreign job.

Settings and Design

This is a hospital-based, descriptive, cross-sectional study of 30 subjects receiving psychiatric services at B.P. Koirala Institute of Health Sciences (BPKIHS), a

tertiary care centre at eastern Nepal. A consultant psychiatrist independently confirmed the clinical diagnosis of the subjects. Written informed consent was taken from the subject and the data were collected and analysed by using SPSS 12.0 software.

The subjects were included from those attending the Psychiatry OPD and admitted in the ward or subjects referred from any other departments of BPKIHS within 3 months period of data collection (February 2006 to April 2006).

The subjects were included by convenient sampling only after a consultant psychiatrist from the department of psychiatry independently confirmed the clinical diagnosis. ICD-10 criteria were used for the diagnosis[8].

Methods And Material

Method: Clinical, descriptive study of data collected retrospectively by chart review. The data was coded and analyzed using the SPSS 12.0 package. Descriptive statistics were used to examine the demographic data.

Definition Of Terms Used:

Foreign job in this study is defined as the temporary movement of people from one place to another, where national boundaries are crossed with an intension to seek job for an earning.

Migration in this study is defined as the movement of people from one place to another and used synonymously to the temporary movement to seek foreign job.

Results

Thirty newly diagnosed cases were studied. Mean age of the subjects was 27.97± SD 6.97 years with age range of 18 to 38 years. **(Table 1)** Majority of the subjects were male (90%), below 30 years of age (60%), married (66.75%), Hindu (90%), literate (76.7%), and were from rural areas (63.3%). **(Tables 2, 3,4,5,6 and 7)** Regarding occupational status at home 46.7% were unemployed, 10% were house wives, and 6.7% were students while the rest were employed. **(Table 8)** Sixty percent (60%) had gone to Arabian countries for job and majorities were employed as labour (70%). **(Tables 9 and 10)** All the subjects presented with one or more of the vegetative symptoms, 73.3% had anxiety feature, 56.7% (N: 17/30) had low mood, 13.3% had elevated mood, 50% had psychotic features and 50% had other symptoms in the form of headache and multiple physical complaints which were medically unexplained. Twenty percent (20%) had history of substance abuse while 16.7% (N: 5/30) presented with intentional self harm. **(Table 11)** Majority of the subjects (N: 17/30; 56.7%) had primary mood disorder and 6.7% had co-morbid mood disorder. Forty percent (N: 14/30; 46.7%) presented with depressive episode. Among others 26.7% had psychotic disorder (ATPD and Schizophrenia) and 16.7% had neurotic, stress related and somatoform disorder as primary psychiatric illness while 70% had more than one psychiatric illness. **(Table 12 and 13)** Majority of the subjects were managed in the department of psychiatry as inpatient (43.3%) and outpatient (50%) while the rest were managed in the referring departments. **(Table 14)**

TABLES:

Table 1: Age variables.

Variables	Age in years
Mean Age	27.97
Std. Deviation	6.049
Age Range	18-38

Table 2: Gender Distribution.

Gender Distribution	Frequency (N)	Percentage (%)
Male	27	90.0
Female	3	10.0

Table 3: Age distribution

Age Interval in years	Frequency (N)	Percentage (%)
<20	3	10.0
21 to 30	15	50.0
31 to 40	12	40.0

Table 4: Marital status.

Marital status	Frequency (N)	Percentage (%)
Married	20	66.7
Unmarried	10	33.3

Table 5: Religion.

Religion	Frequency (N)	Percentage (%)
Hindu	27	90.0
Islam	3	10.0

Table 6: Education status.

Education	Frequency (N)	Percentage (%)
Illiterate	7	23.3
Upto class VII	5	16.7
Class VII-X	9	30.0
SLC*	6	20.0
PCL**	3	10.0

*** School Leaving Certificate.**
**** Proficiency Certificate Level equivalent to XII class.**

Table 7: Domicile.

Domicile	Frequency (N)	Percentage (%)
Rural	19	63.3
Semi-urban	8	26.7
Urban	3	10.0

Table 8: Occupation at home.

Occupation	Frequency (N)	Percentage (%)
Unemployed	14	46.7
House-wife	3	10.0
Student	2	6.7
Employed	11	36.6

Table 9: Country visited

Country visited	Frequency (N)	Percentage (%)
Arabian countries*	18	60.0
America-DV	1	3.3
India	3	10.0
Malaysia	6	20.0
Singapore	1	3.3
Taiwan	1	3.3

*Includes Gulf countries like Saudi Arabia (N: 10, 33.3%), Dubai (N: 2, 6.7 %), Qatar (N: 4, 13.3 %), Kuwait (N: 2, 6.7%)

Table 10:

Job pursued	Frequency (N)	Percentage (%)
Labour	21	70.0
Maid	2	6.7
Record keeper	1	3.3
Salesman	1	3.3
Security personnel	1	3.3
Skilled work	4	13.3

Table 11: Clinical presentation#

Symptoms	Frequency (N)	Percentage (%)
Neuro-vegetative##	30	100.0
Anxiety symptoms	22	73.3
Low mood	17	56.7
Elevated mood	4	13.3
Psychotic symptoms	15	50.0
Others	15	50.0
Substance abuse	6	20.0
Intentional Self Harm	5	16.7

Note #: *Multiple response categories– each subject may have one or more symptoms.*
##: *Neuro-vegetative symptoms include disturbances in sleep, appetite and libido.*

Table 12: Primary diagnosis (ICD-10 category)

Primary diagnosis	Frequency (N)	Percentage (%)
Mood Disorders (F30-39)#	17	56.6
Psychotic Disorders (F20-29) ##	8	26.7
Neurotic, stress related and somatoform disorder (F 40-48) ###	5	16.7

Note #: *Forty percent (N: 14, 46.7%) presented with depressive episode while (N: 2, 6.7%) presented with manic episode and (N: 1, 3.3%) presented with mixed episode.*
##: N: 2, 6.7% presented with Acute and transient psychotic disorder and N: 6, 20% presented with schizophrenia.
###: N: 1, 3.3% presented with Dissociative Disorder, N: 1, 3.3% presented with Somatization Disorder, N: 1, 3.3% presented with mixed Obsessive- compulsive disorder and N: 2, 6.7% presented with Panic Disorder.

Table 13: Secondary diagnosis (ICD-10 category)#

Secondary diagnosis	Frequency (N)	Percentage (%)
ADS,with delirium,with convulsions (F10.41)	1	3.3
Alcohol induced psychosis (F10.52)	1	3.3
Alcohol, harmful use (F10.1)	4	13.3
Catatonia (F20.2)	1	3.3
ISH, cut throat (X78)	1	3.3
ISH, by pesticides (X68)	3	10.0
ISH, drug overdose (X61)	1	3.3
Dhat syndrome (F48.8)	2	6.7
Erectyle dysfunction (F52.2)	1	3.3
Panic attack (F41.0)	2	6.7
Personality disorder, unspecified (F60.9)	2	6.7
Thyroid dysfunction (E03)	1	3.3
Migraine (G43)	1	3.3

Note #: Multiple response categories– each subject may have one or more diagnosis.

Table 14: Settings for management.

Setting	Frequency (N)	Percentage (%)
Admitted in psychiatry ward	13	43.3
In psychiatry OPD	15	50.0
Managed in other wards	2	6.7

Discussions:

Our observation of young age at presentation is of great concern. This is the age when a person usually provides financial support to the family. Male preponderance may be just a reflection that foreign jobs are usually sought by male members in the family. Usually male, moves to an industrial, urbanized area and sends money back to their family to run house hold, perhaps over a period of a year or two. Majority representation of married subjects may point to the fact that leaving spouse and children back home may be an additional factor adding to the overall stressors.

As majorities were Hindus and went to seek job in Arabian countries the cultural and religious differences could have added to the psychological distress. In a community survey cultural and religious differences were found to have the highest rate of psychiatric morbidity[3]. In studies on high ethnic density acting as a protective factor for developing psychotic disorders in migrants may be regarded as evidence pointing at a more general hypothesis of "fit"—that is, that individuals with a particular social characteristic living in areas where that characteristic is less common have higher rates of psychopathology[17, 18, 19].

In a community survey examining the differences in levels of psychological distress and its symptomatology, comparing 110 Ethiopian-Jewish and 400 Russian-Jewish immigrants to Israel, the results suggest that the differences in levels and symptom expression of psychological distress are determined, to a considerable extent, by the differing cultural backgrounds[14]. In a study in Romania the socio-demographic and clinical profile of the migrants who had developed mental illness revealed that most of the patients were young with no previous experience abroad and with few social ties in the host country, with unqualified and insecure jobs[13]. These observations resonate in our study.

Majority of the subjects were literate but did not have a secure job at home. This comprehends to the fact that ongoing economic down turn – predominantly in resource-poor regions like Nepal – is causing many to migrate to industrialised countries.

Though majorities were literate, the job sought at the host country was mainly as a labour. It is said that such discrimination, social isolation, insecurity: may add up and increase the risk for mental illness[13].

In our study ninety percent were from rural and semi-urban areas of Nepal which points to the fact that disruption in established rural/village social networks and local power relations significantly effect and perhaps reflect the contemporary social pressures

of the urban societies in the work place. 'Social pathology' is a term worth rehabilitating to describe the often unexpectedly negative effects of such planned change on human conditions[15]. Confiding to our finding individuals from rural areas had higher morbidity than those coming from urban areas[13].

In a study on forty seven Hungarians, Romanians, Czechoslovakians, Poles and Gypsies referred by voluntary or government agencies, other organizations or community members to a refugee counseling service in Seattle, Washington, psychiatric disorders were frequent (N:31/46; 67%) and were associated with previous mental health problems in seventeen subjects (37%)[1]. In our study, all subject had primary psychiatric disorders. In another study first admission rates to the psychiatric hospital in Kuwait revealed that foreign housemaids as a whole had about five times the rate of Kuwaiti females[5]. Similar to our findings mood disorders and neurotic, stress related and somatoform disorders were common presentation.

In a study on psychopathology of white mentally ill immigrants to Jamaica the major diagnoses were mood disorder (35%), anxiety states (27%), and schizophrenia (20%)[7]. While in our study mood disorders (56.7%), ATPD and Schizophrenia (26.7%) and 16.7% neurotic, stress related and somatoform disorders were primary psychiatric illness. Moreover, in our study 70% had more than one ICD-10 diagnosis, 46.7% presented with depressive episode and 6.7% had co-morbid mood disorder.

In our study 16.7% (N: 5/30) presented with intentional self harm. Studies of suicide in developing countries provide dramatic examples of the interaction of particular patterns of societal transformation, social stress and psychopathology. Micronesia, a group of islands that have undergone massive development since World War II, has seen an increase in suicide among adolescent and young adult men[15]. In a study in the group of returnees in Germany who arrived to Germany as refugees and/or asylum-seekers, suicidal tendencies were also detected in high rates[11]. Studies have shown that there are negative consequences of social change that paint a rather different picture than the usual one presented by development and international health experts[15]. These findings call attention to the importance of local effects on the epidemiology of the psychiatric morbidity and emphasize the need for sensitivity to the special risks of foreign job holders. It is noteworthy that all the subjects of this study returned due to their psychiatric illnesses. The fear of an uncertain future after the return was substantial. In recent years research on the mental health of returnees has gained increasing attention. Level of mental stress, discrimination and insecurity in everyday life were also higher among returnees[11].

Surveys suggest that the majority of adults with mental illness would like to work, preferably in non-sheltered, competitive settings. Such work is widely considered an important ingredient in recovery[2]. In order to reduce the challenge on the capacity for integration as well as for the social security, welfare and health systems, the concept of 'voluntary return' with the goal of a 'humanitarian reintegration' into the country of origin has developed into one of the central instruments of both European and German migration policy[11].

One need not be a radical advocate of a profoundly troubling global phenomenon that has not received the attention it warrants, especially in the health field. Without casting doubt on the real gains of foreign job, we wish to bring to light the social and behavioural pathologies that afflict the peoples of developing countries, some of which are main effects of the changes resulting from development process in host countries. This view is presented from the conviction that it is crucial, for the health and welfare of people in developing countries, to be well acquainted with social experience in host countries. These factors should be taken into account in programs designed to assist returnees, including those that offer support after return to the country of origin.

Summary and Conclusions

Psychological and social distress appears to be increasing worldwide as a direct effect of certain social changes, particularly related to migration. Change from original social milieu is associated with increased psychiatric morbidity. In order to avoid, human misery and burden of disease, mental health evaluation using accurate and careful screening for mental illness should be applied at least for legal migrant. Cultural adjustment programs and orientation program should be introduced/organized prior to departure. Contact and counseling points in the host country would be important for prevention and treatment of mental illnesses. Often, foreign job holders are forced to return permanently for minor psychological problems, which could have been dealt easily in host country and thus save unnecessary expenditure. Clinical studies show that treatment opportunities in the countries included in our study are limited and expensive. Sometimes, they do not exist at all. The cost of the medication is often unreasonable. Furthermore, due to symptoms related to their diagnosis (such as withdrawal, sadness, distrust etc.) people with mental disorders encounter far more integration challenges. It is important to study the phenomenon of return from a psychological and individual perspective: Mental health is not only relevant from a humanitarian perspective, where it is a prerequisite for individual wellbeing. It is also a key in achieving successful reintegration.

It is obviously important to have healthy citizens in a society in order to build the nation physically and politically. However, the limited number of studies in this field makes it difficult to frame a prognosis. Certain stressors which have been influential in foreign job become less important – such as homesickness or inability to attain a work permit-, while new stressors may well turn up after the return – economical insecurity, unemployment, social discrimination, and confrontation with triggers of traumatic experiences[11]. Programs focused on returnees and aimed at developing work opportunities in the native country would increase their self confidence and enable them to perceive their return as success and not as failure[13]. So, it is high time for the government of Nepal to adopt a well designed module incorporating mental health in screening the health of those seeking foreign job.

Among the limitations of our study is the size of the studied sample. So generalization could not be made. As far as we know there is no similar study in Nepal. For returnees we also could not obtain general, i.e. nation-wide, information on demographic characteristics. Hence, comparisons could not be made. In all prospect, further investigations with larger samples should be performed to assure and deepen the results of the study presented in this paper.

Competing interests

The authors declare that they have no competing interests.

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Original article:

Evaluating chronic cough: causes and consequesnces. A study conducted in Charak Hospital and Research Center Pokhara, Nepal.

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Abstract

The discomfort caused by chronic cough compels a great number of people to seek medical services. However, the prevalence of asthma or chronic obstructive pulmonary disease (COPD) in these patients is not known. In most cases a diagnosis of acute bronchitis or upper respiratory tract infection is made; a diagnosis of asthma or COPD is rarely considered.

Aim: *To describe the spectrum and frequency of the causes of chronic cough and to analyses the results of diagnostic tests used to identify the etiology of chronic cough. We also investigated the prevalence of asthma or COPD in the same group studied.*

Material and methods: *This was a prospective, descriptive study. 448 patients who presented with chronic cough with or without dyspnea were enrolled and according to research protocol were evaluated for the etiology of chronic cough.*

Results: *196 were male (43.7%) and 252 female (56.3%); age ranged from 6 to 90 years with a median age of 53 years. 268 patients had smoking habits. Of smokers, 47.1% were male and 52.9% female. The two principal diagnoses were asthma in 38.7% and COPD in 39.0%. However, in almost <7% of the cases, the diagnosis was post nasal drip syndrome or gastroesophageal reflux disease. 89.1% COPD patients were smokers. 94 cases (53.7%) were moderate to severe COPD while 15 cases (8.6%) were very severe and their severity is directly related with the smoking habits and numbers of pack years.*

Conclusion: *More than seventy percent of the patients attending a physician with persistent cough- a common and challenging problem in secondary care, were found to have COPD or asthma.*

Keywords: *Chronic cough, Asthma, COPD, Gastroesophageal reflux disease; Postnasal drip syndrome, Pulmonary function test*

Introduction

The discomfort caused by chronic cough compels a great number of people to seek medical services. Chronic cough is a symptom that can interfere with a person's sleep, studies, and professional and social activities. The prevalence of chronic cough among the nonsmoking adult population ranges from 14 to 23%. [1, 2] However, the prevalence of asthma or chronic obstructive pulmonary disease (COPD) in these patients is not known. In most cases a diagnosis of acute bronchitis or upper respiratory tract infection is made; a diagnosis of asthma or COPD is rarely considered. Asthma or COPDs are more likely if patients have a persistent or recurrent cough as well as other airway symptoms, but whether physicians are more likely to consider asthma or COPD in these cases is not known. This might have consequences for treatment. Antibiotics are often prescribed for these patients, but bronchodilators or corticosteroids would be more suitable. We set out to evaluate 448 patients who complained of chronic cough for at least a fortnight who were not known to have asthma or COPD. This article describes the spectrum and frequency of the causes of chronic cough in the group studied, and it analyzes the results of diagnostic tests used to identify the etiology of chronic cough. We also investigated the prevalence of asthma or COPD in the same group studied.

Materials and Methods

This study was carried out in the Charak Hospital and Research centere, Pokhara, Nepal, a secondary care hospital in the western region of Nepal. This was a prospective, descriptive study of consecutive, unselected, immunocompetent patients who visited outpatient clinic from April to December 2008 for the evaluation of chronic cough with or without dyspnea. A total of 448 patients were enrolled.

Research Outline

A cross-section study was performed. Patients were eligible for inclusion if they had a cough for at least two weeks, if they were > 6years old. All the datas including personal information such as age, sex, height, weight, presenting symptoms and signs, history of allergy to dust, pollens etc or allergic rhinitis, and SPO2 were collected. Dyspnea was defined as reported breathlessness, an attack of dyspnoea, woken up by dyspnea, or persistent dyspnoea during at least the past 2 weeks. Patients were asked about current smoking behaviour and cumulative smoking (pack years of smoking were calculated as the product of years of smoking and the mean number of cigarettes per day divided by 20).

Diagnostic Procedures

The research protocol included the following procedures: present and past medical history; physical examination; plain chest and paranasal sinus radiography; biochemical laboratory tests; pulmonary function test (PFT), and upper gastrointestinal (GI) endoscopy. PFT was performed by a single technician (to reduce the inter-test error), using the MIR spirometers-WinspiroPRO, and complying with the American Thoracic Society (ATS) guidelines published in 1995. [3] PFT included parameters such as the forced expiratory volume in the first second (FEV1), forced vital capacity (FVC), the ratio of FEV1/FVC%, peak expiratory flow (PEF) and the mid flow rate (FEF 25%-75%); volumes, such as total lung capacity (TLC), residual volume (RV), and functional residual capacity (FRC). Reversibility was defined as more than 15% improvement in FEV1 after bronchodilatation. Only patients who completed the above-mentioned tests were included in the final analysis. Because the cost factor and others upper GI endoscopy was not performed on those patients who were already diagnosed with other above means.

Definitions

Asthma was considered present when the patients presented with the following: episodic wheezing, dyspnea, and/or coughing, and auscultation showed the presence of wheezing; and an FEV1 of less than 80% predicted, with improvement of 15% or more after bronchodilatation. [4,5]

A diagnosis of COPD was made from history, symptoms, signs, evidence of airflow obstruction with no improvement after bronchodilator (or reversibility of less than 10%), increased lung volumes and reduced diffusion. This was supplemented by a chest

radiograph, electrocardiograph and arterial blood gases when indicated.[6]

Pulmonary fibrosis was diagnosed by a combination of clinical features, restrictive lung pattern on PFT and reduced diffusion capacity. Further confirmatory tests, such as high-resolution computed tomography and lung (bronchoscopic or open) biopsy were done when indicated.[7]

Bronchiectasis (BRO) was considered present when the patients presented with cough and expectoration for a long time (years). Hemoptysis could also be present as an associated symptom, and coughing usually occurred with the change in lateral decubitus, or when the patient assumed the recumbent position. BRO was also diagnosed when an aspect of infiltration along bronchovascular bundles was noted on chest radiography, with or without the previous condition.[8, 9]

PNDS was considered present when the patients described the feeling of having something dripping down their throats or if they mentioned the need to clear their throats often (throat-clearing sign).[10, 11]

GERD was considered present when the patients complained of heartburn, burning, and/or a sour taste in the mouth; Upper GI endoscopy demonstrated any sign of reflux of gastic fluid to the middle of the esophagus or higher, with or without the previous condition.[12, 13]

Statistical Analysis

Data were represented as Mean ± SD and statistical analysis was done by using software SPSS version-13. The χ 2 test and Fisher's Exact Test were applied for the statistical analysis of data. The P-value <0.05 was established as statistically significant.

Results:

During the period April to December 2008, 448 patients consulted their physicians because of coughing for at least 2 weeks. 196 were male (43.7%) and 252 female (56.3%); age ranged from 6 to 90 years and a quartile range varying from 33 to 61 years with a median age of 53 years. 268 patients had smoking habits. Of smokers, 47.1% were male and 52.9% female. Current smokers were 26.3% of the patients, and 33.4% were ex-smokers. Among the smokers majority of the females (111 vs 66) had the pack years of less than 30 while majority of the males (60 vs 31) had the pack years of more than 30 (Table 1).

Table 1. Demographic profiles of the patients

Profile	Male	Female	All
Patients (%)	196 (43.7)	252(56.3)	448
Age, years			
• Range	6-88	11-90	6-90
• median	53	55	53
Smoking habits (%)			
• current smokers	56 (12.5)	62(13.8)	118(26.3)
• ex-smokers	70 (15.6)	80(17.8)	150(33.4)
Current/ex smoking Pack years			
• <10 years	32	38	70
• 10-19 years	19	49	68
• 20-29 years	15	24	39
• 30-39 years	35	18	53
• >40	25	13	38
Histry of allergic rhinitis	65	97	162

The two principal diagnoses were asthma in 38.7% and COPD in 39.0%. 43 patients (9.7%) had cough due to chest infection including bronchitis (post infection). However, in almost <7% of the cases, the diagnosis was PNDs and GERDs (Table 2).

Table 2. Diagnosis of the study subject

Diagnosis	Patients (448)	
	n	%
COPD	175	39.0
Asthma	173	38.7
Chest infection	43	9.7
Fibrothorax	13	2.9
Bronchiectasis	5	1.1
Other RLD*	9	2.0
PND	15	3.3
GERD	15	3.3

9 cases (5 male) were diagnosed to have cough variant bronchial asthma

* RLD: Restricitve lung diseases which included Sarcoidosis, Interstial lung diseases etc.

Male are more prone to have fibrothorax, bronchiectasis and chest infection including bronchitis while females are in more risk of asthma or COPD. Asthma is more common in younger patients while elderly patients have more risk of COPD. 156 patients out of 175 (89.1%) COPD patients were smokers, while the remaining were exposed to indoor pollution. So smoking and indoor pollution are the major risk for COPD (Table 3). 78.6% of asthma patients have the history of allergy to dust pollens or allergic rhinitis.

Table 3. Prevalence of Asthma, chest infection or COPD according to clinical characteristics of patients with cough. Values are mean (SD) unless indicated otherwise*.

	Asthma	COPD	fibrothorax	Bronchiectasis	Chest infection
No (%) with diagnosis	173 (39.0)	175 (38.7)	13(2.9)	5(1.1)	43 (9.7)
No (%)men	77 (44.5)	60 (34.3)	6 (46.1)	4 (80)	27 (62.8)
Age	39.45±13.1	63.2±8.8	66.6±8.2	49.2±15.6	40.8±15.9
Smoking habits (current/ Ex)	52	156	12	2	5
Pack years of smoking	14.05±11.3	22.4±11.4	22.1±14.0	18.5±6.5	12.8±7.9
% of predicted FEV1	75.6±16.8	63.0±21.2	58.5±17.6	55.4±35.2	78.2±19.2
No (%) with changes in FEV1> 15%	173(100.0)	0 (0.0)	3(23.0)	1(20.0)	1(2.0)
No (%) with allergy to dust etc or allergic rhinitis histry	136(78.6)	5 (2.8)	0(0.0)	0(0.0)	9(18.6)

* RLD, PND and GERD cases are not included.

Out of 175 cases of COPD when divided according to their severity it was found that 94 cases (53.7%) were moderate to severe COPD while 15 cases (8.6%) were very severe. There was no significant age difference. It has shown clearly that females were predominant cases, and their severity is directly related with the smoking habits and numbers of pack years. 34 cases (19.4%) had respiratory failure, and most of them were the severe and very severe cases (Table 4).

Table 4. Severity of COPD

	COPD (175)			
	Mild	Moderate	Severe	Very severe
No (%) with diagnosis	66(37.7)	44(25.1)	50(28.6)	15(8.6)
No (%) men	24 (36.3)	13 (29.4)	18(36.0)	5(33.3)
Age	60(45-80)	66(44-82)	65(45-90)	65 (58-81)
No (%) Smoking habits (current/ Ex)	57(86.3)	40(90.9)	46(92.0)	13 (86.6)
Pack years of smoking				
• <10 years	13	3	6	1
• 10-19 years	19	16	10	0
• 20-29 years	5	7	12	4
• 30-39 years	11	6	11	5
• >40 years	7	8	7	3
% of predicted FEV1	86.2±14.2	63.2±12.1	38.5±11.0	19.0±10.1
SPO_2	95.0±2.5	94.1±2.1	91.3±4.8	88.3±3.5
Respiratory failure	2(3.0)	4(9.0)	18(36.0)	10(66.6)

Discussion

This study involved mostly adults (40–75years old) and few children above the age of six. Children less than 6 years of age are generally unable to reliably perform spirometric studies that need both cooperation and understanding of the spirometry maneuver. The age group of this study was compatible with the age group of patients who usually attend medical OPD or are admitted to medical inpatient wards. Major symptoms were dyspnea, cough and chest pain, with chronic cough and dyspnea being the most common chronic symptom. Generally, dyspnea, categorized into cardiac, pulmonary, mixed cardiopulmonary and non-cardiac non-pulmonary types, can be effectively managed in most cases by the general practioners in the primary care clinic. Usually, a careful history and thorough physical examination can readily identify the cause. An initial test with chest X-ray, electrocardiogram and screening spirometry can provide valuable information. We set out to describe the spectrum and frequency of the causes of chronic cough in the group studied, and it analyzes the results of diagnostic tests used to identify the

etiology of chronic cough who were not a known case of asthma or COPD. Several published studies of the differential diagnosis of chronic cough have employed similar protocols. These studies included chest radiography, sinus radiography, pulmonary function tests, biochemical laboratory tests, upper GI endoscopy. In the present study, we routinely did all the mentioned test except the endoscopy which was preserved when the diagnosis was an dilemma.

In several studies of patients with chronic cough who were referred to physicians/pulmonologists, postnasal drip syndrome, asthma, and GERD are the most common causes and have been referred to as a pathogenic triad of chronic cough. [14] This disease triad accounts for nearly all cases of chronic cough of immunocompetent nonsmokers who were not taking an ACE inhibitor and who had a normal or stable, near-normal chest radiograph. Chronic cough is found to have two or more causes in 18 to 62 percent of patients, and three causes in up to 42% of patients. [15] Table 5 listed all the recent studies found by medline on search of cause of chronic cough. The methacholine inhalation challenge test was the most helpful test in making a diagnosis if the history was not suggestive. In 57% of patients diagnosed with asthma, the positive methacholine inhalation challenge was the only test indicative of the disease. In 23% of patients diagnosed with GERD, the prolonged esophageal pH monitoring test was the only indication of the disease. GERD is a recently recognized cause of chronic cough and is identified as the etiology of cough more frequently in studies that use prolonged esophageal pH monitoring as part of their diagnostic work-up.

In our study COPD was the most commonest etiology then comes the asthma and chest infection including bronchitis (also known as post infection cough), the reason behind was we included all the patients who presented as cough with or without dyspnea including the smokers. Previously done studies were focused on etiology of cough only on the non smokers. As we know smoking is one of the most common causative factor for COPD, and in our study almost 60% of the studied group and 89.1% of COPD patients were smokers, which directly influenced the etiology. Most of the patients with histry of PNDs and GERD had visited their consultants since they had significant history of their respective diseases and only when their cough does not subside were referred to us, so the PNDs and GERD cases were least enrolled.

The comparability of our findings with those of others studies suggest that our findings are applicable to other populations. Those previous studies have shown a similar prevalence of asthma associated with coughing. [16] Thiadens et al found that nearly half the patients attending a general practitioner with persistent cough show features of asthma or COPD which also agrees with our study. [24]

Table 5. Studies found by medline search on causes of chronic cough

Cough study factor	Poe 1982[17]	Irwin 1990[18]	Mello 1996[19]	Pratter 1993[20]	Palombin 1999[14]	Brightling 1990[21]	Ayik 2003[22]	O'Connell 1996[23]
Eligible	134	102	88	45	78	91	36	87
Asthma %	21	32	14	29	46	18	18	-
PND%	19	41	38	56	45	21	13	-
GERD%	4	21	40	11	32	8	13	-
BA, PND, GERD % †	44	86	92	96	94	47	44	40
Post infection %	9	-	-	-	11	13	5	10
COPD %	4	6	4	4	-	7	-	-
Others /no diagnosed %	14	2	10	-	14	33	51	49

Setting/yardstick: Poe-community retrospective, Irwin-referral, Palombin- prospective discription, Mello and Pratter - Questionnaire, and Others- consecutive, referral
PND = postnasal drip;
GERD = gastroesophageal reflux disease;
BA = Bronchial asthma
† One two or three diagnosis are present

The discomfort caused by chronic cough compels a great number of people to seek medical services, and asthma, COPD are the one the most common causes. The World Health Organization (WHO) estimates that

COPD as a single cause of death shares 4th and 5th places with HIV/AIDS (after coronary heart disease, cerebrovascular disease and acute respiratory infection). The WHO estimates that in 2000, 2.74 million people died of COPD worldwide. Together, asthma and COPD cost Americans more than $36 billion per year in direct health care costs and twice that amount when indirect costs (lost productivity, premature death, etc) are included. [25] Currently, more than 17 million Americans have COPD, the fourth leading cause of death in the United States is projected to be the third leading cause of death for both males and females by the year 2020 and a major cause of morbidity. It is estimated that there may be as many as an additional 14 million or more in the United States still undiagnosed, as they are in the beginning stages and have little to minimal symptoms and have not sought health care yet. It is the only major disease with an increasing death rate, rising 16%. Men are 7 times more likely to be diagnosed with emphysema then women, though the prevalence in women is on a steady increase and this number is lowering with each year. People over the age of 50 are more likely to be considered disabled, however, the damage started years before. Smokers are most likely to be disabled by emphysema than the nonsmokers. [26, 27] PFT plays an essential role in the management of patients with, or at risk for, respiratory dysfunction. These tests provide objective lung function assessments that the clinician can correlate with highly subjective symptoms such as dyspnea. These tests also yield reproducible, quantitative results, allowing longitudinal monitoring. This is important because respiratory symptoms correlate poorly with disease severity and progression. [25] When investigated the prevalence of asthma or COPD in the same group studied we found that 348 cases (77.6%) where found to have these diseases and more than 89% of the patients with COPD were smokers. which directly correlates with the global burden. The mean age group of these COPD patients was 65 years which also agrees with GOLD estimations. [28] The prevalence of COPD in the general population sample in ages <45 was 9.1%, in ages >45 were 17.1% according to the criteria of GOLD. The prevalence was strongly associated with higher age and smoking. The prevalence among smokers 76-77 years old was 50%. Persistent smoking, male gender and reported chronic productive cough were associated with a faster decline in FEV1. Among incident cases of COPD a large proportion (23%) had a rapid decline in FEV1,> 90 ml/year, corresponding to a decrease of 28 percent units of normal value during ten years. The increasing prevalence of COPD is partly due to the aging population, where the risk of the disease nearly doubles for every 10 years over the age of 40, and also to smoking. [28]

In our study we found that females COPD cases were significantly quite more than with male. The difference in COPD between men and women is mostly due to differences in smoking habits, including the passive smoking and exposure to indoor pollution and could reflect social and cultural issues. In China, where it is estimated that over 50 percent of the men smoke, chronic respiratory diseases are the 4th leading cause of death in large urban areas, but the first leading cause of death in rural areas. In China, smoking rates among women remain low (estimated at 6 percent), although the prevalence of COPD in men and women is about the same. This points to the importance of risk factors other than smoking as a cause for COPD in Chinese women. [29]

Wen Qi Gan et al [30] found that beyond age 45 to 50 years, female smokers appear to experience an accelerated decline in FEV1% pred/yr compared with male smokers. The mechanisms responsible for the increased susceptibility of women to cigarette smoke are largely unknown. There is now a general consensus that inflammation is at the heart of the pathobiology of COPD and that the inflammatory process involves both the lung (airways and parenchyma) and the systemic circulation. [31] Another potential mechanism may relate to bronchial hyperresponsiveness. In the Lung Health Study, there was a higher prevalence of bronchial hyperresponsiveness among women than among men (85% in women versus 59% of

the men). Additionally, cigarette smoke may modify hormonal status in women, which may affect lung function. Women who are active smokers become relatively estrogen deficient compared with non-smokers because cigarette smoke induces cytochrome P450 isoenzymes CYP1A1 and CYP1A2, which alter estrogen metabolism leading to increased production of inactive catechols. [32] Hormone replacement therapy in the post-menopausal period is associated with improved lung function, reducing the risk of airflow obstruction by ~25%. An alternative hypothesis for higher susceptibility of females to smoking may be differences in lung development between females and males.[30] The women's poorer health status, lower quality of well-being and greater depression than men might also influence the higher susceptibility of COPD. [33]

In our study we also noticed that severity of COPD is directly related with the smoking habits and numbers of pack years. Our results are consistent with Pauwels et al study, which states that the increased risk of lung toxicity of chronic smoking with the time and amount of smoking. Pulmonary symptoms appears to increase in frequency once 10 years-pack history is reached. As many patients with early COPD are asymptomatic, the damaging effect of smoking on the lung function must occur earlier than 10 years-pack smoking and is very difficult to predict. [34]

34 cases (19.4%) had respiratory failure, and most of them were the severe and very severe cases. It is believed that a reduction of FEV1 less than 35% of predicted ones has respiratory failure clinically. [35]

Conclusion

More than seventy percent of the patients attending a physician with persistent cough- a common and challenging problem in secondary care, were found to have COPD and asthma. COPD is underdiagnosed and undertreated. As populations age, the prevalence of COPD and the burden of COPD is going to increase significantly.

Limitation:

Our population was not a general population, since they attended a physician with a troublesome cough, which is not the case in population studies. So we did not provide a control group of asymptomatic subjects in the community since it was beyond our focus.

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Perceptions about the Traffic Safety Among the Taxi Motorcyclists and Their Passengers in Phayathai District, Bangkok

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Objectives
The main objective of the study was to identify traffic safety behavior and its related factors among taxi motorcyclists and their passengers. This general objective was achieved through specific objectives by describing personal characteristics of the taxi motorcyclists and their perceptions about the susceptibility, severity, threat and cue to action, in terms of traffic safety behavior, as perceived by their passengers and by identifying relationship among them.

Methods
It was a cross sectional survey aimed to describe personal characteristics, perceptions towards the susceptibility and severity to RTI, threat to traffic safety and cues to action. The questionnaires were tested for content validity and pre-tested for reliability. The data was collected on structured questionnaires and observations. The study population was selected as accidental sample of 200 respondents for each category i.e. taxi motorcyclists and their passengers. About 220 respondents were contacted and after data cleaning and sorting 208 were found to be eligible for inclusion for data analysis.

Results
Around 60% of the taxi motorcyclists had an above average perception about susceptibility to and severity of road traffic accidents, and also about the traffic safety. However, the passengers of these taxi motorcyclists were concerned about traffic rules and regulations such as, using correct lane, use of helmet, driving smoothly and not drinking and abusing drugs. Most of the taxi motorcyclists acquired information about traffic safety from television, yet only the information from newspapers was responsible for higher traffic safety behavior.

Conclusion
It was found that knowing people without an accident in the past did have a role in practicing high traffic safety behavior.
Total Words 296

Key Words: *Traffic Safety/Taxi motorcyclists/Perception*

INTRODUCTION

Road traffic accident is one of the leading causes of the social, economic and health degradation in the society (1). Thailand has a critical problem in coping-up with morbidity and mortality due to injury (1). Size of the problem, as being stated on national level, the road traffic accidents rank second after HIV/AIDS among ten-leading causes of death in Bangkok. Motorcycle riders are the favorite hiring transport of the Thai people, those who don't have their own transport, during the busy working hours (1). The problem when assessed on the severity level, the accidents and injuries are the major leading causes of the morbidity and mortality. In Thailand a retrospective study was carried out in March 2000 (3) that showed analysis done in 3,225 injured motorcyclists treated at Phra Chom Klao Hospital during April 1, 1999 to March 31, 2000. Male motorcycle riders accounted for 69 per cent of the accident population. Twenty one per cent of the accident-involved riders had been drinking alcohol and about half of the riders were unlicensed. Only 4 per cent of the riders were wearing helmets at the time of the accident. Helmet usage was much lower among passengers (only about 1 per cent). Globally it has been observed that males aged 15-29 years are especially involved (5). The several studies show that motorcycle accidents result in the disability among the sufferers. Clark JA and Langley JD (6) showed in their study conducted in New Zealand that among the sample population disabilities, handicaps and extremity injuries predominated, especially to the lower limb. Most commonly impairments occurred in the areas of 'skeletal', 'disfiguring' and 'generalized' impairment. A recent research (March-June 2003) at Community Medicine Center, Faculty of Medicine, Ramathibodi Hospital, Mahidol University (7), recommended the investigation into behavioral determinants of road traffic accidents and road/traffic safety issues. This study specifically looked at the description of personal characteristics of the taxi motorcyclists in terms of age, sex, marital status, education level, experience, driving license, duration driving and visual problems while driving. It also explored the perceptions of taxi motorcyclists regarding perceived susceptibility and severity to road traffic accidents and perceived threat to traffic safety along with cues to action in terms of traffic safety behavior. Further, the study looked into the traffic safety behavior as perceived by the passengers of the taxi motorcyclists.

METHODS

Study Design

A cross sectional survey, for which data was collected by structured questionnaires and observations during January to February 2004. The study population was selected as accidental sample of 200 respondents for each category i.e. taxi motorcyclists and their passengers. About 220 respondents were contacted and after data cleaning and sorting 208 were found to be eligible to be included for data analysis. Thus the total sample came up to 416 respondents.

Study population and place

Taxi motorcyclists and their passengers in Phayathai district of Bangkok. Sampling frame was done according to the randomly selected geographical locations within Phayathai district and sampling was done on accidental basis. The respondents were free to refuse and the interviewers contacted the next available respondent in such cases. The numbers of jackets of taxi motorcyclists were used to contact the respondents of the same taxi motorcyclist. There were about 20 sites and most of the study population was very dynamic except one.

Sample size

Two hundred taxi motorcyclists and two hundred passengers of those motorcyclists in the study area.

Research instruments

The structured questionnaire prepared in English and translated into Thai language and consisted of five parts.

Data collection

Face to face interviews were conducted for clear information. In order to solve the language barriers and answering the sensitive questions, the questionnaire was translated to Thai language and trained female local language speakers (graduate students), worked as interviewers, ensuring sampling method reliable. The interviewers explained the purpose of the study, and obtained the respondent's

full consent to participate, reducing refusal bias. The data was cleaned at the survey site. In case of a refusal, the next available respondent was contacted to complete the estimated sample size. In total 416 (208 each) questionnaires were found eligible. The respondents' secrecy was strictly maintained. The data hard and soft record was kept under lock/ password protection.

Data analysis

Frequency and percentage were used to describe study variables. Cross tabulation was done along with Chi-square test in order to assess the relationship between independent and dependent variables. The significance level worked at 0.05.

Ethical Approval

The ethical approval was awarded by the respective committee of the Institution/University

Results

According to high and low safety behavior as perceived by the passengers, 59.1% of the respondents had the high safety level and 40.9% were having low safety level. When the personal characteristics of the taxi motorcyclist were cross-tabbed for relationship with the traffic safety, it was revealed that percentage of the high safety behavior didn't have much significant influence by the age difference. For age group 15 to 30 years, 39(41.1%) had a low safety level and 56(58.9%) had high safety level. For age 31 to 45, it did not show much difference from the aforementioned group, being 41(41.4%) in low safety profile and 58(58.6%) at the high safety level also negligible for age group 46 to 75 years (p-value=0.980). In total, considering all age groups, some (41.1%) had the low perception towards traffic safety and more than half (58.9%) had high perception towards traffic safety. The marital status of the respondents, when grouped as unmarried (single, divorced, widowed and separated) and married, showed 38(42.2%) of the unmarried respondents having a low safety behavior, only. 52(57.8%) of the unmarried respondents were having the high safety behavior towards traffic safety. 47(39.8%) of the married respondents were bearing low safety status, while 71(60.2%) of the married respondents showed the high level of perception for traffic safety (p-value=0.728). Generally, percentage wise married had a bit better profile for safety than the unmarried ones. Over all, 40.9% of the respondents divulged low and 59.1% high safety perception level. The education level of the motorcyclists was not significant (p-value = 0.124). The illiteracy and primary school level education was grouped together. One-third (48.5%) were having a low safety level and almost same (51.5%) were having a high safety level. Regarding elementary level education, a little above one third (41.9%) were of low safety perception and more than half (58.1%) unveiled a high safety perception level. High school education depicted more than one-third (38.9%) having low and somewhat more (61.1%) of high safety levels. College and University level group, which constituted bachelors, certificate and diploma, level of education, though minor in number, yet higher in harboring the high safety perception towards traffic safety measures. This is reiterated in number and percentages as being lower (20.8%) for having low and much higher (79.2%) for high level of the safety behavior. The experience of the drivers for the purpose of the inferential statistics was grouped as less than 5 years, 5 to 9 years and 10 and more than 10 years of experience. Amid less than 5 years of experience, more than one-third (36.1%) had a low approach towards the traffic safety and most (63.9%) were having high one. In the age group of 5 to 9 years of experience nearly less than half (46.7%) displayed low and about half (53.3%) showed high perception for the traffic safety behavior. The traffic safety was measured on high and low levels. When compared on cross tabulation, those having low susceptibility to RTI, twelve practiced (30%) at low level and 28(70%) practiced at high level for traffic safety. Measurement of high perception towards susceptibility to RTI commemorates traffic safety practice with less than half (43.5%) at low level and more than half (56.5%) at high level (p-value=0.120). The total percentage for traffic safety by low and high-perceived susceptibility remained at 40.9% and 59.1%, for low and high traffic safety practices. Hence, the level of susceptibility to RTI didn't have any significant association with the traffic safety being practiced by the target population.. The perceived severity to RTI, as divulged by table 6, was measured as low and high perception about the severity of RTI. Less than half

(41.2%), with low perceived severity to RTI also had low level of traffic safety. Somewhat more than (58.8%) with low perceived severity practiced at high traffic safety level. The ones who had high-perceived severity about RTI, more than half (59.5%) did practice at high level of traffic safety among the Thai taxi motorcyclist, interviewed. In accumulation for the practicing traffic safety for perceived susceptibility to RTI, majority (59.1%) did at high level. These results when testified by the Chi-square test proved not being significant for possible association among the group of the respondents as study population. Thus the perceived severity at low and high levels did not have any association with the traffic safety practices among the Thai taxi motorcyclists at Phayathai district of Bangkok. The taxi motorcyclists when they perceive threat to traffic safety at a low level, practice traffic safety almost same at both low and high levels. A little below the half (44%) of them had low traffic safety and mere above (56%) had a practice of high traffic safety. Table 7 elaborates the findings in comparison and association.

In contrast, when they perceive threat at a high level they practice traffic safety at lower percentage at low level and at a higher percentage at high level, although not significant at alpha set for the study (p = 0.05). Slightly above the one-third (38.7%) practiced low traffic safety when they have high perceived threat to traffic safety. Mostly (61.3%) do practice high level of traffic safety among them. Collectively, in a summation, more than middlemost (59.1%) of those who have perceive threat to traffic safety at a high level also practice at high level. Cues to action in favor of traffic safety were inquired and it was found as indicated by table 8, that the taxi motorcyclists of Phayathai district who had a low level of traffic safety in practice, approaching to midway (45.7%) of responses, there was information sought from television. Newspaper was one of the most popular source of information and the ones who had a minimal number and percentage of low traffic safety, had information mainly from newspaper (12, 27.9%). High level of traffic safety was found among the newspaper group for the cues to action i.e. most (72.1%) as compared to low level of safety in the same group. Cut-outs were responsible for the low safety of above one third (38.9%) and a high safety of most (61.1%).

Chi-square test was carried out to look into the possible association. P-value of 0.116 rendered the results non-significant but the preliminary inference drawn gives an insight towards the impoRTInce of newspaper and cut-outs being better information sources for cues to action then the TV. Table 9 shows the results for the role of media in traffic safety. One fourth (28.3%) with low safety level didn't know any person who had had an accident in the past and about two third (71.7%), roughly, of them having high safety, did not know any one who had had an accident in the past two years. That depicts no influence of knowing the people with accidents in practicing high safety behavior (p=0.019).

Table 1 Number and Rates of the Accident Deaths and Injuries, and Estimated Damage 1984-2000 (Thailand Health Profile 1999-2000)

Year	No of Population	No of Accidents	Deaths		Injured		Property Damages (Baht)
			Number	Rate per 100,000 Pop.	Number	Rate per 100,000 pop.	
1984	50,583,105	18,334	2,904	5.74	8,770	17.34	56,265,453
1985	51,795,651	18,955	2,788	5.38	8,901	17.18	60,645,504
1986	52,696,204	24,432	2,086	3.94	9,242	17.45	55,061,650
1987	53,873,172	25,639	3,991	7.41	12,947	24.03	129,539,616
1988	54,960,917	43,439	8,651	15. 74	22,370	40.70	329,527,667
1989	55,888,393	43,557	8,967	16.04	23,083	41.30	439,028,000
1990	56,303,273	43,646	7,997	14.20	23,161	41.14	477,603,000
1991	56,961,030	49,625	8,608	15.11	24,995	43.88	639,616,000
1992	57,788,965	61,329	8,184	14.16	20,702	35.82	607,793,000
1993	58,336,072	84,892	9,496	16.28	25,330	43.42	1,021,464,000
1994	59,095,419	102,610	15,176	25.68	43,541	73.68	1,408,216,000
1995	59,277,900	94,362	16,727	28.22	50,718	85.56	1,631,117,000
1996	60,116,182	88,556	14,405	23.96	50,044	83.24	1,561,708,187
1997	60,186,227	82,386	13,836	22.75	48,711	80.09	1,571,786,469
1998	61,115,888	73,725	12,234	20.00	52,538	85.91	1,378,637,826
1999	61,577,827	67,800	12,040	19.55	47,770	77.58	1,345,958,811
2000	61,770,259	73,737	11,988	19.41	53,111	85.98	1,242,205,524
2001	62,093,855	77,616	11,652	18.76	53,960	86.90	1,240,801,187

Figure 1. Trend of accidents during 1984-2001
Source: Thailand Health Profile 1999-2000

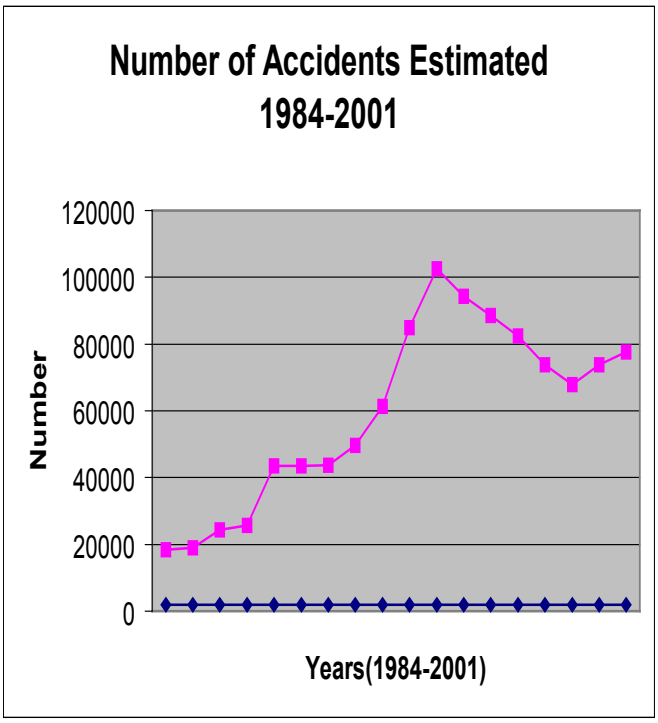

Table 2: Number and percentage of the drivers' answers classified by level of agreement to perceived susceptibility to RTI (Road Traffic Accidents).

No.	Statement	Level of Agreement		
		Agree	Un-decided	Dis-agree
1.	You are driving in an area where accident may occur easily.	61.1	24.5	14.4
2.	Motorcycle is easy to drive, no need to take care as so much because less of accident occur	7.2	13.9	78.8
3.	Traffic lights located in suitable area can prevent accidents	91.8	5.8	2.4
4.	Accident cannot happen more if people use cross roads	84.1	8.7	7.2
5.	It is easy to get accident when it has rained on the roads	95.7	2.4	1.9
6.	The rough road should not be one cause of accidents	13.5	7.7	78.8
7.	No accident occurs if there is clear visibility	60.1	23.6	16.3
8.	It is not likely to get an accident when light is bad	7.2	17.8	75.0
9.	Accident may occur if there is insufficient traffic light	75.5	11.5	13.0

Table 3 Frequency distribution of personal characteristics the drivers.

Personal characteristics	Number (N = 208)	Percent
Sex		
Male	202	97.1
Female	06	2.9
Age		
15 to 30 years	95	45.9
31 to 45 years	99	47.8
46 to 70 years	13	6.3
Mean =32.33,SD=7.704, Min=19, Max=64, Median=32.00		
Marital Status		
Unmarried	90	43.3
Married	118	56.7
Education level		
Illiterate	02	1.0.
Primary school	66	31.7
Elementary school	62	29.8
High school	54	26.0
College/university level	24	11.5
Experience of driving the motorcycle		
Less than 5 years' experience	83	39.9
5-9 years' experience	60	28.8
10 and <10 years' experience	65	31.3
Having driving license		
No	5	2.4
Yes	203	97.6
Status of driving license	**(n=203)**	
Temporary	99	48.8
Permanent	103	50.7
Don't know	1	0.5
Riding motorcycle hours per day		
1 to 6 hours per day	47	22.8
7 to 12 hours per day	131	63.6
13 to 24 hours per day	28	13.6
Visual problems while driving		
None	193	92.8
Blurring	6	2.9
Double vision	2	1.0
Spots	2	1.0
Can't see far	5	2.4

Table 3 Total score about the traffic safety by passengers.

Traffic safety score	Number (N= 208)	Percent
2	2	1.0
3	7	3.4
4	5	2.4
5	27	13.0
6	44	21.2
7	56	26.9
8	17.8	17.8
9	14.4	14.4

Median = 7, ± SD = 1.557, Minimum = 2, Maximum = 9

Table 4: Perceptions about the traffic safety by number and percentage of passengers

Passenger perception level about driving safely	Number (N = 208)	Percent
Safety level in two groups		
≤ Median score	85	40.9
> Median score	123	59.1

Table 5 Relationship between perceived susceptibility to road traffic accidents and traffic safety.

Perceived susceptibility	Traffic safety				χ^2 (df)	p value
	Low N =85	%	High N=123	%		
≤ Median score	12	30.0	28	70	2.419	0.120
> Median score	73	43.5	95	56.5	1	

Table 6. Relationship between perceived severity to road traffic accidents and traffic safety

Perceived severity	Traffic safety				χ^2 (df)	p value
	Low N =85	%	High N=123	%		
≤Median score	40	41.2	57	58.8	0.010	0.919
> Median score	45	40.5	66	59.5	1	

Table 7. Relationship between perceived threat to road traffic accidents and traffic safety

Perceived threat	Traffic safety				χ^2 (df)	p value
	Low N =85	%	High N=123	%		
≤ Median score	37	44.0	47	56.0	0.590	0.442
> Median score	48	38.7	76	61.3	1	

Table 8. Relationship of information source as cue to action with traffic safety

Cue to action	Traffic safety				χ^2 (df)	p value
	Low N =85	%	High N=123	%		
TV	59	45.7	70	54.3	4.313	0.116
Newspaper	12	27.9	31	72.1	2	
Cut-outs	14	38.9	22	61.1		

Table 9. Relationship between role of media, as agreed by the respondents, and traffic safety

Media role	Traffic safety				χ^2 (df)	p value
	Low N =85	%	High N=123	%		
No & Yes (not always)	59	44.4	74	55.6	1.865	0.172
Yes (always)	26	34.7	49	65.3	1	

Table 10. Relationship between knowing the people with accidents and traffic safety

People known	Traffic safety				χ^2 (df)	p value
	Low N =85	%	High N=123	%		
No	17	28.3	43	71.7	5.480	0.019*
Yes	68	45.9	80	54.1	1	
Status of the known		(n = 143)			0.238	0.626
					1	
≤3 persons	45	46.9	51	53.1		
3-25 persons	20	42.6	27	57.4		

Table B 7 Status of license of the taxi motorcyclists

License status	Traffic safety				χ^2 (df)	p-value
	Low Number (N = 85)	%	High Number (N = 123)	%		
Temporary	42	42.4	57	57.6	0.143	0.705
Permanent	41	39.8	62	60.2	1	

Table B 8 Riding motorcycle hours per day

Driving Hours	Traffic safety				χ^2 (df)	p-value
	Low Number (N = 85)	%	High Number (N = 123)	%		
1 to 6 hours	20	42.6	27	57.4	0.039	0.579
7 to 12 hours	53	40.5	78	59.5	2	
13 to 24 hours	10	35.7	18	64.3		

KEY MESSAGE

In this study traffic safety, was identified on a high safety to low safety level. Traffic safety as perceived by the passengers, majority (59.1%) out of the total was having the high safety level. About more than one third (40%) considered the practices of traffic safety by the taxi motorcyclists as being of low safety level. Unsafe practices lead to the fatal injuries, as shown by a study done in Australia by Stella J., in 2002. Almost all of the taxi motorcyclists were of male sex (97.1%). It is evident that from the past study by Ferrando J., in 2000, (16) that males are more prone to both risk taking behavior and involvement in road traffic accidents than the females. For high traffic safety practices, age 46 to 75 years showed a higher percentage than the other two groups. This result is consistent with the study done by Mullin B., in 1993 (15). Regarding marital status of the respondents, the study reveals no significant association; yet show a lower percentage among married respondents for low traffic safety and a higher percentage (60.2%) for the ones in high traffic safety category. The data from a study conducted in 1997 by Na Ayuthya RS, Bohning D., showed that the single marital status had a relative risk (RR) of 2.25 times than that of the married ones. This is consistent with the other studies (17) in general. The higher the education level , higher was the traffic safety level for the taxi motorcyclist. The highest safety practice being for the group having bachelors, certificates and diplomas. These results are totally consistent with the results of the study conducted by Swaddiwudhipong W., Boonmak C., Nguntra P., Mahasakpan P., in rural Thailand in 1995, where an educational program resulted in a decrease in motorcycle accidents. This study didn't reveal any relationship between the job duration and the traffic safety. Drivers with a minimal experience of 6 months to 4 years (39%) were having higher safety than the other groups. This result was not significant and also the figures were inconsistent to previous findings, such as by Mullin B, Jackson R, Langley J, Norton R., a study done in Aukland in 1993, which showed a protective effect if driven more than 5 years. In this study, however, traffic safety was considered and less than 5 years had high safety than the others. Most of the taxi motorcyclists (97.6%) were having license. Na Ayuthya RS, Bohning D., showed in their study (conducted in Bangkok in 1997) that their study population with license for short term was more involved in RTIs. This study didn't show any significant association (table B 7,), when cross-tabbed with traffic safety. The probable reason could be that some of the drivers were found having temporary license for even upto11 years due to the fact that they had to cope with the day to day expenditures and to save money for that then to spend a lot money that they earn over the permanent licensing fee. Riding motorcycle as per hours a day came out to be the most for 7 to 12 hours (63.6%). One to six hours per day was driven by less than one third (22.8%) of the taxi motorcyclists. There was no significant association found among these times and traffic safety (table B 8,). This is also supported by the review done by Brown ID., (25), in his article in June 1994 that the driver fatigue is associated with the irregular working hours rather than the time spent on the wheel.

The information source was evaluated for its role in traffic safety and it was seen that with low safety practices, TV had the almost the same (45.7%) percentage as for the high safety (54.3%). However, newspaper contributed less (27.9%) to low safety practices and rather higher to high safety practices (72.1%). Cut-outs remained the second category showing better results from TV alone but less than newspaper (38.9%), for low safety and 61.1% for high safety). Most had an agreement that media did play a role in traffic safety (65.3%).

With low safety, less (28.3%) didn't know any person in contrast to most (71.7%) who didn't have a person known to them with an accident in the past two years. Fewer than half (45.9%) were having lower safety when they knew some person and a marginal above half (54.1%) were having the higher safety level when they knew a person with accident in past two years. This contrast stood significant with the significant level of 0.019. This shows a better practice when there was better practice going around too among the peer groups.

Based on results and discussion, the study recommends that education and safe practice among the peer groups had a major role in adopting the traffic safety among the taxi motorcyclists in Phayathai district of Bangkok. Thus the target for the intervention is illiterate and the primary education level. Also most of the respondents get the information from the news papers and the campaigns should focus through newspaper.

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Alert bulletin:

Using 'drug addiction' as a base to explore various issues in the Basic Sciences and in clinical medicine

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Abstract :

Drug addiction is a common seminar topic during the undergradaute medical course. Traditionally the departments involved in this seminar are Pharmacology and Community Medicine. In this article the authors plan to show how drug addiction as a starting point can be used to explore a number of issues in both the basic sciences and clinical subjects. This method can serve to emphasize to students the close inter relationship between subjects and how the aim of medical knowledge is to understand the human body and be able to treat sickness.

Introduction

During the MBBS course, seminars are conducted both in the Basic Medical Science and the clinical years. The three main Universities to which medical schools are affiliated in Nepal, conduct seminars in different ways. The Institute of Medicine, Tribhuvan University conducts correlations seminars at the end of an organ system during the first two years where as at the Manipal College of Medical Sciences, Pokhara affiliated to Kathmandu University, seminars have been used as a means for integrating various basic science subjects.[1]

Drug addiction is a common topic for seminars during the Integrated Basic Medical Sciences (IBMS) course. Drug addiction seminars usually involve faculty members from the departments of Pharmacology and Community Medicine. However, it is fast becoming a major problem in Nepal and can be responsible for a number of adverse effects on the individual and society.

In this article, the authors plan to show how drug addiction as a starting point can be used to explore a number of issues in both the basic sciences and clinical subjects. This method can serve to emphasize to students the close inter relationship between subjects and how the aim of medical knowledge is to understand the human body and be able to treat sickness.

Anatomy:

Let us start with anatomy. The common ways by which a drug can be taken into the body are oral, intravenous, inhalational, and intramuscular among others. The inhalational route can be used to introduce students to the respiratory system. Parts of the respiratory tract like pharynx, larynx, trachea and bronchi can be studied. Similarly study of microstructure of bronchioles and alveoli can be useful for understanding the mechanism of breathing, gas exchange through the alveoli and exchange of drugs and other materials.

The intramuscular route can look at the commonest muscles where drugs are injected. The anatomy and functions of these muscles can be explored. While discussing the intravenous route students can find the commonest veins through which these drugs are injected. The anatomy of these veins can be discussed. The nasal route can explore in detail the structure of the nose, smell pathway and vessels and nerves involved in it.

Physiology:

The issues which can be explored in Physiology are the mechanics of normal breathing, circulation of blood from the lungs to the heart, peripheral circulation and factors which govern blood flow from centre to periphery. Other issues that can be explored are blood flow to the muscles and the nasal mucosa and factors regulating the flow.

Drugs produce their effects by binding to receptors for endogenous ligands in many cases. For example, opioids bind to endorphin receptors. The nature of endorphins and other endogenous chemicals and their mode of action can be studied. Drugs interfere with the normal functioning of the body. The number of receptors (to which the drugs bind) and their sensitivity can be increased or decreased. This is actually a border land between physiology and pharmacology and can highlight the interrelated nature of different subjects and their role in understanding the human body. Withdrawal effects can occur if a drug is abruptly stopped or withdrawn. These effects are again a close interplay between physiology and pharmacology.

Most drugs produce their effects by stimulating the reward system. The reward system is a circuit in the brain activation of which results in feelings of pleasure. Neurons, synapses, neurotransmitters can be explored.

Biochemistry:

The major neurotransmitter involved in producing feeling of pleasure is dopamine. The biosynthesis of dopamine and its relationship to other neurotransmitters can be explored. Activation of the sympathetic (noradrenergic) nervous system is a common feature of withdrawal symptoms to a number of drugs. Synthesis of nor epinephrine and the structural similarities between adrenaline and nor adrenaline can be studied. Vitamin deficiency disorders especially of the B-complex group are common in chronic alcoholics. Drug addiction can be used to study the water soluble vitamins in detail.

Alcohol one of the drugs which is commonly abused on chronic use can produce serious impairment of hepatic function and liver cirrhosis. This can be taken as a base to explore hepatic function in a normal individual. Many drugs are weak acids or weak bases. The ionization and passage of these drugs across membranes is governed by the Henderson Hasselbach equation. In cases of overdose, changing in pH of the urine is used to hasten excretion. These topics show the close interrelation between biochemistry and pharmacology.

Pathology:

Poly drug addiction is common; people may take two or more substances e.g. alcohol and tobacco (smoking or chewing). Alcohol and nicotine produce a number of complications. Alcohol produces effects on a number of organs. Acid peptic disease, esophageal ulceration, portal hypertension, stomach cancer, fatty liver, impaired liver function and liver cirrhosis are a short list of the many diseases caused by alcohol. Using case scenarios of chronic alcoholics many of these diseases can be explored.

The major problem of tobacco smoke is lung cancer. The various presentations of lung cancer and its manifestations can be explored. Smoking can also predispose to chronic obstructive lung disease and can worsen bronchial asthma. Chewing tobacco is a major reason for oral cancer which causes death and disability in South Asia.

Microbiology:

Intravenous drug users often share needles. Hepatitis B and HIV are two diseases transmitted by sharing needles. Drug addiction can serve to introduce these two diseases to medical students. Unclean syringes can also transmit bacterial infections to drug users. Lack of personal hygiene exposes them to a number of diseases. Chronic drug addiction is one of the risk factors for tuberculosis as chronic drug addiction suppresses the immune system of the body, so student may get an opportunity to learn about TB.

Opportunistic infections are common among drug addicts who may also be suffering from HIV. Pneumocystis carinii pneumonia, candidiasis are two common opportunistic infections among HIV patients. The topic of immunity is covered in physiology, pathology and microbiology and diseases of immunity can show to students the vital role of the immune system in keeping us healthy.

Community Medicine:

Drug addiction is becoming a major problem in Nepal. The reasons for addiction, the epidemiological triad (the drug, the user and the environment) are all issues of importance for community medicine. Dysfunctional families, lack of access to healthcare, the high incidence of HIV and Hepatitis B among drug users are all important issues. Prostitution as a means of obtaining money for drugs exposes the prostitute, customers and society to many dangers including the risk of sexually transmitted diseases.

Management of the drug addict and rehabilitation as a functioning member of society again is closely linked with the community and community medicine. The epidemiology of diseases like HIV and hepatitis B can also be explored.

Pharmacology:

Drug abuse and non-medical use of drugs is a topic with major implications in pharmacology. The motivations for non-medical use of drugs, the exploration of receptors and receptor pharmacology through drugs, the action of drugs on the central nervous system and other body systems are areas of interest for pharmacology.

The management of drug abuse includes pharmacological measures in addition to non-pharmacological ones. Use of drugs which decrease sympathetic activity, substitution therapy using a drug with a longer half life, anticraving compounds are among the topics which can be explored. Drug abuse is linked with the propensity of a drug to produce a 'high' and the speed with which the particular high is produced. Modern technology has resulted in compounds which are more potent and which can be given by routes which produce a quicker high. For example coca leaves has been chewed by the natives of Andes Mountains for centuries. Addiction was uncommon. Modern technology resulted in the isolation of cocaine which could be given intravenously and through the respiratory route and is more potent. Cocaine became a major drug of abuse

Down regulation/up regulation of receptors and changes in receptor sensitivity are factors responsible for withdrawal symptoms. Tolerance occurs on prolonged use of a drug. The influence of pH on absorption and excretion of drugs has been already discussed. These are important topics in Pharmacology.

Medicine:

Drug abuse can produce a number of medical manifestations. Vitamin deficiencies, liver cirrhosis, fatty liver, portal hypertension, infections are a few of the many disease manifestations. Often patients get addicted to prescription medicines. Repeat prescriptions, not stopping the drug once the patient feels better could be possible reasons. Topic of rational use of medicine, precautions while using potentially addictive drugs and management of drug addiction (though it has strong psychological component) can be explored.

Psychiatry:

The hallucinogenic drugs produce symptoms similar to those produced by mental illness. The management of drug addiction has a strong psychological component and self-help groups and patient support groups are based on psychological principles. Drug abuse patients are handled by the department of psychiatry in a teaching hospital.

Conclusion

The problem of drug addiction and non-medical use of drugs can be used to explore a number of issues in both the basic and clinical sciences and to highlight the close interrelation between the various subjects which have the ultimate goal of understanding the human body both for the sake of knowledge itself and from the applied perspective of being better able to treat deficiencies and disorders of function.

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कर्मण्येवाधिकारस्ते
My right is to my work

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Case Report

Cough induced rib fracture, rupture of the diaphragm and abdominal herniation

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Abstract :

Cough can be associated with many complications. In this article, we present a 59 year old male patient with a very rare combination of a cough related stress fracture of the ninth rib, a traumatic rupture of the diaphragm, and an abdominal wall herniation. The hernia was repaired through surgical treatment without bowel resection, the diaphragm and the internal and oblique abdominal muscle were adapted, and the abdomen was reinforced with a prolene net. Although each individual injury is well documented in the literature, the combination of rib fracture, abdominal herniation and diaphragm rupture has not been reported.

Case report

We report a rare case of a cough related stress fracture of the ninth rib, traumatic rupture of the diaphragm and abdominal herniation in a patient with a chronic cough history. A 59 year old male patient (86 kg; 1,75 m) collapsed at home following intensive coughing. The medical history includes hypertension being treated with a beta-blocker, house-dust-allergy, chronic bronchitis related cough, and two operations on a spinal disc prolaps. The patient is known to have smoked (15 pack years). There was no previous history of trauma. On admission to hospital examination revealed a 10 cm well demarcated area of haemorrhage in the right side of the epigastrium. The abdomen was painful, but soft with no palpable mass or herniation. An abdominal computed tomography showed a fracture of the ninth right rib with a surrounding haematoma and hematothorax; however, no bowel herniation or muscle tear was evident (Fig. 1, 2). A thoracic drain was inserted for two days. During the hospital stay the patient's abdomen became meteoristic and painful. He had no bowel movements for five days. A CT scan confirmed an intestinal obstruction, showing

an ileus due to a massive herniation on the right lateral side of the abdomen (Fig. 3, 4). An operation followed in which a crosswise incision along the ninth rib was made. The herniation was reduced without bowel resection. During the operation a rupture of the diaphragm also was found. The diaphragm and the internal and oblique abdominal muscle were adapted and the abdomen was reinforced with a prolene net.

Post operation the patient remained intubated for six days to prevent coughing. At the time of discharge the patient was well. A clinical and radiographic investigation six months later showed no renewed herniation, and the patient remained well.

Discussion

Violent or sustained coughing can be associated with many complications. The most frequent and best documented complications are rib fractures [1]. Typical locations for rib fractures are the fifth through ninth rib at the lateral aspect of the rib cage. These fractures are caused from opposing muscular forces in the middle of the rib at the axillary line from the serratus anterior and external oblique muscles [2]. Other cough induced rib fractures are caused by a complex interplay between inspiratory and exspiratory muscles. Serious complications are rare and may involve pneumothorax [3], bleeding [4] or even intercostal pulmonary hernia [5]. Therapy for sole rib fracture is conservative with treatment of the cough causing factor.

The diaphragm is mainly an inspiratory muscle, but it also contracts during the expiratory phase of a cough [6]. During forced respiratory movements, the muscles of the abdominal wall contract pushing the diaphragm upward whereas the ribs are pushed inward and downward. This kind of opposing action can result in diaphragmatic rupture with a consequent herniation of bowel loops into the chest.

Defects of the abdominal wall after coughing are rare and require a surgical intervention [7]. Both abdominal herniations as well as abdominal muscle tears were reported. Abdominal muscle tears are frequently misdiagnosed due to their mimicry of an acute abdomen, appendicitis or all kinds of gynaecological diseases and emergencies [8]. A computed tomography seems to be essential for an accurate diagnosis [9]. Abdominal muscle tears are generally most common in middle-aged and elderly patients with chronic bronchitis [10]. In contrast to the abdominal muscle tears, abdominal herniations caused by cough are in general easier to detect, but they commonly appear delayed [11].

In summary, since both the diaphragm and abdominal muscles are attached to the lower ribs, opposing forces can result in a rib fracture, diaphragmatic rupture and abdominal herniation due to cough. Coughing can be associated with many complications. Rib fractures are easily diagnosed, but abdominal muscle tears are frequently missed. They usually appear delayed and a computed tomography seems to be essential for an accurate diagnosis. Although each individual injury is well documented in the literature, the combination of rib fracture, abdominal herniation and diaphragm rupture however has not been reported so far.

Fig1. CT scan on admission. Fracture of the ninth right rib with hematothorax and emphysema.

Fig 2. CT scan on admission. No intestinal herniation.

Fig 3. Muscle rupture with intact external abdominal muscle one week after admission.

Fig 4. Massive intestinal herniation one week after admission.

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CME

Approach to Management of Chronic Lower Limb Ischemia

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INTRODUCTION

Lower limb ischemia due to occlusive peripheral arterial disease (PAD) is a common clinical problem. Intermittent claudication is said to afflict 10% of western population above 70 years of age. Precise Indian figures are not available, though one study from Delhi three decades ago concluded that limb ischemia cases accounted for 0.9% of all hospital admissions. The increasing incidence of atherosclerosis, especially in the urban population, has led to detection of a large number of cases. Sedentary lifestyle, smoking, dyslipidemias and diabetes are known risk factors for atherosclerosis. In addition, Buerger's disease and Takayasu's disease are peculiar to this part of the sub-continent.

Sadly though, the large majority of the cases of lower limb ischemia remain undiagnosed or, worse still, are misdiagnosed. Patients with limb pain are labeled as 'sciatica' or 'arthritis' without examination of peripheral pulses. Some of them deteriorate considerably and present with gangrene/tissue loss, by which time arterial bypass surgery may not be feasible and a major amputation is then be the only answer. Awareness regarding PAD causing limb ischemia is a must, and this article discusses some of the fundamental issues, which must be addressed in chronic lower limb ischemia. A step-wise approach in management of these patients is suggested.

When faced with patients of suspected chronic limb ischemia, the clinician must attempt to answer the following questions:

1. Is lower limb ischemia present?
2. What is the severity of the condition?
3. At what level is the occlusion/stenosis?
4. What is the etiology?
5. Does the patient suffer from any co-morbid conditions?
6. What are the therapeutic options?
7. What is the risk/benefit ratio of planned therapeutic procedure?

STEP 1: IS LOWER LIMB ISCHEMIA PRESENT?

A judicious combination of history, clinical examination and simple, non-invasive investigations can confirm or exclude chronic lower limb ischemia fairly easily.

Clinical Presentation Patients suffering from lower limb ischemia invariably present with one of the following features:

Intermittent claudication. This cramp like pain typically comes on walking and is relieved by taking rest. The pain is felt in bulky muscles at buttocks, thigh, calf or rarely the foot; calf is by far the commonest site of claudication. This is due to lack of oxygen in tissues because the blood supply cannot keep pace with the demand while walking. The respiration changes to anaerobic one at the affected site, with accumulation of metabolites which cause pain (substance P, and lactic acid). Intermittent claudication due to PAD needs to be distinguished from other causes of pain on walking: neurogenic (disc prolapse), venous disorders and arthritis of hip or knee. Neurogenic pain is shooting or radiating (down the back), is felt from the first step itself, is aggravated by coughing or sneezing, and is not relieved by stopping the walk to take rest. A history of backache is often present. Venous claudication is a 'bursting' pain usually felt

in calf on walking; a prior history of DVT or leg swelling may be present. Arthritic pain is localized to a particular joint (knee or hip), and occurs with the first step.

Claudication has been traditionally graded as per Boyd's classification in India; this is of little use in clinical practice because practically all patients are in grade III by the time they report to as doctor. Claudication distance, (i.e. the distance a patient can walk before pain forces him to rest), also called the maximum walking distance (MWD), is of greater importance as it indicates patient's functional disability, and should be carefully recorded.

Rest-pain. This pain is severe, continuous and unremitting, and is often worse at night ('night pain'). It is said to be the 'cry of the dying nerves', and signifies advanced ischemia. In contrast to intermittent claudication, it is felt in the forefoot or the entire foot. The pain keeps the patient awake at night. Hanging the leg by the side of the bed may relieve pain. This intense pain is not relieved by commonly used analgesics; regular use of narcotic analgesics may lead to addiction.

Non-healing ulcers. Some patients present with non-healing ulcers over the toes, foot, or distal leg. A history of trivial trauma may be elicited. These ulcers are painful but may be occasionally painless. There is no evidence of healing in the form of granulation tissue or sloping edges.

Gangrene. The affected area (usually toes or forefoot) is black, dry, shriveled and mummified, with a good line of demarcation. This dry gangrene may be converted to the wet type in the presence of superadded infection. It is worthwhile recalling other causes of gangrene at this stage: Secondary ('BREASTED'), Infective, Traumatic, Physical and Venous. Secondary causes include disease of **B**urger's, **R**aynaud's, **E**rgotism, **A**ccidental arterial drug injection, **S**enile (atherosclerosis), **T**hrombosis, **E**mbolism, and **D**iabetes. Infective causes include gas-gangrene, carbuncle etc. Traumatic causes include arterial injury due to a long bone fracture (classically supracondylar humerus or femoral). Physical extremes of temperature (heat or cold leads to death of tissue. Finally massive deep vein thrombosis (phlegmasia cerulia dolens) can lead to gangrene.

Acute on chronic ischemia. Some patients present with features of acute ischemia (the **six Ps**- pain, pallor, paresis, paresthesiae, poikilothermia, and pulselessness). This is due to sudden thrombotic occlusion of a pre-existing arterial stenosis. While it may be sometimes difficult to distinguish it from acute embolism, the rate of progression of symptoms is usually slower in thrombosis, the symptoms are less severe, and careful questioning may elicit a prior history of intermittent claudication.

Clinical Examination. The diagnosis of lower limb ischemia can be confirmed in most cases by simple clinical examination by way of palpation of limb pulses, and looking for other evidence of ischemia.

Absent / weak pulse. The femoral, popliteal, dorsalis pedis and posterior tibial pulses must be palpated on both sides, as are the carotid, brachial and radial pulses. Absence of ipsilateral pulse (when the contralateral pulse is well felt) is diagnostic of PAD. It should be remembered though that the dorsalis pedis pulse may be absent in about 10% of normal individuals. If the suspicion for chronic limb ischemia is strong but pulses are present, making the patient walk briskly for about five minutes will make the ankle pulse impalpable. This *disappearing pulse* is also pathognomonic of PAD. It cannot be overemphasized that an absent pulse is the **most specific** sign of limb ischemia.

Bruit. Major arteries should be auscultated for a bruit. Its presence indicates stenosis in the artery at a proximal site.

Other signs of chronic ischemia. These include loss of subcutaneous fat, shiny atrophic skin, loss of hair over the affected part, transverse ridges over the nail, and

interdigital fungal infection. Pallor of limb on elevation and rubor on dependency is also characteristic (due to loss of vasomotor tone), but may be difficult to detect in dark-skinned people, Capillary and venous refill time is prolonged. Ulceration or localized gangrene is a feature of advanced ischemia.

Investigation: Estimation of ankle pressure/ABI. The hand-held Doppler probe is used to detect arterial signal over the ankle arteries (dorsalis pedis and posterior tibial). The unmistakable triphasic pulsatile arterial signal is easy to identify. A BP cuff is tied at the ankle, and is inflated. The Doppler probe is used as a stethoscope to detect audible signal over the posterior tibial and dorsalis pedis arteries while the cuff is slowly deflated. The systolic ankle pressure is more than pressure in the brachial artery in a normal person. In PAD the ankle pressure is reduced. An ankle systolic pressure of less than 90 mm Hg confirms the presence of lower limb ischemia. The Ankle Brachial Index (ABI) is calculated by dividing the ankle arterial pressure by the brachial pressure. The normal value is more than 1.00. An index of less than 0.8 confirms the diagnosis.

It should be remembered though that some diabetics may have falsely elevated ankle pressures even in presence of PAD because of incompressible arteries. The **pole test** is useful in such patients. The patient is laid supine on the bed for Doppler pressure measurement. A graduated pole (e.g. the one used for measuring height) is placed near the foot end. The Doppler probe is placed over the artery, and the signals picked up. The patient is then asked to gradually elevate his limb (like the SLR test) till the arterial signal disappears. The ankle arterial pressure is calculated by the height difference on the scale (the height at which the pulse disappears minus the height at the level of heart).

STEP 2: WHAT IS THE SEVERITY OF LOWER LIMB ISCHEMIA?

The next logical question to be answered is how severe is the disease, because therapeutic options, as well as the time frame for treatment depends on the severity of the disease. Again, a judicious mix of history and examination answers this question adequately.

Claudication distance. Estimation of claudication distance (MWD) is a fair guide to severity of the disease. Shorter the distance, more severe is the disease. Making the patient walk on a treadmill at the rate of 2.5 km/hour can easily objectify claudication distance.

Rest-pain, ulceration & gangrene. These three clinical features signify the presence of advanced disease

Ankle pressure / ABI. Lower the ankle pressure/ ABI, more severe is the disease. Generally an ankle pressure of less than 50 mm Hg or ABI of less than 0.3 signifies severe occlusive disease.

Other indices of Severity. Doppler spectral waveform analysis, Plethysmography (air, strain gauge, photoplethysmography), Capillary microscopy (estimation of cutaneous capillaries in a given skin area), TcPO2 and TcPCO2 (transcutaneous oxygen and carbon dioxide pressure estimation), Laser Doppler fluxmetry, and blood flow measurement studies have all been used to estimate the severity of ischemia. Their practical value is limited, and they are used mostly in vascular laboratories/research institutions. Angiography demonstrates the anatomy of the arterial lesions, but does not tell us the physiological severity of the disease.

Fontaine Classification This consists of four categories:

Stage I Asymptomatic
Stage II Intermittent claudication
(a)Well compensated
(b) Poorly compensated
Stage III Rest-pain
Stage IV Non-healing ulcer/gangrene

This is a simple, yet extremely useful clinical classification in lower limb ischemia. The stages

characterize severity of the disease. A certain amount of judgment is required to differentiate between well or poorly compensated claudicating. A claudicating distance of 200 meters in a 70 year old man who also suffers from IHD would qualify as 'well compensated', as it may not limit his lifestyle much. The same walking distance in a relatively healthy 50 year-old man would be amount to 'poorly compensated'. Some form of operative / endovascular intervention is definitely indicated in stage III & IV of the disease. Left untreated, these patients often land up with major (AK/BK) amputation.

Critical Limb Ischemia (CLI). CLI has been defined in the European Consensus Document (*Circulation*, 1991) as the presence of rest pain or non-healing ulcers of more than 2 weeks duration along with an ankle pressure of less than 50 mm Hg or a toe systolic pressure of less than 30 mm Hg. As the name suggests, it denotes an advanced (critical) situation where some form of intervention is indicated because otherwise the patients are a very high risk of losing their limbs due to gangrene.

STEP 3: WHAT IS THE LEVEL OF THE BLOCK?

In the stepwise logical progression of decision-making paradigm, the next important issue to be decided is the level(s) of occlusion / stenosis in the artery. This is important because of several reasons. Proximal (large vessel) lesions are more amenable to surgery / angioplasty, and the long-term patency rates are better. Distal lesions are difficult to treat. Multi-segment disease may require several (sequential) bypasses or a combination of stenting and surgery. Once again, a combination of clinical presentation coupled with examination often gives a definite answer. Some form of more sophisticated investigations may also be required at this stage.

Site of intermittent claudication. The site of intermittent claudication is an excellent guide to the level of block. Pain is felt in both the buttocks in aorto-iliac disease. Impotence signifies poor internal iliac artery perfusion and this combination is referred to as Leriche's syndrome. In isolated iliac artery occlusion patient has pain in the thigh; in femoro-popliteal disease in calf; and in the foot in case of crural artery occlusions.

Presence of bruit over the artery. As mentioned previously, bruit over a major artery indicates stenosis. Carotid, renal femoral arteries and the abdominal aorta should always be auscultated for presence of a bruit.

Absence of pulse. Absence of femoral pulse on both sides signifies aorto-iliac occlusion; absent unilateral femoral pulse suggests ipsilateral iliac occlusion. If femoral pulse is well felt while popliteal is not, the lesion obviously has to be in between these two areas (the superficial femoral or proximal popliteal arteries). A normal popliteal pulse with absent ankle pulsation indicates crural artery disease commonly seen in thromboangiitis obliterans (TAO) or Buerger's disease.

Segmental arterial pressure recording. Sphygmomanometer cuffs can be tied in upper and lower thigh, upper calf, above ankle and over the great toe, and pressure recorded below an inflated cuff at each of the level using the Doppler probe. A pressure drop of more than 20 mm Hg between two levels indicates significant narrowing of the vessel in that region.

Duplex scanning (Colour Doppler). This is perhaps the ideal non-invasive investigation in assessment of lower limb ischemia. It tells us the level of the block(s); differentiates between stenosis and occlusions; and tells us whether a given lesion is hemodynamically significant or not. Spectral analysis can be done and peak systolic velocity calculated. It has the potential of replacing arteriography, at least in some clinical settings. The only drawback is that it is operator dependent, and needs a committed radiologist. The equipment is also expensive.

Arteriography. Some form of arteriography (conventional cut-film, or digital subtraction

angiography, DSA) still remains the "gold standard" in diagnosis of limb PAD. It tells us the

(a) Site and extent of arterial lesion,
(b) State of arteries proximal to occlusion (the "run in"),
(c) State of arteries distal to the lesion (the "run off") and
(d) State of collateral circulation

It should be clarified that arteriography **should not** be used only to *confirm* the diagnosis in PAD, because clinical examination coupled with non-invasive tests usually suffices for this purpose. It should be performed only if some form of intervention (operative or angioplasty / stenting) is planned. The **indications** of arteriography (DSA) are therefore the same as that of surgery/angioplasty. Briefly, these are: presence of rest-pain, non-healing ulcers, localized gangrene, or incapacitating (poorly compensated) intermittent claudication. It should be remembered that one treats the patient and not the angiogram. All arterial blocks do not require surgery!

CT Angiography/MR Angiography. These are relatively non-invasive, and increasingly being performed when PAD is suspected. Unlike DSA these can be done on out-patient basis. There is excellent correlation between CTA/MRA and DSA. MRA has the added advantage that this can be done in patients with compromised renal function. These modalities have decreased the threshold of investigation in limb ischemia.

STEP 4: WHAT IS THE ETIOLOGY?

It is important to know the disease process causing lower limb ischemia, because the natural history of atherosclerosis is quite different from TAO. Because both diseases are common in males and heavy smokers, there is a tendency to label all lower limb PAD as "Buerger's disease". This tendency should be curbed, not only because (contrary to general perception) atherosclerosis is commoner, but also because direct arterial surgery is often feasible in this condition.

Atherosclerosis. Smoking, obesity, dyslipidemia, hypertension and diabetes mellitus are the known risk factors. Contrary to earlier thinking, atherosclerosis is very common in Indians – the large number of coronary angioplasties / coronary bypass surgery bears an eloquent testimony to this fact. It is the commonest cause of lower limb ischemia in this country. It is a generalized disorder, which afflicts the large and medium size vessels. Involvement of coronary, renal cerebral and visceral arteries is common.

Thromboangiitis obliterans (Buerger's disease). It is a common cause of limb ischemia in young males. It classically involves distal small arteries (digital, crural) though proximal involvement may be rarely seen. Histologically there is pan-arteritis. The neighbouring vein and nerve may be involved in the disease process (pan-vasculitis). The differentiating features of the two diseases are listed in the table below.

Feature	Atherosclerosis	Buerger's
Sex	Predominantly male	Exclusively male
Smoking	Common	Invariable
Onset	Over 40 years	20-30 years
Age at presentation	50-70 years	30-40 years
Migrating thrombophlebitis	Absent	May be present
Other system involvement	Common	Very rare
Arteries involved	Large and medium size	Small
Distal Runoff	Usually present	Absent
Collaterals	Extensive, 'tree-root'	Scanty, 'Corkscrew'
Potential for arterial surgery	Yes	Very rare

The Young Claudicant. When faced with a young patient with intermittent claudication, one normally does not think beyond TAO (Buerger's disease). It is important though to remember some of the other conditions because many of these are amenable to surgery. These relatively uncommon causes of lower

limb ischemia may in fact be seen in any age group.

Presenile atherosclerosis. Atherosclerosis can sometimes afflict the younger patient. The condition may may mimic TAO. Like the adult variety, proximal vessels are involved, and direct arterial surgery is feasible.

Popliteal artery entrapment. The medial head of gastrocnemius, which arises from an abnormal position, compresses the popliteal artery. The condition occurs in young atheletes, and several anatomical variants are described. It is possible to demonstrate popliteal artery compression on duplex scan / angiography by asking the patient to forcefully flex his ankle. Division of medial head of gastrocnemius is curative.

Cystic adventitial disease. This is a localized disorder afflicting the media and adventitia of the popliteal artery. The clear jelly – like contents of the cyst resemble that of a ganglion. Angiography reveals 'scimitar sign' (eccentric smooth intraluminal defect). Surgery cures the symptoms.

Coarctation of aorta. Coarctation of aorta (especially infrarenal) can cause claudication. Femoral pulses are weak, and radio-femoral delay is appreciable; murmur over the left hemithorax is common. Angioplasty (with or without stenting) or surgery is curative. ***Persistent sciatic artery*** is a condition where femoral pulses are absent due to failure of proper development of iliofemoral segment, and the supply to lower limb is by the embryonal axial (sciatic) artery. The latter is prone to aneurysmal dilatation which may cause thrombosis or distal embolization. Confirmation is by duplex scan or angiography.

Fibromuscular dysplasa. This primarily tends to afflict the renal and carotid arteries, but can sometimes involve iliac arteries in young adults.

Arteritis (Takayasu's). Arteritis or vasculitis may present as lower limb ischemia. Takayasu's disease mostly afflicts young females. Systemic manifestations like fever, malaise, weight loss and raised ESR are present in acute phase of the disease. Carotid tenderness is often present. A tubercular etiology has been proposed but never proved in India. The condition is dealt with in detail in the chapter on upper limb ischemia.

Thromboembolism. The patient's limb may have survived a prior thromboembolic episode, leaving intermittent claudication as a sequel. Careful history gives a clue to diagnosis. If no source of embolism is evident, patient should be investigated for thrombophilia (hypercoagulable state).

Post-traumatic. A missed arterial injury at the time of a previous trauma may manifest later as intermittent claudication.

Drugs Ergot preparations can induce severe vasospasm leading to gangrene. Accidental intra-arterial injection in drug addicts (main liners) can cause acute peripheral ischemia.

STEP 5: ASSOCIATED CO-MORBID CONDITIONS

Before considering therapeutic options, it is necessary to evaluate the patient fully. It is important to remember that atherosclerosis is a generalized disorder. A detailed evaluation is taken for cardiac disease (angina, history of myocardial infarction or congestive cardiac failure, or palpitations), renal, ocular (amaurosis fugax), cerebro-vascular (TIA or CVA) and mesenteric vessel (postprandial pain, food fear and weight loss) involvement. The common co-morbidities that exist are hypertension, ischemic heart disease (IHD), diabetes, COPD, and renal failure. A recent study (Journal of Vascular Surgery, Feb 2001) has found that claudicants with comorbidities had an annual mortality rate of 12% per year; 66% of the deaths were due to cardiac events. Critical limb ischemia is associated with an annual mortality of 20%; over 70% of patients are dead in 3 – 5 years. Similarly 80% of patients presenting with rest pain, and 95% presenting with gangrene will be dead within 10 years.

Hypertension. Hypertension should be controlled. However it is important to remember that sudden 'excellent' control of BP can worsen limb ischemia due to decrease in perfusion pressure. Beta-blockers have been traditionally avoided, though current evidence does not support the hypothesis that they are harmful in PAD. Anti-hypertensive drugs that have a peripheral vasodilatory effect (nifedipine, minipress) offer a

theoretical advantage in PAD management.

Ischemic Heart Disease (IHD). The major cause of mortality in limb ischemia is cardiac. A detailed history should be taken for prior myocardial infarction or angina. The performance status (NYHA) of the patient should be documented. A careful and thorough cardiac assessment is mandatory prior to any major vascular surgery. X Ray Chest, ECG and cardiac echography are routine investigations. Treadmill testing may not be possible in patients with lower limb ischemia as they may be unable to walk. Dobutamine-atropine stress echography is a useful non-invasive assessment procedure in such cases. If indicated, thallium stress test or cardiac catheterization should be considered.

Diabetes mellitus. The arterial lesions tend to be more diffuse in diabetics. The arteries may be incompressible, leading to a falsely elevated ABI even in presence of significant arterial disease. Several studies have shown that the results of arterial surgery are no different in diabetics: limb salvage and patency rates of peripheral bypasses are comparable to non-diabetics. A good glycemic control, of course, is mandatory.

Chronic Obstructive Pulmonary Disease Smokers are prone to respiratory disorders, Chest X Ray and pulmonary function tests should be used for preoperative evaluation. The pulmonary status should be optimized by cessation of smoking, physiotherapy, bronchodilators, and incentive spirometry.

Renal Failure. Renal status should be assessed by BUN / Creatinine estimation. DTPA/MAG III scan may be indicated. Pre-op dialysis may be required. Nephrotoxic drugs should be used with caution: these include NSAIDs, statins, biguanides (metformin), cephalosporins, ACE inhibitors, beta blockers, and thiazide diuretics, amongst others.

Hyperlipidemia/Dyslipidemia. A lipid profile is mandatory in patients with atherosclerotic PAD. Lipid abnormalities are common and require attention. Serum homocystine levels may also be elevated in patients with PAD.

STEP 6: WHAT ARE THE THERAPEUTIC OPTIONS?

A large majority of patients with lower limb ischemia can be treated by conservative measures. The remainder would require some active therapeutic intervention by way of surgery, angioplasty, or other ancillary procedures. Amputation is required in end-stage disease where all therapeutic options have failed.

Conservative Measures. They are particularly beneficial in managing intermittent claudication. This consists of the following:

Stop smoking. The patient should be told that he can choose between his limb and cigarettes. Cessation of smoking has been shown to arrest the progression of disease and improve walking distance in both atherosclerosis as well as TAO. In fact tobacco in any form should be discontinued.

Keep walking! Patient may be afraid to walk because of the fear that may worsen his clinical condition. He is to be assured that exactly the opposite is true: walking promotes development of collaterals and the claudication distance usually improves. Several randomized trials have shown that a supervised exercise-training program is as effective as PTA (percutaneous transluminal angioplasty) in improving walking distance in intermittent claudication.

Exercise Even exercise of the upper limbs is beneficial. Studies show regular exercise decreased mortality due to a reduction in cardiac events.

Care of feet "Take care of your feet like your face" is a good adage for patient. This is even more crucial in diabetic patients with PAD. Well fitting footwear must be worn at all times. Particular attention is to be paid while cutting nails. Even trivial injuries should be brought to the notice of the physician.

Heel raise An inch of heel raise in the shoe decreases the workload on calf muscles and improves MWD in patients with intermittent claudication.

Life-style modification Elderly patients should be advised to adjust their lifestyle rather than opt for aggressive surgical revascularization for moderate intermittent claudication.

Pharmacotherapy The drugs enumerated below have been tried in atherosclerosis. Their use in TAO remains largely unproven.

- **Soluble aspirin** in doses of 40-300 mg OD has been shown to be beneficial in patients with atherosclerotic PAD. It should be prescribed to all patients unless contraindications to its therapy exist.
- **Other anti-platelet agents** Dipyridamole and ticlopidine / clopidrogel are as effective as aspirin, but considerably more expensive. A combination of dispirin and clopidrogel may be used, especially after PTA/stenting. Picotamide may be used alternatively. Anti-platelet agents reduce adverse vascular events – stroke, myocardial infarction, and death by 25%, and also improve patency of vascular grafts.
- **Statins** These HMG-CoA inhibitors reduce serum cholesterol and LDL. In addition they improve endothelial cell function, reduce plasma fibrinogen levels, and have plaque stabilization and antithrombogenic properties. Their main reason for use is to reduce cardiovascular events. However, a recent study has demonstrated that statins (Atorvastatin) not only reduce cardiac mortality, but also improve the claudication distance. Liver function should be monitored during their therapy.
- **Vitamins** B6, B12 and folic acid should be used if patient has hyperhomocystinemia, an independent risk factor for development of PAD. Homocystine generates oxygen-free radicals which lead to endothelial dysfunction, impaired nitric oxide (NO) generation and smooth muscle cell proliferation leading to worsening of atherosclerosis.
- **Cilostazol (Zilast, Stiloz, Pletal, Pletoz)** This is a phosphodiesterase III inhibitor which increases the cellular levels of cAMP. It acts by inhibiting platelet aggregation, reducing vascular smooth muscle proliferation, and by vasodilatation. Four RCTs have demonstrated improvement in claudication distance with its use. In another randomized controlled trial, this drug was twice as effective as pentoxyfylline in intermittent claudication. Dose: 50-100 mg bd. Congestive heart failure is a contraindication for its use. Response may take 2-3 weeks; it should be tried for at least four weeks before deciding to discontinue it.
- **Pentoxyfylline (Trental)** This hemorheological agent has been shown to modestly increase the claudication distance in intermittent claudication in about 60-70% of cases. Dose: 400-800 mg tds. Like cilostazole, response may be apparent only after 2-3 weeks.
- **Naftidofuryl (Praxilene)** This drug has a local anaesthetic action, and locally it increases ATP levels, reduces lactic acid and improves oxygenation. It is popular in Europe in management of intermittent claudication, and has been claimed to be superior to pentoxyfylline. Dose: 100 mg tds.
- **Buflomedil** has alpha-1 and alpha-2 adrenolytic effects. It decreases vasoconstriction, increases red cell deformability, and has a weak anti-platelet and calcium antagonistic effect. Two small studies have shown improvement in walking distance compared to plcebo.
- **Inositol nicotinate** causes cutaneous vasodilatation, fibrinolysis, and lowers lipids. No significant benefits shown in RCT. Dose: 3-4 gm per day.
- **Carnitine** This naturally occurring foodstuff may be of some benefit in intermittent claudication. L-carnitine and propionyl levocarnitine (2 gm/ day) are commercially available. No RCT available.
- **Alternative Medicines: Ginko Balboa** has been claimed to have a beneficial effect on MWD.
- **Analgesics** These are used in treatment of rest pain; they have no role in intermittent claudication. Treatment is usually begun with a combination of milder analgesics (paracetamol, brufen, diclofenac etc.). Codeine, ketorolac and tramadol may be tried. Narcotic analgesics are best avoided as they can lead to drug dependence; they may only be used for 48-72 hours to break he pain cycle in severe ischemic rest pain.
- **Prostaglandins I & E (Prostin VR, Alpostin,**

Ilomedin) Prostaglandin infusions have been tried for limb salvage in critical limb ischemia (CLI) when direct arterial surgery is not possible. Limb salvage rates of about 60% have been reported. The drugs are expensive (Rs.9, 000 per vial) and the recommended 14 – 28 day course is not affordable by most Indians.

- **Heparin** Unfractionated, or low molecular weight heparin is used in the immediate post-operative period after direct arterial surgery by most vascular surgeons.
- **Oral anticoagulants** Warfarin and nicoumalone (acitrom) have been used for long-term anticoagulation after below knee bypasses, and have been shown to enhance graft patency rates of venous bypass grafts (the Dutch BOA study).
- **Vasodilators** agents like nicotinic acid and duvadilan have **no role** in management of occlusive PAD because there is no known agent that can dilate a pathologically diseased artery. They may be of some benefit in vasospastic disorders.

Local measures to promote wound healing Refractory ulcers which fail to heal are a real management problem in PAD. Regular dressings are usually of little avail. Improving blood supply by surgical revascularization or angioplasty (see below) is the best way to promote ulcer healing. Some of the measures which can be tried as adjunct to revascularization (or independently if revascularization is not possible) are listed below.

* **Beclapermin (rhPGDF-BB) Gel** A number of studies have shown that application of beclapermin gel improves ulcer healing.
* **Hyperbaric Oxygen Therapy (HBOT)** HBOT has been tried for last several decades to promote wound healing. It may be of some use of in TAO, but is of little value in atherosclerotic PAD.
* **Vacuum Assisted Closure (VAC) device** VAC device has been claimed to assist in healing of chronic ulcers, including those due to PAD. No large confirmatory study is available.
* **GMCSF** Peri-ulcer injections of Granulocyte Macrophage Colony Stimulating Factor (GMCSF) have been used to promote healing in chronic ulcers. Their benefit in PAD remains unproven.

Angioplasty / stenting Percutaneous transluminal balloon angioplasty (PTA) alone or in combination with a stent is useful in dilating stenosed arteries. It is most effective in solitary, discrete, small (<5cm), non-calcified stenotic lesion in a large artery (aorta/ iliac) with a good distal outflow. Stent is a metallic device (tube) which is mounted on a balloon catheter and can be inserted at the site of stenosis /occlusion. It is used if significant residual stenosis remains after PTA, if there is a dissection at the time of PTA in total occlusions, and in long-segment occlusions. The obvious advantage of these procedures over surgery is that they can be performed under local anaesthesia, and are minimally invasive avoiding long incisions and complicated surgical procedures. A word of caution, though. Arterial stenosis/occlusions may be detected incidentally while performing angiography for some other reason (e.g. cardiac catheterization). The temptation to angioplasty/stent the lesion ('oculo-cephalic reflex'!) should be strongly resisted till a thorough clinical evaluation has been done and vascular consultation obtained. It is wise to recall that one treats the patient, not the angiographic lesions.

Surgical revascularization Direct arterial surgery may be in the form of endarterectomy or bypass surgery. This can only be attempted if there is a good "run in" and "run off" beyond the block.

Endarterectomy Removal of atheromatous plaque along with portion of media disobliterates the artery and restores normal size of the lumen. It is useful for localized blocks (e.g. carotid artery stenosis or profunda femoris stenosis at origin). The arteriotomy is usually closed by vein or synthetic patch ("patch angioplasty").

Peripheral Bypass Surgery Arterial bypass surgery has now been performed for over five decades with excellent results. The bypass conduit is either

autogenous saphenous vein ('reversed' or 'in situ'), or some synthetic material (coated dacron or polytetrafluoroethylene, PTFE). For larger arteries (e.g. aortobifemoral bypass for aorto-iliac occlusive disease), prosthetic grafts are utilized because of the small diameter of saphenous vein. For infrainguinal bypass, saphenous vein is ideal, though prosthetic grafts can be used for above-knee femoro-popliteal bypass. Bypasses to tibial arteries and even plantar arteries can be done.

Indirect surgical methods for improving circulation. These should **only** be attempted when direct arterial surgery or PTA is not feasible as the results of direct interventions are far superior to the indirect methods.

Sympathectomy Is a useful procedure for management of non-healing arterial ulcers, and in localized gangrene (in combination with conservative amputation). It is also useful in relieving rest-pain in about 80% of cases. It has no role in management of intermittent claudication. Sympathectomy may not be of much use in diabetic PAD, as they are already said to have undergone 'auto-sympathectomy' because of neuropathy.

Omental transfer Omentum can be lengthened, based on its arterial arcades, and can be brought down to lower leg. It is claimed to improve circulation by its angiogenic properties. It is useful only in management of critical limb ischemia in TAO patients; response rates are of the order of 70%.

Unilateral adrenalectomy has also been reported from a center in India for management of Buerger's disease. It lacks scientific basis, and has not been confirmed independently.

Ilizarov technique Ilizarov external fixator has been used for 'distraction angiogenesis' in TAO. At this point of time its use can only be considered experimental.

Epidural spinal cord stimulation A lead can be placed in the epidural space at T10-11 level and connected to an impulse generator implanted subcutaneously. Dorsal column stimulation relieves rest pain. Response rates of 70-80% have been reported. It may also improve skin microcirculation. The device is expensive (about three lakh rupees).

Other methods for improving circulation. Some measures tried in recent times are listed below.

Chelation Therapy Chelation therapy using EDTA (ethylenediaminetetraacetic acid) is one of the non-conventional methods for improving circulation. Repeated EDTA injections are combined with vitamins, trace elements and iron supplements. It is said to reduce the calcium content of atherosclerotic plaques, lowering LDL oxidation and facilitating activity of hydroxyl radical scavengers. It also diminishes platelet adhesion and attenuates reperfusion injury. Tall claims are made regarding its efficacy by its proponents, but there is little validated scientific evidence; the effects are likely to be due to powerful placebo responses.

Therapeutic angiogenesis VEGF (vascular endothelial growth factor), and bFGF (beta fibroblast growth factor) have been used experimentally as well clinically, both in intermittent claudication as well as critical ischemia. While the earlier case control studies showed some dramatic results, two large randomized trials (TRAFFIC study in 2002, and RAVE trial in 2003) failed to demonstrate any significant benefit thereby dampening the enthusiasm in this field.

Stem Cell Therapy Direct injections of stem cells called endothelial progenitor cells (harvested from patient's bone marrow or peripheral blood) in ischemic areas (e.g. calf muscles), in order to promote local formation of capillaries is another method of promoting therapeutic angiogenesis. The TACT study (2002) demonstrated relief of rest pain in 86% and ulcer healing in 66% of patients. This exciting development is in its infancy, and may well be the answer for end-stage PAOD.

Amputation This is required for established gangrene, and in management of critical limb ischemia when all therapeutic options have been exhausted / have failed. Rarely amputation may be preferred to direct revascularization in a patient with severe co-morbidities who is unlikely to be ambulant even with

a successful bypass. Local amputations (e.g. of a toe) usually heal in TAO; in contrast major amputations are usually required in atherosclerosis.

STEP 7: RISK: BENEFIT ANALYSIS (DECISION MAKING) & GUIDELINES

Armed with the knowledge of the clinical condition of the patient and the available therapeutic options, the final step in decision-making arrives: what treatment does one offer the patient? A large number of factors determine the decision, and most of them have already been dealt with. The advantages (**benefits**) of a procedure e.g. surgery - relief from disability (short walking distance) or pain; avoiding a future event (limb loss); improvement in function (increased walking distance); and the duration of benefit (bypass patency rates) have to be weighed against its inherent disadvantages (**risks**) - mortality, permanent and temporary morbidity, lack of improvement (primary failure) and secondary failure (post-op occlusion). While it may not be possible to give exhaustive management guidelines, a few examples would be in order.

1. **Intermittent claudication** is best treated with conservative measures, at least initially. Cessation of smoking coupled with pharmacological measures (aspirin, statins, and cilostazole) improves symptoms, and my halt the progress of disease. Other risk factors (hypertension, diabetes mellitus) should be controlled. Surgery/PTA should be reserved for disabling claudication only. Proximal (aortic/iliac) lesions should be treated more aggressively, at an early stage than distal occlusions.

2. **Critical limb ischemia / Fontaine Stage III/IV.** Some form of intervention is strongly recommended for critical limb ischemia, as these patients may otherwise invariably land up with major amputation. Pain can be relieved by continuous epidural analgesia (via a catheter) while the patient is 'worked up' for surgery. The choice between PTA/Surgery has been dealt with in the previous section.

3. **Aorto-iliac disease.** The patency rates after angioplasty/surgery are of the order of 90-95% at 5 years. The procedure is therefore recommended even for intermittent claudication. PTA / stenting is preferable, if feasible, because of lower mortality and morbidity (1-5%). Open surgery has a mortality rate of 2 - 5 % (depending on associated co-morbidities) and morbidity rate of another 10%.

4. **Femoro-popliteal disease (above knee).** PTA / stenting have only a 50% 1-year patency rate, and are rarely recommended as the initial procedure for this condition. PTA may be however be considered when surgery is not possible due to prohibitive operative risk. Saphenous vein or PTFE bypass has a patency rate of 60% at 5 years; the patency rates of saphenous vein bypass are superior. Pharmacological adjuncts for enhancing prosthetic graft patency include coating the luminal surface with carbon (Carboflo ®), or bonding the graft with heparin (Propaten ®). The advantage of PTFE/Dacron graft is that it spares the native saphenous vein for a future CABG or a redo peripheral vascular surgery. However these grafts are expensive (approx. Rs. 2,000/- or more); the saphenous vein is free. There is also some evidence to suggest that patients whose synthetic grafts occlude at a later date do worse than patients with occluded venous grafts. Operative treatment of above-knee femoro-popliteal occlusions is recommended both for limb salvage (critical ischemia) as well as for severe intermittent claudication. Current evidence favours use of vein grafts; if long term results of heparin bonded grafts are good they may become the preferred conduit of choice.

5. **Distal vessel (below knee) disease.** Bypasses made to below-knee popliteal artery or crural arteries have a limited patency rate of 50-60% at 3 years. The procedure is therefore indicated only for limb salvage in critical ischemia, and **never** for treatment of intermittent claudication alone. A distinction must be made between bypass patency rate and limb salvage rate. The two are not synonymous. Limb

salvage rates are always superior to bypass patency rates, because not all patients with an occluded bypass end up with amputation. Collateral circulation often develops in the intervening period, so that graft occlusion does not necessarily lead to amputation. Only saphenous (or cephalic) vein should be used for below-knee bypass, because prosthetic graft patency rates are extremely poor. If one is forced to use a prosthetic graft due to non-availability of a suitable vein, a venous 'collar' or 'cuff' ('Miller's cuff', or 'St Mary's boot'), or a vein patch ('Taylor's patch') should be used at the distal anastomotic site. There is no difference in the patency rates of reversed or 'in situ' saphenous venous bypass. However wound complication rates are lower with 'in-situ' bypass.
Lately there are increasing reports in literature for the use of infrapoliteal angioplasty in the management of critical limb ischemia. Some series have reported patency rates equivalent to vein bypass surgery. The performance of this (relatively short) procedure under local anaesthesia, avoiding major surgery requiring long anaesthesia makes it an attractive treatment in this group of critically ill elderly patients.

6. **Buerger's Disease**. Conservative treatment is the cornerstone of therapy. Cessation of smoking is mandatory. The patient should be bluntly told that he can choose between his cigarette / 'bidi' or his leg. Direct arterial surgery is rarely possible in TAO. However, when feasible, it should be undertaken as limb salvage results are good. For those patients who present with critical limb ischemia (non-healing ulcers / rest pain), initial management should consist of bed rest (with head end elevated), pain relief by a continuous epidural catheter infusion, anti-platelet agents, oxygen inhalation, and perhaps intravenous prostaglandins (I or E). Hyperbaric oxygen therapy may also be useful for treatment of non-healing ulcers. Sympathectomy is the most accepted and the least controversial procedure in this setting, and carries a success rate of 60-70%. Adrenalectomy has not been proved to be of any benefit. Omental transfer or Ilizarov's technique should be reserved for sympathectomy failures. None of these should be performed for patients with intermittent claudication alone. Conservative amputations (e.g. toe, forefoot) should be attempted in TAO as they often heal well; major ones (e.g. BK amputation) are rarely required.

CONCLUSION

Chronic lower limb ischemia due to PAD is commonly encountered in clinical practice. Atherosclerosis is the commonest cause: Buerger's disease is often the cause in young. Intermittent claudication can be managed conservatively, while rest-pain, ulceration or gangrene require angiography followed by angioplasty/stenting or peripheral bypass surgery. These procedures lead to an improved quality of life and avoid limb loss. Co-morbidities should be carefully assessed in the elderly since majority of these patients suffer from concomitant CAD (coronary artery disease).

दन्त स्वास्थ्य

दाँत र गिजाका रोगहरु र निदानका उपायहरु

डा. प्रकाश बराल
वरिष्ठ दन्त चिकित्सक

दाँते किरा (Dental Caries) र दन्त हर्षा (Periodontitis) समाजमा व्याप्त दाँत र गिजाका प्रमुख संक्रमणहरु हुन् ।

दाँते किरा आँखाले देख्न नसकिने सुक्ष्म जिवाणु (Bacteria) को संक्रमणले हुन्छ । ब्याक्टेरिया धेरै प्रजातिका हुनछन् । दाँते कीरा लाग्ने कारक तत्व बन्ने चाहिँ स्ट्रेप्टो कोकस मुटान्स (Strepto Coccus Mutans), स्टाफाइलोकोकस अरियस (Staphylococcus Aureus), ल्याक्टोब्यासिलस एसिडो फिलस (Lactobacillus Acidophilus) हुन् । यी ब्याक्टेरिया हरुले खाद्य पदार्थलाई सडाई (Formentation) गरी अम्ल (Acid) बनाइदिन्छन् । उक्त अम्लले दाँतको खनिज पदार्थहरु क्यालिसियम र फस्फोरसको क्रिष्टललाई धुलाइदिन्छन् र दाँतमा प्वाल पर्छ । यसरी दाँतमा प्वाल पर्ने प्रक्रियालाई नै दाँते किरा लागेको भनिन्छ । दाँते किराले पारेको प्वाललाई दाँते किराले खाएको भनिन्छ । तसर्थ दाँते किरा अन्य किराजस्तो आँखाले देख्न सकिँदैन, यसलाई सुक्ष्मदर्शक यन्त्र (Microscope) ले मात्र देख्न सकिन्छ ।

दाँते किराको सम्बन्धमा हाम्रो समाजमा एउटा अन्धविश्वास व्याप्त छ त्यो के भने दाँते किरा चामलमा पर्ने कीरा जस्तो लामो हुन्छ र यो झारफुक गर्नेले मन्त्र फुकेर झार्न सक्छन् । यो जादु जस्तो हातको सफाई मात्र हो । यसमा कुनै सत्यता छैन । यदि दाँतमा किराले खाएको ठाउँमा साँच्चिकै त्यस्तो ठूलो किरा हुने भए विश्वमा दन्त चिकित्सकहरुले पहिलेदेखि आजसम्मन अरवौं दाँतहरुको परीक्षण र उपचार गर्दा त्यस्ता किराको बारेमा रिपोटिङ (Reporting) गर्दा हुन् । तर आजसम्म गरेका छैनन् र सबै दन्त चिकित्सकहरुले दाँतेकिराको कारण व्याक्टेरियाको संक्रमणले गर्दा नै हो भन्नेमा एक मत छन् ।

अहिलेसम्म हामीहरुले दाँते किरा के हो र यो कसरी लाग्छ भन्ने बारेमा चर्चा गऱ्यौं । अब हामी दाँते किराका लक्षणहरुको बारेमा चर्चा गर्नेछौं । दाँतमा ब्याक्टेरियाले आक्रमण गरेपछि सुरुमा कालो दाग देखा पर्छ । दाँतमा कालो दाग देखा पर्नु नै दाँते किराको प्रारम्भिक लक्षण हो । व्याक्टेरियाले दाँतमा लागेको खाद्य पदार्थ सडाउने क्रममा मेटाबोलिक प्रोडक्ट (Metabolic Product) को रुपमा कालो दागहरु (Black Stains) उत्पन्न हुनछन् ।

दाँतमा कालो दाग मात्र छ तर प्वाल (Covity) परिसकेको छैन भने त्यसलाई खास केही गर्नु पदैन तर दाँतको सरसफाई र आहारमा सुधार ल्याउनुपर्छ । जस्तो दिनहुँ २ पटक विहान र बेलुका मञ्जनसहितले ब्रस गर्ने र यदि सकिन्छ वा सम्भव छ भने केही ठोस खाद्य पदार्थ खानासाथ ब्रसले दाँत हल्का सफा गरिहाल्ने । गुलियो खाद्य पदार्थ कम खाने वा खाएपछि जोडले मुख कुल्ला गर्ने वा सम्भव भए, सकिन्छ भने ब्रसले दाँत सफा गरिहाल्ने । दाँतमा खानेकुरा अड्किन गएमा खाना खाइसकेछि तुरुन्त अड्किएको खाना झिक्ने र दाँतमा लामो समयसम्मन् अड्किन नदिने ।

माथि उल्लेखित प्रयत्नहरु (Efforts) दाँतको सरसफाइको लागि अति महत्वपूर्ण छन् र यी प्रयत्नहरुलाई अनिवार्य रुपमा व्यवहारमा उतार्नुपर्छ । दाँतमा किरा लाग्नबाट बचाउन यी प्रयत्नहरु किनै प्रभावकारी (Effective) छन् । यसकारण जसरी भएपनि माथि उल्लेखित सुझावहरुलाई मनन् गरेर व्यवहारमा कार्यान्वयन गर्नु "रोग लागेर उपचार गर्नुभन्दा रोग लाग्न नदिनु नै जाति" (Prevention is better Than Cure) हैन र ?

दाँतमा प्वाल परिसकेको छ भने त्यसको लक्षण दात्को प्वाल कति गहिरो छ भन्ने कुरामा निर्भर गर्दछ । यदि प्वाल (Cavity) दाँतको बाहिरी तह, इनामेल (Enamel) मा मात्रै सीमित छ भने कुनै पनि लक्षण देखा पर्दैन । यदि प्वाल दाँतको दोस्रो तह डेन्टिन (Dentine) सम्म पुगेको रहेछ भने दाँत सिरिङ्ग गर्छ, विशेषत: तातो-चिसो खाँदा र गुलियो खाद्य पदार्थ खाँदा । यदि प्वाल तेस्रो तह (Layer) पल्प (Pulp) मा पुगेको छ भने दाँत दुख्छ । दाँतको भित्री तह नै तेस्रो तह हो जसलाई पल्प (Pulp) भनिन्छ । पल्पमा दाँतका नशाहरु, रक्त नलीहरु, कोषहरु (Cells) हुन्छन् । प्राय:जसो दाँते किराले नसा भेटिसकेको रहेछ भनिन्छ । यो भनेको दाँते किरा अथवा व्याक्टेरियाले दाँतको गहिरो भित्री तह (Pulp) सम्म भेटिसकेको भन्ने बुझाउँछ ।

पल्पमा पुगेपछि संक्रमण फैलिँदै गएर जराको टुप्पोमा पनि पुग्छ । त्यसबेला दाँतले चपाउँदा र माथि र तलका दाँतहरु आपसमा सम्पर्कमा ल्याउँदा दाँत दुख्ने हुन्छ । यस अवस्थालाई Periapical Periodontits भनिन्छ । पछ गएर संक्रमण फैलिइ गाला सुन्निने, अनुहार पनि सुनिने हुन्छ । यसलाई सेलुलाइटिस (Cellutitis) भएको भनिन्छ । दाँते किराको संक्रमणले पछि गएर Alveolitits, Osteomyelitis समेत हुन सक्छ ।

जब Facial Cellutist हुन्छ, तब संक्रमण (Infection) फेसियल भेन (Facial Ven) वा सम्पर्क भेन (Communicating Ven) हुँदै Pterygoid Venous Plexus मा पुग्छ, त्यहाँबाट Emssary Veins हुँदै Cavernous Venous Sitius मा पुग्छ र Cavernous Venous Thrombosis पनि गराउन सक्छ । यसरी संक्रमण दिमाग नजिक पुग्छ र यो निकै घातक अवस्था हो, यसले मृत्यु समेत गराउन सक्छ । विश्वमा Antibiotics को आविष्कार नहुँदाको समयमा दाँते किराले मानिसको ज्यान जाने अवस्था थियो । मासिनको स्थायी दाँतहरुमध्ये पहिलो बंगारा (First Molar) सबैभन्दा चाँडै मुखमा उम्रन्छ (Erupts First) । यो दाँतको सबैभन्दा चाँडै आउने र यसमा धेरै खाल्टाखुल्टी (Pitsand Fissures) हुने हुँदा तिनीहरुमा चाँडै दाँते किरा लाग्छ किनकी Pits and Fissures मा खाना अड्किने, सरसफाई गर्न गाऱ्हो हुने हुन्छ । विगतको समयमा सन् १९३० वा पूर्वको समयमा दाँतको उपचार अहिलेको जस्तो व्यापक थिएन । दाँते किराले खान सुरु गरेपछि यो फैलिँदै दाँतको पहिलो तह इनामेल (Enamel), दोस्रो तह (Dentine), भित्री तह (Pulp) हुँदै दाँतको जराको टुप्पो वरिपरिको हड्डी भित्र (Alveolr bone) संक्रमण भएर (Alvealitits) अनुहार समेत सुनिन (Cellutis थालेपछि त्यसलाई नियन्त्रणमा लिन अहिलेको जस्तो प्रतिजैविक औषधी (Antibiotics) थिएन । फलस्वरुप संक्रमण (Infection) ले फैलिने मौका पाउँथ्यो । यो दिमाग (Brain) नजिकको Cavernous Sinus मा पुगेर Covernous Sinus Thrombosis गराउँथ्यो । यस वरपर पनि संक्रमण फैलिएर दिमागलाई सुरक्षित राख्ने आवरण (Meninges) लाई पनि संक्रमण गर्थ्यो (Meningitis) र अन्त्यमा मानिसको मृत्यु हुन्थ्यो । यसरी एन्टीवायोटिक औषधीको प्रचलन अघि हजारौं मानिसले दाँते किराको कारणबाट अकालमा ज्यान गुमाएका थिए । चिकित्सकहरु पनि पहिलो बंगारामा लागिहाल्ने दाँते किराबाट किनै त्रसिद थिए । किनकी उनीहरु तत्कालिन समयमा नियन्तणमा लिन असमर्थ थिए । अत: उनीहरुले पहिलो बंगारा नै फालिदिने अभियान चलाएका थिए । दाँते किरा लाग्नबाट बचाउन र यसको गम्भीर असरबाट मुक्त गर्न पहिलो बंगारा (First Molar) नै फालिदिने गरेका थिए । यसलाई Wilknson's Extractists भनिन्छ ।

अहिले सम्मन् हामीले दाँतेकिराले (Dental Caries) खाएपछि देखिने लक्षणहरु (Symptoms) र त्यसको एकपछि अर्को असरहरु (Sequlae Events) को बारेमा चर्चा गऱ्यौं । अब हामी दाँते किराले खाएपछि कसरी उपचार गरिन्छ भने बारे चर्चा गर्नेछौं ।

दाँते किराले खाएको उपचारको विधि दाँते किराले कति गहिराइसम्मन् खाएको छ भन्ने कुरामा निर्भर गर्दछ । यदि किराले दाँतको इनामेल सम्मन् खाएर प्वाल पारेको छ भने साधारण भरे हुन्छ (Simple Filling is Sufficient) । यदि दाँते किराले अलिक गहिरो सम्मन् खाएको छ र दाँतको दोस्रो तह (Dentin) सम्मन् पुगेको छ भने पहिले बेस (Base) लगाउने अनि मात्र माथि भर्ने काम गर्नुपर्छ । बेस (Base) लगाउनु भएको Zinc Oxide Eugenol, वा Zinc Polycarbotylate Cement को 1 mm मोटाइ भएको सिमेन्टको 1 तह लगाउनु हो । यसले तातो चिसोको प्रभावबाट दाँतको डेन्टिन र पल्पलाई बचाउँछ । त्यसपछि माथि Varnis Coat गरेर चाँदी (Silver Amalgam) ले भर्न सकिन्छ । चाँदीले भर्नु भनेको Silver Amalgem ले भर्नु हो । यसमा Silver Powder बढी र केही मात्रामा तामाको धूलो Cupper, Tin(Sn) and Zinc (An) को पनि थोरै मात्रामा मिश्रण रहन्छ । यसलाई अति शुद्ध पारो (Triple Distilled Mercury) सँग मिसाएर घोलिन्छ र Paste जस्तो बनाइन्छ । त्यही दाँतको प्वालमा राखेर टालिन्छ र यो २४ घण्टाभित्रमा पूर्णरुपमा कडा (Set) हुन्छ । अत: चादीले दाँत भरेको दिनमा उक्त दाँतले २४ घण्टासम्मन् केही नखानु राम्रो हुन्छ ।

दाँत कुन पदार्थ (Material) ले भर्दा राम्रो हुन्छ ? भनी प्राय: मानिसले सोध्ने गर्छन् । दाँत भर्ने पदार्थ विविध छन् जस्तै : Silver Amalgam, Postaier Composite, Glass Ionomer Cement etc। दाँतको बंगारामा मझौला वा ठूलो रुपमा किराले खाएको छ भने र त्यो Occlusel Load पर्ने बिन्दुमा (चपाउँदा दुई दाँत माथि र तलको जोडिने बिन्दु) छ भने सबैभन्दा बलियो पदार्थ चाँदी Silver Amalgam नै हो र यसको वैकल्पिक उपायमा Postaier Composite पनि प्रयोग गर्न सकिन्छ तर Composite अलिक महँगो पर्छ । बंगारा भएपनि सानो वा मझोला खालको दाँतमा प्वाल रहेछ भने वा Occtusal Load नपर्ने विन्दुमा छ भने शीशा Glass Ionomer ले भर्न सकिन्छ । अगाडि पट्टीको दाँत हो भने Anterior Composite ले भर्नुपर्छ । Anterior Composite, दाँत कलरको हुन्छ र

शोभायमान देखिन्छ । Composite ले Filling गर्दा दाँतको कलरको रङ्ग (Shade Selection) छनौट गर्नुपर्छ र Natural दाँत को Color सँग Match खाने Shade Selection गरी Composite लगाउनुपर्छ ।

चाँदी (Silver Amalgam) ले भर्दा दाँतको प्वाल (Cavity) को भित्ताहरु (Walls) मा Varnish Coat गर्नुपर्छ । तर Glass Ionomer वा Composite ले भर्दा सो Coat गर्नु हुँदैन । दाँत भर्दा मुखमा उत्पादन हुने ऱ्याल (Saliva) को विशेषत: नियन्त्रणमा राख्नुपर्छ, उचित तरिकाले Isolation गरेर, नत्र भरेको टिकाउ हुँदैन ।

यदि दाँते किराले तेस्रो तह वा भित्री तहसमेत भेटाइसकेको छ भने त्यसको जरादेखिको उपचार (Root Canal Treatment) गर्नुपर्छ । Root Canal Treatment लाई संक्षेपमा भन्नुपर्दा RCT भनिन्छ । RCT पछि रङ परिवर्तन भएको अगाडिको दाँत र पछाडिको बंगारामा Crown (दाँतको खोल) लगाउनुपर्दछ । यदि पल्प (Pulp), Periapical Region अर्थात जराको टुप्पो वरिपरि पिप (Pus) जमेको छ अनि विरामीलाई थ्रोविङ प्रकारको दुखाई (Trhobbing Pain) वा सेलुलाइटिस (Cellutistis) अथवा हड्डीको संक्रमण (Ostcomyelitis) भएको छ भने प्रति जैविकी औषधी अर्थात एन्टीवायोटिक औषधीको सेवन गर्नुपर्छ । एन्टीवायोटिक औषधीमा Percilin ग्रुपको वा Ciprofloxacin वा Eryturomycin मध्ये कुनै एक Metronidazole वा Tinidazole मा कुनै एक छान्नुपर्छ । यी प्रतिजैविक औषधीहरुको सेवनबाट संक्रमण नियन्त्रणमा आएपछि संभव भए Root Canal Tretment Complete गर्ने र असंभव भए दाँत उखेल्नु पर्छ । पिप जमेको अवस्थामा दाँतमा प्वाल पारी Pus dran गर्न सकिन्छ । यसरी Pus dran गर्दा संक्रमण (Infection) चाँडै नियन्त्रणमा आउँछ दाँतमा किराले खाएर लक्षणहरु देखा पर्नथालेपछि दाँतको X–ray हेरेर Confirm गर्नुपर्छ र उपचारको योजना (Treatment Plan) तर्जुमा गर्नुपर्छ ।

कहिलेकाँही दाँते किराले अनौठो रुपले सुटुक्क खाएर दाँत पुरै सिध्याइदिन्छ र दाँतका ठूटा मात्र बाँकी रहन्छ, तैपनि व्यक्तिलाई न कहिल्यै सिरिङ्ग-सिरङ्ग (Sensitization) र न दर्द (Pain) को अनुभूति हुन्छ । यस अवस्थालाई हाम्रो जनमानसमा लाटो किराले खाएको भन्ने प्रचलन पनि छ । अत: जनमानसको बुझाइमा लाटो किराले दाँतमा आक्रमण गरी खाएमा कुनै लक्षणहरु (पीडा आदि) देखा पर्दैनन् र बाठो किराले खाएमा दर्द/पीडाका लक्षणहरु देखा पर्छन । खास यो किन हुन्छ त ? बैज्ञानिक व्याख्या पनि सुनौं । दाँते किरा भनेको खास अर्थमा व्याक्टेरियाहरु हुन् भन्ने हामीले थाहा पाइसक्यौं । यी ब्याक्टेरियाहरुमध्ये केही व्याक्टेरियाहरु जसलाई पायोनियर ब्याक्टेरिया (Poineer Bacteria) भनिन्छ तिनीहरु अघिअघि सदैं तेस्रो वा भित्री तह, पल्पतर्फ अघि बढ्छन् र दोस्रो तह डेन्टिमा भएका सुरुङहरु (Dental Tubules) लाई बुझ्याइ (Block) र चेतना दाँतको नशा (Pulp) मा पुग्नबाट रोकिन्छ । यसरी व्यक्तिलाई सिरिङ-सिरिङ (Sensitization) हुँदैन । अघि बढिरहेका पायोनियर ब्याक्टेरियाहरुले उत्पादन गरेको रसायनले पल्पमा रहेको नशालाई मारिदिन्छ किनकी त्यो रसायन Neurolytic हुन्छ । जसरी कुष्टरोगको जीवाणुले नशालाई आक्रमण गरी चेतनाशून्य बनाइदिन्छ । यसरी दाँत चेतना शून्य हुनपुग्छ र व्यक्तिलाई दाँत दुख्ने पीडाको अनुभूति नभैकनै दाँते किराले भित्री तहसम्म खाएर दाँत पुरै नष्ट गरी ठूटामात्र बाँकी राख्न सक्छ ।

प्राय: मानिसहरुले जिज्ञासा गर्छन् कि एक पल्प भरेपछि कति वर्षसम्मन् हुन्छ ? यो समयावधि किटान गर्न निकै गाऱ्हो छ किनकी भरेको समयावधि निम्न कुरामा भरपर्छ :

१. दाँतको प्वाल कुन प्रकारको हो जस्तो Class I, Class II, Class III, Class IV, Class V and Class VI आदि । Class II, IV र VI मा भरेको त्यत्ति लामो समयसम्मन् नरहन सक्छ जति Class I, III, V मा रहन्छ । किनकी Class I मा वरिपरि Supporting Walls हरु हुन्छन र अरुमा एउटा Wall पनि नरहन (Missing) सक्छ ।

२. Cavity Design : उपयुक्त तरिकाले गरिएको छ कि छैन । Cavity को Retention Features हरु Incorporate (समावेश) गरिएको छ, छैन त्यसमा भर पर्छ । यो Dentist को Skill सँग भर पर्ने कुरा हो । Dentist को Skill राम्रो छ र उसले उचित तरिकाले Cavity Design गरेको छ भने भरेको लामो समयसम्मन् रहन्छ । तर कहिले काही किराले यति ठूलो गरी दाँत पुरै खाइदिन्छ कि Dentist ले Cavity Design उचित तरिकाले गर्न सक्दैन र भरेको लामो समयसम्मन् नरहने हुन्छ ।

३. दाँत भर्दाखेरी ऱ्यालको मिश्रण (Contanination) भएमा । भर्दाखेरी सुख्खा (Dry) वातावरणमा भर्नुपर्छ ।

४. व्यक्तिको दाँतको सरसफाई गर्ने क्षमता कस्तो छ, त्यसमा पनि भर पर्छ । दिनहुँ २ पटक दाँत माझ्ने, केही कुरा खाएपछि मज्जाले कुल्ला गर्ने, गुलियो कम खाने, खाना अड्किएमा तुरुन्त निकाल्ने गर्ने गरेमा थप किराले खान पाउँदैन । नत्र भरेको ठाउँको किनारा (Margin) बाट पुन: किराले खान सुरु

गर्छ र भरेको दीर्घकालीन रुपले टिकाउ हुन पाउँदैन ।

५. दाँतमा भरेको ठाउँमा चपाउने बल (Occlusal Load) कतिको पर्छ त्यसमा पनि भर पर्छ । बढी Occlusal Load पर्दा बढी घर्षण हुन्छ र भरेको खिइने हुन्छ । चपाउने बल मानिसको Masticatory Muscle Strength, खानाको किसिम जस्तो कुनै व्यक्तिहरु मासुको हड्डी मजाले चपाइदिन्छन् भने कोही नरम मासुमात्र खान्छन् ।

६. भरेको पदार्थ (Material) सुद्धता कत्तिको छ, यसमा पनि भरेको Restaration को Longevity निर्भर गर्छ । मिसावट भएको कमसल खालको गुणस्तरहिन पदार्थहरुको आयु कम हुन्छ र उच्चकोटीको गुणस्तरयुक्त पदार्थको आयु लामो हुन्छ र बढी टिकाउ हुन्छ ।

यसरी भरेको Fillings कति समयसम्मन् रहन्छ भनेर ठोकेरै भन्न कसैले सक्दैन । यी ६ वटा कुराहरु एक साथ केलाउन जरुरी छ, विश्लेषण गरिनुपर्छ । दाँते किराले खाने सम्बन्धमा कोहीकोहीको जिज्ञासा यस्तो पनि रहेको पाइन्छ । "म दिनहु २ पटक ब्रस गर्छु, गुलियो पनि त्यति खान्न तर दाँते किराले मेरो धेरै दाँतहरुमा आक्रमण गरेको छ । तर एकजना साथी त्यत्ति दाँत माझ्दैन, गुलियो पनि मेरो भन्दा बढी नै खान्छ तर उसको किराले खाएको छैन, किन होला ?"

यस्तो जिज्ञासाको उत्तर म यसरी दिन चाहन्छु । वातस्तवमा हाम्रो शरीरको रोगसँग प्रतिरोध गर्ने क्षमता व्यक्तिपिच्छे फरक-फरक हुन्छ । कसैको प्रतिरोध गर्ने क्षमता बढी हुन्छ भने कसैको कम । सकेसम्मन् हाम्रो शरीरले पनि दाँते किरालाई परास्त गर्न खोज्छ । मुखमा उत्पादन भैरहने ऱ्याल (Saliva) इमुनोग्लोबिलिन (Immunoglobulin) हरु हुन्छन् । यिनको अतिरिक्त ल्याक्टोफेरिन (Lactoferin) लाइसोजाइम (Lysozyme) आदि इन्जाइम (Enzyme) हरुले दाँते किरा (Bacterias) हरुलाई मार्न खोजिरहेका हुन्छन् र दाँतलाई संक्रमण (Infection) हुनबाट बचाउन खोजिरहेका हुन्छन् । जुन मानिसको शरीरको प्रतिरोध गर्ने क्षमता (Immunity) बढी हुन्छ, तिनीहरुले ती Bacterias हरुलाई मारिदिन्छन् र दाँतमा किरा लाग्नबाट बचाइदिन्छन् । यस्ता व्यक्तिको दाँतमा दाँते किरा कम लाग्छ, त्यसलाई हामी Coriostatic Person भनेर भन्छौं । कोही व्यक्तिहरुको रोगसँग लड्ने प्रतिरोधात्मक शक्ति (Immunity Power) कम हुन्छ, तिनीहरुमा दाँते किरा लाग्ने Bacterias हरुले आक्रमण गरिहाल्छन् र तिनीहरुको दाँतमा बढी किर लाग्छ त्यस्ता व्यक्तिलाई हामी Cariogenic Person भनेर भन्छौं ।

अन्त्यमा,

यस पटक हामीले दाँते किरा, लक्षण, उपचार र निदानका अतिरिक्त अनय जिज्ञासाहरुका बारेमा पनि विस्तृत चर्चा गऱ्यौं । अर्को पटक हामी दन्त हर्षाका बारेमा चर्चा गर्नेछौं । अहिलेलाई यो लेखनको बीट यही मारिन्छ । धन्यवाद ।

(डा. बराल सामुदायिक दन्त उपचार केन्द्र मासबार, पोखरा (शिव मन्दिर अगाडि) मा कार्यरत हुनुहुन्छ । सम्पर्क फोन: ९८०४१२५०२२)

मानसिक स्वास्थ्य

नेपालमा मानसिक स्वास्थ्यको वर्तमान स्थिति

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पृष्ठभूमि (Background)

वि.स. २०२० सालमा नेपालमा पहिलो पटक मानसिक स्वास्थ्य सेवा प्रदान गर्ने काम नेपालको मानसिक रोग विशेषज्ञ स्व. डा. विष्णुप्रसाद शर्माले वीर अस्पतालबाट सुरु गर्नुभएको हो । मानसिक रोग विभागबाट सुरु गरेर सोहीलाई पचास शैयाको मानसिक अस्पतालमा अपग्रेड गर्ने निर्णय तत्कालिन श्री ५ को सरकारले २०३५ सालमा गरेको हो । तर आफ्नो भवनको अभावको कारणले वि.स. २०४० सालसम्म सो अस्पताल जसोतसो वीर अस्पतालको हाताभित्र सञ्चालन भयो । सरकारले पच्चीस शैयाको जिल्लास्तरीय पाटन अस्पताललाई हालको पाटन अस्पताल (यू.एम.एन. को अस्पताल) मा गाभेपछि सो खाली भएको अस्पताल भवनमा मानसिक अस्पतालाई सार्ने काम भयो । ठाउँको अभावले गर्दा केवल उनन्चालिस शैया मात्र सञ्चालन गर्न सकिएकोमा हाल आएर मानसिक अस्पतालको लागि सोही ठाउँमा नयाँ भवन बनाउने काम पूर्ण भैसकेको छ ।

नेपाल सरकारले मानसिक सेवालाई साधारण स्वास्थ्य सेवासँगै एकीकृत गर्ने र मानसिक स्वास्थ्य सेवालाई समुदायस्तरमा बिरामीको घरदैलोमा नै प्रदान गर्ने नीति बनाएअनुरुप सबै क्षेत्रीय अस्पतालहरु, सबै अञ्चल अस्पतालहरुमा मानसिक रोगको विभाग खोली मानकिस स्वास्थ्य सेवा प्रदान गर्ने योजनाअनुरुप काम भैरहेछ । यस अनुसार हालसम्म मानसिक अस्पताल बाहेक पश्चिमाञ्चल क्षेत्रीय अस्पताल, पोखरा, कोशी अञ्चल अस्पताल, विराटनगर, भेरी अञ्चल अस्पताल, नेपालगञ्ज, लुम्बीनी अञ्चल अस्पताल, बुटवल, भरतपुर अस्पताल, भेरि अञ्चल अस्पताल आदि ठाउँहरुमा मानसिक रोग विशेषज्ञ खटाई मानसिक स्वास्थ्य सेवा प्रदान गर्ने काम भैसकेको छ। जबजब मानसिक रोगविशेषज्ञ प्राप्त हुन्छ तब अन्यत्र पनि यस सेवालाई विस्तार गर्दै लैजाने योजना छ ।

जिल्लास्तरीय अस्पताल, प्राथमिक स्वास्थ्य केन्द्र, स्वास्थ्य चौकी, उपस्वास्थ्य चौकी तथा जनसमुदायसम्म मानसिक सेवा प्रदान गर्ने ध्येयले सरकारले मेडिकल अधिकृत, सिनियर मेडिकल अधिकृत, अ.हे.ब., सि.अ.हे.ब., नर्सजस्ता स्वास्थ्य कार्यकर्ताहरुलाई उपयूक्त प्रकारका तालिम प्रदान गर्ने काम भैरहेको छ ।

यसदेखिबाहेक वीरेन्द्र सैनिक अस्पताल छाउनी, वीरेन्द्र प्रहरी अस्पताल रानीबारी, त्रि.वी. शिक्षण अस्पताल महाराजगञ्ज, बि.पी.के.आइ.एच.एस. धरान तथा अन्य निजी क्षेत्रमा सञ्चालित गण्डकी मेडिकल कलेज, पोखरा, नेपालगञ्ज मेडिकल कलेज, भैरहवा मेडिकल कलेज, भरतपुर मेडिकल कलेज, मणिपाल मेडिकल कलेज पोखरा, काठमाडौं मेडिकल कलेज र नेपाल मेडिकल कलेजमा पनि मानसिक रोगको विभाग छुट्टै खोली मानसिक स्वास्थ्य सेवा प्रदान गर्ने काम भैरहेको छ ।

मानसिक अस्पतालमा जनशक्ति तथा बजेट प्राप्त भएअनुसार काठमाडौं उपत्यकामा पनि Satellite Clinics बेलाबेलामा सञ्चालन गर्दै आइरहेको छ ।

तत्कालिन श्री ५ को सरकारले वि.स. २०५३ साल माघ २८ गतेका दिन राष्ट्रिय मानसिक नीति तथा योजना क्याबिनेटबाट पारित गरिसकेको छ । त्यस्तै मानसिक रोगीहरुको हक र हितको संरक्षण गर्ने र तिनीहरुलाई मानवीय उपचार प्रदान गर्ने उद्देश्यले एउटा छुट्टै मानसिक स्वास्थ्य ऐन ल्याउने कामको प्रारम्भिक कार्य समाप्त भैसकेको छ ।

मानसिक स्वास्थ्यको क्षेत्रमा संलग्न स्वास्थ्यकर्मीको कुरा गर्दा हाल अधिराज्यमा करिब ३ दर्जन नेपाली मानसिक रोगविशेषज्ञ मात्र छन् । क्लिनिकल साइकोलोजिस्ट, साइक्रियाट्रिक सोसल वर्कर, साइक्रियाट्रिक नर्स, अकुपेसनल थेरापिस्ट आदि विभिन्न प्रकारका मानसिक स्वास्थ्यको क्षेत्रमा काम गर्ने अन्य स्वास्थ्यकर्मीहरुको संख्या त झनै कम छ । यसो हुनुका मुख्य कारणहरुमा हाम्रो समाजमा मानसिक स्वास्थ्यप्रति गलत तथा नकारात्मक धारणा हुनु, मानसिक स्वास्थ्यको क्षेत्रमा काम गर्नका लागि थप आकर्षणको व्यवस्था नहुनु, र मानसिक स्वास्थ्यलाई न्यून प्राथमिकता दिनुलाई मान्न सकिन्छ ।

आधुनिक चिकित्सा विज्ञानको द्रुत विकासले दिनपरदिन शारीरिक रोगको उपचार जस्तै **नसा, स्नायु तथा मानसिकरोग**को उपचार पनि आशालाग्दो बनाउँदै लगेको देखिन्छ । नेपालको सन्दर्भमा पनि धेरै स्थानमा यी सेवा बिस्तार हुँदै गएको देखिन्छ। तर पनि जनचेटनाको अभावले धेरै नेपालिहरु अन्य थाउमा विशेषत् भारतको रान्चि, आगरा, गोरखपुर, सिलिगुरी जस्ता ठाउमा उपचारका निमित्त जाने गर्दछन् । हाल नेपालमा पनि उच्च तहको मानसिक स्वास्थ्य जनशक्तिको उत्पादन गर्ने काम भइरहेछ । त्रि.वि. चिकित्साशास्त्र अध्ययन संस्थान तथा वि.पि. कोईराला स्वास्थ्य विज्ञान प्रतिष्ठान धरानले सुरु गरेको यो काम हाल केहि निजी क्षेत्रमा सञ्चालित मेडिकल कलेजहरुबाट पनि यस्तो कार्यक्रम सञ्चालन भएका छन् । अब मानसिक स्वास्थ्यको क्षेत्रलाई चाहिने आवश्यक जनशक्ति केही हदसम्म भए पनि नेपालमा नै पूरा हुने आशा गर्न सकिन्छ ।

नेपालमा विभिन्न प्रकारका मानसिक रोगहरु कति छन् ?

शारीरिक रोग भन्नाले शरीरको रोग जस्तै - क्षयरोग (Tuberculosis), औलो ज्वरो (Malaria), कालाजार (Kalazar), चिनी रोग (Diabetes), कुष्ठरोग (Leprosy), क्यान्सर (Cancer) आदिलाई जनाउँदछ भने मानसिक रोग भन्नाले दिमाग वा मनमस्तिष्कमा लाग्ने विभिन्न रोगहरु जस्तै -सिजोफ्रेनिया (Schizophrenia), उदासिपना (Depression), उत्तेजना (Mania), डर, चिन्ता लाग्ने (Anxiety), मध्यपान तथा लागूपदार्थको दूर्व्यसन (Alcohol and Drug use Disorder), सुस्त मनस्थिति (Mental Retardation), छारेरोग (Epilepsy), यौनइच्छा मा गडबडी (Sexual dysfunction), वा निंद्रामा गडबडी (Sleep disorders) र भोकसम्बन्धी समस्या (Eating disorders) आदि **मानसिक रोगहरु** लाई जनाउँदछ । **मनमस्तिष्कको बिभिन्न भाग र कार्यमा असर परे अनुसार मानिसहरुमा थरिथरि मानसिक रोगहरु हुने गर्दछन् । हालसम्म ३०० देखि ४०० थरिका मानसिक रोगहरुको उल्लेख भएको पाइन्छ ।**

तर सर्वसाधारणले मानसिक रोग भन्नाले केवल साइकोसिस वा कडा खालको मानसिक रोग या पागलपनलाई मात्र लिने गरेको पाइन्छ। यो धारणा गलत हो किनभने हरेक सय जना मानसिक रोगीहरुमा पागलपन वा साइकोसिस पाँचदेखि दस जनाभन्दा कममा मात्र देखिन्छ र नब्बे जनाभन्दा बढी मानसिक रोगीहरु सर्वसाधारणजस्तै देखिन्छन् । उनीहरुको बोलिचालि, व्यवहार, मनस्थिति, काम गराइ, हेराइ आदिबाट उनीहरु मानसिक रोगी हुन् भन्ने कुरा थाहा हुन सक्तैन ।

नेपालमा हामीले सर्वेक्षण नगरे तापनि संसारका विभिन्न विकसित राष्ट्रहरुमा गरिएका अध्ययनहरुबाट के देखिएको छ भने विभिन्न प्रकारका मानसिक रोगहरुको व्यापकता (Prevalence) विकसित राष्ट्रहरुमा र विकासोन्मुख राष्ट्रहरुमा उस्तैउस्तै पाइएको छ र सहरी क्षेत्र र ग्रामीण क्षेत्रमा पनि समानरुपमा पाइएको छ। वास्तवमा मानसिक रोग हरु कुनै पनि उमेर, लिङ्ग, धर्म, पेशा, जाति, वर्ग वा शैक्षिक स्तरका मान्छेलाई लाग्न सक्दछ। कुनै पनि वर्गका मानव मानसिकरोग बाट मुक्त हुंदैनन् ।

कुरा यति हो कि कुनै देशमा एउटा रोगको प्रतिशत केही बढी देखिन्छ भने अर्को रोगको प्रतिशत केही कम देखिन्छ र सालाखाला मानसिक रोगको व्यापकता (Prevalence) भने कुल जनसंख्याको करिब पच्चीसदेखि तीस प्रतिशत पाइएको छ तसर्थ नेपालमा विभिन्न प्रकारका मानसिक रोगहरुको निम्नानुसार भएको मान्न सकिन्छ :-

१) विभिन्न प्रकारका साइकोसिस (स्किजोफ्रेनिया, मेनिया आदि) - करिब २%,
२) विभिन्न खालको न्युरोसिस (कम कडा खालको मानसिक रोगहरु) - १०%,
३) विभिन्न खालका डिप्रेसन (उदासीनता) - करिब ६%,
४) विभिन्न खालका छारे-रोगहरु - करिब ३%,
५) विभिन्न तहका सुस्त मनस्थिति - करिब ३%,
६) मादक पदार्थको कुलत या दुर्व्यसन - करिब ३-५%,
७) लागू पदार्थ दुर्व्यसन - करिब १%,
८) विभिन्न प्रकारका व्यक्तित्वको गडबडी - करिब ३%,
९) अन्य मानसिक रोगहरु - करिब ३% ।

यसरी विभिन्न खालको मानसिक रोगहरु सबै मिलाउँदा कुल जनसंख्याको करिब तीस प्रतिशत मानिसहरु कुनै न कुनै प्रकारका मानसिक रोगबाट पीडित भएको पाइन्छ । फेरी एउटै मानिसमा एउटाभन्दा बढी शारीरिक रोग हुन सकेजस्तै एउटै मानिसमा एउटाभन्दा बढी मानसिक रोग पनि हुन सक्तछ । तसर्थ नेपालको हालको जनसंख्यालाई दुई करोड चालिस लाख मान्ने हो भने हाल नेपालमा कम्तीमा पनि बहत्तर लाख मानसिक रोगीहरु भएको मान्न सकिन्छ ।

विश्व स्वास्थ्य संघको १९ अप्रील सन् १९९९ मा प्रकाशित प्रेस विज्ञप्तिअनुसार हाल संसारमा अशक्तता (Disability) का दसवटा सबैभन्दा मुख्य कारणहरुमा पाँचवटा मानसिक स्वास्थ्य समस्याहरु पर्दछन् । सो विज्ञप्तीमा यो पनि भनिएको छ कि विकसित र विकासोन्मुख दुबै थरीका राष्ट्रहरुमा यस प्रकारका स्थिति पाइएको छ। सोही विज्ञप्तिमा भनिएको छ कि विगत सय वर्षको अवधिमा शारीरिक स्वास्थ्यमा ठूलो प्रगति भयो र यसले गर्दा विकसित र विकासोन्मुख दुबै थरीका राष्ट्रहरुमा मानिसहरुको आयूमा निकै नै वृद्धि भयो । तर त्यसअनुरुप मानसिक स्वास्थ्य क्षेत्रमा काम हुन नसकेको कारणले गर्दा विगत सय वर्षको अवधिमा मानसिक स्वास्थ्यको स्थिति सुध्रिन सकेको छैन र यसको सट्टा कतिपय देशहरुमा मानसिक स्वास्थ्यको स्थिति अरु खस्किन पुगेको छ ।

मानसिक स्वास्थ्यको समस्याले हाम्रो जीवनमा अति नै ठूलो नकारात्मक असर पार्न सक्ने भए तापनि हाम्रो देशमा मात्र नभई संसारभर नै शारीरि स्वास्थ्यको तुलनामा मानसिक स्वास्थ्यलाई निकै नै कम प्राथमिकता दिएको पाइएको छ । सो विज्ञप्तिमा यो पनि भनिएको छ कि मानसिक स्वास्थ्यको स्थिति सुधार्नमा अहिलेदेखि नै हामीले यस क्षेत्रमा महत्वपूर्ण काम थालेनौं भने अरु एक-दुई दशकभित्रमा नै मानसिक स्वास्थ्यको समस्याले अझ विकराल रुप लिनेछ ।

निष्कर्ष

यी सबै तथ्यलाई ध्यानमा राखी नेपाल सरकारले मानसिक स्वास्थ्यलाई पनि क्रमिक रुपमा प्राथमिकता दिएर अगाडि बढ्ने र मानसिक स्वास्थ्यसम्बन्धी समस्याको निराकरण गर्ने लक्ष्य लिन पर्छ ।

(नोट (Testimonial) : यो लेख जनचेतनाको लागी लेखिएको हो ।)

Instructions to authors

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