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Patron - CA Santosh Kumar Khanal
Chief Executive Officer
Gandaki Medical College Teaching Hospital & Research Center Pvt. Ltd. Pokhara, Nepal
Email: ceo@gmc.edu.np

Editor-in-Chief - Prof. Dr. K. Rajeshwar Reddy
HOD, Department of Microbiology
Gandaki Medical College, Pokhara, Nepal
Email: journal@gmc.edu.np
reddysir4861@gmail.com

Editors - Dr Dev Kumar Thapa
Associate Professor
Department of Psychiatry
Gandaki Medical College, Pokhara, Nepal
Email: ddthapa@hotmail.com

- Dr Bijay Aryal
Associate Professor
Department of Pharmacology
Gandaki Medical College, Pokhara, Nepal
Email: phrbijayaryal@gmail.com

- Dr Nuwadatta Subedi
Associate Professor
Department of Forensic Medicine
Gandaki Medical College, Pokhara, Nepal
Email: drndsubedi@gmail.com

- Dr Sanjib Mani Regmi
Assistant Professor
Department of Microbiology
Gandaki Medical College, Pokhara, Nepal
Email: mani.regmi@yahoo.com

Advisors - Prof. Dr. Rabeendra Prasad Shrestha
Principal
Gandaki Medical College & Teaching Hospital
Pokhara, Nepal
Email: principal@gmc.edu.np

- Prof. Dr. Tu Maya Ghale
Medical Superintendent
Gandaki Medical College & Teaching Hospital
Pokhara, Nepal
Email: ms@gmc.edu.np

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Principal Contact
Prof. Dr. K. Rajeshwar Reddy
Editor-in-Chief
Gandaki Medical College
Lekhnath-2, Rithepani,
Pokhara, Kaski, Nepal.
E-mail: journal@gmc.edu.np
Mobile: +977-9819125470

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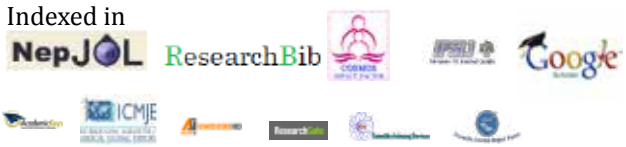

Contact Us

Web address	:	www.gmc.edu.np
Email address	:	journal@gmc.edu.np
Phone Number	:	+977-61-207130
		+977-61-561718
Fax	:	+977-61-561768

Editorial Secretariat
Gandaki Medical College Teaching Hospital & Research Centre Pvt. Ltd.
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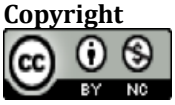

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shashin1981@yahoo.com

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Is Smallpox Dead?
(The Story of Highly Contagious and Most Feared Disease)

Reddy KR
Professor & Head
Microbiology Department
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal

For thousands of years, smallpox raged as a scourge of mankind, causing death and disfigurement. Smallpox has existed for at least 3000 years and was one of the world's deadliest and most feared diseases. The disease that killed Queen Mary II of England, Tsar Peter II of Russia, King Louis XV of France and hundreds of millions more during the past century alone is gone – but not forgotten. Smallpox lives on in the memories of those who witnessed its awful impact. We have an obligation to ensure that our children's children never have to worry about seeing this ancient scourge kill yet again. The global eradication of smallpox, achieved after ten years of concerted campaigns under the auspices of the WHO, has been a most impressive medical achievement.

The earliest credible clinical evidence of smallpox is found in medical writings from ancient India, as early as 1500 BC. In India and Nepal, **Shitala Maata**, the Hindu Goddess of smallpox was worshipped in Temples. It was believed that this Goddess was both evil and kind and had the ability to inflict victims when angered, as well as calm the fevers of the already affected. Portraits of the Goddess show her holding a broom in her right hand to continue to move the disease and a pot of cool water in the other hand in an attempt to soothe victims. Temples were built where Hindus went to worship and attempt to protect themselves.

Fig 1: The Hindu Goddess Shitala Maata was worshipped to prevent or cure smallpox (Source: enwikipedia.org)

SMALLPOX IN NEPAL

From time immemorial, there has been a Temple in Nepal for Sitala, Goddess of smallpox, although the present temple at Swayambhu in Kathmandu was built less than two centuries ago after the abdication of King Rana Bahadur Shah.

The smallpox affected the Royal Family in Nepal and the King Girvana died of smallpox on 20 November, 1816 at the young age of 21. The disease also affected the Royal Court of King Rana Bahadur Shah. A prominent figure in the court suffered from the disease and his disfigurement and subsequent suicide led to the desecration and destruction of many temples including the previous Sitala temple at Swayambhu.

In conformity with the decision of the WHO, His Majesty's Government of Nepal launched the smallpox eradication program in 1967. The geographical distribution of outbreaks in Nepal was closely related to the epidemiological pattern in India and to the routes of population movement. In 1973, smallpox spread to Western Nepal from adjoining Uttar Pradesh, and suffered from its worst epidemic for many years. In 1974, the disease spread to Eastern Terai region from the adjoining state of Bihar. Twenty of the 75 districts of Nepal are in the Terai region, bordering India were more commonly affected than the districts of the other terrains in 1973 and 1974. A cash reward of Rs 100 was offered to the public in March 1975 for reporting an outbreak of smallpox. It was later raised to Rs 1000 by which time no smallpox cases were being reported. The last case of smallpox in Nepal occurred on 6 April, 1975. Eradication of the smallpox in Nepal was declared on 13 April, 1977 (1st Baishak, 2034).

Although Nepal has a long border with the Tibet region, there has been no report of importation of smallpox from Tibet. Travel across border is much more restricted than across the Indian border which is freely open without any requirement for documents.

DR. EDWARD JENNER

Dr. Edward Jenner (1749-1823) was an English physician, who discovered a safe and efficient vaccination against smallpox, which ultimately led to eradication of small pox (***Variola***). Jenner is often called the **Father of Immunology**. Folklore claimed that milk maids were immune to smallpox. Dr Jenner also observed that milk maids exposed to occupational cowpox infection, were immune to smallpox. He proved experimentally that resistance to smallpox can be induced by injecting cowpox material (***Vaccinia***) from disease pustules into man. The first experiment to test this theory involved milkmaid Sarah Nelmes and James Phipps, the nine year old son of Jenner's gardener. Dr. Jenner took material from a cowpox sore on Nelmes' hand and inoculated it into Phipps' arm on May 14, 1796. Months later, Jenner exposed Phipps a number of times to variola virus, but Phipps never developed smallpox. Jenner published his findings in 1798 in a pamphlet "*An inquiry into the cause and effect of variole vaccine*". Louis Pasteur gave the general term **vaccine** (Vacca = cow) in honor of Jenner's cowpox vaccine to various materials used to induce active immunity.

Fig 2: Dr. Edward Jenner (1749-1823) (Source: bbc.co.uk)

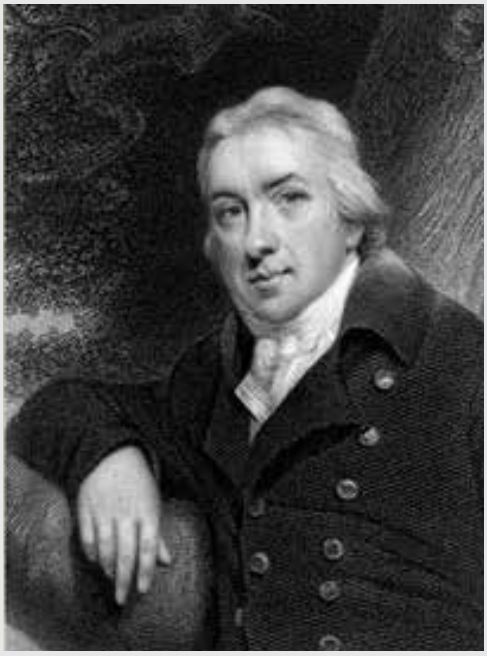
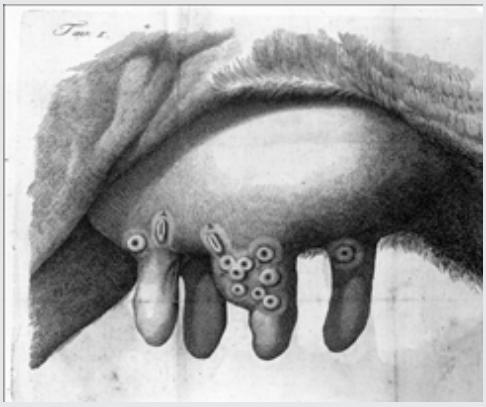


Fig 3: Cowpox lesions on udder (Source: livescience.com)



VIROLOGY

The ***Variola virus*** is the causative agent of smallpox, closely related to cowpox virus, belongs to family ***Poxviridae*** (Dermotropic DNA viruses), subfamily ***Chordopoxvirinae***, and genus ***Orthopoxvirus***, which includes vaccinia (smallpox vaccine), monkeypox virus, buffalopox, mousepox, camelpox, cowpox and variola (smallpox) viruses. Poxviruses are the largest viruses (400 x 240 x 100 nm)-large enough to be seen under light microscope. They are brick shaped and enveloped. They possess a double layered membrane surrounding a biconcave nucleoid containing DNA core. The nucleocapsid does not show any symmetry (complex symmetry). The lipoprotein envelope encloses a core and two lens shaped structures of unknown function, called lateral bodies. The core contains large viral genome, a single linear molecule of double-stranded DNA. The genome possesses the capacity to code for more than 200 polypeptides.

Vaccinia virus used for smallpox vaccination is derived from Jenner's original cowpox vaccine. The virus since Jenner's time was maintained by arm to arm passage in humans.

During this passage, the virus underwent some permanent changes differing in some respects from the freshly isolated cowpox virus, resulting in an artificial virus. Thus vaccinia virus is unique in that it is an artificial virus, which is not found in nature as such. The virus has been studied in detail as it is found to be safer to work with. Vaccinia virus is used as vector for introducing foreign genes and live virus (recombinant) vaccines has been developed. The genome of vaccinia virus can accommodate approximately 25,000 foreign base pairs – sufficient for introducing several genes. Many genes have been inserted in the genome, such as antigens of hepatitis B virus, rabies, HIV, and several pharmacological products (e.g. neuropeptides).

Fig 4: Electron microscopic picture of Variola major

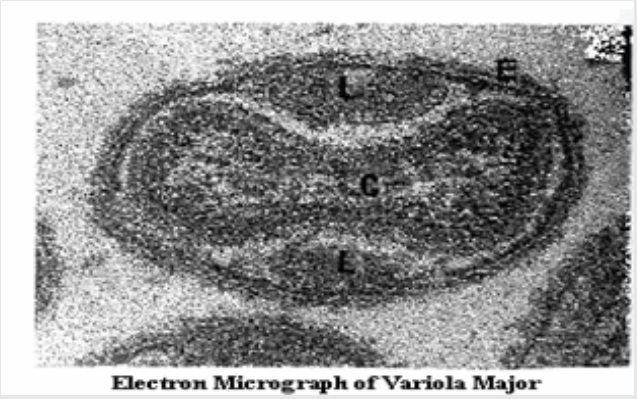
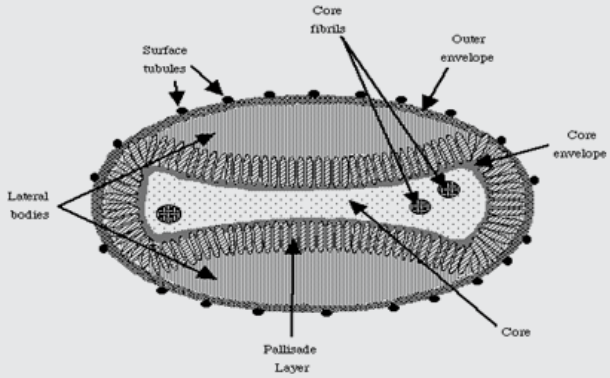


Fig 5: The structure of Variola virus



Smallpox epidemics in the past appeared in two distinct clinical varieties-the florid, highly fatal disease (**Classical smallpox**) typically seen in Asia, and the mild, nonfatal disease (**Alastrim**) typically seen in Latin America. The virus causing classical smallpox was called ***Variola major*** and that causing alastrim ***Variola minor***. Variola major and Variola minor were antigenically identical but differed in certain biological characteristics. They were stable variants as the diseases produced by each always bred true; alastrim did not lead to smallpox and vice versa.

PATHOGENESIS

Smallpox was an exclusively human infection, with no animal reservoir. There were no carriers as the virus was eliminated completely from the patient on recovery. Smallpox was highly contagious and spreads through person-to-person contact and saliva droplets in an infected person's breath or through formites such as bedding. The source of infection

was a patient in the early phase of the disease, though infectivity extended from the appearance of buccal mucosal lesions to the disappearance of all the skin lesions. Infection usually occurred only in close contacts. Virus entered the body by inhalation. After initial multiplication in the local lymphoid tissues, the virus reached the reticuloendothelial cells, where further multiplication took place, leading to severe viremia. The virus multiplies in the mucus membranes of mouth and pharynx and invades capillary epithelium of the dermal layer in skin heralding the clinical disease. Oropharyngeal and skin lesions contain virions abundantly, particularly in the early phase of illness.

CLINICAL MANIFESTATIONS

The incubation period was around 12 days (7 – 17 days). The prodromal phase, which lasts for two to three days, was characterized by severe headache, backache, and fever, all beginning abruptly. The temperature often rises to more than 40°C and then subsides over a period of two to three days.

During viremia, viruses settle at skin and mucosa; two to five days of fever precedes the appearance of skin rashes. The rash first appears on the tongue, mouth, and oropharynx (enanthema), and then on skin (exanthema). A **maculopapular rash** begins on the face and extremities and spreads to the trunk. The lesions were initially maculopapular and evolve rapidly from small, reddish **macules** to **papules** with a diameter of 2 to 3 mm over a period of one or two days; after an additional one or two days, the papules become **vesicles** with a diameter of 2 to 5 mm, and finally **pustules** that are 4 to 6 mm in diameter develop about four to seven days after the onset of the rash and remain for five to eight days, followed by umbilication and crusting. The **crusts** begin separating by the second week of the eruption. **Scabs** form over the lesions leaving survivors with **pitted scars**. These lesions were common on the face because the large sebaceous glands tend to become infected.

Smallpox lesions have a peripheral or centrifugal distribution and are generally all at the same stage of development. Death from smallpox is due to toxemia, associated with immune complexes, and to hypotension. There was a 10 – 30% mortality in classical smallpox and 5 – 10% of naturally occurring smallpox cases appear as either of two highly virulent atypical forms–hemorrhagic and malignant.

Fig 6: Classical smallpox patient (Source: owlcation.com)

Fig 7: A baby with smallpox (From the CDC)

Fig 8: The lesions (vesicles) in classical smallpox on skin (Source: cdc.gov)

LAB DIAGNOSIS

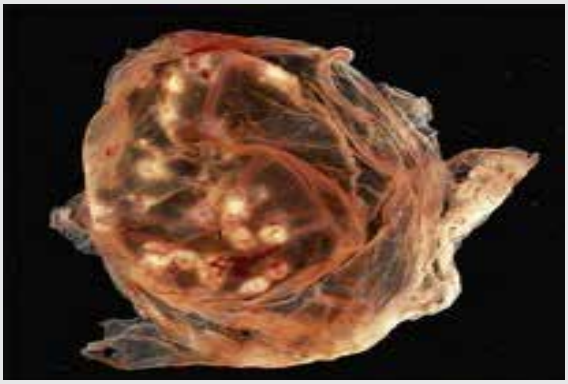
Scrapings of skin lesions, popular, vesicular or pustular fluid, crusts, blood samples, and tonsillar swabings can be used for the detection of virus. Several methods are available to confirm the diagnosis of smallpox.

Microscopy: Paschen (1906) devised a staining technique of virus particles and demonstrated the elementary bodies (**Paschen bodies**) in smears prepared from vesicular lesions of smallpox. On account of the distinctive morphology of the virion, rapid diagnosis was possible by electron microscopy.

Cultivation: 1) **Variola** and **vaccinia virus** can be cultivated by inoculating onto **chorio-allantoic membrane (CAM)** of 11 -13 day old chick embryos. Viruses produce visible lesions on CAM, known as **pocks**. Under optimal condition, each infectious virus particle can form one pock. Therefore **Pock counting** can be used for **assay** of pock-forming viruses. **Variola pocks** are small, shiny, white, convex, non-necrotic, non-hemorrhagic lesions. **Vaccinia pocks** are larger, irregular, flat, greyish, necrotic lesions, some of which are hemorrhagic.

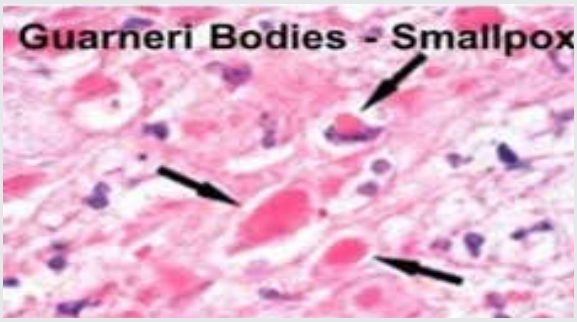
Fig 9: Variola pocks (small, shiny, white, convex, non-necrotic, non-hemorrhagic) on CAM (Source:enwikipedia.org)

Fig 10: Vaccinia pocks (larger, irregular, flat, greyish, necrotic lesions, some of which are hemorrhagic) on CAM 9Source: veteriankey.com)



2) The viruses can be grown in cell lines of monkey kidney, HeLa and chick embryo cells. Cytopathic effects are produced by vaccinia in one to two days and more slowly by variola. Eosinophilic inclusion bodies, known as **Guarieneri bodies**, can be demonstrated in stained preparations. Vaccinia virus produces plaques in chick embryo tissue cultures but not variola virus.

Fig 11: Eosinophilic inclusion bodies (Source: cram.com)



3) Monkeys, calves, sheep and rabbits can be infected by scarification leading to vesicular lesions

Detection of virus antigen: Viral antigen can be detected by immunodiffusion in gel by Ouchterlony procedure.

Serology: Antibodies appear after the first week of infection and can be detected by heamagglutination inhibition (HI), neutralization, immunofluorescenece, RIA and ELISA.

DIFFERENTIAL DIAGNOSIS

Many eruptive diseases can be misdiagnosed as smallpox. Severe chickenpox is most frequently misdiagnosed as smallpox. Smallpox must be differentially diagnosed as it may be confused with pustular acne, meningococcemia, secondary syphilis, drug rashes and other diseases associated with a skin eruption.

IMMUNITY

An attack of smallpox confers complete life-long protection against reinfection. Ancient healers knew that smallpox could be prevented by transferring pustular material from a patient with the disease to an uninfected individual. The term **variolation** was used for this crude form of immunisation. This was done either by scratching the material into the arm or inhaling it through the nose. The practice of variolation was prevalent in ancient India since time immemorial. The practice of variolation spread from India to the West and in the 18th century became very popular in Europe, till it was replaced by vaccination introduced by Edward Jenner in 1796.

PREVENTION

Smallpox vaccine was a live attenuated vaccinia virus prepared from vesicular lesions produced on the skin of calves or sheep, or it can be grown in chick embryos. The final product contained 40% glycerol to stabilize the virus and 0.4% phenol to prevent bacterial contamination.

The vaccine was administered into the basal layers of epidermis by **multiple-puncture** with a **bifurcated needle** by scarification (scratching live virus into skin). In some mass vaccination situations, a compressed-air gun device was used. But during the global eradication program, the bifurcated needle was universally used for multiple-puncture vaccination, as recommended by WHO. Each bifurcated needle is sterile and individually wrapped. The needle is designed to hold a minute drop of vaccine. The preferred site for vaccination is the deltoid area on the upper arm. Three to fifteen perpendicular insertions within an area of 5 mm in diameter are made. Three insertions are recommended for primary vaccination and 15 for revaccination. Strokes should be vigorous enough to evoke a trace of blood at the site after 15 to 30 sec. the vaccination site should be inspected six to eight days after vaccination, to ensure that a take has occurred.

Fig 12: Bifurcated needle for smallpox vaccination: A needle is shown both empty and containing vaccine in (Source: reserachgate.net)

Fig 13: Smallpox vaccine being administered by the bifurcated needle (Source: en.wikipedia.org)

Fig 14: compressed-air gun device for smallpox vaccination

Following a successful primary vaccination, there will be no visible reaction for the first three to four days. A **papule** develops at the site in 3 – 4 days, which progresses to **vesicle** with surrounding erythema by five to six days. The formation of a vesicle is indicative of a 'take' (Success). The centre of the vesicle umbilicates and become **pustular** by seven to nine days. The pustule crusts and a dark brown or black **scab** forms by approximately day 12, which detaches in 2 – 3 weeks, leaving a **depressed scar**, which remains life-long. Smallpox vaccination may carry a small risk of complication such as developing a mild smallpox disease and rarely encephalitis.

Fig 15: Smallpox vaccination adverse reaction (Source: dxline.info)

In spite of widespread and, in many places, compulsory vaccination, smallpox was not eliminated till a concerted program of its global eradication was initiated by the WHO in 1967, with the cooperation of the member countries. The disease was then present in 44 countries, with a global incidence of around 10 million cases annually. After ten years of intense effort, the disease was wiped out.

The **last natural case of *Variola major*** detected was Rahima Banu in late 1975, a three year old girl from Bangladesh; the last person in Asia to have active smallpox. She was isolated at home with house guards posted 24 hours a day until she was no longer infectious. A house-to-house vaccination campaign within 1.5 mile radius of her home began immediately, and every house, public meeting area, school, and healer within five miles was visited by a member of the smallpox eradication program team to ensure the illness did not spread. A reward was also offered to anyone for reporting a smallpox case.

The **last case of *Variola minor*** occurred in Merca, Somalia, in October 1977. The patient was Ali Maow Maalin, a hospital cook. Maalin was isolated and made a full recovery.

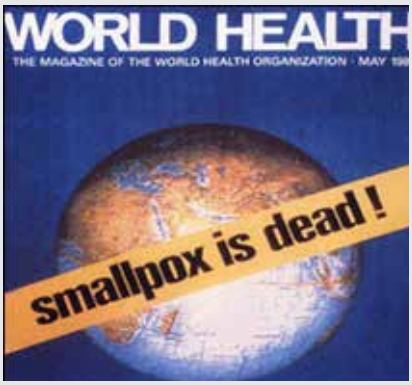
Janet Parker was the last person to die of smallpox on September 11, 1978. She was a medical photographer at **Birmingham University Medical School** in England and worked one floor above the **Medical Microbiology Department** where smallpox research was going on. An investigation performed afterwards suggested that she had been injected either via an airborne route through the Medical school building's duct system or by direct contact while visiting the Microbiology corridor one floor above.

It was promptly identified and controlled but the incident showed the hazard of keeping variola virus stocks in laboratories. Following a directive by the WHO, all such laboratory stocks of the virus have been destroyed. The last stocks of smallpox virus were held under high security in the Centres for Disease Control and Prevention, Atlanta, Georgia (USA) and the Centre for Research on Virology and Biotechnology, Koltsova (Russia). These stock cultures were also to have been destroyed by June 30, 1999, but fears of the possible use of smallpox in bioterrorism led to an indefinite extension of the deadline.

Variola virus is a category A **bioterrorism agent** along with anthrax, botulism, plague, tularemia and hemorrhagic fever. Because of eradication of smallpox (Variola virus) and discontinuation of vaccination, at present the world's human population possesses no immunity against smallpox and hence highly susceptible to this viral infection. All those born from 1978 are susceptible to infection. Due to recent concerns about bioterrorism (Particularly after terrorist attacks of September 2001 in USA); smallpox vaccination is recommended in certain groups such as military and health workers.

When two years after the last case of smallpox, no further case could be detected anywhere in spite of active surveillance, the whole world was certified free of smallpox in October, 1979. **Global eradication of smallpox was formally declared by the 33rd World Health Assembly of the WHO on 8 May, 1980**, almost two centuries after Jenner published his hope that vaccination could annihilate smallpox.

Fig 16: The poster depicting the eradication of smallpox



The factors which contributed to the elimination of smallpox were

- Availability of very effective, attenuated vaccine - freeze-dried vaccine
- Antigenically stable and only a single antigenic type existed
- The absence of asymptomatic cases, subclinical cases or persistent carriers
- The absence of an animal reservoir
- The emotional effect of this highly fatal, disfiguring diseases helping gain public cooperation in the eradication efforts
- Long term (Life-long immunity) conferred by infection
- Aggressive surveillance-containment measures
- Technique of vaccination by multiple puncture with bifurcated needle, which was simple, effective and economical

The process of eradicating smallpox was long and complicated, requiring the coordinated efforts of people around the globe. Not every disease can be eradicated; it just so happened, that smallpox has many characteristics that lend ease to eradication. The incubation period, the time between initial infection and visible symptoms, is relatively short, which prevents the disease from spreading undetected. The symptoms are also very distinctive, allowing for easy identification of smallpox patients. The WHO put in place a **ring vaccination** method whereby vaccines were not given only to infected people, but also to anyone who may have been exposed to an infected person. Ring vaccination effectively hindered the mass spread of smallpox since officials were able to isolate and treat affected areas early. In remote areas, WHO workers tracked down infected persons by showing locals pictures of people with smallpox symptoms and asking if they had seen anyone with them.

However, as a measure of protection against the remote danger of smallpox re-emerging, large stocks of smallpox vaccine are maintained by the WHO for rapid deployment, if needed. The future generations are unlikely to witness the disease but its disppearance has been too recent for it to be ignored altogether.

Anyone who has been vaccinated against smallpox (in most countries, this means anyone aged 40 or over) will have some level of protection; though not fully effective, but is likely to protect them from the worst effects of the disease.

OTHER DISEASES ON THE VERGE OF ELIMINATION

Six other diseases have been identified as possible candidates for eradication by the Carter Center International Task Force for Disease Eradication: Dracunculiasis caused by Guinea worm (*Dracunculus medinensis*), poliomyelitis, mumps, rubella, lymphatic filariasis (caused by *Wuchereria bancrofti*, *Brugia malayi*, *Brugia timori*), cysticercosis (caused by larval stage *Cysticercus cellulosae* of *Taenia solium*) and measles.

Guinea worm disease is likely on the verge of eradication. Only 30 cases were reported in 2017, from just two countries (Chad-15 cases, Ethiopia-15 cases)

Sex Ratio at Birth: Where Did Our Female Fetus Go?

Gurung TK[1*], Gurung RT[1], Shrestha R[1], Shrestha R[2]
[1]Lecturer, Department of Obstetrics & Gynecology
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal
[2]Consultant Gynecologist, Manmohan Memorial Community Hospital, Kathmandu, Nepal

Keywords
Abortion, Multiparous, Primiparous, Sex ratio.

Corresponding author
Dr. Tika Kumari Gurung
Lecturer, Department of Obstetrics & Gynecology
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal
Email: tikanirvana18@gmail.com

ABSTRACT

Objectives: The aim of the study was to determine the ratio of male to female gender at birth and compare the sex ratio between primipara and multipara women.

Methods: This is a cross sectional retrospective study done using the data available from the medical records of the patients who were admitted in the labor room of Gandaki Medical College Teaching Hospital from July 2016 to June 2017 (Shrawan 2073 to Asad 2074).

Results: In one year period, a total of 1625 women were admitted for delivery. There were 845 male and 780 female babies delivered to those women. The sex ratio calculated was 108 male births for every 100 females. When comparing the sex ratios at birth for primipara, multipara with previous abortions and fetal death and mulipara with no history of abortions and fetal death, the sex ratio was 81.75, 125.89 and 120.16 respectively.

Conclusions: Overall there were more male births than female. But in primiparous women more female babies were born unlike in multipara. There is definitely a need of in depth study to identify the cause for the skewed value. The society needs to acknowledge that high sex ratios at birth will adversely affect the fertility patterns causing the imbalance in the overall development of community.

INTRODUCTION

The sex of the baby has always been a prime importance in our male dominating society. Though, the perspectives of the community have changed but not much. Studies have shown that at birth most babies delivered have been males. The male to female sex ratio at conception is considered to be 50:50. But more males are born throughout the world due to higher mortality rate for female fetuses, according to a new study that focused on the sex ratio from conception to birth. The death of a female child before birth at times could be simply for being a female child in a developing world where male is preferred. Though abortion after sex determination is illegal, it still does happen and it is happening around us. Therefore it is still a matter of confusion if the sex ratio in a country like ours is a true data or not.

A study has shown that male outnumber female children at birth[1]. The average sex ratio at birth is defined as the ratio of newly born male to female neonates in a population and this is considered to be around 1.05[2]. Nepal sex ratio at birth was at level of 1.07 ratio in 2015, which was 1.05 in 2010, this is a change of 1.04% male births per female births as per world data atlas[3].

As per World Health Organization the natural "sex ratio at birth" is considered to be around 105 which means that at birth on average, there are 105 males for every 100 females. Furthermore WHO states that if ever a country's population sex ratio does not equalize or rather exceeds the 105-threshold, it means societies with a dominating preference for male child tend to intervene in nature

and reduce the number of born girl child by sex-selective abortion and infanticide. It is estimated that annually in India approximately six lakh girls were missed during the period 2001–2007 due to prenatal sex selection. This equates to roughly 1,600 girls a day[4].

Gender bias in the sex ratio still does exist in our society. The United Nations in 2007 estimated more than 117 million girls/women "missing" in Asia alone due to sex selective abortions as per information provided by the United Nations Population Fund with Nepal ranking 11th in skewed child sex ratio.

One study showed that prior to legalization of abortion in Nepal (1998–2000), the conditional sex ratio (CSR) was 1021 (906–1150). After legalization, the CSR dropped most among educated and richer women, especially in urban areas. Just 325 girls were born for every 1000 boys among the richest urban women[5]. However, it is believed that a combination of sex-selective technology and a small-family culture has caused the highest sex ratios[6,7].

METHODS

This retrospective study included a total of 1625 women who were admitted in the labor room at Gandaki Medical College Teaching hospital for delivery. These women were from Pokhara city and outskirts of Pokhara mostly from Tanahun, Kaski, Syangja, Gorkha, Baglung. At the time of admission, these women were in labor or admitted to terminate the pregnancy for various reasons such as hypertension, intrauterine fetal growth retardation, oligohydramnios etc. Those not in labor were induced with single or multiple doses of misoprostol. The age of gestation was computed from the last menstrual period and also from the early first trimester ultrasound if available. Those who did not have early first trimester or second trimester ultrasound, the age of gestation was based on the last menstrual period (LMP). Stillbirths were not included in this study. The sex ratio was calculated using the formula. Sex ratio (Number of males per 100 females) = (No. of male births/ No. of female births) x 100.

RESULTS

There were a total of 1625 live deliveries in a period of one year from July 2016 to June 2017. Lowest number of deliveries on the month of December and January was due to some unavoidable circumstances in the hospital. A total of 120 were preterm deliveries (born before 37 weeks age of gestation), 1238 were term (Between 37 weeks till 40 weeks and 6 days) deliveries and 267 were post term (Beyond 41 weeks of age of gestation) deliveries.

Table1: Total number of deliveries at different age of gestation (AOG) from July 2016 to June 2017

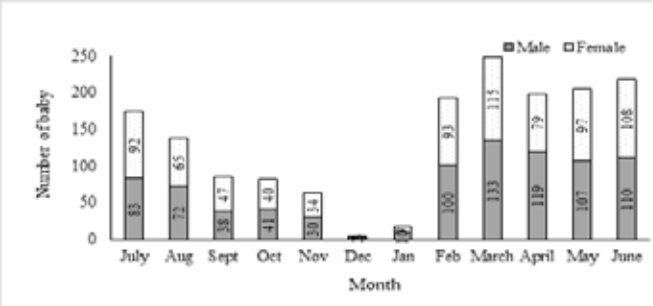
Month	Total deliveries		< 37 weeks AOG		>37 to 40 weeks and 6 days AOG		=/>41 weeks AOG		=/>42 weeks AOG	
	n	%	n	%	n	%	n	%	n	%
July	175	100	13	7.42	140	81.14	18	10.28	4	2.28
Aug	137	100	11	8.02	107	78.10	16	11.67	3	2.18
Sept	85	100	6	7.05	69	81.17	8	9.41	2	2.35
Oct	81	100	8	9.87	63	77.77	7	8.23	3	3.70
Nov	64	100	5	7.81	56	87.50	2	3.12	1	1.56
Dec	5	100	0	0	5	100	0	0	0	0
Jan	17	100	0	0	16	94.11	1	5.88	0	0
Feb	193	100	12	6.21	133	68.91	42	21.76	6	3.10
March	248	100	23	9.27	178	71.77	40	16.12	7	2.82
April	198	100	11	5.55	149	75.25	34	17.17	4	2.02
May	204	100	15	7.35	155	75.98	28	13.72	6	2.94
June	218	100	16	7.33	167	76.60	31	14.22	4	1.83
TOTAL	1625	100	120		1238		227		40	

Among 1625 deliveries, there were 845 male babies and 780 female babies. Highest number of male birth was seen in the month of April 2017 which was 119 (60.10%). The sex ratio was as high as 150.63 also in the month of April of 2017. The overall sex ratio was 108.33.

Table 2: Total number of male and female babies per month

Month	Total deliveries		Males		Females		Sex ratio
	n	%	n	%	n	%	
July	175	100	83	47.42	92	52.57	90.21
Aug	137		72	52.55	65	47.44	110.76
Sept	85		38	44.70	47	55.29	80.85
Oct	81		41	50.61	40	49.38	102.5
Nov	64		30	46.87	34	53.12	88.23
Dec	5		2	40	3	60	66.66
Jan	17		10	58.82	7	41.17	142.85
Feb	193		100	51.81	93	48.18	107.52
March	248		133	53.62	115	46.37	115.65
April	198		119	60.10	79	39.89	150.63
May	204		107	52.45	97	47.54	110.30
June	218		110	50.45	108	49.54	101.85
TOTAL	1625		845		780		108.33

Fig 1: Male and female babies born in each month during the study



There were a total of 787 primaparous women and 838 multiparous women. Primipara had more female birth than male with a sex ratio of 81.75. In the case of multipara women, irregardless of the history of previous abortions or stillbirth or fetal death, they had more male births with the sex ratio of greater than 120.

Table 3: Sex ratio of the baby calculated from the total deliveries during the study period

Parity	Males	Females	Total	Sex ratio
Primipara	354	433	787	81.75
Multipara with previous abortion, fetal death	175	139	314	125.89
Multipara with no previous abortion or fetal death	286	238	524	120.16

DISCUSSION

Supposedly the sex ratio of human is approximately 1:1. But due to higher female fetal mortality[8], the sex ratio at birth worldwide is commonly thought to be 107 boys to 100 girls[9] and as previously stated it is 105 as per WHO. Thus, average national sex ratio at birth (SRB) in humans is slightly male biased (105 males per 100 males), with remarkable deviation for some countries[10].

The number of new born males slightly outnumber new born females because as they grow up, men are at a higher risk of dying than women not only due to sex differentials in natural death rates, but also due to higher risk from external causes (accidents, injuries, violence, war casualties). Thus, the sex ratio of total population is expected to equalize. Graunt described a net excess of male births in his study[11]. By the late 1800s, there were more males than females die during later pregnancy[12]. Nonetheless, the demographic and genetic dynamics of the sex ratio from conception to birth are poorly resolved. In our study the sex ratio at birth was around 108 which means there were 108 males for every 100 female births. This number is definitely higher than 105 threshold stated by WHO.

Some scholars have suggested that countries considered to have significant practices of prenatal sex-selection are those with birth sex ratios of 108 and above (selection against females) and 102 and below (selection against males), although this assumption has been questioned by some scholars[13]. A study done in Kaski and Tanahun, the two hill districts in the Western developmental region showed that the sex ratio was adverse in Kaski while it was normal in Tanahun[14], and most of our patients belonged to Pokhara city which belongs in Kaski district.

Another study conducted in India showed that the sex ratio was 972 females per 1,000 males in primipara, which decreased to 879 females per 1,000 males in second para and further reduced to 784 females per 1,000 males in third para. With increase in parity, there was decline in number of females per 1,000 males[15] which was also the case in this study.

The current study showed that primipara delivered more female babies while multipara had delivered more male babies than female babies with sex ratio of 81.75 in primipara while it was more than 120 in multipara regardless of the status of previous deliveries. The causes for abortions or fetal death were not identified in this study due to the retrospective nature of the study.

Social outlook for sex preference is more male sex preference is found in multigravida with previous female baby. Male sex preference was also found in primigravida and multigravida with previous male baby but in relatively low percentage[16]. Numerous studies done in Nepal has long been showing decreasing number of female births[17,18] with sex ratio of much higher than 108 of this study.

Multiple factors have been linked to the sex ratio of the newborn such as age of both parents and ecological factors, regional variation, demographic factors[19,20,21]. Few studies have shown no links to these factors. These factors are not included in the study.

CONCLUSIONS

Overall there were more male births than female. But in primiparous women more female babies were born

unlike in multipara. There is definitely a need of in depth study to identify the cause for the skewed value. The sex of the fetus is easily identified without a hassale albeit the law has prohibited it. With stronger law and strict action, most likely we can curb the sex ratio at birth to adjustable level. The society needs to acknowledge that high sex ratios at birth will adversely affect the fertility patterns causing the imbalance in the overall development of the community.

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Assessment of Adenosine Deaminase Level and the Utility of Polymerase Chain Reaction in Diagnosis of Tuberculous Pleural Effusion

Nagila A[1*], Khanal S[2], Dhakal N[3], Bhatta M[4], Tamrakar BK[5]
[1]Associate Professor, Department of Biochemistry, Gandaki Medical College & Teaching Hospital, Laboratory Chief, Fishtail Hospital and Research Center Pvt. Ltd., Pokhara, Nepal
[2]Lecturer, Pokhara Bigyan Tatha Prabidhi Campus, Pokhara, Nepal
[3]Lecturer, [4]Assistant Professor, Department of Biochemistry, Gandaki Medical College & Teaching Hospital, Pokhara, Nepal
[5]Consultant Physician, Fishtail Hospital and Research Center Pvt. Ltd., Pokhara, Nepal

Keywords
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Polymerase Chain Reaction,
Tubercular pleural effusion.

Corresponding author
Dr. Amar Nagila PhD Biochemistry
Associate Professor, Department of Biochemistry
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal
Email: nagila2a@gmail.com

ABSTRACT

Background: Extrapulmonary tuberculosis is one of the major causes of exudative pleural effusion. The paucibacillary nature of effusion suggests the need of markers and methodologies for accurate diagnosis and prognosis of tuberculosis as well as to differentiate it from other non-tubercular causes of pleural effusion.

Objectives: This study was focused to evaluate the utility of polymerase chain reaction (PCR) in detection of tuberculosis antigen and to assess the level of Adenosine Deaminase (ADA) in tubercular pleural effusion (TPE) and contrast it with other causes.

Methods: This is a cross-sectional study where 100 samples of pleural effusion suspected to be tuberculosis were analyzed by PCR for the detection of IS6110 segment of DNA. The level of ADA was then determined and compared in both PCR positive and negative samples. The cut-off value of ADA was >40 U/L for TPE. Student t test was applied to compare the means with statistical significance set at $p<0.05$.

Results: Out of 100 samples analyzed, 45% were positive for TPE and remaining 55% were non-tuberculous pleural effusion as detected by PCR. The level of ADA was above cut-off (>40 U/L) in 43% TPE samples whereas all the non-tuberculous effusion had ADA <40 U/L ($p<0.001$).

Conclusion: The ADA level was significantly higher in TPE than in non-tuberculous cases, and PCR was able to detect suspected cases of tuberculous effusion in almost half of the cases. This findings suggests the diagnostic utility of combined use of ADA and PCR in diagnosis of TPE.

INTRODUCTION

Globally one third population carry the burden of tuberculosis (TB) and is a major public health problem with morbidity and mortality surpassing that of any other infectious disease. It is caused by *Mycobacterium tuberculosis*[1]. Nearly 85% of reported TB cases were limited to lungs with only 15% in extrapulmonary sites or both pulmonary and extrapulmonary sites[2]. Among this, pleural TB is commonly encountered extrapulmonary form, occurring in TB afflicted areas[3]. The common manifestation of extra-pulmonary TB is Tuberculosis Pleurisy (TP) which leads to pleural effusion. Examination of pleural fluid is therefore done for diagnosis of extrapulmonary TB infection[4].

Pleural effusion resulting from tubercular infection is an exudative type[5] as a result of hypersensitivity reaction

to mycobacteria and mycobacterial antigens in pleural space[6]. Tuberculous pleural effusion characteristically presents with lymphocytosis and elevated adenosine deaminase (ADA) levels distinct from other types of pleural effusions[7]. Diagnosis of pleural TB is based on biochemical, microbiological and cytological analysis which has number of limitations[8]. However, measurement of Adenosine Deaminase enzyme in tubercular pleural fluid seems to be sensitive and reliable method as a diagnostic tool in high endemic TB areas, which is cheap and easy to form[9,10]. ADA in non tuberculous lymphocytic effusion rarely surpasses the cut off for tuberculous effusion[11]. Another quick method is Polymerase Chain Reaction (PCR) amplification method[12] which is based on amplification of mycobacterial DNA fragments. As TB pleural effusion is paucibacillary disease, the sensitivity could be improved by PCR, as it can detect as few as 10 *mycobacteria.* However, PCR based methods are costly and pose a risk of contamination[13].

In this study we aimed to differentiate pleural effusion as tuberculous and non-tuberculous using sensitive methodology of PCR and to compare the level of ADA activity in these tubercular and non-tubercular pleural effusions (NTPE).

METHODS

This is a cross-sectional comparative study conducted on patients with pleural effusion to rule out tubercular effusion from non-tubercular. This study was carried out from September 2016 to September 2017, in the Laboratory of Fishtail Hospital and Research Center Pvt. Ltd. Pokhara, Nepal. A total of 100 samples from patients of all age group who visited Fishtail Hospital and those who were suspected of having tubercular pleural effusion based of clinical findings were included in the study.

Samples collected aseptically in clean, sterile, leak proof vials and syringe with no visible signs of contamination, having proper label were accepted for analysis. Samples were aliquoted for ADA analysis and stored at -20^{0}C for PCR.

Pleural fluid samples were centrifuged at 3000 rpm for 15 minutes, the supernatant was used for ADA examination whereas whole pleural fluid was stored and used for PCR analysis. ADA level was measured in supernatant by automated analyzer using ADAZYME enzymatic method. The cutoff value of pleural fluid ADA for the diagnosis of tubercular pleural effusion was >40 U/L according to this method [Tulip Diagnostics (P) Ltd, INDIA][14]. Values higher than cut-off were grouped under >40U/L whereas values less than cut-off were grouped under <40 U/L.

Extraction of DNA was done by CTAB (cetyl-tri-methylammonium bromide)-phenol chloroform extraction method. IS6110 is an 1191-bp repetitive insertion sequence that is usually present 6-20 times in the *M. tuberculosis* complex genome. It is exclusively found in *Mycobactrium tuberculosis* complex (MTC) and thus has become important diagnostic tool for the identification of MTC species[15]. Amplification of DNA was performed with primers IS-F-5'-CCTGCGAGCGTAGGCGTCGG-3'and IS-R-5'-CTCGTCCAGCGCCGCTTCGG-3', to amplify 123 bp fragment of insertion element IS6110 of *M. tuberculosis* complex.

PCR was carried out according to the standard protocol (provided by Fast-track reagent kit) The positive control included the DNA of H37Rv strain and negative control included PCR grade water. After PCR the amplified products were subjected to electrophoresis on a 2% agarose gel containing ethidium bromide and the results were recorded. The presence of 123 bp fragment indicates the positive test for *M. tuberculosis* complex.

Data were entered on Microsoft Excel 2013 and were exported to Statistical Package for Social Sciences (SPSS) version 25 and analyzed. Student t-test was applied for comparison of means and a p value <0.05 was deemed statistically significant. All the data were presented in the form of bar diagram in percentages.

RESULTS

Table 1 shows the demographic characteristics of cases enrolled for the study.

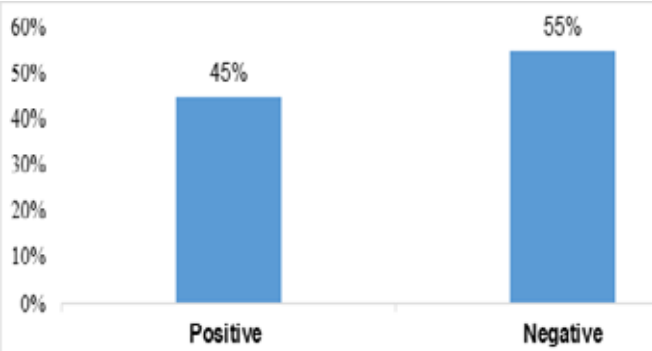
Table 1: Demographic characters of study subjects

Gender→ Age group↓	Males n (%)	Females n (%)	Total n (%)
≤15 yrs	3 (3%)	2 (2%)	5 (5%)
16 - 45 yrs	49 (49%)	8 (8%)	57 (57%)
≥46 yrs	24 (24%)	14 (14%)	38 (38%)
Total	76 (76%)	24 (24%)	100 (100%)

According to the table 1, there were more than three times the number of males (76%) than females (24%) and most of them were in their fifties (57%) with only 5% of younger subjects with age less than 15 years.

Figure 1 shows the percentage of positive and negative cases as detected by PCR. A total of 100 pleural effusions were taken in the study. Out of these, only 45 (45%) samples were positive for tuberculosis and remaining 55 (55%) samples were negative by PCR.

Fig 1: Cases classification by PCR



According to figure 2, the level of ADA was above the cut-off value of 40 IU/L in 43% of tubercular pleural effusion but was below 40 U/L in all NTPE (p<0.001). Only 2% of PCR positive cases had ADA level <40 U/L.

Fig 2: Pleural fluid ADA level in tubercular and non-tubercular pleural effusion

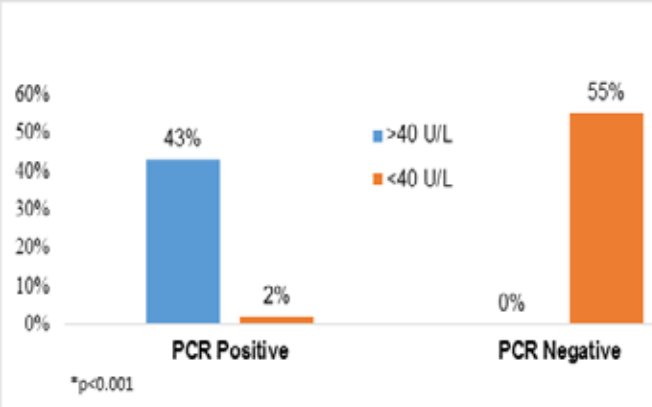


Table 2 compares the mean ADA level in tuberculous and non-tuberculous pleural fluid in different age groups.

Table 2: Age wise mean ADA level in tuberculous and non-tuberculous pleural fluid

Age (Years)	Pleural Fluid ADA activity		p-value
	TPE (n = 43) Mean ±SD	NTPE (n = 55) Mean ±SD	
≤15	76.32 ±12.81	15.32 ±9.92	<0.001
16 - 45	125.21 ±34.32	29.32 ±6.62	<0.001
≥46	102.21 ±23.39	19.29 ±8.93	<0.001
Total average	101.24 ±23.50	21.31 ±8.49	<0.001

According to figure 3, the mean ADA level in TPE (101.24 ±23.50) was significantly higher as compared to NTPE (21.31 ±8.49) with p value <0.001. On the basis of age group, pleural fluid ADA was significantly higher in TPE in all three age groups as compared to their NTPE counterparts (p<0.001 for each age group).

DISCUSSION

Adenosine deaminase activity is elevated due to chronic antigenic stimulation of immune response as a result of cell mediated immunity (CMI) as seen in tuberculosis[16]. It is suggested that ADA has higher sensitivity than histopathological examination of pleural tissue for differential diagnosis of tubercular pleuritis because tuberculous pleurisy is a hypersensitivity reaction[11]. The use of PCR based test further enhances the sensitivity and specificity of diagnosis as it can detect small number of bacteria[17]. For example, use of IS6110 which exclusively occur in *Mycobactrium tuberculosis* complex (MTC) and thus has become important diagnostic tool for the identification of MTC species[15]. Our study also showed more positive cases (45%) of tubercular effusion by using IS6110 based PCR technique. Studies suggests that detection of IS6110 based PCR methods provides higher chance of detection of mycobacterial DNA in pleural fluid[18]. Our study showed pleural effusions in PCR positive TPE cases with ADA level above cut-off value (>40 U/L). This finding is supported by several other studies done by various authors in different time and places[8,11,16,19,20] who have reported elevated ADA level in TPE cases than NTPE. From our study it can be reasoned that ADA can be used in differential diagnosis of tubercular pleural effusion form other types. Furthermore, the use of PCR in detection of mycobacteria from pleural effusion enhances detection. Thus, the combined used of PCR and ADA measurement can viewed to provide accuracy and exclude other cause of TPE.

The limitations of this study were that, we relied only on PCR and could not follow other diagnostic tools like culture and staining to find out specificity and sensitivity of methods. Large sample size and investigation of other biochemical markers could provide more information about the nature of pleural effusion which would help in establishing criteria for diagnosis of TPE.

CONCLUSIONS

Hence, we found significantly high level of ADA in TPE than in non-tuberculous cases. The use of PCR helped to detect more tuberculous cases. In this context we recommend to use multiple tools for TB diagnosis in paucibacillary conditions like pleural effusion.

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Conflicts of Interest

All the authors declare that we have no any conflicts of interest

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Cardiovascular Risk Behavior Amongst Adolescents of Lekhnath Muncipality of Kaski district, Nepal

Ghimire HP[1], Dhungana A[2]
[1]Assistant Professor, [2]Lecturer, Department of Community Medicine,
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal

ABSTRACT

Background: Life style related behavioral risk factors are mainly implicated for increase burden of cardiovascular diseases. Research related to these risk behaviors especially among adolescents is essential considering their role as future citizens of the country.

Objectives: The study aimed to evaluate the burden of cardiovascular risk behavior amongst the adolescents of Kaski district, Lekhnath Nepal.

Methods: A cross sectional study was carried out among the adolescents of Lekhnath Muncipality Kaski District. Total 350 participants from five different schools from Lekhnath Muncipality took part in the study and the sampling technique was simple random method by using a random number table. Self administered questionnaires were used to collect information on identification of risk behaviors.

Results: Descriptive statistics and Chi square test were computed. Out of 350 adolescents 175 males and remaining 175 females were interviewed. Alcohol and tobacco consumption were more amongst males whereas fast food and soft drinks were more amongst the females. Nearly 40% of the adolescents were not involved in physical activity. Tobacco and alcohol consumption was 26% and 16% respectively, which was higher amongst the late adolescents group studying in the 11th and 12th standard. In this study fruits and vegetables consumption was very less only 42% whereas soft drinks and fast food consumption was more 83% which shows that the adolescents are not aware about their food habits. Some participants did not consume fruits due to low purchasing power to buy fruits. Adolescence is a period of experimentation and so some participants told that they have just started taking alcohol and also started consuming tobacco for fun and were not aware that it was cardiovascular risk behavior.

Conclusions: The adolescents had a high burden of cardiovascular risk behavior and if immediate intervention is not done to reduce these high risk behaviors many may be vulnerable to cardio vascular diseases in the future.

Keywords
Adolescents, Cardiovascular diseases, Risk factor.

Corresponding author
Dr. Hari Prasad Ghimire
Assistant Professor
Dept of Community Medicine
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal
Email: hari_ghimire77@yahoo.com

INTRODUCTION

Cardiovascular diseases (CVD) are the leading causes of morbidity and mortality worldwide[1]. Low and middle income countries contribute significantly to the global burden of CVD accounting for 78% of all deaths attributable to this cause[2]. Countries such as India, Pakistan, Bangladesh, Sri Lanka and Nepal comprising of 20 percent of the world's population have a very high prevalence of CVD[3]. In Nepal, few community based studies have suggested a very high prevalence risk factors of CVD in the general population that includes diabetes

mellitus, hypertension, overweight, inadequate physical activity, and tobacco consumption[4,5]. People dying of CVD have major modifiable risk factors which include high blood pressure, abnormal lipids, tobacco use, excessive alcohol use, physical inactivity, obesity, unhealthy diet and diabetes mellitus[6-11]. These lifestyle risk factors which include smoking, tobacco and excessive alcohol use, poor dietary patterns and physical inactivity have been observed in adolescents and adults in both developed and developing countries[12-16].

METHODS

Study design, population and sampling

A cross sectional study was carried out among the adolescents of Lekhnath Muncipality, Kaski District Nepal. Total 350 participants from five different schools from Lekhnath Muncipality took part in the study and the Sampling technique was simple random method by using a random number table. Self administered questionnaire was used to collect information on identification of cardiovascular risk behaviors. Consumption of fruits and vegetables, fast foods, carbonated drinks was assessed for last seven days. Physical activity (which increases heart rate and makes one short of breath for some time) carried out in last week and hours spent in sedentary activity on a typical day was assessed. Students with physical activity of at least 30 min/day for two or less days in the past week were classified as inactive and for three or more days as active. Consumption of any form of tobacco (smoking/ smokeless) or alcohol in past 30 days was also enquired. Non-responders or participants who choose "don't know" option or those who had a missing response for desired risk factor were excluded from the analysis. All data were analyzed by using software Excel 2010.

Table 1: Consumption of fruits or vegetables in past week among adolescents

Class	n	Fruits or vegetable consumption three or more times per/day	
7	60	23 (38.3%)	Chi Square =5.99
8	78	18 (23.0%)	
9	44	12 (27.2%)	df = 1
10	30	15 (50.0%)	
11	54	30 (55.5%)	P<0.05
12	84	50 (59.5%)	
	N=350	**148 (42.2%)**	

Table 2: Soft drinks and fast food consumption in past week among adolescents

Class	n	Soft drinks and fast food consumption one or more times a day	
7	60	50 (83.3%)	Chi square =3.22
8	78	62 (79.4%)	
9	44	37 (84.0%)	df=1
10	30	24 (80.0%)	
11	54	44 (81.4%)	P<0.05
12	84	74 (88.0%)	
	N=350	**291 (83.1%)**	

Table 3: Activity pattern among adolescents in past week

Class	n	Physical activity among adolescents	
7	60	42 (70.0%)	Chi square =4.78
8	78	60 (76.9%)	
9	44	35 (79.5%)	df=1
10	30	15 (50.0%)	
11	54	20 (37.0%)	P<0.05
12	84	45 (53.5%)	
	N=350	**217 (62.0%)**	

Table 4: Tobacco use among adolescents in last 30 days

Class	n	Tobacco users among adolescents	
7	60	1 (1.6%)	Chi square =3.26
8	78	3 (3.8%)	
9	44	18 (40.9%)	df=1
10	30	16 (53.3%)	
11	54	19 (35.1%)	P<0.05
12	84	34 (40.4%)	
	N=350	**91 (26.0%)**	

Table 5: Alcohol use among adolescents in last 30 days

Class	n	Alcohol users among adolescents	
7	60	1 (1.6%)	Chi square =2.16
8	78	2 (2.56%)	
9	44	5 (11.3%)	df=1
10	30	6 (20.0%)	
11	54	18 (33.3%)	P<0.05
12	84	24 (28.5%)	
	N=350	**56 (16.0%)**	

RESULTS

Out of 350 adolescents 175 males and remaining 175 females were interviewed. Among the 350 adolescents the mean age of the study population was 15.66 ±2.22. Alcohol and tobacco consumption were more amongst males whereas fast food and soft drinks were more amongst the females.

Consumption of fruits and vegetables three or more times a day in the past week was highest 50 (59.5%) amongst the class of 12th standard and least was consumed by 18 (23%) amongst the class 8 students as shown in Table 1; Chi Square value 5.99, P value <0.05. Soft drinks and fast food consumption one or more times a day in past week was highest 74 (88%) amongst the class of 12th standard followed by 9th class 37 (84%) and least 62 (79.4%) amongst the class of 8 as shown in Table 2; Chi square value 3.22, P value <0.05.

Physical activity amongst students was highly appreciated by the 9th class 35 (79.5%) and least appreciated by 11th standard which was only 20 (37%) as shown in Table 3; Chi square value 4.78, P value <0.05. Tobacco use among adolescents in last 30 days was high amongst the 10th class 16 (53.3%) and least was amongst the grade 7 students one (1.6%) as shown in Table 4; Chi Square value 3.26, P value<0.05. Alcohol use amongst adolescents in last 30 days was highest amongst the 11th standard 18 (33.3%) followed by 12th class 24 (28.5%) and least was amongst the grade 7 students which was only one (1.6%) as shown in Table 5; Chi Square value 2.16, P value<0.05.

DISCUSSION

Cardiovascular disease (CVD) is on the increase in developing countries and more prevalent in the working age population resulting in large social and economic burden. The increase in CVD burden in developing countries is largely the result of an increase in the prevalence of CVD risk factors.

People dying of CVD have major modifiable risk factors which include high blood pressure, tobacco use, excessive alcohol use, physical inactivity, obesity, unhealthy diet and diabetes mellitus. Many of these risk factors are caused by unhealthy lifestyle and habits, as such they are sometimes referred to as lifestyle risk factors. These lifestyle risk factors which include smoking tobacco and excessive alcohol use, poor dietary patterns and physical inactivity have been observed in adolescents and adults in both developed and developing countries.

In this study fruits and vegetables consumption was very less only 42% whereas soft drinks and fast food consumption was more (83%) which shows that the adolescents are not aware about their food habits. Fruits and vegetables consumption is gradually replaced with fast foods or ready to eat foods as student progress through the college reported by Rustagi *et al*[17] which showed similiarity with this study. Some participants did not consume fruits due to low purchasing power to buy fruits. Physical activity was practiced by only 62% of the participants and most of them were boys. Tobacco and alcohol consumption was 26% and 16% respectively, which was higher amongst the late adolescents group studying in the 11th and 12th standard. Similar type of study done amongst the adolescents of Nepalgunj, Manita *et al*[18] shows lower prevalence of consumption of tobacco 8.4% and alcohol 6.9% by adolescents. Adolescence is a period of experimentation and so some participants told that they have just started taking alcohol and also started consuming tobacco but were not aware that it was a cardiovascular risk behavior.

Investigating CVD risk factors among adolescents is important because adolescence is a critical temporal window for the development of obesity in adult age. Dietary habits, and risky behaviors, such as smoking and drinking are experimented with and established in childhood and adolescence. Furthermore researchers have advocated that children and adolescent populations should be the target for cardiovascular risk factors prevention programs because lifestyle risk factors are usually learnt and established during this period. CVD prevention program are thus likely to be more effective in this subpopulation. Modifiable risk factors can be prevented, treated and controlled, hence the need for early detection of risk factors and CVD prevention programs so that adolescents adopt healthy behaviors into adulthood.

In conclusion, the presence of cardiovascular risk factors is an important health problem among the adolescents of Lekhnath Muncipality. There is a need for a national program to control cardiovascular risk factors among these adolescents who may be vulnerable to cardiovascular diseases in the future. Promotion of supportive environment for strengthening student-based approaches and strategic delivery of health education is also essential to target these risk behaviors among our future citizens.

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Trends of Abortion Care Utilization in a Medical College of Western Region of Nepal

Shrestha R[1*], Adhikari P[2]
[1]Lecturer, [2]Intern, Department of Obstetrics and Gynecology,
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal

Keywords
Maternal health,
Manual vacuum aspiration (MVA),
Safe abortion.

Corresponding author
**Dr. Reecha Shrestha*
Lecturer, Department of Obstetrics and Gynecology
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal
E-mail: drreechashrestha@gmail.com

ABSTRACT

Introduction: Unsafe abortion is one of the important issues in reproductive and women's health in developing countries. Social values and stigmas have much role and have been obstacle in countries like Nepal for the utilization of safe abortion services.

Objectives: This study helps to provide brief overview of the pattern of abortion and its associated factors in a centre providing safe abortion services.

Methods: This is a retrospective study carried out in Gandaki Medical College Teaching Hospital after reviewing the records of all the women who underwent Manual Vacuum Aspiration (MVA). Age, gravida, week of gestation and type of abortion were noted and analysed.

Results: Maximum number of women belonged to age group of 25 - 29 and is primigravida. Most of them presented at fifth to ninth weeks of gestation and had incomplete abortion.

Conclusions: Awareness and education regarding the availability of safe abortion services and its practice would improve the women's reproductive health and well being.

INTRODUCTION

Among the abortions occurring worldwide, nearly half of them are unsafe and almost all of them (98%) occur in developing countries[1]. Nepal being one of it has significant number of unsafe abortion cases due to poor access to the abortion care services, social values and stigmas[2]. Despite the liberalization of the abortion laws, the communal attitudes have limited the opportunity for women to utilize their right for safe abortion and thus sometimes lands in complication from unsafe abortion[3]. Expanding the care providers, innovative approaches for providing proper information and awareness are of much use for improving the current scenario of unsafe abortion[4].

This study was conducted to find out the trends of abortion care utilization among the women who took safe abortion services from one of the medical colleges in Western Region of Nepal.

METHODS

This is a retrospective study carried out in the Gandaki Medical College Teaching Hospital. The hospital records of the patients from the obstetric ward who underwent Manual Vacuum Aspiration (MVA) from January 2017 to June 2017 were taken from record section. Age, gravida, week of gestation and type of abortion were noted. The data was entered in Microsoft Excel and analyzed.

Ethical clearance for the study was taken from Institutional Review Board of Gandaki Medical College and Teaching Hospital.

RESULTS

The total patients who underwent the safe abortion

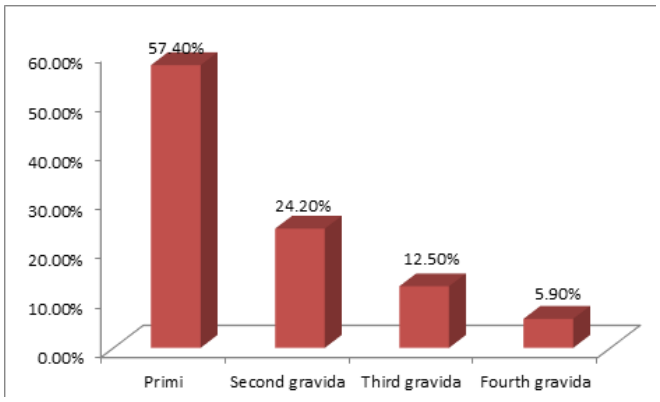
service during the study period were 256. The mean age of the women taking the abortion service was 27.80 with maximum belonging to the age group 25-29 (Table 1).

Table 1: Age wise distribution of the patients

Age	N=256	%
15 - 19	32	12.50%
20 - 24	57	22.30%
25 - 29	63	24.60%
30 - 34	59	23.00%
35 -3 9	32	12.50%
40 - 45	13	5.10%
Total	256	100.00%

Similarly, most of the women who underwent Manual Vacuum Aspiration (MVA) are primigravida (Fig 1). Among the multigravida (N=109), it was the first abortion for 77 of them, second for 23 of them, five had undergone for third time and its fourth time for four of them.

Fig 1: Gravida of the women underwent MVA



The maximum number of women presented at fifth to ninth weeks of gestation followed by 10 to 14 weeks of gestation (Table 2). The mean week of presentation is 10.19 weeks.

Table 2: Weeks of gestation of the women underwent MVA

Weeks of gestation	N=256	%
5 – 9	121	47.30%
10 – 14	107	41.80%
15 – 19	21	8.20%
20 – 24	7	2.70%
Total	256	100.00%

Similarly, most of them who underwent MVA were diagnosed of incomplete abortion (Table 3).

Table 3: Type of abortion

Type of abortion	N=256	Percentage
Incomplete	189	73.80%
Missed	34	13.30%
Threatened	22	8.60%
Septic	11	4.30%
Total	256	100.00%

DISCUSSION

WHO defines abortion as the expulsion or extraction of fetus from its mother weighing 500 gram or less when it is not capable of independent survival before 20 weeks of gestation[5]. Though abortion rate has been declined in the developed countries it is still significant in developing and low income countries[6].

Our study showed the majority of women who underwent MVA were belonging to the age group 25 to 29 years which was in consistent with the study conducted by Paudel *et al*[7] in a Maternity Hospital in Kathmandu. These age groups of women are recently married age group in our socioeconomic scenario. It may be either due to the lack of family planning methods have undergone conception and landed in complication after medically terminating pregnancy or as a result of spontaneous complication in first trimester.

Similarly, our study demonstrated that most of those who underwent MVA were nulliparous in contrast to the other Asian countries which showed the multiparous accounted for high number of reported abortions[8]. Though exact cause is not known, this may be due to intake of medial termination pills earlier and unavailability of family planning measures.

Those women who underwent MVA presented to fifth to ninth week of gestation in our centre though mean week of presentation was 10.19. Nepal's 2002 abortion law has stated that pregnancy termination up to only 12 weeks is available for any indication by request[9]. Though our study suggested there were significant number of MVA done above 14 weeks too. It may be due to the case of missed abortion diagnosed later or patient presented with incomplete abortion after self intake of medical termination pills after 12 weeks. Among the different types of abortion the majority of them were diagnosed as incomplete abortion.

There has been increased utilization of safe abortion

care after its legalization in Nepal[7,10]. Though still there have been some socio-cultural barriers, issues regarding sex selective abortion, and post abortion contraceptive measures; which are the rooms for further improvement.

As our study was retrospective and single centered, our limitations were that we couldn't include other significant variables like socioeconomic background, literacy level of the women. Similarly, we also couldn't differentiate those incomplete abortion we encountered were spontaneous or as a result of medical termination pills intake. Further studies are recommended for discovering the medical termination pill using habits by buying from the pharmacy without proper medical consultation.

CONCLUSIONS

Our study concluded that among those seeking abortion services and underwent MVA in our institution majority were primi women of age group 25 – 29 years at fifth to ninth weeks of gestation with incomplete abortion. Awareness among the women regarding the availability of safe abortion facilities will further improve the women's reproductive health and well being.

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Evaluation of Different Thyroid Lesions with Fine Needle Aspiration Cytology and Thyroid Function Tests

Ranabhat S[1*], Parajuli B[1], Poudel S[1], Pun G[1]
[1]Lecturer, Department of Pathology, Gandaki Medical College & Teaching Hospital, Pokhara, Nepal

Keywords
Fine Needle Aspiration Cytology (FNAC), Thyroid Function Test (TFT), Thyroid lesions.

Corresponding author
**Dr. Sunita Ranabhat*
Lecturer, Department of Pathology
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal
Email: sunitaranabhat7@gmail.com

ABSTRACT

Introduction: Swelling of the thyroid gland is a commonly encountered clinical problem in all age groups whether benign or malignant. Fine Needle Aspiration Cytology (FNAC) of the thyroid lesions along with hormonal function test helps in the proper preoperative assessment. Ultimately it changes clinical management and improves the patient outcome.

Objectives: To describe the cytomorphological features of palpable thyroid nodules using fine needle aspiration cytology (FNAC) along with the assessment of thyroid hormonal status of the patient.

Methods: The study was conducted in the Department of Pathology of Gandaki Medical College and Teaching hospital from January 2017 to December 2017 and included 50 patients with thyroid lesions. Cytological assessment was done using FNAC along with serological assessment of thyroid hormones.

Results: In the study 50 cases of thyroid swelling were included and evaluated by cytological and hormonal analysis which comprises of 10% males and 90% females with a with a female to male ratio of 9 : 1. Maximum number of cases was seen in the age range 41 - 60 years (46%), mean age being 44.6 years. The cytological diagnosis comprised colloid goiter (58%), lymphocytic thyroiditis (16%), Hashimoto thyroiditis (10%). Thyroid hormone analysis showed 66% euthyroid, 22% hypothyroid and 12% hyperthyroid.

Conclusions: The study showed that FNAC and TFT profile both are essential for the proper management of thyroid lesions. FNAC along with hormonal analysis helps in proper patient assessment and management.

INTRODUCTION

Swelling of the thyroid gland is a common manifestation of various diseases of thyroid whether benign or malignant. Although, many are benign but still the reports and study have shown that the prevalence of malignancy among the solitary nodular goiter is about 10%. Among the various types of malignancy of thyroid gland, papillary carcinoma of thyroid is the most common followed by follicular, medullary, anaplastic and lymphoma[1].

It is said that FNAC of thyroid was introduced in 1950 and has been popular worldwide since 1980[2].

Nowadays FNAC of thyroid is a well-established gold standard procedure performed in outpatient department for the evaluation of diffuse and solitary thyroid swelling. FNAC is a simple, cost effective, readily repeated

minimally invasive and quick to perform procedure. The main purpose is to reduce unnecessary surgery thereby confirming benign lesions[3]. FNAC is however not without limitation; accuracy is lower in suspicious cytology and in follicular neoplasm.

In thyroid gland follicles are the basic morphological unit. They produce hormones triiodothyronine (T3) and thyroxin (T4) which are in turn regulated by thyroid stimulating hormone produced by anterior pituitary gland[4]. The lesions of thyroid can be categorized in hypothyroid euthyroid or hyperthyroid condition based on the assessment of the level of T3, T4 and TSH.

In the present study, cytomorphological features of thyroid FNAC were evaluated and classified in different categories based on The Bethesda System of Reporting Thyroid Cytology and evaluated with the hormonal status of the concerned patient.

METHODS

The present study was conducted at the Department of Pathology, Gandaki Medical College and Teaching Hospital, from January 2017 to December 2017. A total 50 cases were analysed during this period. Prior to aspiration a physical examination was done to note the mobility and presence of any cervical lymph node. FNAC was performed using aseptic precaution with nonaspiration or aspiration technique by 23G needle with 10 ml syringe. In cases of cystic lesion fluid was aspirated first followed by reaspiration from the nodule. In cases when the lesions were invisible USG guided FNAC was performed. One slide was kept in absolute alcohol and others were air dried and stained in Papanicolau and Giemsa stains respectively.

The TFT profile was performed using ELISA kits from Human Gesellschaft fur Biochemica and Diagnostic MbHMaxPlanck-Ring 21, D-6205 Wiesbaden, Germany Serozyme ELISA. The cytomorphological detail, FNAC diagnosis and TFT detail were entered in Microsoft excel 2013 and study variable were statistically analysed by SPSS16.

RESULTS

The study was conducted in the Gandaki Medical College and Teaching Hospital from January 2017 to December 2017. A total of 50 thyroid swelling were analyzed. In this study the total number of females were 45 (90%) while males five (10%) (Table 1). In this study we found the most of the patients were females and female to male ratio was 9 : 1. The age of the patients in the study ranged from 8 years to 82 years. Maximum number of cases were seen in the age group of 41 - 60 years (46%) followed by 20 - 40 years (30%). The Mean age of the patients with thyroid lesions was 44.6 years.

Table 1: Age and gender distribution of patients with palpable thyroid lesions

Age group	Sex		Total
	Females	Males	
< 20yrs	3	1	4
21 - 40yrs	13	2	15
41 - 60yrs	21	2	23
> 61yrs	8	0	8
Total	45	5	50

FNAC was performed by aspiration and non-aspiration technique on all patients with serological thyroid hormone estimations. Out of 50 cases non-neoplastic lesions were more common accounting 44 cases (88%) while neoplastic were six cases (12%). The cytological diagnosis consisted predominantly of colloid goitre 29 cases (58%) followed by lymphocytic thyroiditis eight cases (16%) and hashimoto's thyroiditis five cases (10%). Other cases included papillary carcinoma of thyroid, subacute thyroiditis, follicular neoplasm and anaplastic carcinoma (Table 2).

Table 2: Distribution of cytological diagnosis in different age group

Age group	Diagnosis							Total
	Colloid	Subacute	Lympho	Hashimoto	Pap	FN	Anaplastic	
< 20 yrs	3	0	0	1	0	0	0	4
21 - 40 yrs	4	1	4	1	4	1	0	15
41 - 60 yrs	15	1	3	3	0	0	1	23
>61 yrs	7	0	1	0	0	0	0	8
Total	29	2	8	5	4	1	1	50

Thyroid hormone profile was done, which showed 33 cases (66%) were euthyroid, 11 cases (22%) were hypothyroid and six cases (12%) were hyperthyroid. Out of 29 cases (58%) of colloid goitre, 23 cases (79%) were euthyroid, two cases (7%) were hyperthyroid and four cases (14%) were hypothyroid. In case of Hashimoto's thyroiditis four cases (80%) were hypothyroid and one case (20%) was euthyroid. Whereas in lymphocytic thyroiditis four

cases (50%) were euthyroid, three cases (38%) were hypothyroid and one case (12%) were hyperthyroid. In neoplastic lesion, out of four cases (8%) of papillary carcinoma of thyroid three cases (75%) were euthyroid and one case (25%) was hyperthyroid. Similarly both follicular neoplasm and anaplastic carcinoma presented with euthyroid (Table 3).

Table 3: TFT analysis in different thyroid lesion

Diagnosis	TFT			Total
	Euthyroid	Hyperthyroid	Hypothyroid	
Anaplastic	1	0	0	1
Colloid	23	2	4	29
Follicular neoplasm	1	0	0	1
Hashimoto	1	0	4	5
Lympho	4	1	3	8
Papillary carcinoma	3	1	0	4
Subacute	0	2	0	2
Total	**33**	**6**	**11**	**50**

In our study, among males the common cause of thyroid swelling was subacute thyroiditis followed by colloid goitre and anaplastic carcinoma. In case of females, common thyroid swelling was due to colloid goitre followed by lymphocytic thyroidits, hashimoto's thyroiditis then papillary carcinoma of thyroid and follicular neoplasm (Table 4).

Table 4: Distribution of cytological diagnosis among gender

Sex		Diagnosis							Total
		Colloid	Sub-acute	Lym-pho	Hash-imoto	Pap	Fn	Ana-plastic	
F	Count	28	0	8	5	3	1	0	45
	% within Sex	62.2%	.0%	17.8%	11.1%	6.7%	2.2%	.0%	100.0%
M	Count	1	2	0	0	1	0	1	5
	% within Sex	20.0%	40.0%	.0%	.0%	20.0%	.0%	20.0%	100.0%
Total	Count	29	2	8	5	4	1	1	50
	% within Sex	**58.0%**	**4.0%**	**16.0%**	**10.0%**	**8.0%**	**2.0%**	**2.0%**	**100.0%**

Fig 1: Papillary structures in papillary carcinoma of thyroid (Giemsa 100X)

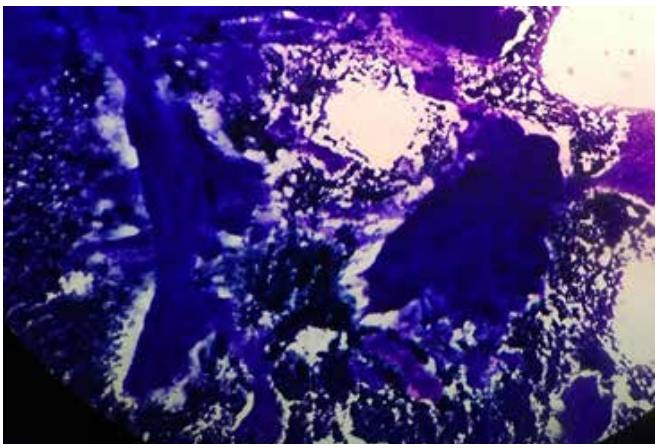


Fig 2: Intranuclear cytoplasmic inclusion in PTC (Giemsa 1000X) Papillary carcinoma of thyoid

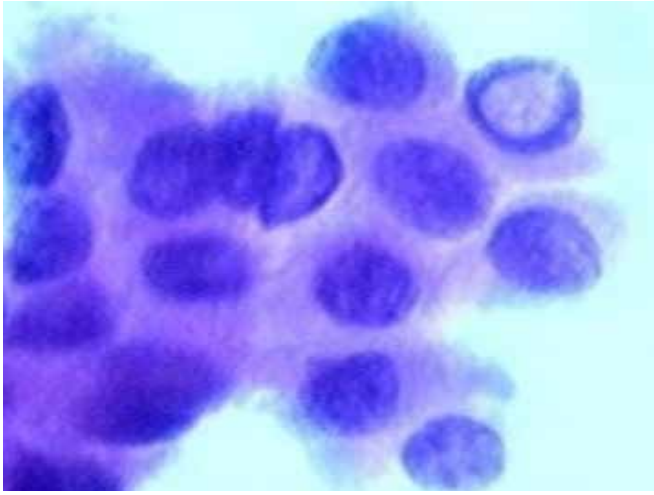


Fig 3: Lymphocytes impinging into follicles along with hurthle cells in Hashimoto thyroiditis (Giemsa 400x)

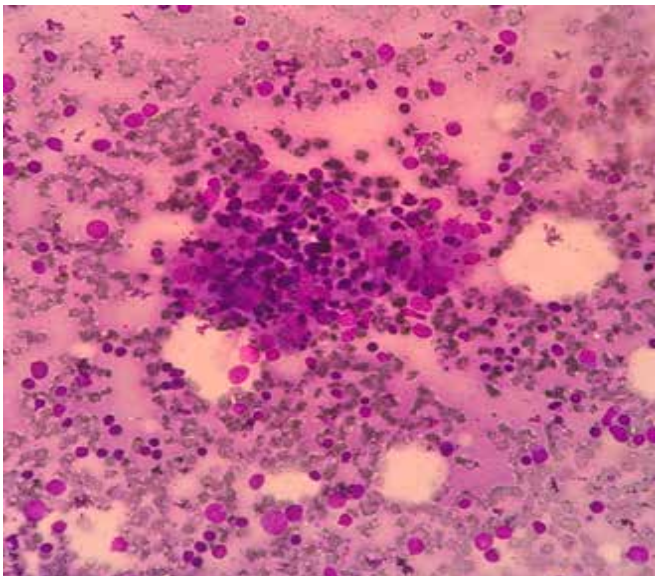
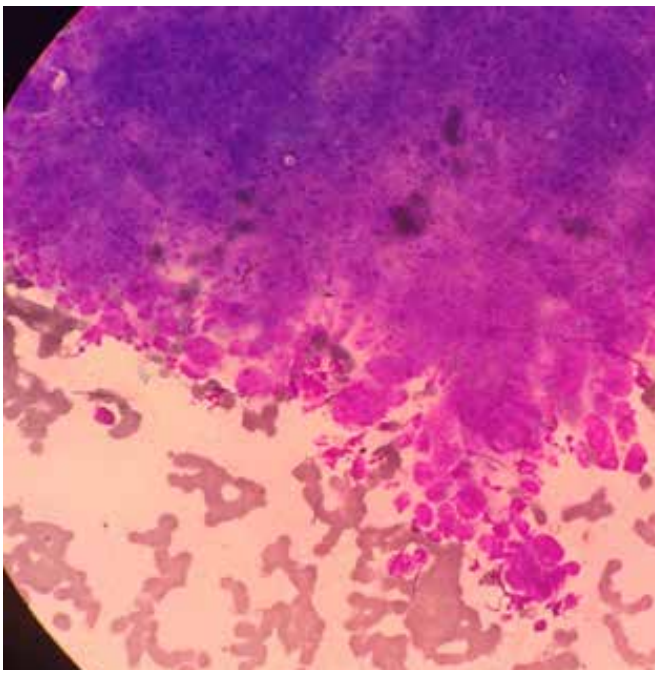


Fig 4: Pleomorpic bizzare cells in case of anaplastic carcinoma of thyroid. (Giemsa 400x)



DISCUSSION

Enlargement of thyroid or goitre are a very common problem encountered in clinical practice and it occurs in 4-10% of the population[5]. Most of the swellings are benign and frequency of malignancy range from 10 to 20%[5,6,7]. Thyroid enlargement whether benign or malignant, needs thorough investigation mainly to rule out the possibility of malignancy and thyroiditis[8].

FNAC is a simple and inexpensive procedure done in outpatient department for obtaining diagnosis. This procedure has few complications including the tumor implantation along the needle tract[9]. The recommendation of American Thyroid Association (ATC) (2015) state that for any thyroid nodule > or equal to 2 cm, ultrasound should be the initial investigation followed by FNAC[10]. FNAC along with other investigation like USG, TFT, thyroid scan and antibody level are done aiming to select the patients who require surgery and those who can be managed conservatively[11,9].

Our present study showed that thyroid lesions are common in females with female to male ratio 9 : 1 which is similar to the study done by Poudel *et al*[12], Yang *et al*[13], Sood *et al*[14], Jaragh *et al*[15], Renshaw *et al*[16] and Junu *et al*[17]. In the present study, age of the patient ranged from 8 - 82 years with the mean age of 44.6 years. This is justified by similar findings stated by Karki *et al*[18] and Staii *et al*[19],. Present study showed most commonly affected age is 41 - 60 years which is comparable to the study done by Junu Devi *et al*[17] and Poudel *et al*[12].

The study showed that 88% are non neoplastic lesion and 12% are neoplastic lesion whereas in study by Junu Devi *et al*[17], Choudhary R *et al*[3] and Chandanwale S *et al*[20] (neoplastic and non neoplastic cases were 4.55% and 94.95% respectively. This variation might be due to the sample size.

According to the study done by Siddegowda *et al*[21], Chaudhary R *et al*[3], Chandanwale S *et al*[20] and Junu Devi *et al*[17], among the non neoplastic lesion colloid goitre was the common thyroid lesion followed by lymphocytic thyroiditis which had the similarity with the present study.

Among the neoplastic lesion, papillary carcinoma of thyroid is the most common followed by follicular neoplasm which is similar to the study by Junu Devi *et al*[17], Chadanwale S *et al*[20] and Tabaqchali *et al*[2] but in the study done by Chaudhary S *et al*[22] and CK Sang *et al*[7] follicular lesions were most common (followed by papillary carcinoma).

The cytological analysis was accompanied with the thyroid hormone status as according to the guidelines of ATC, serum estimation of TSH should be part of initial assessment of the thyroid lesion[10]. The etiology of thyroid lesion is different so does the thyroid hormone status differ depending on the stage and extent of the disease. In our study, most of the patients were euthyroid (66%) which is similar to the study by Siddegowda *et al*[21]. This showed while correlating the thyroid disease with hormonal status, most patients with colloid goitre 79% had euthyroid (66%) status followed by hypothyroid (22%) and hyperthyroid (12%). This finding was similar to a study done by Siddegowda *et al*[21], Junu *et al*[17] and Chaudhary R *et al*[3]. Goitre is due to the impaired synthesis of thyroid hormone which is most often the result of dietary iodine deficiency leading to increase in the TSH level and this TSH increment stimulates thyroid follicular cells causing compensatory hypertrophy and hyperplasia which finally leads to enlargement of the gland. Goitre leads to increased hormonal level and achievement of euthyroid status in patients[23].

In patients with Hashimoto's thyroiditis, most of the patients were hypothyroid 80% which is similar to the

study done by Minnu Prasannan *et al*[24] and Siddegowda *et al*[21]. Hashimoto thyroiditis progress over a period of time to subclinical and then clinically over to hypothyroidism. In some cases, it may be preceded by a transient hyperthyroid state (hashitoxicosis) due to destruction of follicles and subsequent rise in the free T3 and T4 along with fall in TSH[23]. In our study, patient with lymphocytic thyroiditis 50% were euthyroid followed by 38% hypothyroid which is similar to the other study by Junu *et al*[17] and Baruah RN *et al*[25].This is explained by the fact that generally in six to eight weeks after inflammation subsides, thyroid function returns to normal[23,26]. Cytologically thyroid follicular cells entangled with lymphocytes, oxyphil cells, abundant polymorphous population of lymphocytes, multinucleated giant cells, cant or no colloid were observed in Hashimoto's or lymphocytic thyroiditis.

All the cases of subacute thyroiditis were hyperthyroid in our study which is similar to Junu *et al*[17] and comparable to the study by by Barua RN and Aman FZ[25]. In this study papillary carcinoma had a biochemical diagnosis of euthyroid which is similar to the study by Junu *et al*[17], Sang CK *et al*[7] and *Poudel et al*[12]. Cytologically According to Orell and Sterrett, it is highly suspicious for PTC, if the smears contain nuclear groove in more than 20% of cells and INCIs in 5%, but still it is not significant. Besides cellularity, nuclear grooving and INCI, pleomorphism, pattern, nucleoli, foam cells are also statistically significant for the diagnosis of thyroid lesions[27].

CONCLUSIONS

Fine needle aspiration cytology (FNAC) is a safe, inexpensive, easy, less time consuming modality for evaluation of different thyroid swellings. FNAC together with thyroid function test (TFT) analysis leads to early and accurate diagnosis of various thyroid diseases and reduces surgical intervention. The study showed that FNA cytologic diagnosis cannot be used to predict thyroid function using total serum T4, T3 and TSH concentrations. Measurement of TSH, free T4, and free T3 would be preferable.

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Pattern of Drugs and Therapeutic Agents Exposure among Pediatric Inpatients in the Fatima University Medical Center

Subedi N[1*], Shrestha B[2], Poudel S[1], Bhattarai A[1], Namrata KC[1]
[1]Lecturer, [2]Associate Professor, Department of Pediatrics,
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal

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Corresponding author
**Dr. Nabraj Subedi*
Lecturer, Department of Pediatrics
Gandaki Medical college and Teaching Hospital, Pokhara, Nepal
Email: nrsped@gmail.com

ABSTRACT

Background: Drugs and therapeutic agents exposure is essentially universal for persons, young and old in the Philippines. In the hospital, many drugs and therapeutic agents are being given to the patients according to severity of the illness. The evidence has suggested that complex medication combination increase the risk for adverse drug events. The most common results of many drugs and therapeutic agents are increased adverse drug reactions, drug-drug interactions and higher costs.

Objectives: To assess the prevalence and patterns of exposure to drugs and therapeutic agents among pediatric inpatients.

Methods: *Study Design*: Retrospective study. *Setting:* Pediatric inpatients in the Fatima University Medical Center. *Patients*: A total of 1075 patients younger than 19 years, excluding healthy newborn, hospitalized in 2011, representing a part of pediatric inpatients in the Philippines.

Results: The most common exposure was with D5.3NaCl, paracetamol, cefuroxime, salbutamol, zinc sulphate. Most of the pediatric inpatients received five or less number of medication varied by age and length of stay in the hospital. Pediatric inpatients were exposed to numerous drugs and therapeutic agents, especially patients with dengue III.

Conclusions: A large portion of pediatric inpatients are exposed to numerous drugs and therapeutic agents, especially patients with Dengue III.

INTRODUCTION

Drugs and therapeutic agents exposure is essentially universal for persons young and old in the Philippines. In the hospital, many drugs and therapeutic agents are being given to the patients in order to cure certain diseases. The number of therapeutic agents being administered to the patients varies according to severity of the illness. Polypharmacy is the use of multiple drugs by a patient, when too many drugs are prescribed than is clinically warranted, or even when all prescribed medications are clinically indicated but there are too many drugs to take[1].

The evidence has suggested that complex medication combination increase the risk for adverse drug events. Exposure to many drugs and therapeutic agents is most common in the elderly but is also widespread in the general population[2].

Drugs and therapeutic agents exposure is more prevalent in patients who changes doctors frequently to treat a particular illness and those who are buying over-the-counter medications on their own. The most common results of many drugs and therapeutic agents are increased adverse drug reactions, drug-drug interactions and higher costs.

A large proportion of hospitalized children are exposed to numerous medications on a daily basis, according to a new study by Chris Feudtner (2012). In addition, children with rare conditions are more likely to be exposed to more drugs and therapeutic agents[3].

In a developing country like the Philippines, many children are being hospitalized, and being exposed to multiple drugs and therapeutic agents every day.

To address these objectives, we used data from Fatima University Medical Center. The data set represent part of pediatric inpatients hospitalization in the Philippines. In this report we examine patterns of use of drugs and therapeutic agents among hospitalized pediatric patient (Excluding the healthy newborns) focusing on exposure to drugs and therapeutic agents, which has shown to be associated with an increase risk of adverse drug reaction in adult patients[4,5].

METHODS

The data was collected from Fatima University Medical Center, Valenzuela city, Philippines. For this study, one year (2011) data were collected from the record section. We went through the chart and discharge summary of all inpatients from January 2011 to December 2011.

There was implementation of standardized drugs and therapeutic agent dictionary built up that were specified by 93 distinct codes and non specific drugs were narrowed to 1 code categories, using the FUMC Hospital Formulary (2011 Ed), the generic entities were grouped to major 15 categories[6].

To describe the pattern of exposures, we calculated percentage of exposure to specific generic drugs and therapeutic agents by patient, by length of hospital stay. The number of exposures to discrete generic drugs and therapeutic agents were divided into three groups. The mean length of stay (LOS) was 4.07 (SD1.755). The mean age of the patient was 5.67 (SD 5.02). The total number of pediatric inpatients was 1075. To assess the relationship of total drugs and therapeutic agents exposure by age and LOS, we categorized it into three groups and two groups respectively.

RESULTS

In the year 2011 sample, a total of 3329 pediatric patients younger than 19 years, 1075 experienced hospitalizations in Fatima University medical center (FUMC)[7]. Among the hospitalized patients 537 (50%) were boys and 538 (50%) were girls (Table 1).

Table1: Characteristics of patients in FUMC

Patients		Number	Percent
Gender	Males	537	50.0%
	Females	538	50.0%
Age group	<1 yr	170	15.81%
	1 – 9 yr	642	59.72%
	10 – 19 yr	263	24.46%

The pediatric patients are from one day to 18 year and 364 days[8]. There were 170 patients under one year old, 642 patients under one to less than 10 years old and 263 patients under 10 to 19 year old as shown in Table 1.

Table 2 lists of 20 common generic medications exposure (excluding intravenous fluilds) in the FUMC reveals the prevalence of exposures to acetaminophen, salbutamol, ranitidine, diphenhydramine, cefuroxime, ampicillin, zinc sulphate. A complete list of number and percentage of patients hospitalized exposed to all drugs and therapeutic agent is available from the author.

Table 2: Top 35 drugs entity exposures by patients

Drugs entity	% of patients
Paracetamol	67.0%
Ibuprofen	3.0%
Salbutamol	21.7%
Ipratropium bromide	8.4%
Budesonide	6.0%
Ampicillin	14.3%
Amikacin	7.0%
Erythromycin	1.3%
Gentamycin	2.3%
Co-amoxiclav	3.7%
Cefuroxime	22.3%
Cefixime	1.2%
Ceftriaxone	6.3%
Clarithromycin	5.1%
Cotrimoxazole	1.1%
Metronidazole	4.7%
Meropenem	0.1%

Drugs entity	% of patients
Chloramphenicol	0.2%
Anti Kochs	1.0%
Cloxacillin	0.8%
Other Antibiotics	3.8%
Ointment	4.9%
Vitamin C	3.7%
Zinc	16.2%
OMX	5.4%
Bacillus Clausi	7.7%
Hydrocortisone	2.5%
N-acetylcysteine	1.4%
Ranitidine	6.0%
Famotidine	3.7%
Diphenhydramine	7.4%
Hydroxizine	7.2%
Other Drugs	5.3%
Diazepam	4.0%
Phenobarbital	1.2%

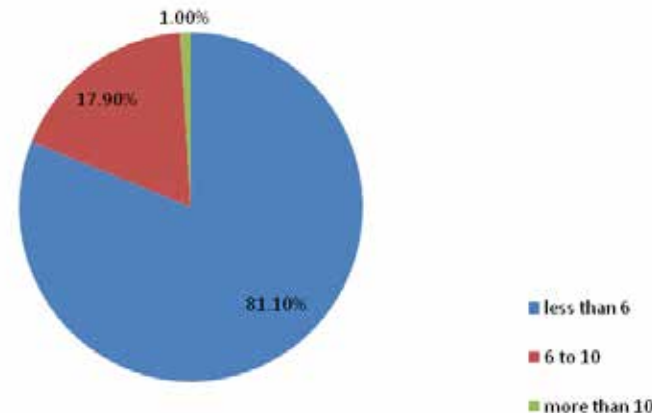
The pediatric patients were all selected from the general pediatric ward. The common intravenous fluid given to the patient during the length of hospital stay were as follows; 0.9% normal saline (PNSS) (18.2%), Ringer's lactate solution (PLR) (28.5%), 5% dextrose with 0.3% normal saline (D5 0.3NaCl)(50.9%) as tabulated in Table 3.

Table 3: Intravenous fluid exposure by Patients

Intravenous Fluids	% of patients
PNSS	18.2%
PLR	28.5%
D50.3 NaCl	50.9%
D5LR	15.3%
D5IMB	7.8%
D5NM	1.0%
Voluven	1.0%
Fresh frozen plasma	0.6%
Packed RBC	0.3%
Cryoprecipitate	0.2%

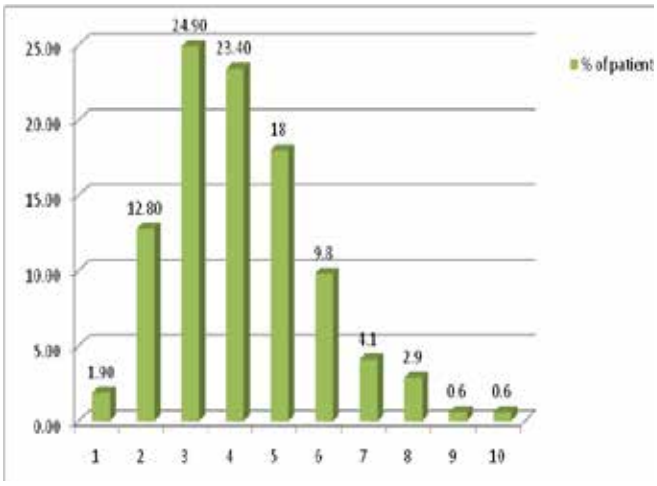
As illustrated in Figure 1, on the total length of stay in the hospital, 81.1%, 17.9% and 1.0% of patients received less than six, 6 to 10 and more than 10 drugs and therapeutic agents respectively.

Fig 1: Percentage of patients exposed to numbers drugs and therapeutic agents



The total number of drugs and therapeutic agents exposure was found ranging from one to 22. Twenty patients received only one medication and one patient received 22 medications. Most of the patients received three to six medications. As shown on figure 2, total number of medication given to the patients showed that three drugs and medications were given to 24.9% of patients, four and six were given to 23.4% and 18.0% of patients respectively.

Fig 2: Number of medication with respect to patients



The pediatric patients hospitalized in the FUMC were staying in the hospital ranging from one to 16 days with the mean length of stay (LOS) 4.07 days. The LOS was divided into two groups: One staying for less than five days and another staying for five and more days. On comparing the LOS with the number of drugs and therapeutic agents exposure, it was found that 86.1% of patients were given less than six medications within less than five days (LOS). 2.7% of patients were given more than 10 medications in more than 5 days (LOS) (Table 4).

Table 4: Number of medications given with respect to length of stay

Total Medication						
Length of stay	Less than 6		6 to 10		More than 10	
	Number	Percentage*	Number	Percentage*	Number	Percentage*
Less than 5 days	636	86.1%	101	13.7%	2	0.3%
5 days and above	236	70.2%	91	27.1%	9	2.7%

{*number of patients in percentage}

The age of the pediatric patients were grouped into three categories: less than one year, one to less than 10 year and 10 to less than 19 year. As illustrated in Table 5, for all age groups most of medications were less than six. In infants, 14.7% received 6 to10 medications. For patients 10 years and above 1.9% of patients were exposed to more than 10 medications.

Table 5: Percentage of patients exposed to drugs and therapeutic agents by age group

Total drugs and therapeutic agents						
Age in years	Less than 6		6 to 10		More than 10	
	Number	Percentage	Number	Percentage	Number	Percentage
Less than one year	144	84.7%	25	14.7%	1	0.6%
One to less than 10	501	78.0%	136	21.2%	5	0.8%
10 to less than 19	227	86.3%	31	11.8%	6	1.9%

The study was also done for few common diseases like dengue, pneumonia and acute gastroenteritis in relation to drugs exposure which revealed less medication were exposed to common condition. Level of exposure to drugs and therapeutic agents were higher for patients with cardiac diseases, and dengue III. Some of the common medical conditions were illustrated in the Table 6.

Table 6: Level of exposure to drugs and therapeutic agent for patient medical condition

Total number of drugs and therapeutic agents						
Diagnosis	Less than 6		6 to 10		More than 10	
	Number	Percent	Number	Percent	Number	Percent
DFS	82	93.2%	6	6.8%	0	0%
DHF I	94	90.4%	10	9.6%	0	0%
DHF II	88	86.3%	14	13.7%	0	0%
DHF III	10	40.0%	11	44.0%	4	16.0%
Pneumonia	133	70.0%	56	29.5%	1	5%
Gastroenteritis	152	82.6%	32	17.4%	0	0%
Tonsillitis	48	90.6%	5	9.4%	0	0%
Systemic viral infections	16	100.0%	0	.0%	0	0%
Febrile convulsion	36	83.7%	7	16.3%	0	0%
Neonatal sepsis	33	91.7%	3	8.3%	0	0%
Other diseases	180	76.9%	48	20.5%	6	2.6%

DISCUSSION

The most common generic drugs and therapeutic agents to which children were exposed included intravenous fluids; analgesics such as paracetamol; anti-infective agents such as cefuroxime, ampicillin and amikacin; gastrointestinal drugs such as ranitidine, famotidine, diphenhydramine, zinc sulphate; certain classes of drugs, such as cardiovascular drugs and central nervous system drugs were less commonly used. In this study, D5.3NaCl (50.9%) was found to be most commonly used intravenous fluid.

We also found that large proportion of hospitalized children were exposed to five or less drugs and therapeutic agents during entire days of their hospitalization with the most patients stayed in the hospital for less than five days.

The number of medication exposures for the admission of three common disease were also found less than six medications with (LOS <5), with slight increase of number of medication with increase in length of stay in case of

pneumonia and dengue III.

This study based on data from 1075 admissions in 2011, the most common drug exposure were to paracetamol (67.0%), salbutamol (21.7%), cefuroxime (22.3%), ampicillin (14.3%), zinc sulfate (16.2%), and noted in variation in the likely hood of exposure to medication based on patients age and diagnosis (Statistical testing for variation was not performed).

European study of outpatient pediatric drug use documented prevalent exposures to anti-infective agents (such as amoxicillin, amoxicillin/clavulanic acid, clarithromycin, or azithromycin, with 48% of the population exposed to an anti-infective agent during the course of a year) dermatologic drugs (such as fusidic acid, hydrocortisone, or miconazole, with 30% annual exposure); and respiratory drugs (such as albuterol, fluticasone, or desloratadine, with 30% annual exposure). This study also found substantial variation in likelihood of exposure by patient age and sex (especially for adolescent girls)[9].

An American study of in-patient found that the most common generic drugs and therapeutic agents to which children were exposed included intravenous fluids; analgesics such as the narcotics fentanyl and morphine or the antipyretics/analgesics acetaminophen and ibuprofen; anti-infective agents such as ampicillin, gentamicin, and cephalosporins; anesthetic agents such as lidocaine and propofol; gastrointestinal drugs such as ranitidine, ondansetron, and metoclopramide; and a bundle of drugs often provided to newborns as part of routine care, including vitamin K, erythromycin eye drops, immunization drugs, and application of triple dye anti-infective agents to the umbilicus[3].

An analysis of medication use in children with autism reveals polypharmacy is common, with up to 20% of children between the ages of three and 12 years being prescribed four or more medications. The most commonly used drugs were stimulants and antidepressants, followed by antipsychotics and other psychotropics[10].

While the present study has considerable pediatric inpatient drug and therapeutic agent exposures, five limitations of the study warrant consideration. First, the study was limited to inpatient only (excluding pediatric inpatient hospitalized for surgical, ophthalmological, or ENT problems), and is also for outpatient drugs exposure studies. Second, the drugs mentioned on the medication sheet includes the medication prescribed as PRN which does not necessarily assure that the patient received the medication, or the patient may have refused the medication, or has been change in the course of therapy from what was prescribed.

Third, we do not report drug doses in terms of either the amount of medications or the number of doses. Fourth, the data do not contain complete information on the indication and purpose for which the medication is prescribed. This is an inherent limitation regarding the certainty with which investigator can study drugs used for particular purpose. Fifth, drug classification schemes, which tends to categorize drugs according to FUMC Hospital formulary. A drug that was not included in the formulary were categorized as others and same drugs can be placed in two categories.

CONCLUSIONS

Pediatric inpatients were exposed to numerous drugs and therapeutic agents, especially patients with dengue III, and cardiac problems. Most of the pediatric inpatients received five or less number of drugs and medication by age and length of stay in the hospital. The most common exposure to drugs and therapeutic were with D50.3NaCl, paracetamol, cefuroxime, salbutamol, zinc sulphate. The number of exposure to different drug and therapeutic agent was 1 (lowest) and 22 (highest).

The finding and the data of this study offers important means to improve pediatric inpatient medication efficacy, effectiveness and safety. Ranking of drug and therapeutic agents based on the prevalence of hospitalized children's exposure can guide prioritization for further research. For example, research should focus on drugs that used principally for off-label of indications. Researcher should also develop methods to detect adverse event for pediatric patients[11].

Second, the level of drugs and therapeutic agents exposure found in this study raises patient safety concerns on pediatric patient, as adverse drug events that has been documented for adults in both hospital and nursing home settings[11,12].

For pediatric patients at PICU and NICU who are likely to be exposed to numerous drugs and therapeutic agents, observational study of treatment to detect adverse event and health outcome is recommended. The study encourages other researchers to conduct similar study in large scale, including hospital from rural and urban area.

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Distribution of Dental Diseases and Treatment Delivered amongst Patients Visiting Dental Outpatient Department at Gandaki Medical College, Nepal

Tuladhar SL[1*], Parajuli U[2], Manandhar P[1], Subedi N[3], Kunwar D[4]
[1]Lecturer, Department of Prosthodontics, [2]Associate Professor, Department of Orthodontics,
[3]Associate Professor, Department of Forensic Medicine,
[4]Lecturer, Department of Conservative and Endodontics,
College of Dental Surgery, Gandaki Medical College, Lekhnath, Pokhara, Kaski, Nepal

Keywords
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Corresponding author
Dr. Sapna Laxmi Tuladhar MDS
Lecturer, Department of Prosthodontics
College of Dental Surgery, Gandaki Medical College
Lekhnath, Pokhara, Kaski, Nepal
Email: drsapnalaxmituladhar@gmail.com

ABSTRACT

Introduction: A study of dental diseases amongst patients attending dental outpatient department (OPD) helps us plan a preventive, and/or a definitive dental treatment.

Objectives: To find out the distribution of dental diseases amongst patients visiting dental OPD at College of Dental Surgery, Gandaki Medical College (GMC), Pokhara, Nepal.

Methods: The present study was a hospital based cross sectional descriptive study carried out during a period of one year extending from 1st February 2016 to 31st January 2017. A total of 3052 patients attending the dental OPD were included in the study. The distribution of dental diseases according to sex, age and diagnosis were collected and analyzed. Additionally, frequency distribution of treatments provided to the patients was observed.

Results: Dental caries was the most prevalent dental disease (64.41%) followed by gingivitis (13.04%). The prevalence of dental caries was significantly higher in females (Females 56.91% vs. males 43.08%, $P < 0.05$). Conversely, the prevalence of maxillofacial injuries (85.06%), dental impactions (72%), and malocclusion (53.88%) were significantly more common in male patients ($P < 0.05$). The age group ≤19 years comprised 23.98 % of patients who visited the dental OPD, and the dental caries was most prevalent (27.10%) in the age group. The order of more frequent dental treatments was root canal treatment (18.84%), tooth extraction (18.44%), dental restoration (10.48%), and scaling (9.20%).

Conclusions: The most prevalent dental disease was dental caries and it was more prevalent in females than in males. The most common age group reporting to Dental OPD was ≤19 years.

INTRODUCTION

Knowledge of a pattern of dental diseases among patients attending a dental OPD is essential to plan a proper preventive and therapeutic dental treatment. Worldwide 100% of the adults and 60 - 90% of the school children have dental caries[1]. Oral disease is a major public health problem which leads to higher prevalence and significant social impact[2].

Based on a previous study conducted in Nepal, dental caries was the most prevalent dental disease followed by periodontitis, pericoronal abscess, chronic gingivitis, malocclusion, trauma, cyst, and others[3].

This study aimed to find out the distribution of diseases among the patients at dental OPD of GMC. Such studies will help us to know the prevalence of dental diseases locally, which can be compared with other population. As Nepal has entered the Federal system of Government and decentralization such studies will help us to formulate policies for uplift men of oral health in the province.

METHODS

This is a hospital based cross sectional descriptive study carried out at dental outpatient department of Gandaki Medical College Teaching Hospital and Research Center, Pokhara, Nepal. The duration of study was a period of one year from 1st Feb 2016 to 31st Jan 2017. All the patients attending dental OPD were screened after obtaining consent. Those patients who denied giving the consent were excluded from the study. Total 3052 patients were screened. Data relating to age, sex, diagnosis and treatment rendered were obtained. The obtained data were entered in Microsoft Excel 2003 and further analyzed by SPSS version 25. The distribution of patients according to age, sex and diagnosis was calculated. The percentage of distribution and Pearson Chi Square test with 5% level of significance was applied to look for differences in disease distribution according to sex. The percentage for treatments delivered was calculated.

RESULTS

A total of 3052 patients attending the dental OPD were screened. Table 1 show that out of total patients, 1558 (51.05%) were males and 1494 (48.95%) were females. The most prevalent dental disease in patients visiting dental OPD was dental caries in 64.41% followed by gingivitis (13.04%). The prevalence of dental caries was significantly high amongst females (56.91%; P value <0.05). While the prevalence of malocclusion (53.88%), maxillofacial injuries (85.06%) and impactions (72%) were more common amongst male patients (P value, 0.05).

Table 1: Dental Diseases and distribution according to sex

Dental Diseases	Males N (%)	Females N (%)	Total N (%)	P-value*
Dental Caries	847 (43.80%)	1119 (56.91%)	1966 (64.41%)	<0.001
Gingivitis	278 (69.85%)	120 (30.15%)	398 (13.04%)	0.74
Periodontitis	22 (53.66%)	19 (46.34%)	41 (1.34%)	0.38
Malocclusion	118 (53.88%)	101 (46.12%)	219 (7.18%)	<0.001
Edentulous	18 (24.32%)	56 (75.68%)	74 (2.42%)	<0.001
Maxillofacial injuries	131 (85.06%)	23 (14.94%)	154 (5.05%)	<0.001
Impaction	144 (72%)	56 (28%)	200 (6.55%)	<0.001
Total	1558 (51.05%)	1494 (48.95%)	3052 (100.00%)	

*P value taken from Pearson Chi Square tests

The distribution of dental diseases according to age (Table 2) showed that age group ≤19 years visited the dental OPD most which was 23.98% out of total. Dental caries was more prevalent in age group ≤19 years (27.10%), gingivitis in age group 40 to 49 years (24.87%), periodontitis in age group ≥60 years (24.39), malocclusion in age group ≤19 years (43.84), partially edentulous in age group ≥60 years (32.43%), maxillofacial injuries in age ≤19 years (27.92%) and impaction in age group 20 to 29 years (59.5%).

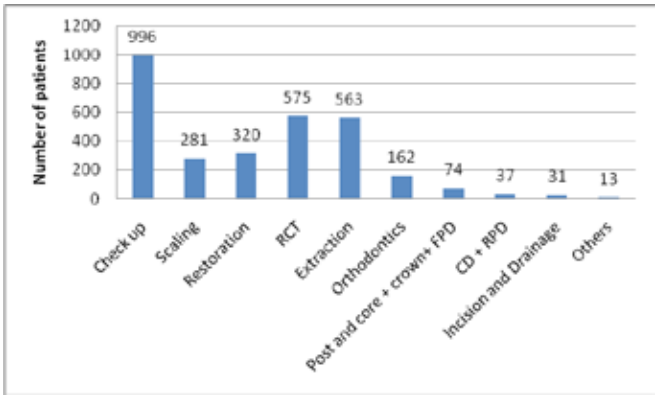
Fig 1 shows that the maximum number of patients just did checkup (32.63%) followed by root canal treatments

(18.84%) and extractions (18.45%).

Table 2: Dental Diseases according to age groups

Dental Diseases	Age group (Years) N (%)						Total
	≤19 (%)	20 - 29 (%)	30 - 39 (%)	40 - 49 (%)	50 - 59 (%)	≥60(%)	
Dental Caries	541 (27.10)	286 (14.33)	256 (12.83)	238 (11.92)	393 (19.69)	252 (12.63)	1996
Gingivitis	49 (12.31)	72 (18.09)	69 (17.34)	99 (24.87)	39 (9.80)	70 (17.59)	398
Periodon-titis	0 (0)	6 (14.63)	4 (9.76)	9 (21.95)	12 (29.27)	10 (24.39)	41
Malocclu-sion	96 (43.84)	85 (38.81)	38 (17.35)	0 (0)	0 (0)	0 (0)	219
Edentu-lous	3 (4.05)	19 (25.68)	5 (6.76)	13 (17.57)	10 (13.51)	24 (32.43)	74
Maxil-lofacial injuries	43 (27.92)	56 (36.36)	20 (12.99)	11 (7.14)	12 (7.79)	12 (7.79)	154
Impaction	0 (0)	119 (59.5)	60 (30)	21 (10.5)	0 (0)	0 (0)	200
Total	732 (23.98)	643 (21.07)	452 (14.81)	391 (12.81)	466 (15.27)	368 (12.06)	3052

Fig 1: Distribution of treatments delivered



DISCUSSION

In our study, the most common dental disease was dental caries (64.41%) and was prevalent in age group ≤19 years which is consistent with the WHO study which shows worldwide 60 to 90% of school children have cavities[1]. This was also consistent with the National Path finder survey which showed 58% of the school children suffer from dental caries[4,5]. Our results were comparable with the study done by Hassan *et al*[6] in Srinagar Hospital with dental caries to be most prevalent (60.3%).

In our study, the second most prevalent dental disease was gingivitis (13.04%) but in contrary Hassan *et al*[6] in their study showed that periodontitis (18.3%) as the second prevalent dental diseases. This could have been because the majority of the patients visiting dental OPD in our hospital are of younger group ≤19 years and periodontitis is less prevalent in younger age group.

The finding of Garkoti *et al*[7] 2015 is consistent with our study both the study showed that dental caries is the most prevalent dental disease followed by gingivitis. They showed dental caries to be 54.54% followed by gingivitis (37.62%) which is comparable to ours dental caries (64.41%) and gingivitis (13.04%).

In our study the prevalence of dental caries was significantly higher in female population (56.91%) ($P<0.05$) but Garkoti *et al*[7] in their showed almost equal prevalence of caries in male and female patients (50.09 %).

In our patient group, the prevalence of dental caries (27.10%), malocclusion (43.84%) and maxillofacial injuries (27.92%) were more in age group ≤19 years. The distribution of malocclusion was similar to the study done by Garkoti *et al*[7] (38.46%). School oral health awareness program could be effective in our area where the prevalence of preventable dental diseases like dental caries is more common in younger group.

The results of study done by Yadav K *et al*[8] in Dhanusha district, Nepal is almost similar to our results. They showed that the prevalence of dental caries was mostly in 15 to 19 years of females (66.32%) than males (39.70%).

The majority of patients in our study underwent only checkup (32.63%), this could be related to decreased compliance to treatment procedures after dental check up. In a study done by Upadhaya C *et al*[9] at Dhulikhel, Nepal more than 56% of the total teeth extractions were due to dental caries. In our study the percentage of patients undergoing root canal treatment (18.84%) was marginally more than extractions (18.45%) which should prove that there is some change in patients' attitude towards saving the teeth with caries.

CONCLUSIONS

The most prevalent dental disease in patients visiting Dental OPD GMC was dental caries and was more in females than males. The most common age group reporting to Dental OPD was ≤19 years. The maximum number of patients did checkup (32.63%) followed by root canal treatments (18.84%) and extractions (18.45%). Considering the most common age group, school oral

health awareness program could be effective to control the dental disease prevalence.

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Tumors with Pilosebaceous Differentiation: A Five Year Retrospective Study at BPKIHS

Paudyal P[1*], Pradhan A[1], Pokharel S[1], Sah N[1], Karki S[1], Marhatta S[2]
[1]Department of Pathology, [2]Department of Dermatology & Venereology
B. P. Koirala Institute of Health Sciences, Dharan, Nepal

Keywords
Keratoacanthoma, Pilomatrixoma, Pilosebaceous differentiation.

Corresponding author
**Dr Punam Paudyal*
Associate Professor
Department of Pathology
B P Koirala Institute of health sciences, Dharan, Nepal
Email: punam.paudyal@bpkihs.edu

ABSTRACT

Background: Skin appendageal tumors (SAT) are a large and diverse group of tumors that are commonly classified according to their state of appendageal differentiation: Follicular, sebaceous, eccrine and apocrine. Most adnexal neoplasms are uncommonly encountered in routine practice, and pathologists can easily recognise frequently encountered tumours. In this study, the histological features of important benign and malignant tumors of pilosebaceous origin were reviewed considering its morphologic types, subtypes, age, sex and anatomic site.

Methods: This is a hospital based retrospective study which includes all cases of tumors with pilosebaceous differentiation diagnosed histologically during the period of five years (1st January, 2008 to 31st December, 2012). Tumors were analyzed considering the anatomic location and type of the tumor, along with age and sex of the patient. The Histological characterization was done according to the WHO classification system for SAT. Collected data were entered in Microsoft Excel 2000 and converted it into SPSS PC+ 11.5 Version for statistical analysis.

Results: A total of 53 neoplasms of pilosebaceous differentiation included, 52 (98.1%) were benign and one (1.8%) was malignant. The mean age was 39.23 years. Females comprised of 35 (66%) and 18 (34%) were males. Most common location was in head and neck area. Of all, 51 (96.2%) tumors were follicular, and two (3.7%) were with sebaceous differentiation. Among all follicular tumors, Pilomatricoma (33.9%), Keratoacanthoma (26.4%) and Trichoepithelioma (22.6%) were the commonest tumors observed.

Conclusion: The study findings reveal majority of the tumors origin were of follicular differentiation and all were benign.

INTRODUCTION

Skin appendageal tumors (SAT) are those neoplasms that differentiate toward or arise from pilosebaceous apparatus, apocrine, and eccrine glands. Clinical diagnosis of different entity is often difficult, as most of them present as asymptomatic papules or nodules[1]. Anatomic location, number and distribution of lesions provide important clue but histopathology is invaluable in confirmation of the diagnosis[2]. These tumors basically originate from undifferentiated pluripotent stem cells and finally differentiate to specific tumors influenced by genetics, local vascularity, and the microenvironment of the epidermis and dermis[3,4,5]. They are usually missed clinically and often confirmed by histopathology[6].

Most SAT are benign, and local complete surgical excision

is curative. However, diagnosing some of these tumors has important implications, as they might be markers for syndromes associated with internal malignancies, such as trichelemmomas in cowden disease and sebaceous tumors in Muir-Torre syndrome[7,8]. A malignant counterpart of almost every SAT has been described. These tumours are rare, locally aggressive, and have the potential for nodal involvement and distant metastasis, with a poor clinical outcome[9]. Therefore establishing a diagnosis of malignancy in SAT is important for therapeutic and prognostic purposes. Because pathologists may not frequently encounter SAT, and owing to their different derivation and broad histogenesis, diagnosing these tumors may be challenging even to an experienced pathologists[9].

OBJECTIVES

The main objectives of this study were to study the histopathologic spectrum of tumors with pilosebaceous differentiation and its clinicoepidemiological profile.

METHODS

This is a hospital based retrospective study spanning over a period of five years conducted in the section of histopathology department of B P Koirala institute of Health Sciences (BPKIHS), Dharan, nepal.

All the diagnosed cases of pilosebaceous tumors over a period of five years from 1st January, 2008 to 30th December, 2012 were retrieved from the indexed histopathology files of the Pathology Department, BPKIHS. The clinical data of the patients were obtained from their respective files.

All skin biopsies sent from the Department of Dermatology and Venerology were fixed in 10% formalin, processed in paraffin wax and stained with Haematoxylin and Eosin and were subjected for histopathological examination.

Out of total 70 skin adnexal tumors (SAT) diagnosed histologically during this study period, only 53 SATs revealing pilosebaceous differentiation were included in the study. The Histologic characterization according to the WHO classification system for skin tumors was done. Tumors were categorized with respect to age, sex and anatomic site as well. Cases clinically diagnosed as SAT but not histologically and tumors with eccrine and apocrine differentiation were excluded from the study.

Collected data were entered in Microsoft Excel 2000 and converted it into SPSS PC+ 11.5 version for statistical analysis. The descriptive statistics were presented in percentage, proportion, tabular forms and mean and standard deviation were calculated. For inferential statistics odds ratio, chi square test with p-values were calculated at the level of significant at 95%, to find out the relationship between dependent variables and independent variables.

Approval was taken from the Institutional Review Committee of BPKIHS before the start of the study, along with permission from the Hospital Director to obtain health records and confidentiality was maintained throughout.

RESULTS

All the patients included in this study attended BPKIHS with skin lesion. Lesions were examined clinically and were excised for clinico-histopathological correlation.

According to the WHO histological classification, they were broadly classified into four types i.e. follicular, sebaceous, eccrine and apocrine. Out of 70 cases of SATs diagnosed histologically, only 53 cases of pilosebaceous tumors have been included in the study. Most commonly diagnosed tumor was with follicular differentiation which constituted of 51 (96.22%) cases and only 2 (3.77%) cases were of sebaceous differentiation.

Tumors with Pilar differentiation

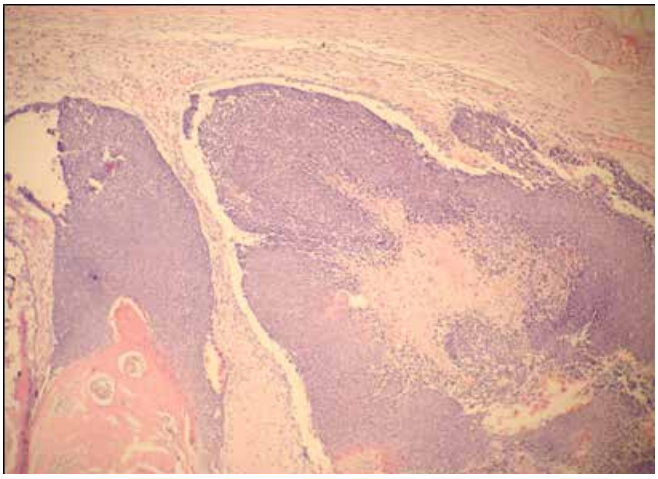
All the follicular tumors were benign. Among this category the commonest tumor encountered histologically was pilomatrixoma (PM), which constituted of 18 cases (33.96%) of total (Table 1). Histology revealed a well circumscribed nodular lesion in the dermis, surrounded by fibrous stroma along with basaloid cells lining and contiguously transforming into pale eosinophilic anucleated shadow/ghost cells (Fig 1). Some showed multinucleated giant cells and calcification.

Most of these tumors were seen in fourth decade of life, comprising of 6/18 cases. Majority (13/18) of cases were observed in females and was found to be located in scalp (5/18). None of the cases of PM was diagnosed clinically as PM. Most of them were submitted as sebaceous cysts.

Table 1: Origin, nature, histologic type of pilosebaceous tumors and its frequency

Origin of tumor (%)	Nature (%)	Histologic type	Histologic diagnosis, frequency (%)
Follicular tumors (96.2%)	Benign (96.2%)	PM	18 (33.9%)
		KA	14 (26.4%)
		TE	12 (22.6%)
		TL	5 (9.4%)
		TF	1 (1.8%)
		TB	1 (1.8%)
Sebaceous Tumors (3.7%)	Benign (1.8)	Seb ad	1 (1.8%)
	Malignant (1.8%)	Seb Ca	1 (1.8%)
TOTAL			**53 (100%)**

Fig 1: Basaloid cells which are transforming into pale eosinophilic anucleated ghost cells in Pilomatricoma (H & E x 40)



Second most common tumor with follicular differentiation was keratoacanthoma (KA), which constituted of 14/53 (26.4%) cases. Histology revealed a central, keratin filled crater. The extension of the epidermis was seen like a lip or a buttress over the sides of the crater. At the base of the crater, irregular epidermal proliferations extend both upward into the crater and downward from the base of the crater. Many horn pearls were observed and the base appeared regular and well demarcated and does not extend below the level of the sweat glands (Fig 2). Most of these tumors were seen in fifth decade of life. There was female predominance and scalp was the commonest location. None of the cases of KA was diagnosed clinically as KA. Most of them were submitted as basal cell carcinoma.

Fig 2: Central, keratin filled crater and extension of the epidermis like a lip or a buttress over the side of the crater in keratoacanthoma (H & E x 4)

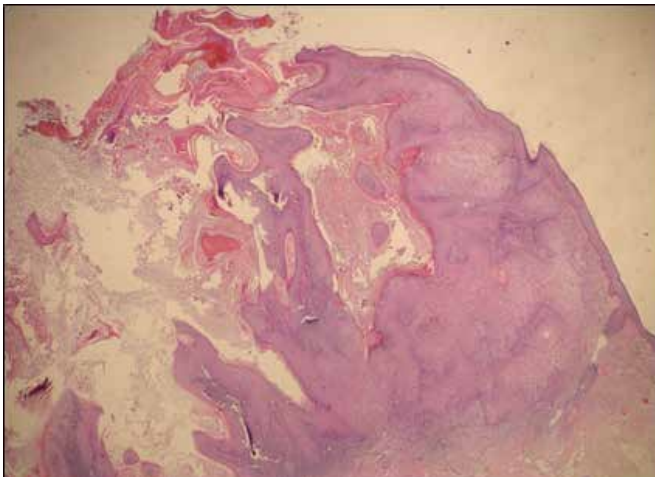
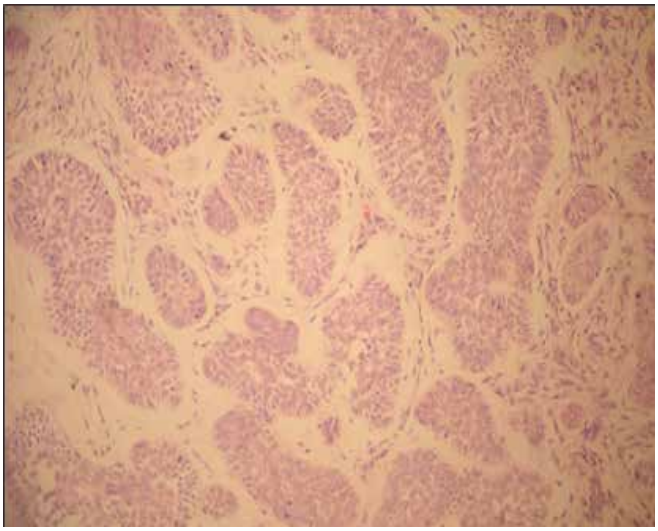
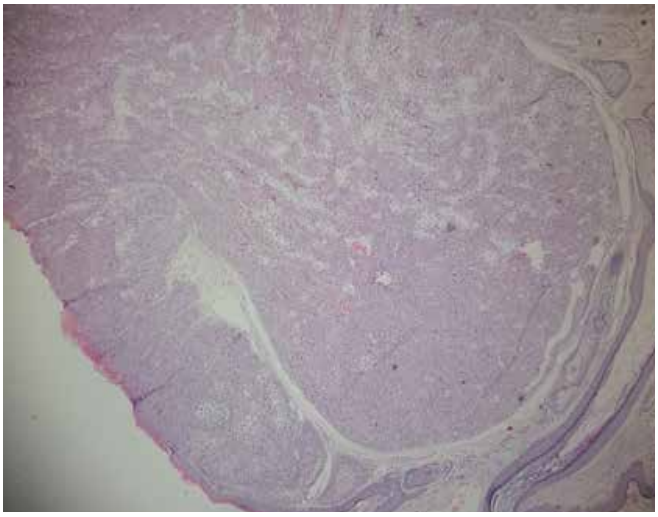


Fig 3: Lobules of uniform basaloid cells with peripheral palisading and surrounded by a fibromyxoid stroma in trichoepithelioma (H & E x20)



Third common tumor was trichoepithelioma (TE) which constituted of 12 (22.6%) cases. Histology of TE reveal aggregates and branching strands of uniform basaloid cells with peripheral palisading of the nuclei arranged within a prominent fibrous stroma in the reticular dermis (Fig 3). One focus exhibits a papillary mesenchymal body with hair bulb formation. Stromal clefts and cysts lined by squamous epithelium with infundibular keratinization are present. The tumor shows no connection to an unremarkable epidermis. Most of these tumors (5/12) were seen in third decade of life. There was male (7/12) predominance and nose (7/12) was the commonest location. Only 2/12 cases of TE was diagnosed clinically as TE rest were diagnosed as basal cell carcinoma, nevus and papilloma.

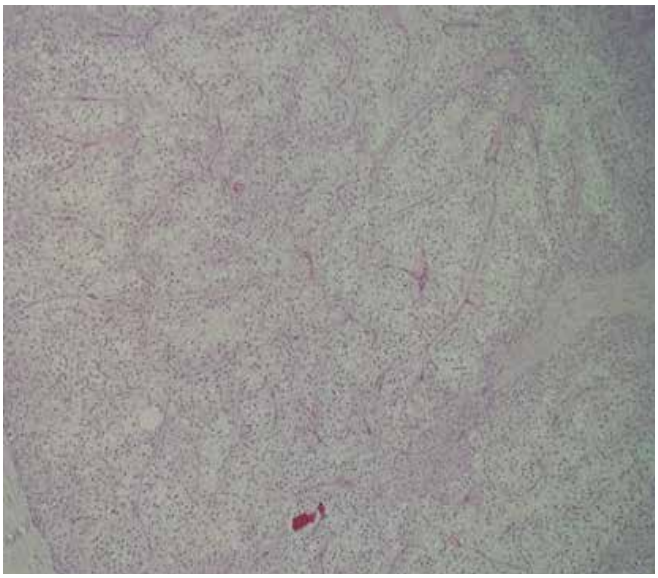
Fig 4: A symmetrical epithelial nodular proliferation and mild papillomatosis with overlying hyperkeratosis and downward growth of epithelial cells (H & E x 20)



Fourth common tumor was found to be a trichilemmoma (TL) which constitutes 5 (9.4%) cases. Trichilemmoma reveal a symmetrical epithelial nodular proliferation (Fig 4). There is mild papillomatosis with overlying hyperkeratosis and down growth of epithelial cells with increasing clear cell differentiation at the base of the lesion (Fig 5). These tumors were most commonly seen in second decade of life with male predominance and back and leg being the predominant sites.

Rest of the tumor diagnosed within follicular differentiation which did not contribute to a significant proportion of cases were trichofolliculoma (1.8%), and trichoblastoma (1.8%).

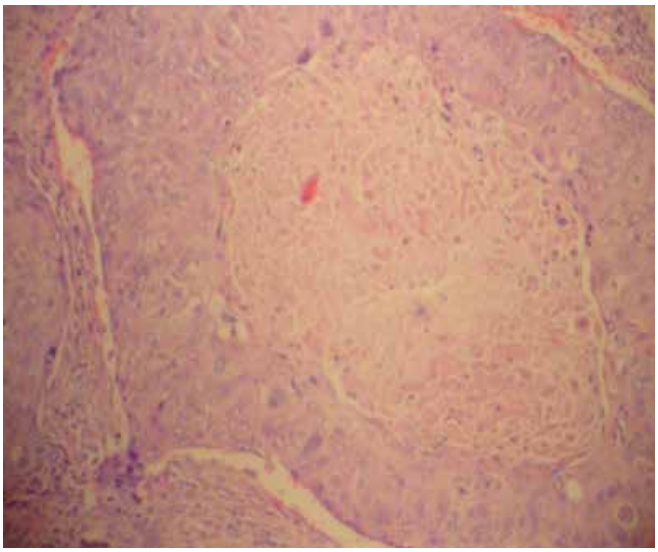
Fig 5: Tumor cells reveal increasing clear cell differentiation at the base of the lesion (H & E x 40)



Tumors with sebaceous differentiation

Tumor with sebaceous differentiation constituted only two(3.7%) cases (Table 1). Out of two, one (1.8%) was benign i.e. sebaceous adenoma and thigh being the site. This was diagnosed clinically as sebaceous cyst. Another one (1.8%) was malignant i.e. sebaceous carcinoma (Fig 6), eye lid being the site and clinically diagnosed as meibomian carcinoma. Both of these tumors were found to be occurring in females.

Fig 6: Vacuolated tumor cells arranged in lobule with central comedonecrosis in sebaceous carcinoma (H & Ex 40)



DISCUSSION

It is currently believed that ATs are derived from cells that have the ability to differentiate toward any of the appendages. In many lesions, the differentiation is uniform and the tumor can be recognized and categorized based on its resemblance to a normal appendage or part of it[9,10,11.]

In this study 52 cases (98.11%) were benign and only one (1.8%) case was malignant. The commonest tumor was with follicular differentiation (96.22%), all of them were benign and most of them were located in head and neck region. Similarly, in a study conducted by Yagoob *et al* total of 166 skin appendage tumors studied, 87.3% were benign, while 12.6% were malignant**.** All tumors showed a predilection for occurrence on skin of head and neck (48.1%), followed by upper limb (10.9%) and lower limb (10.9%). Out of total, 41.56% showed pilosebaceous differentiation, 37.34% showed eccrine differentiation, 14.45% showed apocrine differentiation and, 6.62%

exhibited mixed differentiation[12]. Similarly in the study conducted by Samilo MO *et al* in total of 52 adnexal tumors seen, 46 were benign and six were malignant. Most of the lesions were distributed in head and neck region and were of follicular differentiation[13.]

Pilomatricoma

Although uncommon, PM, are quite common among all pilar tumors[1]. PM, also known as a calcifying epithelioma of Malherbe, is a benign skin tumor derived from the hair matrix[14]. In 1961, Forbis and Helwig, after histochemical and electron microscopic analysis of 228 tumors, found the cell of origin to be the outer root sheath cell of the hair follicle[15]. They are single, skin-coloured or purplish lesions arise on the head and neck, but they may occur on any site[1,6,8]. This finding is consistent to our study, where the commonest site for PM was scalp.

Pilomatricoma (PM) was the most common benign tumor consisting of 72/244 (30.1%) cases, according to the study carried out by Song KY *et al*[14].

Similarly in a study done by Yaqoob *et al* on tumours of pilo-sebaceous unit found that, PM was one of the five most common SAT encountered in their study[12].

A female preponderance is noted in majority of the studies[14,15,16]. In this study out of 18 cases, 13 cases occurred in females while five occurred in males**.**

In the study done by Zaman S *et al* maximum numbers of PM were observed in second and third decades[17]. In our study the maximum number of PM were diagnosed in second and fourth decade of life. In contrast, most of the studies concluded that one to 20 years was the most affected age group[18,19].

The typical clinical picture of PM is the occurrence of a solitary, small, firm nodule, varying in size from five to 30 mm[20].

Keratoacanthoma

KA is a common skin lesion, typically present as solitary, firm, skin colored reddish papules that rapidly progress to dome shaped sessile, nodule with central crateriform ulceration. The lesion has the same male and female predilection with a slightly more tendency to male individuals[21].

Our study showed male predominance and most of the lesions were solitary.

Kerathoacanthoma was first described by Jonathon Hutchison in 1889 as a distinct lesion with a crater-like facial ulcer[22]. This lesion; which most commonly involves the face and hands, is a rapidly-growing cutaneous tumor with atypical histopathological manifestations that resembles the squamous cell carcinoma (SCC). It leaves an atrophic scar when resolves[23,24].

Trichoepithelioma

TE can be a single or multiple. This is a harmless benign tumor that arises on face after puberty[25]. The tumors are small (<1 cm), firm, rounded and shiny. They may be yellow, pink, brown or bluish. They usually gradually increase in number with age, occurring on both cheeks, eyelids and around the nose[6].

In the study done by Saha A *et al* the second most common tumor seen was TE[13]. In our study also TE was found to be the third commonest tumor

In our study 7/12 cases of TE were distributed around nose. According to the various studies, TE remains primary differential diagnosis of ATs centered on nose[6,13,25].

Clinically as well as histologically, TE is considered in the differential diagnosis of basal cell carcinoma (BCC)[25]. This could be the fact that in this study also, most often, TEs were clinically diagnosed as BCC.

Trichilemmoma

Is a benign neoplasm that differentiates toward cells of the outer root sheath. The lesion is often seen in the face and neck region. Multifocal occurrence is associated with Cowden syndrome, patients with which exhibit hamartomatous intestinal polyposis as well as tricholemmoma[26,27].

In our study TL was found most commonly to be located at back and in leg.

Tumors with Sebaceous Differentiation

SATs with sebaceous differentiation are uncommon, difficult to classify, and may be controversial. The main controversy concerns the microscopic features, which vary from well to poorly differentiated and sometimes undifferentiated varieties. When patients with numerous sebaceous adenomas and other neoplasms with sebaceous differentiation have an associated internal malignancy, the clinical condition is known as Muir-Torre syndrome[7,8]. However, in our study, tumors with sebaceous differentiation did not contribute to a significant proportion, so such association was not observed.

CONCLUSIONS

1. Among pilar tumors, PM (33.9%), KA (26.4%) and TE (22.6%) were the commonest tumors observed.
2. Pilomatricomas are commonly distributed in the head, neck and trunk and have female predominance and majority were present in fourth decade of life
3. Trichoepitheliomas are centered around nose, have male predominance and were present maximum in third decade of life
4. Keratoacanthomas are mostly seen in scalp, have female predominance and majority were found in fifth decade of life.
4. Malignant adnexal tumors were uncommon in our setting (1.8%)
5. Tumors with sebaceous differentiation were almost found to be non contributory (3.7%).

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Conflict of Interest

The authors declare no conflict of interest.

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Knowledge, Attitude and Practice towards Exclusive Breastfeeding among Mothers in Pokhara-Lekhnath

Gurung R[1*], Silwal M[2], Gurung A[1], Sah I[1], Koirala D[1], Paudel S[1], Upadhayaya S[1]
[1]Lecturer, [2]Co-ordinator
College of Nursing Sciences, Gandaki Medical College, Pokhara, Nepal

ABSTRACT

Background: Exclusive breastfeeding means that the infant receives only breast milk. Infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional requirements, infants should receive nutritionally adequate and safe complementary foods, while continuing to breastfeed for up to two years or beyond. Breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants; it is also an integral part of the reproductive process with important implications for the health of mothers.

Objective: To assess the knowledge, attitude and practice of pregnant women on exclusive breastfeeding.

Methods: The quantitative descriptive research design was used for this study. Purposive sampling technique was used to select the subjects in community setting. Total 140 subjects were taken as a sample and self-administered structured questionnaire on knowledge, attitude and practice of exclusive breast feeding among reproductive age group women was used to collect data.

Results: The study shows that out of 140 women, 48 (34.3%) belonged to 26 - 30 age group, 136 (97.14%) were married, 109 (77.9%) women followed Hindu caste, 67 (47.9%) women belonged to Dalit group, 129 (92.1%) women were housewife, 73 (52.1%) women had taken primary education, 68 (48.6%) had monthly income >20000, 116 (82.9 %) had ≤3 children. Among 140 women, 69 (49.3%) had good knowledge and fair knowledge whereas only 2 (1.4%) had poor knowledge. Regarding attitude 122 (87.1%) thought that EBF was better than other artificial feeding, 75 (53.6%) believed that first milk should be discarded, 108 (77.1%) agreed that EBF is enough for child up to 6 months, 77 (55%) didn't feel comfortable with extra feeding other than breast milk, 51 (36.4) stated that they were not comfortable because of insufficient amount to meet child's demand, 100 (71.4%) agreed that child less than six months who is exclusively breastfed were healthier than child who took additional foods. Out of 140 women, 139 (99.3%) breastfed her last child, 83 (59.3%) started breastfeeding within 1 hr after delivery, 77 (55%) breastfed on demand of baby, 91 (65%) had not given anything before initiating breastfeeding, 25 (17.9%) had given plain water before breast milk after delivery, 107 (76.4%) had given breast milk only starting from birth to six months of age.

Keywords
Attitude, Exclusive breast feeding, Knowledge, Practice, Reproductive age group mother.

Corresponding author
Ms Rajmi Gurung
Lecturer, College of Nursing Sciences
Gandaki Medical College, Pokhara, Nepal
Email: rajmi.gurung@gmail.com

Conclusions: The study revealed that there was good level of knowledge and practice among women in the reproductive age group in Pokhara-Lekhnath. Hence the study strongly suggests that there was appropriate level of knowledge about exclusive breast feeding among mother of reproductive age group in Pokhara - Lekhnath which will help in enhancing the growth and development of child.

INTRODUCTION

Breastfeeding is a natural act, it is also a learned behaviour[1]. Exclusive breastfeeding is defined as giving no other food or drink not even water except breast milk. Infants should be exclusively breastfed which means receiving only breast milk for the first six months of life to achieve optimal growth, development and health. It is an unequalled way of providing ideal food[2]. Breast milk is the ideal food for the healthy growth and development of infants; breastfeeding is also an integral part of the reproductive process with important implications for the health of mothers[2].

Breast milk is the natural first food for the babies[1]. For the first six months of life, breast milk alone is the ideal nourishment, providing all the nutrients, including vitamins and minerals, an infant needs, meaning no other liquid or food is needed[3]. It continues to provide energy and nutrient up to half or more of a child's nutritional needs during the second half of the first year, and up to one –third during the second year of life[1].

Breastfeeding helps strengthening the mother–child bond. It not only helps in making the mother-child relation more intimate, but also helps infant to fight diseases[4]. Breast milk carries antibodies from the mother that help combat the disease[5]. It protects infant against infectious and chronic diseases. Exclusive breastfeeding reduces infant mortality rate due to common childhood illness such diarrhea or pneumonia, and helps for a quicker recovery during illness[1]. It also stimulates an infant's immune system and response to vaccination[6].

Breastfeeding is one of the most effective ways to ensure child health and survival. If breastfeeding were scaled up to nearly universal levels, about 820,000 children would be saved every year. Globally, only 40% of infants under six months of age are exclusively breastfed[7]. It has been estimated that optimal breastfeeding of children under two years of age has the potential to prevent 1.4 million deaths in children under five in the developing world annually[8].

As a global goal for optimal maternal and child health and nutrition, all women should be enabled to practice exclusive breastfeeding, and all infants should be fed exclusively on breast milk, from birth to six months of age (March 2001)[9]. Breastfeeding is nearly universal in Nepal and the median duration of breast-feeding is long (33 months). But on the contrary to the recommendations of WHO only two-third of children less than six months of age are exclusively breast fed[10]. Hence, this study is planned to get the base line data on knowledge, attitude and practice of exclusive breastfeeding among lactating women. Study explored the relationship among knowledge and practice, knowledge and attitude of exclusive breastfeeding.

METHODS

This is a quantitative descriptive study done among the reproductive age group mothers in Pokhara-Lekhnath. Purposive sampling technique was used for data collection and data were collected in the community setting with the help of self-administered structured questionnaire on knowledge, attitude and practice of exclusive breast feeding among reproductive age group women. Four part structured questionnaire were developed to cover the entire aspects of study.

Part I: This part included demographic characteristics of the participants: Age, marital status, religion, ethnicity, occupation, education, monthly income and number of children.

Part II: This part included the questionnaire on knowledge of study participants towards exclusive breast feeding.

Part III: This part included the questionnaire on attitude of study participants towards exclusive breast feeding.

Part IV: This part included the questionnaire on practice of study participants towards exclusive breast feeding.

The data collection was started on June 15, 2017 (2074/03/01 B.S.) and the data collection was completed on July 14, 2017 (2074/03/30 B.S.). Consent was taken voluntarily from the participants before the data

collection procedure with assured confidentiality. Ethical clearance is obtained from institutional review board of GMC. Purposive sampling technique was used for data collection and data were collected in the community setting with the help of self-administered structured questionnaire on knowledge, attitude and practice of exclusive breast feeding among reproductive age group women. SPSS Program version 16.0 was used for entering and tabulating data. Frequency and Percentage was used to analyze socio-demographic characteristics.

Table 1: Frequency and percentage distribution of demographic characteristics (N = 140)

Demographic characteristics	Frequency	Percentage
Age (in years)		
• ≤20	19	13.6%
• 21 - 25	42	30%
• 26 - 30	48	34.3%
• ≥31	31	22.1%
Marital status		
• Married	136	97.14%
• Widow	4	2.9%
Religion		
• Hindu	109	77.9%
• Christian	8	5.7%
• Buddhist	21	15%
• Others	2	1.4%
Ethnicity		
• Brahmin	5	3.6%
• Chhetri	14	10%
• Janajati	54	38.6%
• Dalit	67	47.9%
Occupation		
• Housewife	129	92.1%
• Service	3	2.1%
• Business	5	3.6%
• Labour	3	2.1%
Education		
• Illiterate	45	32.1%
• Primary	73	52.1%
• Secondary	19	13.6%
• Bachelor and above	3	2.1%
Monthly income		
• ≤10000	22	15.7%
• 10001 - 20000	50	35.7%
• >20000	68	48.6%
Number of children		
• ≤3	116	82.9%
• >3	24	17.1%

The above Table shows that out of 140 women, 48 (34.3%) belonged to 26 - 30 age group, 136 (97.14%) were married, 109 (77.9%) women followed Hindu caste, 67 (47.9%) women belonged to Dalit group, 129 (92.1%) women were housewife, 73 (52.1%) women had taken primary education, 68 (48.6%) had monthly income >20000, 116(82.9 %) had ≤3 children.

Fig 1: Knowledge of exclusive breastfeeding N = 140

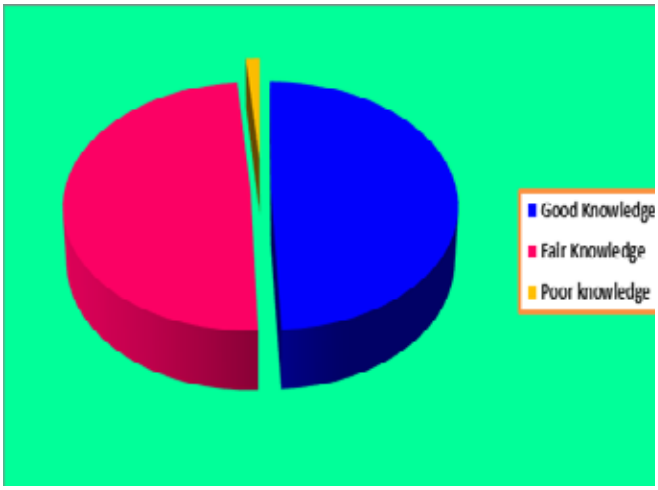
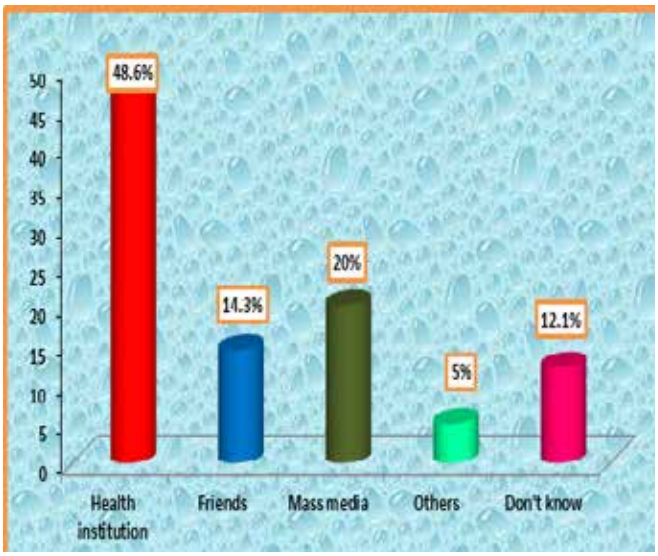


Fig 2: Source of information on exclusive breastfeeding (N = 140)



The above figure showed that out of 140 women, 123 (87.9%) heard about exclusive breastfeeding and obtained their information 68 (48.6%) from health institution, 20 (14.3%) from friends, 28 (20%) from mass media, seven (5%) from others and 17 (12.1%) women don't know about exclusive breastfeeding.

The result shows that among 140 women, 69 (49.3%) had good knowledge and fair knowledge whereas only

two (1.4%) had poor knowledge with mean and standard deviation (2.47 ±0.53).

Table 2: Attitude of study participants towards exclusive breastfeeding (N = 140)

Items	Frequency	Percentage (%)
Do you think that EBF is better than other artificial feeding?		
• Yes	122	87.1%
• No	7	5%
• Don't know	11	7.9%
Do you believe that the first milk (Colostrums) should be discarded?		
• Yes	65	46.4%
• No	75	53.6%
Do you agree that only EBF is enough for child up to 6 months?		
• Agree	108	77.1%
• Disagree	32	22.9%
How did you feel when you give extra food other than breast milk to your child <6 months?		
• Didn't feel comfort	77	55%
• Comfortable with it	63	45%
Why you are not comfortable with extra feeding other than breast milk?		
• Not sufficient to meet child's demand	51	36.4%
• It's not necessary for child	28	20%
• Complain of feeling pain	3	2.1%
Do you agree that child less than 6 month who is exclusively breastfed is healthier than child who takes additional food?		
• Yes	100	71.4%
• No	8	5.7%
• Don't know	32	22.9%

EBF – Exclusive Breast Feeding

The result shows that out of 140 women, 122 (87.1%) thought that EBF was better than other artificial feeding, 75 (53.6%) believed that first milk should be discarded, 108 (77.1%) agreed that EBF is enough for child up to 6 months, 77 (55%) didn't feel comfortable with extra feeding other than breast milk, 51 (36.4) stated that they were not comfortable because of insufficient amount to meet child's demand, 100 (71.4%) agreed that child less than six months who is exclusively breastfed were healthier than child who took additional foods.

Table 3: Practice of study participants towards exclusive breast feeding (N = 140)

Items	Frequency	Percentage (%)
Have you breastfed your last child?		
• Yes	139	99.3%
• No	1	0.7%
When did you start breast-feeding after delivering your last child?		
• Within 1 hr	83	59.3%
• Between 1 and 24 hrs	46	32.9%
• After 24 hrs	11	7.9%
How frequently did you breastfed your last child?		
• On demand	77	55%
• Regularly	30	21.4%
• Randomly	33	23.6%
Have you given your last baby anything before initiating breastfeeding?		
• Yes	49	35%
• No	91	65%
What was given to your last baby before breast milk after delivery?		
• Plain water	25	17.9%
• Cow milk	5	3.6%
• Butter	4	2.9%
• Formula	7	5%
• Honey	18	12.9%
What was given to your last child starting from birth to 6 months?		
• Cow and breast milk	28	20%
• Breast milk only	107	76.4%
• Formula	3	2.1%
• Others	2	1.4%

The result shows that out of 140 women, 139 (99.3%) breastfed her last child, 83 (59.3%) started breastfeeding

within one hour after delivery, 77 (55%) breastfed on demand of baby, 91 (65%) had not given anything before initiating breastfeeding, 25 (17.9%) had given plain water before breast milk after delivery, 107 (76.4%) had given breast milk only starting from birth to six months of age.

DISCUSSION

The study shows that out of 140 women, 48 (34.3%) belonged to 26 - 30 age group, 136 (97.14%) were married, 109 (77.9%) women followed Hindu caste, 67 (47.9%) women belonged to Dalit group, 129 (92.1%) women were housewife, 73 (52.1%) women had taken primary education, 68 (48.6%) had monthly income >20000, 116 (82.9 %) had ≤3 children. 123 (87.9%) women heard about exclusive breastfeeding and obtained their information 68 (48.6%) from health institution, 20 (14.3%) from friends, 28 (20 %) from mass media, seven (5%) from others and 17 (12.1 %) women don't know about exclusive breastfeeding.

Similar study was conducted in Mizan Aman town, South West Ethopia to assess knowledge, attitude and practice towards breastfeeding mothers which showed that majority of (68.5%) were between 20 - 30 years, were married (80.6%)[11]. Another study done in Aminu Kano Teaching Hospital, Nigeria to assess the knowledge, attitude and practice of exclusive breastfeeding among multigravid women attending antenatal clinic which showed that most of the respondents (57.6%) were in the age group of 21 – 30 years, 97.2% were married and 95.2% knew about exclusive breastfeeding and obtained their information 74.4% from health care workers, 3.6% from media and 17.2% from family/friends[12].

Among 140 women, 69 (49.3%) had good knowledge and fair knowledge whereas only two (1.4%) had poor knowledge (2.47 ±0.53, M±SD).

Similar study was done on India to assess knowledge, attitudes and breastfeeding practices of postnatal mothers which showed that mothers had good knowledge on breast feeding (12.05 ±1.74, M±SD)[13].

Regarding attitude 122 (87.1%) thought that EBF was better than other artificial feeding, 75 (53.6%) believed that first milk should be discarded, 108 (77.1%) agreed that EBF is enough for child up to six months, 77 (55%) didn't feel comfortable with extra feeding other than breast milk, 51 (36.4%) stated that they were not comfortable because of insufficient amount to meet child's demand, 100 (71.4%) agreed that child less than six months who is exclusively breastfed were healthier than child who took additional foods.

Similar study was conducted in Mizan Aman town, South West Ethopia to assess knowledge, attitude and practice towards breastfeeding mothers which showed that out of mothers, 205 (73%) stated that EBF was better than artificial feeds, most mothers 281 (89.5%) preferred to feed their children only breast milk, 59.3% agreed that EBF is enough up to six months of age, 59.6% (187) did not feel comfortable when they gave extra foods other than the breast, and (182; 58.0%) agreed that exclusively breastfed children are healthier than non-exclusively breastfed children[11].

Another study done in Aminu Kano Teaching Hospital, Nigeria to assess the knowledge, attitude and practice of exclusive breastfeeding among multigravid women attending antenatal clinic which showed that majority (69.6%) of the respondents agreed that breast milk alone is sufficient to the baby during the first six months of life and almost all (94.4%) the respondents agreed that exclusive breastfeeding has benefits to the baby[12].

The result shows that out of 140 women, 139 (99.3%) breastfed her last child, 83 (59.3%) started breastfeeding within one hour after delivery, 77 (55%) breastfed on demand of baby, 91 (65%) had not given anything before initiating breastfeeding, 25 (17.9%) had given plain water before breast milk after delivery, 107 (76.4%) had given breast milk only starting from birth to six months of age.

Similar study was done in BPKIHS, Dharan to assess the knowledge and actual practices of mothers regarding breastfeeding. The study showed that 41.5% had started breastfeeding less than one hour. Another study done in Aminu Kano Teaching Hospital, Nigeria to assess the knowledge, attitude and practice of exclusive breastfeeding among multigravid women attending antenatal clinic which showed that 47.2% exclusively breastfeeds for first six months of life[14].

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Nutritional Status of Senior Citizens in Selected Rural and Urban Area of Kaski, Nepal

Gautam S[1*], Shrestha N[1], Shah T[2], Angur B[2]
[1]Lecturer, Gandaki Medical College Teaching Hospital, Pokhara Nepal
[2]Professor, Community Nursing, B. P. Koirala Institute of Health Sciences, Dharan, Nepal

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Corresponding author
**Mrs Srijana Gautam*
Lecturer, Gandaki Medical College Teaching Hospital, Pokhara Nepal
Email: gautamsrijana1@gmail.com

ABSTRACT

Background: Nutritional status is a valuable determinant of quality of life as well as morbidity and mortality. Adequate nutrition, including balanced diet is important among the senior citizens for maintaining good health.

Objectives: To assess the nutritional status of senior citizens, compare between rural and urban and find out association between demographic variables and study parameters.

Methods: A community based cross-sectional comparative study was carried out in one Municipality and one VDC of Kaski district, Nepal. Stratified random sampling was adopted to draw 120 samples from urban, 120 from rural. Data was collected by face-to-face interview with the respondents using semi-structured questionnaire. Anthropometric measurement (Height and weight) and hemoglobin measurement was done for assessment of nutritional status.

Results: Underweight was found in maximum (47.5%) respondents in rural than urban (18.3%). while overweight was in maximum in urban (30.0%) than in rural (12.5%).Similarly, BMI within normal range was higher in urban (45.8%) than in rural (37.5%). Mean BMI in rural was 19.0 ±4.1 and in urban was 23.2 ±4.7. Below normal hemoglobin level was slightly higher in rural (47.5%) than in urban (44.17%). Mean hemoglobin in rural was 11.89 ±1.63 and urban was 12.06 ±1.27.

Conclusions: The study concludes that, underweight was found more among in rural senior citizens but overweight was found more among in urban senior citizens. Below normal hemoglobin level was more among rural samples. There was statistically significant association of mean BMI between rural and urban but not statistically significant association of mean hemoglobin between rural and urban.

INTRODUCTION

Nutrition is the provision to the body of the right mixture of nutrients found in food for attainment of proper health[1]. Aging is the developmental process, part of the cycle, beginning at conception to the end of the life. Senior citizens as defined by WHO is people 60 years and above[1]. The Senior Citizen Acts 2063 BS of Nepal also defined the senior citizens as people who are 60 years and above[2]. In Nepal, there were 1.5 million in 2001 and 2.1 million in 2011, elderly inhabitants, which constitute 6.5% and 8.1% of the total population in the country respectively[3].

WHO declared 2010 "Health for All" and one of their goal is to pay attention on elderly health and nutritional status. In recent years there has been increasing international awareness of the health issues relating to aging populations, and in April 1995, WHO launched a new

program on aging and health. In 1999, World Health Day focused on the goal of active aging. Globally it is estimated that under nutrition is responsible, directly or indirectly. Nutrition is a prerequisite for the national development of countries. Under nutrition has always been considered to be the predominant problem in this age group, which is under shadow[5].

Although problems related to poor nutrition affect the entire population, elderly are especially vulnerable from nutrition because of their unique physiology. Even in the best of circumstances, aging weakens the immune system. Insufficient calories, lack of protein, and micronutrient deficiencies in the elderly further weaken their immunity and expose them to infections that may reduce absorption of essential nutrients, there by compounding the cycle of under nutrition and infection[5].

After the age of 60 years there are many metabolic and physiological changes which impact on nutritional need of individual. The metabolic rate slow and can decline as much as 30% percent over a life time. This results in decrease calorie need which can be complicated by changes in an older person ability to balance food intake and energy need. More over physical activity decreases in aging and results in lower caloric intake, leading to reduced intake essential nutrients[6].

Better nutrition means stronger immune systems, less illness and better health. Healthy people are stronger, are more productive and more able to create opportunities to gradually break the cycles of both poverty and hunger in a sustainable way. Better nutrition is a prime entry point to ending poverty and a milestone to achieving better quality of life (WHO, 2008). Poor nutritional status is a primary concern for the elderly. Aging is generally believed to alter nutrient requirements for energy, protein and other nutrients because of changes in lean body mass, physical activity and intestinal absorption[8].

Nutrition may play a role in the progressive decline of several body functions with aging. Many elderly drink less than the recommended amounts of water and consume less than the recommended dietary allowances of calcium, iron, zinc, copper, thiamin, riboflavin, folate, vitamins B-12 and vitamin D. Nutrition needs of the elderly to maintain activities of daily living are expected to increase in future years. Because diminished physical activity and old age disabilities cause the elderly to modify eating habits acquired at a younger age, dietary and other life-style changes should be implemented early in life so that optimal tissue function will be maintained[9].

They are usually active and productive in their advancing years doing things such as taking responsibilities for child care, cattle herding, handicrafts and many more. A majority of elders depend upon agriculture and are living under the poverty. They suffer from deprivation, illiteracy, poor health and nutrition, low social status, discrimination and restriction on mobility. Because of poverty, they enter into old age in a poor state of nutritional status and without saving or material assets[11].

METHODS

A community based cross-sectional comparative study was used to investigate the nutritional status of senior citizens in Pokhara Municipality and Machhapurchae VDC of Kaski District Nepal. Using stratified sampling technique, 120 from rural and 120 from urban population were selected. Semi-structured questionnaire and interview technique used to gather information. Measuring tape and self zeroing same calibrated weighing scale was used for the measurement of height and weight then compute the body mass index. BMI was categorized based on the WHO recommendation. Hemoglobin was measured by Sahil's method and also categorized on the WHO recommendation.

Questionnaire included the socio demography information, dietary pattern, physical activity and exercise, alcohol, smoking and chewing tobacco habits, Health problem and utilization of health services. The instrument was developed through review of literature. Then it was reviewed with concerned subject exports for the validity. Informed consent was taken from each respondent. Pretesting of the instrument was done on 10% of population of similar setting of non study area to test reliability and clarity of the instrument and necessary modification in tools updated after pre-test.

Questionnaire was checked thoroughly after completion to minimize the error of missing data as well as for the completeness and accuracy. Coding and organizing was done before data entry. Data analysis was done using statistical package for social science (SPSS) 16 versions. Descriptive statistics such as frequency, percentage, mean, standard deviation and range use to describe the characteristics of collected data. Pearson chi- square test was used to find out the association between two categorical variables. Independent sample T test was used to compare the mean.

RESULTS

In this study, 24.2% of respondents belonged to the age group 65 - 70 years in rural as the age group 70 - 75 years comprises the largest (25%) population in urban. sixty six percent of the respondents in urban were from upper cast where as relatively advantage janajatis were higher 54.2% in rural. Seventy seven percent of the respondents in both areas were residing with joint family (Rural 70.8% and urban 90.0%). Regarding the religion, majority rural (88.3%) and urban (63.3%) were Hindu by religion. Regarding the source of income, main source of income was senior citizen allowance provided by Government in both areas.

Seventy eight percentage in rural respondents and 75% in urban respondents were non-vegetarians. Regarding the frequency of consumption major food items, 59% of rural respondents consumed the legumes two times a week, while in urban 47% respondents consumed weekly. Forty one percent of respondents were consumed meat two times a week while in urban 38% of respondents consumed two times a week. Sixty one percent of respondents consumed pulses two times a week in rural while in urban 79% of respondents consumed pulses daily. Thirty six percent of respondents consumed pulses daily in urban. Regarding the physical activity 78% in rural, where as more than half 58% in urban respondents were do physical activity like farming, household activities and gardening.

Regarding the alcohol intake more than half (55.9%) of respondents in rural had habit of taking alcohol while in urban it was about less than half (49%).

Fig 1: Body mass index in rural and urban areas (n=240)

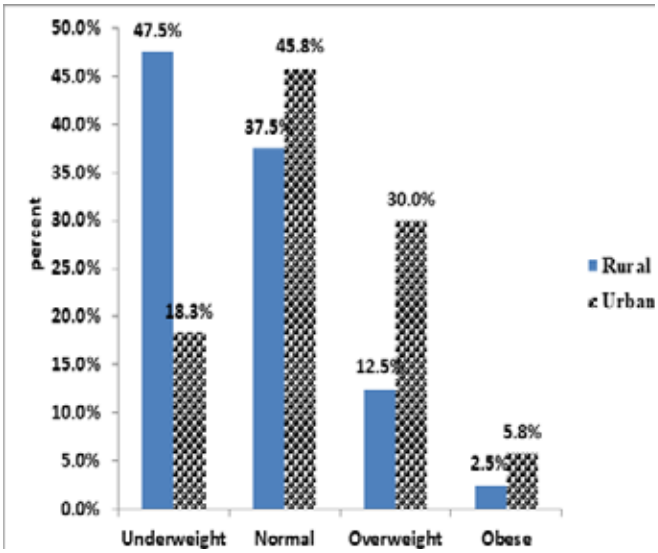

Figure 1 shows, According to BMI, underweight was found more (47.5%) respondents in rural than urban (18.3%). while overweight was more (30.0%) in urban than in rural (12.5%). Obesity is also more in urban among 5.8% of the respondents, against 2.5% in rural area of their counter parts.

Fig 2: Hemoglobin in urban and rural areas (n=240)

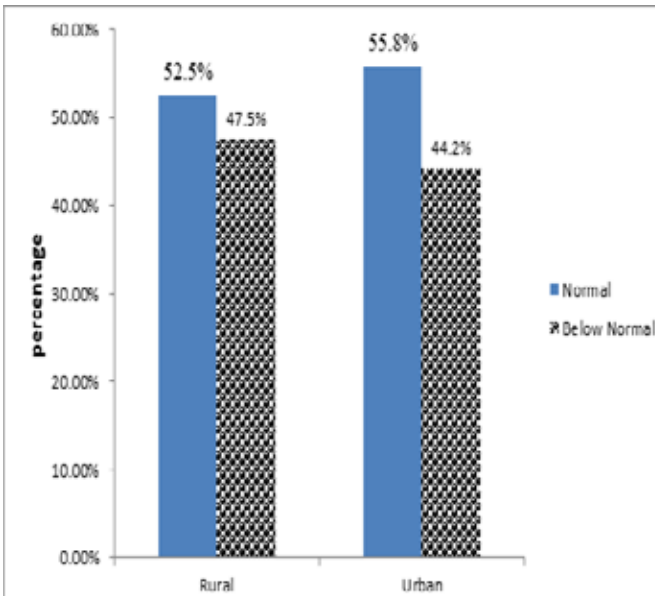

Figure 2 shows hemoglobin within normal range was higher in urban (55.8%) than in rural (52.5%). In the same way below normal hemoglobin was slightly higher in rural (47.5%) than urban (44.17%).

Table 1: Hemoglobin of respondents according to sex in rural and urban (n=240)

Characteristics	Category	Rural (n=120)		Urban (n=120)	
		Normal	Below Normal	Normal	Below Normal
Gender	Males	30 (48.5%)	17 (29.2%)	25 (37.3%)	32 (60.4%)
		Mean ±SD (12.8 ±1.4)		Mean ±SD (11.9 ±1.3)	
	Females	33 (51.5%)	40 (71%)	42 (62.7%)	21 (39.6%)
		Mean ±SD (11.6 ±1.4)		Mean ±SD (11.9 ±1.5)	

*Normal; Males = >13g/dl Females = >12g/d1

Table 1 shows that, below normal hemoglobin level was higher among females 71% as compared to 29.2% males in rural, where as below normal hemoglobin level was higher in males 60.4% than females 39.6% in urban.

Table 2: Association of BMI with socio-demographic characteristics (n=240)

Characteristics	Category	Rural (n=120) BMI			P value	Urban (n=120) BMI			P value
		Under weight	Normal	Over weight		Under weight	Normal	Over weight	
Age (Years)	60 - 70	21 (36.8%)	20 (44.4%)	9 (50.0%)	0.54	9 (48.0%)	16 (29.1%)	19 (44.2%)	0.14
	>70	36 (63.2%)	25 (55.6%)	9 (50.0%)		13 (52.0%)	39 70.9%)	24 (55.8%)	
Sex	Males	24 (42.1%)	19 (42.2%)	5 (22.2%)	0.27	4 (18.2%)	28 50.9%)	25 (58.1%)	0.001
	Females	33 (57.9%)	26 (57.8%)	13 (77.8%)		18 (81.8%)	27 (49.1%)	18 (41.9%)	
Marital Status	Married	47 (82.5%)	36 (80.0%)	17 (94.4%)	0.36	20 (90.9%)	40 (72.7%)	33 (76.7%)	0.22
	Unmarried	10 (17.5%)	9 (20.0%)	1 (5.6%)		2 (9.1%)	15 (27.3%)	10 (23.3%)	
Ethnicity	Upper cast	5 (8.8%)	4 (8.9%)	4 (22.4%)	0.22	11 (50.0%)	38 (69.1%)	31 (72.1%)	0.19
	Relatively advantage janajatis	28 (49.1%)	29 (64.4%)	8 (44.4%)		4 (18.2%)	9 (16.4%)	8 (18.6%)	
	Others	24 (42.1%)	12 (26.7%)	6 (33.3%)		7 (31.8%)	8 (14.5%)	4 (9.3%)	
Type of family	Single	19 (33.3%)	11 (24.4%)	5 (27.8%)	0.21				NA
	Joint	38 (66.7%)	34 (75.6%)	13 (72.2%)					
Education	Illiterate	43 (75.4%)	36 (80.0%)	14 (77.8%)	0.86	4 (18.2%)	19 (34.5%)	11 (25.6%)	0.31
	Literate	14 (24.6%)	9 (20.0%)	4 (22.2%)		18 (81.1%)	36 (65.5%)	32 (74.4%)	
Religion	Hindu	5 (8.8%)	7 (15.6%)	2 (11.1%)	0.56	12 (54.5%)	23 (41.8%)	20 (46.5%)	0.59
	Others	52 (91.2%)	38 (84.4%)	16 (88.9%)		10 (45.5%)	32 (58.2%)	23 (53.5%)	
Per capita income	>1US$	37 (64.9%)	31 (68.9%)	11 (61.1%)	0.82	14 (63.6%)	31 (56.4%)	22 (51.2%)	0.62
	<1US$	20 (35.1%)	14 (31.1%)	7 (38.9%)		8 (36.4%)	24 (43.6%)	21 (48.8%)	
Occupation	Agriculture	40 (70.2%)	31 (68.9%)	11 (61.1%)	0.76	8 (36.4%)	24 (43.6%)	17 (39.5%)	0.82
	Others	17 (29.8%)	14 (31.1%)	7 (38.9%)		14 (63.6%)	31 (56.4%)	26 (60.5%)	

*Chi-square test

Table 2 reveals, no statistically significant of BMI with sex, ethnicity, religion, marital status, type of family, education and per capita income in both rural and urban areas. Statistically Significant association of BMI with sex in urban (P=0.001) but no association in rural.

Table 3: Association of hemoglobin with socio-demographic characteristics (n=240)

Characteristics	Category	Hemoglobin Normal	Hemoglobin Below Normal	P value	Hemoglobin Normal	Hemoglobin Below Normal	P value
Age (Years)	60 - 70	21 (33.3%)	20 (39.9%)	0.04	26 (38.8%	20 (37.7%)	0.90
	>70	42 (66.7%)	37 (59.1%)		41 (61.2%)	33 (62.3%)	
Gender	Male	30 (48.5%)	17 (29.2%)	0.02	25 (37.3%)	32 (60.4%)	0.01
	Female	33 (51.5%)	40 (71%)		42 (62.7%)	21 (39.6%)	
Type of family	Single	26 (41.3%)	9 (15.8%)	0.002	7 (10.4%)	5 (9.4%)	0.85
	Joint	37 (58.7%)	48 (84.2%)		60 (89.6%)	48 (90.6%)	
Ethnicity	Upper cast	4 (6.3%)	9 (15.8%)	0.17	43 (64.2%)	37 (69.8%)	0.75
	Relatively advantage janajatis	34 (54.0%)	31 (54.4%)		12 (17.9%)	9 (17.0%)	
	Others	25 (39.7%)	17 (29.8%)		12 (17.9%)	7 (13.2%)	
Education	Illiterate	49 (73.0%)	47 (82.5%)	0.21	18 (26.9%)	16 (30.2%)	0.68
	Literate	17 (27.8%)	10 (17.5%)		49 (73.1%)	37 (69.8%)	
Marital status	Married	49 (77.8%)	51 (89.5%)	0.08	53 (79.1%)	40 (75.5%)	0.63
	Unmarried	14 (22.2%)	6 (10.5%)		14 (20.9%)	13 (24.5%)	
Family type	Single	26 (41.3%)	9 (15.8%)	0.002	7 (10.4%)	5 (9.4%)	0.85
	Joint	37 (58.7%)	48 (84.2%)		60 (89.6%)	48 (90.6%)	
Religion	Hindu	8 (12.7%)	6 (10.5%)	0.71	30 (44.8%)	25 (47.2%)	0.79
	Other	55 (87.3%)	51 (89.5%)		37 (55.2%)	28 (52.8%)	
Occupation	Agriculture	43 (66.7%)	38 (70.4%)	0.66	25 (37.3%)	24 (45.3%)	0.37
	Others	20 (33.3%)	16 (29.6%)		42 (62.7%)	29 (54.7%)	
Income	0 - 5000	56 (88.9%)	40 (70.2%)	0.04	64 (95.5%)	48 (90.6%)	0.31
	5000 - 15000	1(.9)	4 (7.0%)		2 (3.0%)	3 (5.7%)	
	>15,000	6 (10.1%)	13 (22.8%)		1 (1.5%)	2(3.8%)	
Per capita income	>poverty	46 (73.0%)	33 (57.3%)	0.04	36 (52.2%)	31 (58.5%)	0.60
	<poverty	17 (27.0%)	24 (42.1%)		31 (46.3%)	22 (41.5%	

*Chi-square test

Table 3 shows, statistical association of hemoglobin with socio-demographic variables (Age, gender, ethnicity, religion, marital status, and education level, type of family,

occupation, personal income and per capita income). It shows that there is no statistically significant association of hemoglobin with ethnicity, religion, marital status, education, type of family and occupation in both rural and urban. Statistically significant association of hemoglobin with age (p=0.04), gender (p=0.02), type of family (p=0.006), personal income, per capita income (p=0.04) in rural but no association in urban.

DISCUSSION

In this study respondents were from age group 65 - 70 years from rural where similar proportion (25%) comprises from urban in age group 70 - 75 years. Similar finding was revealed in the study conducted by Saxena *et al* in Uttrakhand, India. This study also reveals majority of respondents were females in both rural and urban areas. Majority of the respondents were married from both areas.

In this study normal BMI was found higher in urban (45.8%) than rural (37.5%). This finding was supported a study conducted by WHO in Macedonia, where normal BMI was higher in urban 27.59% than in rural 26.19%. Similar finding was found by a study conducted by Shivaji *et al*. in Rajasthan, India where rural elderly 52.21% were more malnourished, 25.41% were at risk of malnutrition than urban elderly 40% and 3.49% respectively. In the hemoglobin evaluation, within normal hemoglobin were slightly lower in rural 52.5% than urban 55.8%. Similar finding was observed in a study conducted by Kim in korea, where the prevalence of anemia in rural was higher 10.8% than urban 9.9%. Present study reveals mean hemoglobin level was significantly higher for man than women in rural areas. This finding is supported the study by WHO in Macedonia, Where mean hemoglobin was higher for man 14.3 g/dl than women 13.5 g/dl.

The present study reveals that, there is no statistically significant association of BMI with age. This finding was contradictory with the study conducted by WHO in Macedonia, where It was found that BMI was decreasing with age. Study reveals, statistically significant association of BMI with food pattern in urban area (p=0.03) but not found in rural. Prevalence of underweight was higher in vegetarian than non-vegetarian. Similar finding was found in the study conducted by Sharma in Lucknow city in India, showed that hemoglobin level was higher in non-vegetarian obese women (12.35 = -1.083) than vegetarian (9.036 = -1.002).

CONCLUSIONS

The study concludes that, underweight was found more among rural senior citizens but overweight was found more among in urban senior citizens. Below normal hemoglobin level was more among rural respondents. There was statistically significant association of mean BMI between rural and urban, whereas no statistically significant association of mean hemoglobin between rural and urban.

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The Duties and Responsibilities of a Medical Teacher

Reddy KR
Department of Medical Education,
Professor & Head of Microbiology Department
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal

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Corresponding author
**Dr. K. Rajeshwar Reddy*
Professor & Head of Microbiology Department
Gandaki Medical College & Teaching Hospital,
Pokhara, Nepal
Email: reddysir4861@gmail.com

ABSTRACT

Teachers play vital roles in the lives of the students. Teachers are best known for the role of educating the students. A teacher must be a leader if he/she wants to function effectively in the class room. Teachers set the tone of their class rooms, build a warm environment, mentor and nurture students, and become role models.

A teacher is the force that drives the educational system. A teacher is a person who will have to fill many roles. They are people with educational leadership skills and they must continue to grow & develop as professionals. Anyone seeking to be a teacher should take advantage of any chance they get to grow as a person and as a teacher.

The most important function of a teacher in the current educational context is managerial function consisting of planning, implementing the plan and controlling the educational process. Planning in education involves formulating educational objectives (departmental and institutional) and planning teaching-learning activities. One of the most important factors in the development and implementation of a teaching – learning program is the leadership style of the teacher. The controlling process in education is called evaluation. Evaluation, not only monitors the progress and achievements of the students, but also provides important information towards modification and improvement of the teaching-learning process.

This article pertaining to the discipline of Medical Education discusses some important roles, responsibilities and functions of medical teachers.

INTRODUCTION

The role of the teachers has always been vital in the all round personality development of the students. In fact, a teacher is a role model influencing every facet of the student's growth and developing their innate potentials, in addition to being a motivator, guide and friend[1].

Besides, the teacher of today is also responsible to enable and empower the learner to emerge as a competent youth, ready to take on the challenges of the rapidly changing world.

Hence, it is imperative that the teacher continuously upgrades his/her knowledge and methodology in order to enhance the quality of teaching. If the quality of teaching is good and the commitment of the teachers is high, the standard of the institution is bound to rise[1].

THE RESPONSIBILITIES AND FUNCTIONS OF A MEDICAL TEACHER

To make the education process meaningful, teachers should give attention to the following guidelines regarding their duties and responsibilities.

- Be punctual and be available in the departments during official working hours.
- Follow the policies, standards, rules, regulations and procedures of the Institution.
- Conduct the classes at the scheduled times.
- Reach the class room on time for teaching.
- Plan and prepare well each and every aspect of the topic before the delivery of the lecture.
- Motivate the students before the actual delivery of the lecture.
- Link the topic with the previous knowledge of the students.
- Develop and use the relevant teaching aids.
- Use a combination of different methods and techniques of teaching.
- Interact with the students to induce curiosity, motivate, and provoke thinking, imagination and application of the concept taught.
- Implement the designated curriculum completely and in due time.
- Give activity/application-based work/assignment beyond the book, with guidance to use various resources and keep a record of the work given.
- Engage students in creative thinking and integrated or interdisciplinary learning experiences.
- Maintain cleanliness, discipline, and a safe, orderly environment conducive to learning.
- Mark the attendance of the students in the class register.
- Create learning environment for the students by giving examples of noble work of great personalities to inspire the students.
- Make best use of the laboratory and use models, lab equipment, apparatus to conduct experiments on a regular basis.
- Make a schedule for the practical classes and ensure that the entries in the records and files are not copied.
- Encourage students to prepare and participate in medical/science exhibitions and help them in preparing working models.
- Encourage students to develop reading habits by consulting various text books, journals, magazines etc.
- Help check truancy and long absenteeism among students.
- Collect and compile information related to medical profession and medical education from sources like news papers, magazines etc. and display it through charts, posters, and bulletin boards.
- Hold seminars on various topics relevant to medical profession.
- Must evaluate the students from time to time.
- Display clearly the time table/ teaching schedule of the class.
- Maintain the teacher's diary (log book) daily
- Maintain stock resister of equipments and instruments, chemicals, glass ware and furniture of the concerned departments.
- Participating In-service education and training courses as well as in continuing professional development (Continuing medical education) opportunities.

Therefore, the role of a teacher's overall responsibility and functions, in the educational process has increased tremendously.

1. Resource person

A teacher must be a resource specialist and must have expert knowledge of the subject area. Many people including students and coworkers will come to the teacher seeking information. Even if the person is only seeking a source of information, the teacher is the one who must know how to find what the student is looking for[2].

A leader in a medical college is a teacher who takes on extra tasks. Teachers who are active in their work will often have more jobs than just the one they were hired to perform.

2. Curriculum specialist

The most common role a teacher plays in the class room is to teach knowledge to students. Teachers are given

a curriculum they must follow that meet concerned University guidelines. This curriculum is followed by the teacher so that throughout the year, all pertinent knowledge is dispensed to the students.

Understanding content standards, how various components of the curriculum link together, and how to use the curriculum in planning instruction and assessment is essential to ensuring consistent curriculum implementation throughout a medical college.

3. Instruction specialist

A teacher must be an instructional specialist. An instructional specialist helps colleagues implement effective teaching strategies. This help might include ideas for differentiating instruction or planning lessons in partnership with fellow teachers[1].

4. Role model

Teachers typically do not think of themselves as role models, however, inadvertently, they are. Students spend a great deal of time with their teachers and therefore, the teacher becomes a role model to them. Students look up to the teachers and may pattern their own behavior and work ethic to match the instructor. Teachers are there not only to teach the students, but also love and care for them. Teachers are typically highly respected by people in the community and therefore become a role model to students and parents.

Students learn from what they see rather than from what they are taught. This is especially true for the development of attitudes. It is essential that teachers should help students acquire desirable skills and attitudes by providing a role model[4].

5. Mentor

Mentoring is a natural role taken on by Teachers, whether intentional or not. Mentoring is a way a teacher encourages students to strive to be the best they can. This also includes encouraging students to enjoy learning. Part of mentoring consists of listening to students. By taking time to listen to what students say, teachers impart to students a sense of ownership in the class room. This helps build their confidence and helps them want to be successful. An older teacher can even be a mentor to a younger teacher who is just starting out in the profession[5].

6. Learner

A learner is a person who is always growing in life and will never claim that they know it all. A teacher is challenged everyday with a new task that will help them grow into a better person. Anyone who has been involved in a profession long enough knows that there is always something new to learn.

In the present era of information explosion, a teacher has to keep up with the scientific literature in his/her discipline and choose relevant information for the teaching and learning of MBBS students. Furthermore, the teacher should also try to be aware of the recent developments in medical education so that he/she could facilitate the learning by students effectively and efficiently[6].

7. Learning facilitator

Facilitating professional learning opportunities among staff members is another role for teacher leaders. When teachers learn with and from one another (professional learning), it becomes more relevant, and they can focus on what most directly improves student learning[3].

8. Communicator

Communication is not only transfer of information from a teacher to the student, but also a two-way process of sharing thoughts and feelings. Communication could be verbal or non-verbal and includes the use of appropriate audio-visual aids to facilitate the process. Important principles of verbal communication include the use of simple language, familiar words and emphasis by repetition. Non-verbal communication is as important as verbal communication. It includes the maintenance of a uniform eye contact, and the use of facial expressions and body gestures (body language) to convey desirable attitude[3,7].

9. Research worker

Medical teachers should have a scientific attitude and should be willing to generate new ideas and try them out to facilitate teaching-learning process in their setting[1].

CONCLUSIONS

Teachers exhibit leadership in multiple, sometimes overlapping ways. Some leadership roles are formal with designated responsibilities. Other more informal roles emerge as teachers interact with their peers. The variety of roles ensures that teachers can find ways to lead that fir their talents and interests. Regardless of the roles they assume, teacher leaders shape the culture of their medical colleges, improve student learning and influence practice among their peers.

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A Rare Anomaly of the Long Head of the Biceps Brachii Muscle

Kumar S[1*], Baidya R[1], Baral P[2]
[1]Assistant professor of Anatomy teaching in Radiology division of gross anatomy and anatomical body visualization, Weill Cornell Medicine, New York
[2]Professor, Anatomy Department, Gandaki Medical College & Teaching Hospital, Pokhara, Nepal

Keywords
Arm, Biceps brachii, Glenoid, Long head, Muscle.

Corresponding author
**Dr. Sushil Kumar*
Assistant professor of Anatomy teaching in Radiology Division of Gross Anatomy and anatomical body visualization
Weill Cornell Medicine, New York
Email:szk2008@med.cornell.edu

ABSTRACT

Introduction: Biceps brachii is a muscle of arm which brings about supination when fore-arm is flexed and flexion of elbow joint. Proximally it is attached with two heads: long and short heads.

Case report: The absence of long head of biceps brachii muscle is very rare anomaly. It may be unilateral or bilateral with or without other congenital anomalies. The exact prevalence of this anomaly is unknown. This anomaly has been reported to occur as the result of an insult to the fetus during the sixth or seventh week of gestation, at which time the long head of the biceps tendon is developing.

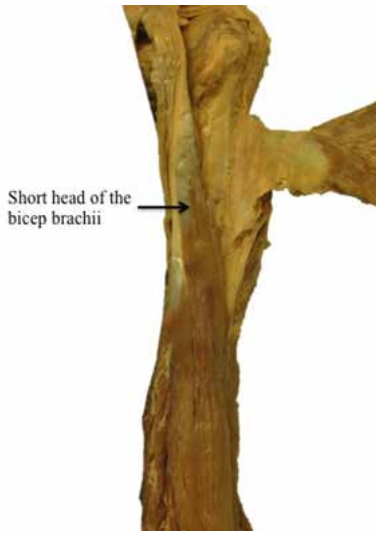
INTRODUCTION

The bicep brachii muscle has two tendinous origins. The short head arises by a thick, flattened tendon from coracoid process of scapula with coracobrachialis. The long head starts within the capsule of the shoulder joint as a long narrow tendon, running from the supraglenoid tubercle of the scapula at the apex of the glenoid cavity, where it is continuous with glenoid labrum. The tendon of the long head arched over the humeral head, emerges from the capsule under the transverse humeral ligament, and descends in the intertubercular sulcus. The two tendons lead into elongated bellies which turn into flattened tendon at elbow joint which is attached to the rough posterior area of the radial tuberosity[1].

CASE REPORT

During a routine anatomical dissection of a 45 year old female cadaver at the Department of Anatomy, at Weill Cornell Medicine, we observed an intriguing finding. In left arm long head of biceps brachii tendon was absent. The short head of biceps brachii was normal and was coming from tip of the coracoid process along with the coracobrachialis. Distally it was attached on the posterior aspect of radial tuberosity. It was innervated by musculocutaneous nerve. On right arm both head had normal development. We did not observe any other variations.

Fig 1: Showing absence of the long head of bicep brachii



DISCUSSION

Anomalies of the long head of the bicep brachii include absence, hypoplasia, duplication and various origins (from the capsular ligaments, the bicipital groove, the insertion of the oracobrachialis, the tendon of the pectoralis major and the greater tuberosity of the humerus)[2]. Absence of the tendon of the long head of the biceps brachii can be congenital and is associated with other anomalies such as the VATER association, which includes vertebral defects, anal atresia, tracheo-esophageal fistula with esophageal atresia, radial anomalies and renal anomalies[3]. Variations, with the exception of congenitally absent long heads are classified in terms of their relationship, or extent of fusion, with the supraspinatus tendon[4].

Wahl and McGillivray classified the anatomical variants of the intraarticular segment of the tendon of the long head of biceps brachii on the basis of arthroscopy into four types; incomplete proximal mesenteric, incomplete distal mesenteric, complete mesenteric, and congenitally absent[5]. Diericks *et al* analyzed 2976 shoulder pathologies and classified the 57 shoulders (1.91%) that had an anatomic variation into four types: Mesotendon, adherent, bifurcated, and congenitally absent[6]. These attempts to classify the many variations of the biceps brachii demonstrate the great variety of anatomical anomalies that are associated with this muscle.

Variations of the long head of biceps brachii could be found accidentally during the treatment of the various shoulder disorders including cuff degeneration, shoulder impingement, acromioclavicular joint arthritis[7,8]. Long head of biceps brachii anomalies have been reported as a possible mechanism for development of shoulder instability[9].

In the clinical settings, most of the anatomical variations of the long head of biceps brachii are not diagnosed during radiological assessments, but rather during arthroscopic inspection. This underlines the need for surgical awareness during arthroscopic surgery due to possible unexpected anatomical variations or lesions of the LHB[4]. Diagnostic difficulties at the time of shoulder arthroscopy also arise from the fact that the tendon of the long head of biceps brachii is used as a landmark and may confuse even experienced surgeons[3,9].

CONCLUSION

In conclusion, the present case reports describe a rare anomaly of the biceps brachii. Although rarely encountered, it can create diagnostic difficulties, as it is not easily discovered through routinely used imaging modalities. Thus, clinical awareness of their existence and MRI appearance can help prevent misdiagnosis and avoid unnecessary surgery.

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Case Report on Esophageal Coin Management at District Hospital

Gupta S[1*], Sharma N[2], Thakali K[3]
[1]Assistant Professor, Department of General Practice and Emergency,
Gandaki Medical College Teaching Hospital, Pokhara, Nepal
[2]Health Service Director, HDCS, Nepal
[3]Lecturer, Department of General Practice and Emergency, NAIHS, Nepal

Keywords
Coin, Esophageal foreign body, District Hospital.

Corresponding author
Dr. Sandeep Gupta,
Assistant Professor
Department of General Practice and Emergency, Gandaki Medical College & Teaching Hospital, Pokhara, Nepal
Email: sandeep140@hotmail.com

ABSTRACT

Accidental foreign body ingestion is commonly encountered in the pediatric population, with a peak incidence between the ages of six months and three years. Since the act may go unnoticed, the child may present late. Here, we report a case of an 11 year old boy who present at Lamjung District Hospital after 24 hours of ingestions of two rupee Indian coin. To the best of our knowledge this is the first time we describe a case report on coin removal at district hospital of Nepal.

INTRODUCTION

The majority of foreign body ingestions occur in the pediatric population, accounting for 75 – 85% of patients with foreign bodies in the upper GI tract but edentulous adults are also at greater risk of ingesting foreign bodies, including an obstructing food bolus or their dental prosthesis[1,2]. Coins are the foreign body most commonly ingested in infants and children[3].

Anatomically the narrowest area within the GI tract is the esophagus, making this the commonest site of foreign body impaction. Within esophagus foreign body may lodge in the thoracic inlet, the aortic arch area, or the gastro esophageal (GE) junction. Coins are the most common foreign body ingested by children; others include toys, toy parts, magnets, batteries, safety pins, screws, marbles, bones, and food boluses[4].

Foreign bodies in the esophagus can produce various symptoms, including dysphagia, drooling, and occasionally airway obstruction. Gastrointestinal foreign bodies produce less specific symptoms, including abdominal pain, melena, and hematochezia. All children with a history of foreign body ingestion should be evaluated with radiographs of the neck, chest, and abdomen. Radiolucent objects require direct visualization or contrast radiographs[4]. We present our experience of managing an impacted coin at upper esophagus.

CASE PRESENTATION

An 11 year old boy studying in grade 5 of Lamjung District attended the emergency room of Lamjung District Community Hospital with his father with history of ingestion of coin almost after 24 hours ago. He complained of mild discomfort over his throat. The Anterior-posterior radiograph film showed an esophageal foreign body lodged at the level of the cricopharyngeus muscle (Fig 1). His vitals and systemic examination were unremarkable. We plan for admission and evaluation

under anesthesia the next day after observing overnight at our hospital. He was given General Anesthesia and endotracheal intubation done. Under direct visualization with the help of Magill forceps the coin was grasped in between the blade of forceps. The forceps along with the coin was safely removed (Fig 2 and 3). The procedure was uneventful and with no any trauma or hemorrhage noted. After been observed over night our patient was discharged on next day with smile on his face.

Fig 1: Anterior-posterior radiograph film showed an esophageal foreign body

Fig 2: Foreign body been grasped with Magill forceps

Fig 3: Foreign Body was a two rupee Indian coin

DISCUSSION

Foreign body ingestion is a potentially serious problem that peaks in children. The common sites of retained esophageal foreign bodies are related to age. Clinical management focuses on identifying and treating the cases at risk for complications, which depends on the location and type of foreign body. Children are more typically have objects entrapped in the upper part of the esophagus at the level of the cricopharyngeus muscle 70%, aortic cross over 20% and lower esophageal sphincter 10% where as adults more commonly have entrapment at the lower esophageal sphincter 60%, cricopharyngeus muscle 25% and aortic cross over 15%[5].

Most children with esophageal foreign bodies are brought to medical attention by their parents. A careful history and physical examination are the keystones in diagnosing an esophageal foreign body and to the prevention of its complications. Imaging can be used to confirm the findings and to localize the site of the foreign body. The diagnostic steps and treatment depend on the patient's symptoms, the shape and location of the foreign body, whether it is radio-opaque, or whether it has magnetic properties[5].

Airway and breathing should always be examined first. The physical examination of the neck may reveal swelling, erythema, or crepitus, suggesting that an esophageal perforation has occurred, and surgical consultation is mandatory. The chest examination may reveal inspiratory stridor or expiratory wheezing, suggesting a lodged esophageal foreign body with tracheal compression. The abdominal examination may show evidence of small bowel obstruction or perforation, in which case

immediate surgical consultation and abdominal imaging should be obtained[6].

A variety of techniques are used to extract foreign bodies from the esophagus or stomach. Rigid esophagoscopy and flexible endoscopy for most foreign body extractions have been used at specialized centers. Magill forceps, Bougienage (passage of a dilator) and Foley catheter has been used in some of the centers to removed foreign bodies like coins[7]. In our study as well we used the Magill forceps to grasp and extract the coin from the impacted in the upper esophagus.

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Pattern of Pediatric Morbidity in Hospital Admitted Patients in Western Region of Nepal

Adhikari P[1*], Kandel D[2], Shrestha U[2]
[1]Intern, [2]MBBS 3rd year, Gandaki Medical College & Teaching Hospital, Pokhara, Nepal

Keywords
Child health, Morbidity, Pediatric patients.

Corresponding author
**Dr. Purushottam Adhikari*
Intern, Gandaki Medical College & Teaching Hospital, Pokhara, Nepal
Email: puru.ad12@gmail.com

ABSTRACT

Background: Pediatric age group comprises the important fraction of hospital admissions in our health care settings and it is the major challenge to address in the developing countries like ours. This study was carried out to find out the significant epidemiological trends and disease patterns of the admitted children in a pediatric ward.

Methods: This retrospective study was carried out by reviewing hospital records of the patients admitted in the pediatric ward from July 2015 to January 2016 in Gandaki Medical College Teaching Hospital. The disease pattern was analyzed on the basis of age, sex, final diagnosis of the disease, duration of hospital stay and months of admission.

Results: Among the 1348 admitted children during the study period, majority were males (65%) and below five years (74%). Lower respiratory tract infections (30%), enteric fever (10%) and acute gastroenteritis (7.7%) were the three major causes for admission. The mean days of hospital stay was 4.43 and maximum number of children was admitted during August/September.

Conclusion: Infectious diseases are the major cause for morbidity and more were during the rainy season.

INTRODUCTION

Pediatric morbidity is one of the major health challenges of the developing and underdeveloped nations. It comprises one of the important fractions of hospital admission in our settings. As per the World Health Organization factsheets, around 5.9 million children under the age of 5 years died in 2015 and more than half them were due to those conditions that could either be prevented or treated with access to simple, affordable interventions[1].

Nepal has the infant mortality rate of 32 per 1000 live births and under-5 mortality rate of 39 per 1000 live births. It has decreased in recent decades but still long way to meet the Sustainable Development Goals target for 2017 to reduce under-5 mortality to 28 per 1000 live births[2].

This study has been planned with objective to analyze the demographic characteristics, disease profile and epidemiological trends of the pediatric patients admitted in Gandaki Medical College Teaching Hospital.

Similar studies have been conducted in other medical colleges and hospitals of Nepal[3,4,5], but quite earlier. Also there has been paucity of this type of research around Western hilly region of Nepal. This would help to find out the burden of particular childhood disease in this region and it would promulgate the necessity for policies and plan to address the preventive approach for that particular diseases.

METHODS

This was a retrospective study carried out in the Gandaki Medical College Teaching Hospital. The hospital records of the patients admitted in the pediatric ward from July 2015 to January 2016 was taken from record section. Age,

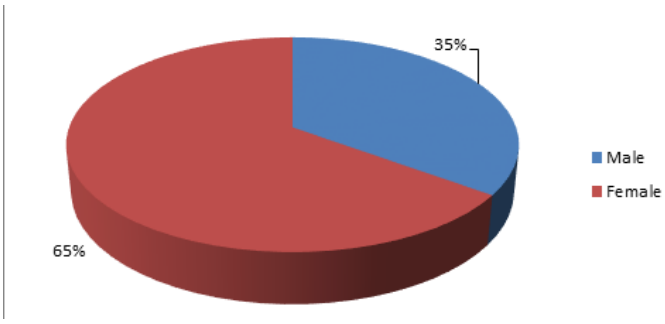
sex, address, duration of hospital stay and final diagnosis was noted. Patients were admitted from the pediatric outpatient department as well as from Emergency Department and managed by Medical Officers and Pediatricians. Final diagnosis of disease was recorded in accordance to International Classification of Disease. Neonates admitted in neonatal intensive care unit and other pediatric patients admitted in pediatric intensive care unit were not included in study. The data was entered in Microsoft Excel and analyzed.

Ethical clearance for the study was taken from Institutional Review Board of Gandaki Medical College Teaching Hospital.

RESULTS

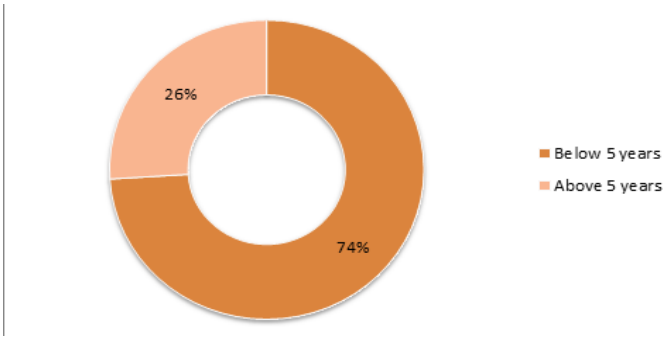
A total of 1348 patients were admitted in the ward during the study period. Among them 474 (35%) were females whereas 874 (65%) were males as shown in Figure 1.

Fig 1: Gender wise distribution of the patients



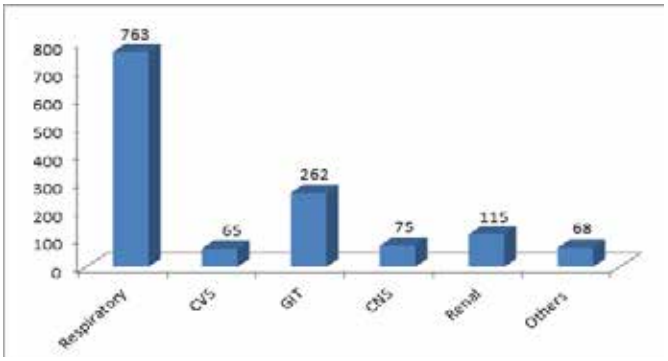
More than half of the patients are below the age of 5 years as shown in Figure 2.

Fig 2: Age wise distribution of the patients



The most commonly involved system among those admitted is respiratory system followed by gastrointestinal and renal as shown in figure 3. Among the respiratory system diseases, lower respiratory tract infection including pneumonia (413; 30%) was the most common cause of admission followed by acute bronchiolitis (68; 5%) and bronchial asthma (46; 3.4%). Enteric fever (137; 10%) and acute gastroenteritis (105; 7.7%) were the major gastrointestinal diseases for admission. Similarly, urinary tract infections (43; 3%) and post streptococcal glomerulonephritis (20; 1.4%) accounted for the important renal diseases. Febrile seizure (54; 4%) and hematological disorders (15; 1.1%) were the significant diseases involving central nervous system and cardiovascular diseases respectively.

Fig 3: System wise involvement of the disease



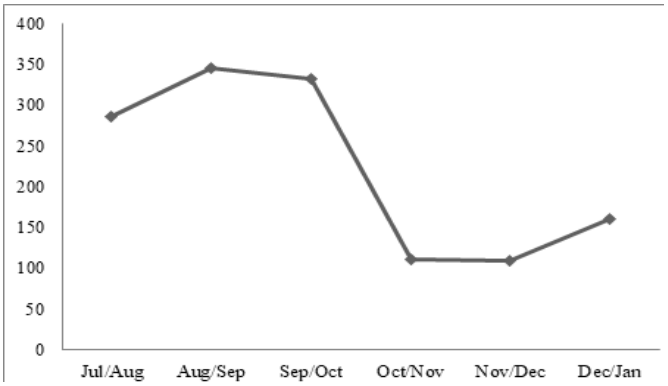
Similarly, all the admitted patients stayed in hospital for one day in minimum and up to maximum of 23 days. The detail of duration of hospital stay is shown in Table 1.

Table 1: Duration of hospital stay

Duration of hospital stay (Days)	No of patients
1 – 3	338
4	324
5	443
6 and more	243

During the six months of study period the maximum of admissions were during the month of August/September.

Fig 4: Month wise distribution of patients



DISCUSSION

During the study period male children were more in number (65%) than female children (35%) admitted in pediatric ward for the treatment with male: female ratio of 1.84.

This finding is similar to the other studies conducted in the Medical College and Zonal Hospital of Nepal[3,4,5]. This may be due to the preference of male child to bring hospital as soon as possible in our society. Similarly, children of less than five years are more in number (74%) than the age group more than five years among the admitted ones in our study.

Respiratory system was the most commonly involved with respiratory tract infection including pneumonia being the major cause of morbidity of children in our scenario. Enteric fever and acute gastroenteritits involving the gastrointestinal system were the subsequent causes for the admission. These findings are in consistent with the similar studies conducted in other set up including the one conducted in Bangladesh by Hasan *et al*[4,5,6]. The national data from recent Annual Health Report published by Department of Health Services also shows the acute respiratory infection being the most common cause of childhood diseases followed by acute diarrhea[7]. The socioeconomic status of the people, lack of education, sanitation and poor access to health care facilities are supposed to be the causes for these infectious diseases being the major reason for hospital admission. A study by Rice *et al* published in WHO Bulletin suggests malnutrition as the important underlying cause for the mortality associated with infectious disease in children in developing countries[8].

Similarly, the maximum number of patients stayed for five days in the hospital. A patient of lower respiratory tract infection stayed for 23 days. The mean days of hospital stay for the patients were 4.43 days.

During the six months of our study, maximum number of admission was in August/September. This finding was similar with the study conducted in a Zonal Hospital of Nepal[4]. This may be due to the rainy season favoring for the more diarrhea and enteric fever cases.

The results in our study came up with the brief epidemiological trend of the disease pattern with which the children are admitted in the Hospital of Western Region of Nepal. Though it's the limitation of our study that we did only the retrospective analysis of the cases for a period of six months, this finding could be the basis for policy makers to address the current challenges in the management of childhood illness.

CONCLUSIONS

Our study concluded that lower respiratory infections and acute gastroenteritis are the main cause for the hospital admission for the children living in the Western hilly region of Nepal. Males were more in number to be admitted in Hospital and the age groups of less than five years were more predisposed for admission than the elder age groups. August/September is the period for the maximum number of admissions.

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- Clarity of presentation and organization of the article
- English composition

Articles accepted would be copy edited for grammar, punctuation, print style, and format. The Editor-in-Chief of J-GMC-N reserves the right to accept or reject any article submitted for publication. Publication in the journal is free of charge. The authors need not pay the article processing and publication fees.

GUIDELINES TO AUTHORS

Manuscripts must be prepared in accordance with "Uniform requirement for Manuscripts submitted to Biomedical Journals" developed by the International Committee of Medical Journal editors (October 2006) (http://www.icmje.org). The uniform requirements and specific requirements of J-GMC-N are summarized below.

Types of manuscripts

Editorial Articles: These articles are written in each issue by the Editor-in-Chief or members of the editorial board.

Original Articles: Randomized clinical trials, interventional studies, studies of screening and diagnostic tests, outcome studies, cost effectiveness analyses, case-control series and surveys with high response rate will be considered for publication. Articles can be up to 3000 words excluding the abstract (can be up to 250 words), figures, tables, and references (can be up to 30).

Review Articles: Systematic critical reviews of literature and data sources will be accepted. Reviews must not exceed 4000 words, excluding the abstract (can be up to 250 words), figures, tables, and references (up to 150 can be accepted).

Medical education: Articles pertinent to the education process in the medical field will be published in this section. It may be about teaching-learning process in undergraduate, postgraduate or higher levels. Word limit may vary.

Case Reports: Interesting or new or rare cases with clinical significance or implications along with literature review can be reported. Such case reports can be up to 1000 words, excluding abstract (can be up to 100 words), references (can be up to 15), and photographs (up to 4).

Viewpoint: Articles related to your own point of view or personal views on any issue related to health will be published. Viewpoint can be up to 1000 words excluding references (up to 10).

Letter to the Editor: Letters with reference to articles published in J-GMC-N can be up to 250 words, and must be received within one month after publication of the article. The author must give a full reference of the article published in J-GMC-N while writing the letter to which he is referring. The letters unrelated to a Journal article can be up to 500 words, excluding 5 references.

Images and tables: For all the above mentioned categories, the number of images and tables can be up to one per 400 words

MANUSCRIPT PREPARATION

Manuscripts must be clearly typed double-spaced on one side only on A4 size white paper with Arial Font, size of 12 points, with a margin not less than 25 mm. The pages should be numbered consecutively, beginning with the title page. Uniformity in language is required, with preference to American English.

Numbers less than 10 should be written in words. Words not numbers should begin a sentence. Numbers less than 1, begin with a zero. Use one space between a number and its unit. Generic drug names should be used.

The text of the article should be divided into sections with the headings, and should commence on a new page in the following sequence: title page, abstract, key words, introduction, materials and methods, results, discussion, conclusions, acknowledgement, references, tables and figures.

Title page

The title page should carry

1. Type of manuscript (e.g. Original article, Review article, Case report etc).
2. Title of the article: The simpler the title better; should be concise and informative, should reflect the content of the paper.
3. Short, running title (should not be more than 45 characters).
4. Author(s) names with highest academic degree(s), designation, name of the department and institution affiliated (where the research was carried out), postal and email address, phone numbers.

Abstract

The abstract should contain the essence of the whole paper. Be clear and concise without any cited references and avoid unnecessary detail. Abstract must not exceed 250 words and should be presented in prescribed structured format: Background, Aims & objectives (hypothesis), Methods, Results, and Conclusions. Provide three to six key words below the abstract arranged alphabetically. The abstract need not be structured for a review article or case report. Universally accepted standard abbreviations used in standard text books can only be used.

Introduction

Introduction should be short and tell the reader why you undertook the study. Divide the introduction into three paragraphs. The first paragraph should be a very short

summary of the existing knowledge of your research area. This should lead directly into the second paragraph that summarizes what other people have done in this field, what limitations have been encountered, what questions still need to be answered? This in turn, will lead to the last paragraph, which should clearly state what you did and why.

Materials and Methods

This section should describe how and why a particular study was done in a particular way. Basically, it should include three questions: How was the study designed? How was the study carried out? And how was the data analysed? Mention the following, in order of their appearance, and writing in past tense or passive verb.

1. Study type and study design e.g. randomized clinical trials, cross sectional study, retrospective study, experimental study, cohort study, survey etc. Investigators embarking on Randomized clinical trial reports should present information based on the CONSORT (Consolidated Standards of Reporting Trials) statement (http://www.consort-statement.org).
2. Place and duration of the study.
3. Setting for the study.
4. Sample size and sampling method.
5. Inclusion and exclusion criteria.
6. Methods of data collection.
7. Technical information about methods, apparatus, and procedures should be provided in detail to allow other workers to reproduce the results. Give references to established methods.
8. Ethical approval and patient consent.
9. Protocols followed, if any.
10. Statistical analysis and computer software used.

Ethical approval

Ethics committee approval (for both human as well as animal studies) from respective institution is obligatory for manuscript submission. A statement on ethics committee permission and ethical practices must be included under the 'Materials and Methods' section.

Written informed consent must be obtained from the patient (or parent or guardian) for publication of any details or photographs that might identify an individual.

Results

The main outcome of the study and data obtained should be summarized in the Results section, in logical sequence in the text, tables and graphs. Remember that data and results are not the same thing. Results should be presented in a concise manner avoiding data that are already given in tables and figures. The tables and figures used in the manuscript should be precisely incorporated in sequential order in the result section. In this section, generally the minimum, maximum and mean values of the parameters should be mentioned. Likewise, statistical values should also be mentioned.

Discussion

In this section, at first the findings of the research should be elaborated giving citation of previous works supporting the hypothesis and present findings. Compare and contrast the results with other relevant studies. Describe the new and important aspects of the study. Do not repeat the data or other information given in the introduction or results section. State the limitations of the study.

Conclusions

State the conclusions that are linked with the objectives of the study, directly supported by the evidence and explore the implications of the findings for future research and for clinical practice.

Acknowledgements

This section should state person/s and/or institution/s or funding agencies to whom the author has to acknowledge, and should specify the nature of support.

Source of Financial support

Grants, funds, honoraria sanctioned for research, if any.

Conflicts of Interest

Potential conflicts of interest (e.g. employment, affiliation, consultancy, honoraria, grants or other funding etc.) should be disclosed.

Review Articles

Review article must incorporate various aspects of topic chosen, and should also incorporate latest research and findings. It should not merely be a collection of quotes from text books or very old articles of journals that does not contribute anything new to the scientific literature base already available. The ideal review should be topical, up to date, balanced, accurate, authoritative, quotable, provocative and a good read. The ideal contents of review should contain the problem, historical background, basic science, methodology (Describing the methods used for locating, selecting, extracting, and synthesizing data), human studies, discussion, conclusions, recommendations, and the future. Of course with an abstract (need not be structured).

Case Reports

Case reports should include unstructured abstract with keywords, introduction, case report, discussion, references, tables and figure legends.

Student J-GMC-N

This is a section in the Journal especially provided for students and interns. Students can take the help of an expert from concerned subject in the conception of the topic providing suitable resources, revision and final approval of the write-up to ensure that article submitted to J-GMC-N are authoritative and accurate. Articles in this students' section can be on education, medical profession, careers, case reports, viewpoint etc.

References

Number the references by Arabic numerals in superscript consecutively in the order of their appearance in the text, tables or figures. Include the last names and initials of the authors, title of article, Name of publication, year published, volume number, and inclusive pages. The titles of the journals can be abbreviated according to the style used in Index Medicus. For non-indexed journals complete name of the journal should be used. The style and punctuation of the references should conform to the following examples. The journal name should be in italics.

Journal

Baral G. An assessment of the safe delivery incentive program at a tertiary level hospital in Nepal. *J Nepal Health Res Counc*. 2012 Jan; 10(20):118-124.

Sherchand JB, Tandukar S, Sherchan JB, Rayamajhi A, Gurung B, Shrestha L, Rijal B, Pokhrel BM. Hospital-based study in children with Rotavirus gastroenteritis and other enteropathogens. *J Nepal Health Res Counc*. 2012 Jan; 10(20):130-135.

Book

Reddy KR. Text book of Immunology. Delhi, India: AITBS Publishers; 2016.

Chapter

Shapiro BM. Awaking of the invertebrate egg at fertilization. In: Mastoianni L, Biggers JD, eds. Fertilization and embryonic development *in vitro*: New York, Plenum Press, 1981: 232-235.

For other types of references such as electronic media, newspaper items etc. please refer to ICMJE guidelines (http://www.icmje.org or http://www.nlm.nih.gov/bsd/uniform_requirements.html)

Tables

Tables should be self explanatory and should not duplicate text material. Tables should be numbered in Arabic numerals, consecutively in the order of their first citation in the text and provide a brief title for each. Each and every table must be cited in the text. Tables should be with not more than 10 columns and 25 rows. Give each column a short or an abbreviated heading. Explanatory matter should be placed in footnotes, not in the heading. Explain all nonstandard abbreviations in footnotes, and use the following symbols in sequence: *, **, †, ††, ‡, ‡‡, ¶

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Figures (Graphs, photographs, x-ray films, images) should be numbered consecutively according to the order in which they have been cited in the text. If a figure has been published previously, acknowledge the original source and submit written permission from the copyright holder to reproduce the figure. The figures should be supplied electronically (scanned) and should have a resolution of 300 dpi with a dimension of 640 x 480 to 800 – 600 pixels and picture format should be JPEG. Pictures will be published in black and white free of charge. But, if

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Measurements of length, height, weight, and volume should be reported in metric units (meter, kilogram, or liter) or other decimal multiples. Temperatures should be in degrees Celsius. Blood pressures should be in millimeters of mercury (mmHg). Laboratory information should be reported in both local and International System of units (SI). Since SI units are not used universally, alternative or non-SI units may be provided in parentheses. Drug concentrations may be reported in either SI or mass units, but the alternative should be provided in parentheses wherever appropriate.

Currency exchange rates should be in US $ along with local currency for the appropriate date for any prices cited.

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Use 12-hr time system with four digits, the first two for hours and the last two for minutes (e.g. 09.30 AM). Dates are reported with day of the month first, then month, followed by the year without comma (e.g. 13 Oct 2017).

Abbreviations and symbols

Standard abbreviations and symbols used in standard text books can be used, provided the full form has been given when it first appears in the text. Avoid abbreviations in the title of the manuscript.

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6. Body of the paper (Introduction/Background, Methods, Results, Discussion, and Conclusions)
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All manuscripts should be submitted electronically to:

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Prof. Dr. K. Rajeshwar Reddy

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Author(s) are requested to declare the funding source if any, and briefly describe the role of sponsor(s), if any.

Author(s) should provide their given name(s) and family name(s). The affiliation addresses (where the actual work done) should be below the names. Authors should provide the complete postal address of each affiliation with country name and email address of each author and check that they are accurately spelled.

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Conducting the Review

Reviewing needs to be conducted confidentially, the articles that have been sent for review should not be disclosed to a third party. In general, a single manuscript is reviewed by two anonymous reviewers.

The reviewer should consider the following things:

- Originality of the work
- Importance of the research to researchers in the field
- Interest for researchers or practitioners outside the field
- Appropriateness of the approach and experimental design
- Adequacy of experimental techniques
- Soundness of conclusions and interpretations
- Relevance of discussion
- Clarity of presentation and organization of the article
- Conducted according to the highest ethical standards
- English composition

The reviewer should focus on below questions in each section:

Title

- Does the title clearly represent the main theme and contents of the manuscript?
- Does it resemble with key words used in the manuscript?

Abstract

- Does it represent the concise form of the complete manuscript?
- Does the author(s) indicate what the objective of the study is, what is being researched, how it was carried on and what are the main findings, conclusions and implications?

Introduction

- Does it accurately describe what the author main objectives to achieve?
- Are you satisfied with the problems being investigated? Is the statement of the problems briefed satisfactorily?
- Do the contents in this section referred relevant, up to date and most recent research works published in referred journals to justify the context of research?

Methods

- Does the author mention satisfactorily how the data/ information was collected?
- Does the author apply universally known methods to address the problems? Are there citations?
- Does the materials and methods replicable by other scientists of the same field?

Results

- Does the author clearly give the range of main and sub-main parameters minimum, maximum and mean values?
- Are the statistics correct? Does the author mention P-values in parenthesis after using the term significant?
- Are results laid out in a logical sequence?
- Does the author describe the results based on Tables, Figures, Photographs etc. used in the manuscript sequentially?

Discussion

- Does the author give clear cut results what has been discovered?
- Does the author provide adequate comments/ arguments and support in support of findings?
- Are you satisfied with the comments/arguments made? Do the comments/arguments seem reasonable?
- Are the new findings articulated with the objectives and results?
- Are the recommendations based on the findings? What are the implications of the findings?
- Are the graphs clear and within the size? Units used in Y and X axis satisfactorily?
- If necessary can the author supply raw data to the reviewers?

References

- Are the references cited properly and follows all instructions comply with J-GMC-N guidelines?

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- Does the article follow J-GMC-N format accurately?
- Is the article readable and communicative in terms of language and style?

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- Whether the article is a substantial copy of another work?
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- Accept without revision
- Accept but needs revision (either major or minor)

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