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Instructions to authors
In recent years epidemiology has become an increasingly important approach in both public health and clinical practice. Epidemiology is the basic science of disease prevention and plays major roles in the development and evaluation of public policy as well as in social and legal arenas. Together with laboratory research, epidemiology is now used to identify environmental and genetic risk factors for disease and to shed light on the mechanisms involved in the pathogenesis of different diseases. The heightened media attention that epidemiology has recently received has major applications for health care providers and policy makers as well as for epidemiologists. As a result of this scrutiny, the approaches, methodology, and uses of epidemiology have garnered increasing interest from an ever-broadening group of professionals in different disciplines as well as from the public at large.

Epidemiology is defined in many different ways over decades. Epidemiology is the study of how disease is distributed in populations and the factors that influence or determine this distribution. Why does a disease develop in some people and not in others? The premise underlying epidemiology is that disease, illness, and ill health are not randomly distributed in human populations. Rather, each of us has certain characteristics that predispose us to, or protect us against, a variety of different diseases. These characteristics may be primarily genetic in origin or may be the result of exposure to certain environmental hazards. Perhaps, most often, we are dealing with an interaction of genetic and environmental factors in the development of disease.
A broader definition of epidemiology than that given above has been widely accepted. It defines epidemiology as “the study of the distribution and determinants of health-related states or events in specified populations and the application of this study to control of health problems”. What is noteworthy about this definition is that it includes both a description of the content of the discipline and the purpose or application for which epidemiologic investigations are carried out.

The specific objectives of epidemiology can be summarized as follows:

1. To identify the etiology or cause of a disease and the relevant risk factors—that is, factors that increase a person’s risk for a disease.

   We want to know how the disease is transmitted from one person to another or from a nonhuman reservoir to a human population. Our ultimate aim is to intervene to reduce morbidity and mortality from the disease. We want to develop a rational basis for prevention programs. If we can identify the etiologic or causal factors for disease and reduce or eliminate exposure to those factors, we can develop a basis for prevention programs.

2. To determine the extent of disease found in the community. What is the burden of disease in the community? This question is critical for planning health services and facilities, and for training future health care providers.

3. To study the natural history and prognosis of disease.

   Clearly, certain diseases are more severe than others; some may be rapidly lethal while others may have longer durations of survival. Still others are not fatal.

   We want to define the baseline natural history of a disease in quantitative terms so that as we develop new modes of intervention, either through treatments or through new ways of preventing complications, we can compare the results of using such new modalities with the baseline data in order to determine whether our new approaches have been truly effective.

4. To evaluate both existing and newly developed preventive and therapeutic measures and modes of health care delivery.

5. To provide the foundation for developing public policy relating to environmental problems, genetic issues, and other considerations regarding disease prevention and health promotion.
Role of Fluoroscopic Guided Percutaneous Vertebral Body Biopsy in Vertebral Body Lesions

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ABSTRACT

Objectives: To analyze the safety and diagnostic accuracy of fluoroscopy guided percutaneous vertebral body biopsy and its impact in the line of management.

Methods: It is an observational cross sectional study comprising of patients with vertebral lesions of dorsal, lumbar and sacral vertebra, which were chosen for fluoroscopic guided percutaneous vertebral biopsy at the National Institute of Neurological and Allied Sciences, Bansbari, Kathmandu, Nepal, over a period of five and a half years time. Outcome was measured in terms of diagnostic accuracy, impact on management and procedure related complications.

Results: Altogether 39 patients underwent fluoroscopic guided vertebral body biopsy over the study period. Non tubercular vertebral body infection (65%) was common in young ages and healing fracture (32%) were common in elder population. Lumbar vertebral body (50%) was the commonest affected site followed by thoracic vertebral body (25.8%), and lumbar disc (17.77%). Sensitivity and specificity of CT/MRI in correctly diagnosing vertebral body lesions in this study were 25% and 52.63% respectively. Diagnostic accuracy of percutaneous vertebral body biopsy was 94.87%, and impact in management was 69%. There was no procedure related complications.

Conclusions: Fluoroscopy guided percutaneous vertebral body biopsy appears to be a safe procedure with high accuracy to obtain tissue diagnosis. It is therefore advisable to perform vertebral biopsy whenever there is a diagnostic dilemma.

INTRODUCTION

Identifying vertebral body pathology is crucial for patient management¹. A lytic lesion in vertebral body could be various pathologies like secondaries, tuberculosis or other pathologies, all of which warrants unique management strategy. There are various cancers which metastasize to the vertebral body, so its tissue diagnosis is a must for prognostication²³.

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Radiological diagnosis of vertebral body lesion has high sensitivity and specificity⁴, however to conclude with certainty requires tissue diagnosis. There are various methods of obtaining vertebral body biopsy. Open technique, closed technique, CT guided, fluoroscopy guided, transpedicular, posterolateral percutaneous approach, are some of the different modalities mentioned. Open technique definitely has the highest accuracy⁵⁶ however it bears risk of missing smaller multiple lesions, has a high risk of postoperative wound infection, and associated with longer hospital stay and higher morbidity⁷. Compared to open biopsy, percutaneous biopsy has several advantages like lower cost, shorter hospital stay, lower morbidity, less risk of post operative wound infections, decreased likelihood of a pathological fracture, earlier commencement of radiation
therapy and biopsy of multiple sites not amenable to open surgical procedure and can be applied to patients who are surgically poor candidates\textsuperscript{8,9}.

In a country like Nepal, where tuberculosis is still a common pathology\textsuperscript{10}, it is very important to obtain a tissue diagnosis before initiating antitubercular therapy which needs to be continued for long time and have toxic sequelae. So, this study was conducted to see the impact, a proper tissue diagnosis makes in the management of patients with vertebral body lesions.

**METHODS**

**Study design**

Observational cross sectional study.

**Sampling technique**

Non- probability purposive sampling.

**Study Place**

National Institute of Neurological and Allied Sciences, Bansbari, Kathmandu, Nepal.

**Sample size**

39 patients.

**Study Duration**

April, 2007 to December, 2012.

**Inclusion criteria**

All admitted patients, who underwent fluoroscopy guided percutaneous vertebral body biopsy indicated for dorsal, lumbar and sacral vertebral disc and body lesions which were diagnosed on clinical and radiological grounds.

**Tools and technique**

Patient’s demographic profile pertaining history and physical examination findings were recorded in the database. Investigation findings namely, full blood count, urea and electrolytes, ESR and Mantoux test were recorded. All patients underwent magnetic resonance (MR) imaging and/or computed tomography (CT) scan of the spine before biopsy. The whole spine scout film with sagittal T1 and T2-weighted sequences were obtained. Axial T1 and T2-weighted sequences were used through areas of abnormality and all patients had sagittal and axial T1-weighted postgadolinium sequences through abnormal areas. Initial diagnosis, empirical therapy started before biopsy, procedure notes and biopsy results were obtained. All biopsies were done in an inpatient basis and were performed by the senior consultant neurosurgeon. All information was recorded in computer database using Microsoft Excel 2007 for further analysis.

**Fluoroscopic guided percutaneous vertebral body biopsy procedure**

All procedures were performed under general anesthesia in prone position for patient’s comfort. Biopsy was done through right side to avoid inadvertent aortic injury. The site of entry was determined under fluoroscopy guidance, using a biplanar C-arm digitalized radiographic system (Fig 1). This procedure was done by either posterior-lateral percutaneous approach or transpedicular approach. Small skin incision was made to insert K-wire under C-arm fluoroscopy guidance until the wire reach the targeted area (Fig 1), followed by insertion of dilator and sheath under fluoroscopic guidance (Fig 2a). After the sheath reached the targeted area, the wire and the dilator was removed and trephine cutting needle was advanced. A 10 ml syringe was used to withdraw content. If pus was found then decompression was achieved at the same moment (Fig 2b). Pus was sent for microbiological analysis (Gram staining and Ziehl-Neelsen staining for acid fast bacilli) and tissue obtained was sent in 10% formalin for laboratory workup. The specimen was processed for paraffin embedding and slides were prepared.

**RESULTS**

Altogether 39 patients underwent fluoroscopic guided vertebral body biopsy over the period of five and half years. Males (59%) were found to be predominantly affected than female (41%) counter parts. Affected age groups had bimodal distribution: 31 - 40 years and 50 - 80 years (Fig 3). The first group was mostly affected with non-tubercular spondylitis, with no incidence of
metastatic carcinoma (Fig 5), but in the second group there were mostly healing fracture, non-tubercular spondylitis, and metastatic carcinoma (Fig 6).

Fig 3: Age distribution chart

There were 7 patients who were initially diagnosed as tubercular spine on clinicoradiological grounds and were on empirical antitubercular therapy but their histopathological diagnosis changed to osteomyelitis, spondylitis and one case was small cell metastatic carcinoma. There were 3 patients who had their histological diagnosis made as tuberculosis when surprisingly none of them were suspected as tuberculosis on clinicoradiological grounds.

There were 7 cases of metastatic carcinomas in our series and only 3 were suspected initially, one of whom was on empirical antitubercular therapy. We had false diagnostic impression in 71% of the cases evaluated.

The vertebral body lesions were mostly located over lower lumbar (50%) and dorsal vertebra (25.8%) (Fig 7) and similarly the disc lesions were also mostly concentrated over the L2/L3, and L4/L5 region (17.8%) (Fig 8). This clearly explains why low back pain was the commonest presenting complaints of those patients.

Fig 5: Disease distribution of <50yrs of age

Fig 6: Disease distribution of >50yrs of age
In our study, 31% of cases had their initial diagnosis confirmed, 26% of cases with inconclusive initial diagnosis had it diagnosed, and 43% of cases had their initial diagnosis proved wrong by the biopsy. Total impact on management was therefore 69% (Fig 11). Out of 39 cases, 2 had inconclusive histopathological diagnosis. Hence, diagnostic accuracy of percutaneous vertebral body biopsy in this study was 94.87%. There were no procedure related complications which explains the safety of the procedure.

**DISCUSSION**

Since Robertson and Ball first described needle biopsy of destructive spinal lesion, lot of advancements have occurred in image guided closed spinal biopsy. Now, closed vertebral body biopsy is regarded as a safe and effective method. However, initial studies quoted several complications during this procedure like pneumothorax, paravertebral hematoma, paraplegia, and even death. In view of these complications, it is clear that this procedure should be performed only if it carries a significant role in patient management. There are various indications of vertebral body biopsy like establishing diagnosis of an unknown lesion before starting right treatment, lesions unresponsive to empirical therapy, a child with discitis who fails to improve after 6 weeks, intractable or worsening back pain along with a vertebral compression fracture, and persistent or worsening pain with Paget’s disease of spine.

In Nepal, most of the General Hospitals can not offer percutaneous spinal biopsy, so most of the spinal pathologies are treated empirically. Spinal tuberculosis has several features in CT/MRI, like relative preservation of the intervertebral disc with features of osteomyelitis than discitis, paraspinal abscess, and involvement of posterior elements. From our study, it is clearly evident that sensitivity and specificity of initial prebiopsy diagnosis of vertebral body lesion by CT/MRI are 25% and 52.63% respectively and clinico-radiologically diagnosed cases of tuberculosis were actually non-tubercular vertebral body lesions and metastatic carcinoma.

Rifampicin in antitubercular therapy is effective against staphylococcal infection and therefore, some of the mild
pyogenic infections too may respond to antitubercular drugs, thereby encouraging clinicians to prescribe empirical antitubercular drugs in most of the spinal lesions.

The accuracy of percutaneous spinal biopsy has been increasing. In 1991, Brugieres P et al reported the accuracy rate in thoracic and lumbar percutaneous spinal biopsy as 67% and 63%\textsuperscript{16}. This rate has been observed higher in other subsequent studies\textsuperscript{17-22} with overall accuracy of 71 - 100%. In our study there was 94.87% diagnostic accuracy with 69% overall impact in management. There are several procedure related complications quoted by various studies\textsuperscript{6,12,13}. The pleural space, aortic arch, descending aorta, major veins, esophagus, thoracic duct, and posterior mediastinum are all potentially at risk during thoracic spine biopsies\textsuperscript{2,23}. However we were fortunate enough to have no procedure related complications may be due to the paucity of cases done so far.

CONCLUSIONS

Fluoroscopy guided percutaneous vertebral body biopsy is a safe procedure with high accuracy in yielding a tissue diagnosis. As it has greater impact in obtaining the right tissue diagnosis and have the management. It is advisable to perform the procedure before commencing final management modality especially when in diagnostic dilemma.

REFERENCES

Comparison between Goldmann Applanation Tonometry and Tonopen Tonometry in Measuring Intraocular Pressure

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ABSTRACT

Background: Glaucoma is a progressive, asymptomatic disease of the optic nerve that is often associated with optic disc cupping and irreversible visual field loss. Elevated intraocular pressure is not a diagnostic factor and many people with high pressures have normal vision. However, raised intraocular pressure is the only established risk factor for glaucoma. Currently, the two most widely employed devices to measure intraocular pressure are Goldmann applanation tonometer and the Tono-Pen.

Objectives: This study was undertaken to compare intraocular pressure readings between Tonopen tonometry and Goldmann applanation tonometery in normal pressure ranges. The correlation with central corneal thickness was identified as well.

Methods: This is a prospective cross sectional study of 100 eyes of 50 individuals conducted at the Fatima Eye Laser Center, Fatima University Medical Center, Valenzuela City, Philippines. Healthy individuals with central corneal thickness of any range and intraocular pressure within normal range with no upper age limit were included in this study. Eyes with history of any ocular disease or surgery were not included in this study. A single ophthalmologist took all intraocular pressure. Central corneal thickness measurement was taken by a trained ophthalmic staff. Data was analyzed using SPSS for windows. Paired t-test was used to compare the intraocular pressure readings between two tonometry methods. Pearson correlation method was used to verify correlations among tonometry readings and the central corneal thickness. The level of significance was set at p-value of <0.05.

Results: T test analysis gave a p-value of .000, a value less than 0.05, which indicates that there is significant difference between applanation and Tonopen. The mean difference -2.35 indicates that Tonopen have the greater mean value than applanation. Correlation between the central corneal thickness and Tonopen and central corneal thickness and Goldmann applanation tonometer gave a p value of 0.011 and 0.005 respectively indicating that there is positive correlation between central corneal thickness, with the two methods compared.

Conclusions: Tonopen tonometry gives higher intraocular pressure readings as compared with the Goldmann applanation tonometer in the normal intraocular pressure ranges and normal eyes. Central corneal thickness has an effect on both tonometry methods.

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INTRODUCTION

In a routine ophthalmologic examination, intraocular pressure (IOP) assessment is one of the essential parts done in every examination. It is important not only in the diagnosis of glaucoma but also in the assessment of all intraocular surgical interventions. This means therefore that every patient who comes to an ophthalmologist, IOP should be checked. For many years, the Goldmann applanation tonometer (GAT) has been the gold standard in checking the IOP. The Goldmann applanation technique is based on the principle that the force required to flatten a certain defined area of the cornea (which has a curved surface) is proportional to the IOP. However according to several studies, IOPs' measured by applanation tonometry are affected by the central corneal thickness (CCT)\(^1\)-\(^3\). A thicker cornea requires greater force to applanate and conversely, a thinner cornea is more easily flattened. A thin cornea is a significant risk factor for the development of glaucoma and it has yet to be determined whether this is an independent effect or a result of the influence of CCT on IOP measurements\(^4\). Precision in obtaining the IOP measurement also requires cooperation from the patients. Sometimes the patient is not able to cooperate due to co-existing illness. The GAT also has to be mounted in a slit lamp and the GAT has difficulty measuring IOPs' on irregular corneas. This is where the Tonopen tomometry comes in. The Tonopen tomometry, utilizing a small-size transducer tip, gently makes contact with the cornea, and displays the average IOP measurements quickly and easily. The Tonopen tomometry involves both applanation and indentation processes. It is a small, handheld, battery-powered device. It has an applanating surface with a tiny plunger protruding microscopically from the center. As the tonometer makes contact with the eye, the plunger gets resistance from the cornea and IOP producing a rising record of force by a strain gauge. At the moment of applanation, the force is shared by the footplate and the plunger resulting in a momentary small decrease from the steadily increasing force. This is the point of applanation, which is read electronically. Multiple readings are averaged. Because the area of applanation is known, the IOP can be calculated. The readings of the Tonopen tomometry correlate well with Goldmann tonometry within normal IOP ranges according to several studies\(^4\). It can be considered as an alternative tool for IOP measurements in patients who cannot cooperate properly with the GAT method. Measurements can be performed while the patient rests back in the chair, avoiding false high readings from increased intra-abdominal pressure (in obese patients leaning forward). Tonopen can also be used for patients with irregular corneas. In contrast to GAT, the Tonopen tomometer self-calibrates. However, there is increasing evidence that the Tonopen also has an effect of the CCT because it also utilizes the applanation principle\(^10\). According to a study by Mok KH et al reducing the applanation area reduces the difference between the applanation pressure and IOP, because of the reduced resistance offered by the cornea for a smaller contact area\(^10\). Tonopen has an applanation area smaller (2.36 mm\(^2\)) than that of the GAT (7.35 mm\(^2\))\(^10\). In this regard, the possibility of the effect of CCT on measuring the IOP using the Tonopen will also be compared with the GAT.

Thus, the aim of the study is to compare the Goldmann applanation tonometry with the Tonopen tomometry in obtaining the intraocular pressure to be of use in a routine ophthalmologic examination and the effect of corneal thickness on both methods.

METHODS

This is a prospective cross sectional study of 100 eyes of 50 individuals conducted at the Fatima Eye Laser Center, Fatima University Medical Center. The objectives of this study were to compare the GAT (Haag Streit) with Tonopen (Reichert) tomometer and the effect of CCT on both in normal individuals. IOP and CCT were recorded for both eyes of 50 normal subjects who had come for routine ophthalmologic examination. IOP was measured using GAT and Tonopen tonometer and CCT was measured using the Visante OCT. A single ophthalmologist measured all IOP readings using GAT and Tonopen tomometer. A trained ophthalmic staff measured the CCT. Each subject underwent all measurements in a single day. To avoid any intra-instrument variability, the same GAT and Tonopen tomometer were always used.

Inclusion criteria

Healthy individuals with IOP within normal range and CCT of any range with no upper age limit were included in this study. Informed consent was taken from every patient for measurement.

Exclusion criteria

Patients with glaucoma in one or both eyes, eyes with any corneal disorder like opaque or disfigured cornea, corneal ulcer, corneal inflammation, corneal dystrophy, corneal degeneration, keratoconus and large pterygium were excluded. Eyes with history of any other ocular disease or surgery were also not included in this study.

Measuring IOP

Each tonometer was used to take three readings in each subject, and the mean was recorded for each participant. Tonopen was used first and then GAT.

Subject was sat comfortably in the examination chair. Cornea was anesthetized with one drop of 0.5% proparacaine hydrochloride and was asked to close the eye for 5 minutes. A disposable tip diaphragm was used per patient. Subject was instructed to look straight ahead at a fixation target located at 5 m. To facilitate the hand-held tonometer movements, the hand of the user was placed on the subject's forehead for stability. After having pushed the button to initiate an IOP measurement and waited for the beep sound, the probe tip was gently positioned on the subject's cornea, right in the center to indent it. The Tonopen transducer was perpendicular to the apex of
the cornea. If the measurement was valid, the value appeared on the digital display. In this study only a statistical reliability of 5% was considered. When statistical reliability was less than 5%, the results were ignored, and the measurement was repeated.

The GAT was mounted on the end of the lever hinged on the slit-lamp. The prism has been disinfected with 70% isopropyl alcohol then rinsed in sterile water and wiped dry with a clean swab (residue of the disinfectant may cause a caustic burn on the cornea). The calibrated dial of the tonometer was set to 10 mmHg. The subject was sat comfortably at the slit lamp: at the right height, with their chin on the rest and their forehead against the headband. Magnification of the slit lamp was at ×10. A local anesthetic drop was instilled to the eye and then the fluorescein dye. Only a very small amount of dye is needed. In measuring the IOP in the right eye, the slit beam is shining onto the tonometer head from the subject’s right side; for the left eye, the beam should come from the subject’s left side. The subject was asked to look straight ahead, open both eyes wide, fix his or her gaze and keep perfectly still. With the thumb, the subject’s eyelid is gently held up taking care not to put any pressure on the eye. The blue light from the slit lamp was directed onto the prism head and the tonometer head is perpendicular to the eye. The tonometer is moved slowly forward until the prism rests gently on the center of the subject’s cornea. Using the other hand, the calibrated dial on the tonometer is turned clockwise until the two fluorescein semi-circles in the prism head are seen to meet and form a horizontal ‘S’ shape. (Note: The correct end point is when the inner edges of the two fluorescein semi-circle images just touch). The reading on the dial was recorded. The prism was withdrawn from the corneal surface and the same procedure was done for the other eye.

Measuring CCT

The CCT was measured using the Visante OCT, high-resolution, non-contact optical coherence tomography customized for anterior segment evaluations including glaucoma and refractive surgery. The subjects were positioned with the aid of a headrest, and internal fixation was used. A real-time charge-couple device displayed the position of the scan. The room illumination was 44 (SD 0.5) lux as determined by a TES-1330A light meter. The anterior segment single-line scan mode was used to scan the tomographical cross section of the anterior chamber. The images acquired should have had a reflection axis of the light source, which is an optically produced vertical white line through the center of the cornea. The CCT is measured.

Data was analyzed with Statistical Packages for the Social Sciences (SPSS) for windows. Paired t-test was used to compare the IOP readings between two tonometry methods. Pearson correlation method was used to verify correlations among tonometry readings and the CCT. The level of significance was set at p-value of <0.05.

RESULTS

Out of 100 eyes of 50 subjects included in this study, 46 (46%) were males and 54 (54%) were females. The minimum age of subject was 18 years, maximum was 69 years and mean age was 37.2 years standard deviation (SD) ± 14.24 years (Table 1 and Table 2).

Table 1: Gender

<table>
<thead>
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<th>Gender</th>
<th>Number</th>
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<tr>
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<tr>
<td>Females</td>
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Table 2: Mean age

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Table 3: Comparison between GAT and Tonopen tonometry in measuring IOP

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<th>Mean Difference</th>
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<tr>
<td>GAT</td>
<td>13.2200</td>
<td>-2.35000</td>
<td>.000</td>
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<tr>
<td>Tonopen</td>
<td>15.5700</td>
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Table 3 shows the mean comparison of GAT and Tonopen tonometry. The significance or p-value present a value less than 0.05 which indicates that we will reject the null hypothesis and therefore conclude that there is significant difference between GAT and Tonopen. The mean difference of -2.35 is negative which indicate that Tonopen have greater mean value than GAT. This tells us that Tonopen tonometry have greater values in terms of intraocular pressure readings than the GAT.

Figure 1 shows the graphical presentation of the comparison between Goldmann applanation tonometer and Tonopen tonometry.
Comparison between Goldmann Applanation Tonometry and Tonopen Tonometry in Measuring Intraocular Pressure

A study done by S-Y Hsu et al. using the Tonopen values would range from 12 - 23 mmHg. The results of the study using t-test revealed that there is significant difference between applanation and Tonopen. A mean difference of -2.35 indicates that Tonopen have the greater mean value than GAT. This tells us that Tonopen measurement is comparable to GAT in the normal pressure range although there is an overestimation in Tonopen tonometry measurement. The Tonopen can be used in routine ophthalmic examination, in screening patients for glaucoma, for intra operative pressure monitoring or any instances as long as the pressure is within normal range. A higher IOP warrants a repeat measurement using the gold standard, Goldmann applanation tonometer.

Another aim of the study is to determine whether the central corneal thickness (CCT) has an effect in the IOP measurements measured using the GAT and Tonopen. There are several reports on the relationship between CCT and IOP15-18. However present study focuses on the effect of CCT on the measurements measured using GAT and Tonopen. The current study revealed CCT and GAT presented a p-value (.005) less than 0.05 that conclude that there is relationship between CCT and GAT. A thicker CCT will give a higher intraocular pressure reading on GAT. The same finding is found with CCT and Tonopen with a p value of .011. Comparing the GAT and Tonopen, we can conclude that the GAT is more correlated with CCT than the Tonopen although both are correlated. A study done by Mok KH et al.9 stated that it is thought that the Tono-Pen may be less affected by CCT than the GAT because it applanates a smaller area of the cornea. However the r value of CCT and GAT and CCT and Tonopen revealed values of 0.278 and 0.252 respectively. This indicates a weak correlation between the CCT and the two methods of getting the IOPs. We can therefore conclude that Tonopen measurement is comparable to GAT in the normal pressure range although there is an overestimation in Tonopen tonometry measurement. The Tonopen can be used in routine ophthalmic examination, in screening patients for glaucoma, for intra operative pressure monitoring or any instances as long as the pressure is within normal range. A higher IOP warrants a repeat measurement using the gold standard, Goldmann applanation tonometer.

DISCUSSION

Goldmann applanation tonometer has been considered as the gold standard in obtaining the intraocular pressure for many years. Many methods have been introduced but none have been comparable to the ability of the GAT to detect the accurate IOP. The GAT as mentioned earlier needs cooperation from the patients and has to be mounted on a slit lamp. The aim of the study is to show that if the IOP obtained using the GAT is comparable to the Tonopen which is a hand held portable device and results could be obtained in seconds. Included in the study are patients with normal IOP ranges and normal ocular surface. The normal IOP pressure ranges from 10 - 21 mmHg. The results of the study using t-test revealed that there is significant difference between applanation and Tonopen. A mean difference of -2.35 indicates that Tonopen have the greater mean value than GAT. This tells us that Tonopen tonometry have greater values in terms of intraocular pressure readings than the Goldmann applanation. Therefore if the pressure ranges from 10 - 21 mmHg using the GAT, we can say that using the Tonopen values would range from 12 - 23 mmHg. A study done by S-Y Hsu et al. indicates that the difference between Tonopen and GAT readings is inversely related to IOP value. Tonopen readings were higher than GAT in the lower IOP range but lower in the higher IOP range. Minckler et al. found similar IOP readings using the Goldmann tonometer and Tonopen. They reported that Tonopen underestimated the IOP in eyes with a high IOP and overestimated the IOP in eyes with a low IOP. Thus the Tonopen accuracy of getting IOP will be limited to the normal ranges. In a study done by Michele Lester et al. Tonopen XL and Goldmann applanation measurements showed some difference; we do find Tonopen to be accurate for screening or for out-of-office examinations. Eisenberg et al. also stated that Tonopen was the most accurate instrument in the laboratory setting, but when used intraoperatorically it was the least accurate of the instruments they tested.

REFERENCES


Table 4: Correlation between CCT and GAT and Tonopen tonometry

<table>
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<tr>
<th>Model</th>
<th>Correlation (r)</th>
<th>Significance</th>
<th>Verbal significance</th>
</tr>
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<tbody>
<tr>
<td>CCT and GAT</td>
<td>0.278</td>
<td>.005</td>
<td>Significant</td>
</tr>
<tr>
<td>CCT and Tonopen</td>
<td>0.252</td>
<td>.011</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Table 4 shows the correlation between CCT and GAT and CCT and Tonopen. CCT and GAT present a p-value less than 0.05 which indicates that we will reject the null hypothesis and therefore conclude that there is significant relationship between CCT and GAT. The degree of correlation between the two is moderate with positive correlation that indicates that there is direct relationship between the two variables. This indicates that a thicker CCT will give a higher intraocular pressure measurement using GAT.

CCT and Tonopen present a value less than 0.05 which indicates that we will reject the null hypothesis and therefore conclude that there is significant relationship between CCT and Tonopen. The degree of correlation between the two is moderate with positive correlation, which indicates that there is direct relationship between the two variables. This indicates that as the CCT increases, the intraocular pressure reading of Tonopen tonometry also increases.


A Meta-analysis Study Exploring the Relationship between HIV and Tuberculosis Prevalence in African Population

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ABSTRACT

Background: TB and HIV co-epidemic is a major public health problem in many parts of the world, particularly in developing counties.

Objectives: The aim of the research is to summarize the relationship between HIV and tuberculosis prevalence in African population, using meta-analysis based on systematic review of published articles.


Results: In total, 7 studies were included in this review, with lack of homogeneity among results. The higher prevalence of HIV among TB is 44% compared to the prevalence of TB among HIV/AIDS population was 4.69%. Data was analysed using descriptive analysis such as prevalence percentage, mean, median, range and standard deviation.

Conclusions: The research analysis indicated that the prevalence of HIV/TB co-infection in Africa deserves special attention, screening of HIV among tuberculosis populations should be attached more importance, which would be much more helpful for treatment of both diseases in Africa.

INTRODUCTION

Since the beginning of the AIDS epidemic, more than 15 million Africans have died from this disease¹. Several studies show that Africa’s unfortunate position in the worldwide HIV epidemic, as the 19 countries worldwide with the highest prevalence of reported HIV infections are all African countries with more than 24.5 million, and more than 60% of the AIDS-infected population, South Africa is reported to have the largest population living with the disease, as well over 5 million people infected, followed by Nigeria in second². HIV has increased the incidence of tuberculosis (TB) by up to sevenfold in African countries, but antiretroviral therapy (ART) reduces the incidence of AIDS-related tuberculosis³. Similarly, tuberculosis is one of the most common infections and cause of death in HIV-infected persons in African countries⁴. In 2007, an estimated 13.7 million people had active tuberculosis with 9.3 million new cases and 1.8 million deaths; the annual incidence rate varied from 363 per 100,000 in Africa⁵. The rise in HIV infection and the neglect of tuberculosis control program have enabled a resurgence of tuberculosis⁶. The emergence of drug-resistant strains has also contributed to this new epidemic with, from 2000 to 2004, 20% of the tuberculosis cases being resistant to standard treatments and 2% resistant to second line drugs. The rate at which new tuberculosis cases occur in these
Identification of common causes of morbidity and mortality in HIV co-infected tuberculosis patients is a research priority identified by WHO. A recent review outlined the current state of knowledge of the interaction between HIV infection and tuberculosis in Africa. Most African cohort studies of tuberculosis patients characterized by HIV serostatus have been situated in large urban centres. However, there is little follow-up information on tuberculosis patients from rural areas of sub-Saharan Africa. Few studies have had two or more years of follow-up. There is limited data on the prevalence of HIV among tuberculosis patients. Similarly, the prevalence of TB among HIV patients in Africa is poorly understood.

The objective of the study is to investigate the relationship between HIV and tuberculosis in African population, using meta-analysis based on systematic review of published articles.

**METHODS**

**Research Design**

Meta-analysis is a statistical procedure that combines the results of different studies. In this study, we highlight the findings from a cohort study or cross-sectional studies conducted in African population.

Meta-analysis design will be more appropriate for studying the degree of relationship to which HIV contributes to tuberculosis in African region because of the design’s ability to collate different findings from several quantitative studies. Current epidemiological studies investigating the relationship between HIV and tuberculosis prevalence have demonstrated that people who are infected with HIV are at an increased risk of contracting tuberculosis. However, it is unclear to what extent the prevalence of HIV associated tuberculosis has increased, largely because notification of tuberculosis in the HIV infected population is unreliable and underestimates the problem.

This study will carry out a meta-analysis to estimate the overall strength of association between HIV and tuberculosis by summarizing the findings of studies conducted among people of African origin, which will assess relation between HIV and tuberculosis in African countries.

**Data collection method**

A coding system has been determined prior to selection of the articles, which will enable removal of researcher bias. Once coding has been determined all selected articles will be combined according to design and research question to bring similar and identical results and to relate all these studies to get reliable results. Meta-analysis software will be utilised to generate variances, odds ratio, effect size and clinically significance results. We hope that by combining different studies, we can increase the power and determine significance level more accurately and can influence clinical decision making.

**Population / Sample**

The target sample is published or unpublished articles exploring the relationship of TB and HIV in African countries.

**Search strategy**

We formulated a focused question as the first stage of evidence based practice (EBP) that helps to clarify the information needed and guide this search for the evidence. The acronym a PICO/PIO structure (Table 1) was used to develop key search terms.

Table 1: Developing key search terms

| Problem: Relationship between HIV and TB prevalence in African population? |
| Population HIV and tuberculosis population from Africa |
| Issue HIV and tuberculosis |
| Outcome Relationship between HIV and TB prevalence in Africa |

A structured search strategy (second stage of EBP) is used to identify different types of evidence relevant to the research question. A search strategy identifies potentially relevant articles that are assessed for eligibility using a standard form. A good search strategy is both comprehensive (Finding all the evidence related and not related to the research question) and specific (Finds evidence focused on the specific question).

A comprehensive search of the literature was first conducted to locate appropriate studies to be included in this meta-analysis. Articles were identified through searches on bibliographic electronic databases in University of Wolverhampton, Harrison learning centre. After passing authenticity to the Athens system of University and carried out through EBSCO host web the search was carried out mainly in AMED (2000 - 2011), CINAHL (2000 - 2011), SOCINDEX (2000 - 2011) and MEDLINE (1990 - 2011) and use of University of Wolverhampton Online Catalogue (OPAC) supplemented through hand searches of the books and Journals related to HIV and tuberculosis in Africa were included.

The two selection criteria were made on the search engine. Firstly, selection was based on title and abstract only which resulted in 2090 articles that were finalised by adding quantitative such as cross sectional or cohort study, the limiters resulting to 191 articles. The selection was further narrowed down on reading full text only resulting to 47 articles that were deemed to be relevant for the critical review. The search was further narrowed down by selecting recent journals published...
between January 2000 and December 2011 which gave 38 articles. Out of 38 articles, the limiters employed ensured that qualitative and discussion papers, papers whose data was irrelevant and papers which does not meet the criteria of research were not retrieved, hence, making the search more specific. Finally, 5 articles were selected based on inclusion criteria of study (Table 2).

Search strategy 1
Table 2: Flow chart for search strategy

<table>
<thead>
<tr>
<th>Articles identified by first search</th>
<th>191</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full text articles</td>
<td>47 (144 excluded from above)</td>
</tr>
<tr>
<td>Year 2000 - 2011</td>
<td>38 (9 excluded from above)</td>
</tr>
</tbody>
</table>

**Excluded articles**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrelevant to topic</td>
<td>28</td>
</tr>
<tr>
<td>Different study design</td>
<td>3</td>
</tr>
<tr>
<td>News/Bulletin</td>
<td>2</td>
</tr>
<tr>
<td>Total articles excluded</td>
<td>33</td>
</tr>
<tr>
<td><strong>Remaining eligible for study</strong></td>
<td><strong>5</strong></td>
</tr>
</tbody>
</table>

Table 3: Flow chart for search strategy

<table>
<thead>
<tr>
<th>Articles identified by search terms</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potentially relevant articles</td>
<td>5 (10 excluded from above)</td>
</tr>
</tbody>
</table>

**Excluded articles**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrelevant to topic</td>
<td>2</td>
</tr>
<tr>
<td>Already included articles</td>
<td>1</td>
</tr>
<tr>
<td>Total articles excluded</td>
<td>3</td>
</tr>
<tr>
<td><strong>Remaining eligible for study</strong></td>
<td><strong>2</strong></td>
</tr>
</tbody>
</table>

In order to determine appropriate papers for the study, the variables that can influence a search strategy for example, how the research study articles are selected or rated for inclusion or exclusion purposes, were determined as shown in Table 4.
Having considered the above inclusion and exclusion criteria, we used a two-stage search process employing the following key search terms to select the studies most appropriate to answer the research question. The first stage to planning a search of the electronic databases is to break the focused question down into keywords (and alternatives for each keyword) according to the PICO structure. These keywords can then be searched for individually (which will produce a comprehensive search), and then the key words can be combined (which will provide a specific search). Combination of keywords was undertaken using Boolean operators to search on the database as indicated in Table 5.

To continue with the search, all key words related to the same aspect of the ‘P’ element, ‘I’ element and ‘O’ element of the question were retrieved with the Boolean term ‘or’. Once the ‘or’ search was completed then, the operator ‘and’ was used to combine keywords related to different aspects of the PICO structure thereby narrowing the searches and making it more specific. Thus, failure to accomplish a comprehensive search of relevant studies undermines the conclusion of the study17.

**Coding of the studies**

Seven eligible studies were identified (Table 2 and 3) and located through the above search process, and coded using a detailed coding scheme based on a coding sheet developed by Brown et al18 (Table 6). We developed formalized process of coding sheets that are formatted for easy extraction of data and for establishing reliability and validity of the coding materials and has been used in seven separate studies. Coding was done prior to selection of the article to reduce bias. All studies were coded using a detailed coding scheme based on a coding manual developed. Coding process was watchfully performed and two independent rated coders and checked each study coding. Independent coder plays important role here as this process help to reduce the bias19. Finally after confirmation from two dependants’ coders seven studies were included for research.

Each of seven studies was systematically reviewed and then information has been entered. Two general categories of information were coded: study descriptors and effect size information. Study descriptors were methodological variables (e.g., random assignment, sample size), study context (e.g., year, type of publication), interventions type (e.g., intervention duration, aim, focus), subject characteristics (e.g. age, sex, ethnicity), and training materials characteristics (e.g., difficulty
Table 6: Coding format sheet

<table>
<thead>
<tr>
<th>Level</th>
<th>Methodological features</th>
<th>Substantive features</th>
<th>Intervention characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Identification of selected studies

The following final seven articles were identified from the search engine and illustrated on the template on the basis of database, Journal name, author name, date of publication, type of research design, population, issue and outcome of each study and summarised below.

Table 7: Seven articles identified

<table>
<thead>
<tr>
<th>No</th>
<th>Database/ Journal</th>
<th>Year</th>
<th>Author</th>
<th>Type of study</th>
<th>Population</th>
<th>Issue</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medline/ BMJ</td>
<td>1990</td>
<td>Elliott et al</td>
<td>Cross sectional study</td>
<td>Hospital based</td>
<td>To establish the prevalence of HIV infection among tuberculosis patients</td>
<td>The high prevalence of HIV among tuberculosis patients suggests that an epidemic of reactivating tuberculosis is arising in those who are infected with HIV</td>
</tr>
<tr>
<td>2</td>
<td>Medline/ BMJ</td>
<td>1991</td>
<td>De cock et al</td>
<td>Cross sectional study</td>
<td>Hospital based</td>
<td>To examine association of HIV-1 and HIV-2 among tuberculosis patients</td>
<td>35% of tuberculosis is attributable to HIV infection and only 4% specifically to HIV-2</td>
</tr>
<tr>
<td>3</td>
<td>Cinahl BMC Infectious Diseases</td>
<td>2008</td>
<td>Meintjes et al</td>
<td>Cross Sectional study</td>
<td>Hospital based</td>
<td>To measure patients and provider delay in diagnosis of tuberculosis in area with high prevalence of HIV</td>
<td>Delay in tuberculosis diagnosis was mainly due to provider delay and associated with increased mortality</td>
</tr>
<tr>
<td>4</td>
<td>Cinahl The Journal of Infectious Diseases</td>
<td>2010</td>
<td>Glynn et al</td>
<td>Retroseptive cohort study</td>
<td>Mine based</td>
<td>To examine the rate of recurrent tuberculosis in those with or without HIV</td>
<td>Tuberculosis recurrences rate due to re-infection were much higher than incidence rates</td>
</tr>
<tr>
<td>5</td>
<td>Medline The Journal of Infectious Diseases</td>
<td>2005</td>
<td>Sonnenberg et al</td>
<td>Retroseptive cohort study</td>
<td>Mine based</td>
<td>HIV increases the risk of tuberculosis but it will assess how this risk changes with time since HIV seroconversion</td>
<td>The risk of tuberculosis increases unexpectedly soon after infection with HIV.</td>
</tr>
<tr>
<td>6</td>
<td>Cinahl The Lancet</td>
<td>2001</td>
<td>Sonnenberg et al</td>
<td>Cohort study</td>
<td>Mine based</td>
<td>To find out whether recurrent tuberculosis among HIV positive and negative patients was due to relapse or reinfection</td>
<td>HIV increases the risk of recurrent tuberculosis because of an increased risk of reinfection</td>
</tr>
<tr>
<td>7</td>
<td>Medline BMC Public Health</td>
<td>2008</td>
<td>Ngowi et al</td>
<td>Cross sectional study</td>
<td>Hospital based</td>
<td>To examine the prevalence of undiagnosed tuberculosis and drug susceptibility among the HIV patients attending for treatment</td>
<td>High prevalence of tuberculosis found among HIV patients</td>
</tr>
</tbody>
</table>
Assessment of methodological quality of selected papers

In this critical review, we utilised the CASP (Critical Appraisal Skills Programme) framework to assess for methodological quality. In addition two independent assessors were engaged and were given the qualitative CASP tool to assess for methodological quality of identified articles. The use of two independent assessors was viewed as a way of minimising researcher bias thereby strengthening the review. In this study, we defined the inclusion and exclusion criteria clearly prior to engaging the independent assessors. This was to avoid the problems of quality scoring disagreements.

CASP tool utilised in this review comprises of ten questions that have a maximum score of six and giving a grand total of sixty. The rating ranges from 1 to 6, with 1 indicating that the criterion was not met and 6 indicating that the criterion was completely met. The highest scoring paper must score a grand total of sixty making it of best quality. Those papers scoring above fifty percent i.e. thirty and above will be considered and those that score thirty will be considered to be of poor quality and will be excluded from the study. We made an attempt to critically appraise the quality of seven retrieved papers using the CASP frame work for included research and how this may have affected quality of evidence of the articles has been summarised in Tables 8, 9, 10, 11, 12, 13, and 14.

Table 8: Study No 1: Impact of HIV on tuberculosis in Zambia: A cross sectional study20

<table>
<thead>
<tr>
<th>Screening for quality questions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was there a clear statement of the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>2. Is a quantitative methodology appropriate?</td>
<td>6</td>
</tr>
<tr>
<td>3. Was the research design appropriate to address the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>4. Was recruitment strategy appropriate to the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>5. Were the data collected in a way that addressed the research issue?</td>
<td>6</td>
</tr>
<tr>
<td>6. Has the relationship between researcher and participants been adequately considered?</td>
<td>6</td>
</tr>
<tr>
<td>7. Have ethical issues been taken into consideration?</td>
<td>5</td>
</tr>
<tr>
<td>8. Was the data analysis sufficiently rigorous?</td>
<td>6</td>
</tr>
<tr>
<td>9. Is there a clear statement of findings?</td>
<td>6</td>
</tr>
<tr>
<td>10. How valuable is the research?</td>
<td>6</td>
</tr>
</tbody>
</table>

In this research, the author clearly follows the CASP framework. The study had ethical approval from research and ethics committee of the University Teaching Hospital but did not mention anything about consent and confidentiality. Therefore, the researcher gave score 5 out of 6.

Table 9: Study No 2: Risk of tuberculosis in patients with HIV-1 and HIV-2 infections in Abidjan, Ivory Coast21

<table>
<thead>
<tr>
<th>Screening for quality questions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was there a clear statement of the aims of the research?</td>
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<tr>
<td>2. Is a quantitative methodology appropriate?</td>
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</tr>
<tr>
<td>3. Was the research design appropriate to address the aims of the research?</td>
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</tr>
<tr>
<td>4. Was recruitment strategy appropriate to the aims of the research?</td>
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<tr>
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<tr>
<td>6. Has the relationship between researcher and participants been adequately considered?</td>
<td>6</td>
</tr>
<tr>
<td>7. Have ethical issues been taken into consideration?</td>
<td>1</td>
</tr>
<tr>
<td>8. Was the data analysis sufficiently rigorous?</td>
<td>6</td>
</tr>
<tr>
<td>9. Is there a clear statement of findings?</td>
<td>6</td>
</tr>
<tr>
<td>10. How valuable is the research?</td>
<td>5</td>
</tr>
</tbody>
</table>

In this research, the author did not mention about any ethical approval from the participants and local concerned ethical committee before the start of the study. The study also did not take the consent from each participants and mention about their confidentiality throughout the research. Therefore, the researcher gave score 1 out of 6. Furthermore, the research conclusion was not mentioned clearly in the articles that question the reader about the validity of the research.

Table 10: Study No 3: Pulmonary tuberculosis among people living with HIV/AIDS attending care and treatment in rural Northern Tanzania22

<table>
<thead>
<tr>
<th>Screening for quality questions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was there a clear statement of the aims of the research?</td>
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</tr>
<tr>
<td>4. Was recruitment strategy appropriate to the aims of the research?</td>
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<tr>
<td>7. Have ethical issues been taken into consideration?</td>
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</tr>
<tr>
<td>8. Was the data analysis sufficiently rigorous?</td>
<td>6</td>
</tr>
<tr>
<td>9. Is there a clear statement of findings?</td>
<td>6</td>
</tr>
<tr>
<td>10. How valuable is the research?</td>
<td>6</td>
</tr>
</tbody>
</table>
In this research, the author clearly follows the CASP framework and the author also acknowledges the strength and limitation of the study which shows that the research is valid and acceptable flexibly.

Table 11: Study No 4: HIV-1 and recurrence, relapse, and reinfection of tuberculosis after cure: A cohort study in South African mine workers

<table>
<thead>
<tr>
<th>Screening for quality questions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was there a clear statement of the aims of the research?</td>
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<tr>
<td>2. Is a quantitative methodology appropriate?</td>
<td>6</td>
</tr>
<tr>
<td>3. Was the research design appropriate to address the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>4. Was recruitment strategy appropriate to the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>5. Were the data collected in a way that addressed the research issue?</td>
<td>6</td>
</tr>
<tr>
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</tr>
<tr>
<td>7. Have ethical issues been taken into consideration?</td>
<td>6</td>
</tr>
<tr>
<td>8. Was the data analysis sufficiently rigorous?</td>
<td>6</td>
</tr>
<tr>
<td>9. Is there a clear statement of findings?</td>
<td>6</td>
</tr>
<tr>
<td>10. How valuable is the research?</td>
<td>6</td>
</tr>
</tbody>
</table>

In this research, the author clearly followed the CASP framework for assessing the quality of the paper.

Table 12: Study No 5: High rates of recurrence in HIV-infected and HIV-uninfected patients with tuberculosis

<table>
<thead>
<tr>
<th>Screening for quality questions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was there a clear statement of the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>2. Is a quantitative methodology appropriate?</td>
<td>6</td>
</tr>
<tr>
<td>3. Was the research design appropriate to address the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>4. Was recruitment strategy appropriate to the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>5. Were the data collected in a way that addressed the research issue?</td>
<td>6</td>
</tr>
<tr>
<td>6. Has the relationship between researcher and participants been adequately considered?</td>
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</tr>
<tr>
<td>7. Have ethical issues been taken into consideration?</td>
<td>6</td>
</tr>
<tr>
<td>8. Was the data analysis sufficiently rigorous?</td>
<td>6</td>
</tr>
<tr>
<td>9. Is there a clear statement of findings?</td>
<td>6</td>
</tr>
<tr>
<td>10. How valuable is the research?</td>
<td>6</td>
</tr>
</tbody>
</table>

In this research, the author clearly followed the CASP framework for assessing the quality of the paper.

Table 13: Study No 6: How soon after infection with HIV does the risk of tuberculosis start to increase? A retrospective cohort study in South African gold miners

<table>
<thead>
<tr>
<th>Screening for quality questions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was there a clear statement of the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>2. Is a quantitative methodology appropriate?</td>
<td>6</td>
</tr>
<tr>
<td>3. Was the research design appropriate to address the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>4. Was recruitment strategy appropriate to the aims of the research?</td>
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</tr>
<tr>
<td>5. Were the data collected in a way that addressed the research issue?</td>
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<tr>
<td>6. Has the relationship between researcher and participants been adequately considered?</td>
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</tr>
<tr>
<td>7. Have ethical issues been taken into consideration?</td>
<td>6</td>
</tr>
<tr>
<td>8. Was the data analysis sufficiently rigorous?</td>
<td>6</td>
</tr>
<tr>
<td>9. Is there a clear statement of findings?</td>
<td>6</td>
</tr>
<tr>
<td>10. How valuable is the research?</td>
<td>6</td>
</tr>
</tbody>
</table>

In this research, the author clearly followed the CASP framework for assessing the quality of the paper.

Table 14: Study No 7: Patient and provider delay in tuberculosis suspects from communities with a high HIV prevalence in South Africa: A cross-sectional study

<table>
<thead>
<tr>
<th>Screening for Quality Questions</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Was there a clear statement of the aims of the research?</td>
<td>6</td>
</tr>
<tr>
<td>2. Is a quantitative methodology appropriate?</td>
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<tr>
<td>3. Was the research design appropriate to address the aims of the research?</td>
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<tr>
<td>4. Was recruitment strategy appropriate to the aims of the research?</td>
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</tr>
<tr>
<td>8. Was the data analysis sufficiently rigorous?</td>
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<tr>
<td>9. Is there a clear statement of findings?</td>
<td>6</td>
</tr>
<tr>
<td>10. How valuable is the research?</td>
<td>6</td>
</tr>
</tbody>
</table>

In this research, the author clearly followed the CASP framework for assessing the quality of the paper.
Validity, Reliability and Generalisability of the selected studies

We have considered the reliability, validity and generalisability in the research to assess the quality of the selected articles. According to the Nunnally, reliability refers to the extent to which results are consistent over time and are an accurate representation of the total population under study. In other words, if the results of a study can be reproduced under a similar method, then the research instrument is considered to be reliable. It is important to note, however, that as each type of measurement has a certain level of non-systematic error, and it is impossible to remove systematic error completely from the studies. Similarly, Cook and Campbell defined validity as the best available approximation to the truth or falsity of a given inference, proposition or conclusion. Others have explained that validity refers to whether the research truly measures what it intended to measure or how truthful the research results are. Finally, Generalisability is defined as the extent to which the findings obtained on a specific sample can be applied to the target population. This definition does not imply that all the characteristics of the sample should be similar to those of the target population, although it is intuitive that a lack of representativeness in the study sample will limit generalisability.

First paper (Table 8) to be reviewed is by Elliott et al. who focused on the impact of HIV and tuberculosis in Zambia using a study design which is cross-sectional. The author properly describes the objective of the study, that is to assess the prevalence of HIV infection among patients with tuberculosis in hospital based study in University Teaching Hospital outpatient clinic in Lusaka with sample size of 346 tuberculosis patients. The author correctly used the sample of subjects appropriate with regard to the population to which the findings will be referred. The data was collected from all participants via a questionnaire relating to history, clinical examination including radiological and laboratory were recorded anonymously for each patient. The study had taken ethical approval from concerned ethics committee but did not mention anything about consent and confidentiality. It can be argued that, the researcher would have not got through the ethics committee approval without proper consent from the participants of the study. The authors adequately described all the statistical procedures used in this study. The author justified the conclusion drawn from statistical analyses. However, the sampling techniques and some issue related to ethical approval were not properly explained in the study. In this paper, author did not mention about any ethical approval from the participants and the control used in this research is the representative the sample is and how reliable is the result. The study did not mention about any ethical approval from the participants and local concerned ethical committee. Moreover, the study did not take the consent from each participants and mention about their confidentiality throughout the research. The authors adequately described all the statistical procedures used in this study. The author correctly used statistical methods for the interpretation of data with well-presented tables. The author also justified the conclusions drawn from statistical analyses.

The second paper to be analysed is by De cock et al. In this paper, the researcher explored the prevalence of HIV-1 and HIV-2 infections in patients with tuberculosis and in blood donors in Abidjan. The author properly describes the objective of the study is to clarify the association between tuberculosis with HIV-2 by comparing the prevalence of HIV-1 and HIV-2 infections in patients with tuberculosis (cases) and in blood donors (controls). The author used the cross sectional survey in this research and clearly described the source of the subjects in the study. The design of the study is appropriate to the research objective. The author clearly described cross-sectional design would be the most appropriate for the study because the study explores the prevalence of a phenomenon, situation, problem, attitude, or issue by taking a cross section of the population at one time. In this paper, author did not mention about the sampling technique as it may question the readers about how representative the sample is and how reliable is the result. However, the controls used in this research is the representative of that in the general population. The author correctly used the sample of subjects appropriate with regard to the population to which the findings were considered. The study did not mention about any ethical approval from the participants and local concerned ethical committee. Moreover, the study did not take the consent from each participants and mention about their confidentiality throughout the research. The authors adequately described all the statistical procedures used in this study. The author correctly used statistical methods for the interpretation of data with well-presented tables. The author also justified the conclusions drawn from statistical analyses.

The third study (Table 10) is to be reviewed by Ngowi et al. In this paper, the author properly describes the objective of the study to address the extent of the tuberculosis among people living with AIDS attending care and treatment in hospital based study in Mbulu district, Tanzania with the sample size of 233 AIDS patients aged 12 - 55 years. The author used cross-sectional survey design in this study. The design of this study is appropriate to the objective of the research because the cross-sectional design is most appropriate for the study of prevalence of a phenomenon, situation, problem, attitude, or issue by taking a cross section of the population at one time. The author clearly described the selection process of the participants. The participants were recruited from the hospitals who were attending the HIV care and treatment clinic. Participants who were already diagnosed to have tuberculosis and started treatment were excluded from the study. The sample of patients in this study is appropriate with regard to the population to which the finding will be referred. The sample size based on pre-study of statistical power was not considered in this paper because the descriptive study would not need the statistical power. The satisfactory response was achieved from the participants in this study. The author clearly mentioned about the ethical issue in this research. The ethical protocol was sought from concerned committee before the start of the study. Oral informed consent was sought from the patients prior to
enrolment to study and for those who were below the age of 18 years permission was taken from parents or care takers. The authors adequately described all the statistical procedures used in this study. The author correctly used statistical methods for the interpretation of data with well-presented tables on the study. The author justified the conclusions made from statistical analysis. Moreover, the authors clearly describes the strength of the study is that the data comes from a clinic that takes care of the HIV/AIDS patients daily, so the study results reflect the real situation in a rural HIV clinic though the sample size was small. The author also argues about the limitation of the study is that it is hospital based and the patients included were those who were seriously ill. Thus the study might have missed the group of not seriously ill patients who opted not to attend the hospital for care. Also the culture medium used in the study lacks sensitivity so that the study might have missed some cases of tuberculosis. However, in a poor resource setting country like Tanzania the researcher used the available culture media to reflect the actual situation in this study.

The fourth study (Table 11) is to be revised by Sonnenberg et al. In this paper, the author described the issue clearly. The study investigates the recurrences of tuberculosis among HIV positive and negative South African gold mine workers and tries to find out whether recurrence of tuberculosis is due to relapse or reinfection and analysed the risk factors associated with these two mechanisms. The author used cohort study in this research for analysis of risk factors associated with relapse and reinfection and followed up a cohort of 326 South African gold miners from 1995 to 1998 and used correlations to determine the absolute risk of subject contraction. Similarly, a cohort is a group of people who share a common characteristic or experience within a defined period. The comparison group may be the general population, from which the cohort is drawn, or it may be another cohort of persons thought to have had little or no exposure to the substance under investigation, but otherwise similar. In this way, the author addressed the research question successfully in this study. The cohort recruited in acceptable way in this paper because the cohort was representative sample taken from South African gold miners. However, the potential limitation of the study is that the participants were lost during follow-up due to health condition. The ethical approval was received from concerned ethical committee before the start of the study.

The sixth study (Table 13) reviewed by Sonnenberg et al. In this paper, the author described the issue clearly. The study clearly describes the aim of the research is to investigate the infection with HIV increases the risk of tuberculosis but how this risk changes with time since HIV seroconversion. The author justified the use of retrospective cohort in this research. The cohort recruited in acceptable way in this paper because the cohort was representative sample taken from South African gold miners. Ethical approval was sought from concerned ethical committee before the start of the study. However, the limitation of study is that the detection bias has been occurred.

The final study (Table 14) reviewed by Meintjes et al. In this study, the author properly describes the objective of the study is to describe patients and provider delay in the diagnosis of tuberculosis in patients with suspected tuberculosis requiring admission to determine its risk factor for delay and its consequences. The author used the cross sectional survey in this research and clearly described the source of the participants in the study. The design of the study is appropriate to the research objective. The author clearly described cross-sectional design would be the most appropriate for the study because the study explores the prevalence of a phenomenon, situation, problem, attitude, or issue by taking a cross section of the population at one time. Ethical approval and written consent was sought from the participants and concerned ethical committee. The authors adequately described all the statistical procedures with interpretation of data with well-presented tables in the study. However, several limitations have been occurred in the study. Firstly, the study relied upon patient’s recall of the history of disease rather than document record which question the reader about the validity and reliability of the results. Finally, the results are not generalisable to all patients presenting to health services with tuberculosis symptoms because the study was conducted at secondary hospital so patients who were sick enough to require referral for admission were included.

Ethical approval

This critical review did not have direct contact with human beings therefore did not require ethical approval. However, according to the University of Wolverhampton requirements, ethical release letter was approved to continue with the research by the CHSI (Centre for Health and Social care Improvement) in the University of the Wolverhampton.

RESULTS

A total of 206 articles published in English Language were identified. After excluding 154 articles without full text and 9 original articles without prevalence data based on abstract evaluation, 36 studies addressing tuberculosis and HIV co-infection were selected, and the full-text versions were
A Meta-analysis Study Exploring the Relationship between HIV and Tuberculosis Prevalence in African Population

retrieved. Of these, 29 were excluded based on the exclusion and inclusion criteria of the study. Finally 7 studies were included in this review (Table 2 and Table 3).

Seven studies, from 4 different countries or provinces, addressing TB prevalence among HIV patients are presented in Table 15 and similarly, HIV prevalence among TB patients are presented in Table 16. Four of them were hospital based and 3 were mine based studies. Sample size of the studies ranged from 20 to 9981. A total of 13,375 subjects were included in the meta-analysis.

Table 15: The prevalence of tuberculosis among HIV patients

<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Total HIV patients</th>
<th>Tuberculosis infected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sonnenberg et al23</td>
<td>326 (2.99%)</td>
<td>65 (0.59%)</td>
</tr>
<tr>
<td>Ngowi et al22</td>
<td>233 (2.14%)</td>
<td>20 (0.18%)</td>
</tr>
<tr>
<td>Glynn et al24</td>
<td>342 (3.14%)</td>
<td>115 (1.05%)</td>
</tr>
<tr>
<td>Sonnenberg et al25</td>
<td>9981 (91.72%)</td>
<td>313 (2.87%)</td>
</tr>
<tr>
<td>Total percentage (%)</td>
<td>10,882 (100%)</td>
<td>513 (4.69%)</td>
</tr>
<tr>
<td>Mean</td>
<td>2720.5</td>
<td>128.25</td>
</tr>
<tr>
<td>Median</td>
<td>334</td>
<td>90</td>
</tr>
<tr>
<td>Range</td>
<td>9,748</td>
<td>293</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>4840.57</td>
<td>258.31</td>
</tr>
</tbody>
</table>

The results were analysed from each study to answer the research question. Table 15 shows the prevalence of tuberculosis infection among HIV patients. A research conducted by Sonnenberg et al23 proposed that out of 326 (2.99%) patients with HIV, 65 (0.59%) of them developed recurrence of tuberculosis in the study. Similarly, Ngowi et al22 shows that a total number of 233 (2.14%) HIV patients were included in the study out of 20 (0.18%) of the patients have developed tuberculosis which is confirmed by acid fast bacillus (AFB) culture positivity. Additionally, a research did by Glynn et al24 illustrated that the recurrences of tuberculosis cases were found to be 115 (1.05%) in 342 (3.14%) HIV infected people. Furthermore, Sonnenberg et al25 showed that the prevalence of 313 (2.87%) tuberculosis cases was found in 9981 (91.72%) patients with HIV. Similarly, the prevalence of tuberculosis among HIV infected people also shows the mean of 128.25, median of 90, range of 293 and standard deviation of 258.31 compared to the HIV infected people with the mean of 2720.5, median of 334, range of 9748 and standard deviation of 4840.57

On the contrary, Table 16 shows the prevalence of HIV infection among tuberculosis patients. A study conducted by Elliott et al20 shows that out of 346 (13.87%) patients with tuberculosis, 206 (8.26%) were found to be positive for HIV. Similarly, De cock et al21 included 2043 (81.94%) patients with tuberculosis in which 821 (32.93%) had been found positive for HIV in the study. Finally, Meintjes et al26 shows that out of 104 (4.17%) patients with tuberculosis, 70 (2.80%) patients were found to develop HIV infection. Similarly, the prevalence of HIV infection among tuberculosis people shows the mean of 365.66, median of 206, range of 751 and standard deviation of 693.08 compared to the tuberculosis people with the mean of 831, median of 346, range of 1939 and standard deviation of 1830.04. The results show that the higher prevalence of HIV infection among tuberculosis patients compared to the lower prevalence of tuberculosis among HIV patients in Africa.

Therefore it has been found that among seven articles included in the research, three studies have shown the higher prevalence of HIV infection among tuberculosis patients (44%) whereas four studies have shown the lower prevalence of tuberculosis among HIV patients (4.69%).

The research shows that the prevalence of HIV infection among tuberculosis patients is higher although the prevalence of tuberculosis is low among HIV patients.

DISCUSSION

The studies show the higher prevalence of HIV infection among tuberculosis patients in Africa20,21,26. Similarly, the research also suggests that an epidemic of reactivating tuberculosis is arising in those infected with HIV. It was also observed that there was no difference in prevalence of HIV between relapsed and new cases of tuberculosis20. Another research concluded that the delay in the diagnosis of tuberculosis among HIV patients was
more attributable to provider than the patient’s delay. Further study shows the higher prevalence of HIV-1 and HIV-2 among tuberculosis patients in West Africa. However, we excluded the prevalence rate of HIV-2 from the study and is mainly focused on HIV-1. Similarly, the four of the studies included in the research were from South Africa. Few of the studies were from Zambia, Abidjan and Tanzania. Therefore, the research findings may not be generalizable to whole population of Africa.

HIV infection leads to both greatly increased rate of reactivation of latent tuberculosis infection and a greatly enhanced susceptibility to progression to active tuberculosis following new infection. Current strategies for the control of tuberculosis are not sufficient in these dually burdened areas in Africa and the research need to identify additional strategies and new approaches to control tuberculosis in high HIV prevalence settings. One of the research conducted in South Africa by Badri et al. shows that the onset of tuberculosis in HIV infected patients is associated with an increased risk of AIDS and death.

Although a causal link cannot be established in an observational study. However, the research findings support the view that prolonged immune activation induced by tuberculosis leads to prolonged increased HIV replication and consequent accelerated disease progression. The strong link between tuberculosis and HIV has been shown in sero-prevalence surveys in places as diverse as Burundi, the United States, Tanzania and Haiti. In a study conducted in Lusaka shows that the prevalence of HIV infection among tuberculosis patients was found 60% which is higher than normal population. According to the Harries et al., the HIV prevalence in tuberculosis patients is up to 75%. Tuberculosis is the most frequent cause of death among HIV-infected persons in sub Saharan Africa. Tuberculosis related deaths are expected to be doubled as the immune system of HIV-infected persons becomes more vulnerable to active disease. In much of Africa, the spread of HIV is primarily responsible for driving the parallel epidemic of tuberculosis, often at the rate of 6% per year.

For many years, the efforts to tackle TB and HIV have been largely separate, despite the overlapping epidemiology. However, it is now increasingly recognized that only through combined and coordinated efforts for both TB and HIV can this dual epidemic be halted. There is an increasingly alarming trend in the overall incidence of TB across the globe. While several regions seem to be experiencing declines in TB incidence, there is a dramatic increase in Africa. HIV-positive individuals are at greater risk of contracting such opportunistic infections such as TB, and treatment for co-infected patients is complicated by interactions between prescribed drugs. Furthermore, TB control efforts have been hampered in countries that are overwhelmed by the HIV/AIDS epidemic.

A number of important limitations of the current study need to be considered. First, as positive results are more likely to be published, publication bias cannot be excluded completely, although no major publication bias was observed in the meta-analysis. Second, due to the specific high-risk behaviors for TB and HIV infection, the selection of subjects might make results prone to potential selection bias even though two studies performed among prisoners and injecting drug users were excluded. Third, most of the included studies were all published in English language. However, we acknowledge that due to time factor, the language bias could not be excluded from the study. Further, the research includes the articles mostly from the South Africa so the results of the research cannot be representative of the whole population of Africa. Moreover, the research findings were unable to calculate the relative risk and odds ratio due to lack in homogeneity among included studies. However, we calculated the descriptive analysis using mean, median, mode and standard deviation and prevalence percentage. Finally, due to the limited number of relevant studies, incidence rate of TB and HIV co-infection was not addressed in this study.

CONCLUSIONS

The most significant findings emerging from this study is that the higher prevalence of HIV infection among tuberculosis patients and the lower prevalence of tuberculosis infection in HIV population in Africa.

The present study confirms previous findings and contributes additional evidence that suggests HIV and tuberculosis are the one of most common pandemics affecting the world till today. Further, the prevalence of HIV and TB infection is extremely high in African countries accounting for millions of death per annum.

Recommendations

The research recommends that health awareness, education, early diagnosis, effective treatment and preventive approaches should be attached more importance for combating this immense health problem throughout the world and especially among African population. Moreover, effective health policies and health intervention should be brought up by health agencies and Government in order to tackle the situation. The research also recommends that further research needs to be carried out in different parts of Africa to get the exact in depth knowledge of the situation regarding HIV and TB among African population.

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First and foremost I would like to thank Supervisor, staff of University Wolverhampton for their unflagging support, invaluable guidance and timely support through out the work. Additionally, I thank University of Wolverhampton ethical committee for allowing the project to be undertaken.
REFERENCES


Study Determining the Occurrence of Anxiety Symptoms Among the Preoperative Cases

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2,3Associate Professor, Department of Psychiatry
Gandaki Medical College & Teaching Hospital, Pokhara, Nepal

ABSTRACT
Background: Preoperative anxiety is described as an unpleasant state of uneasiness or tension that is secondary to a patient being concerned about a disease, hospitalization, anesthesia and surgery, or the unknown. Preoperative anxiety and stress are common in patients awaiting surgical procedures. Several studies have shown that people undergoing surgery do develop preoperative anxiety symptoms that can lead to the need of higher amount of anesthetics, affects level of recovery and postoperative pain.

Methods: This was a hospital based, cross-sectional, collaborative study between the Department of Anesthesia and Psychiatry. The duration of study was 3 months, from January to March, 2015. After obtaining the ethical clearance, consenting adult elective surgical patients who fulfilled the inclusion criteria were recruited. The checklist was administered to each one of the subjects by the same anesthetist. In cases of illiterate subjects checklist was read to them by the same anesthetist. Its contents were basic demographic data followed by tick mark of presence of anxiety symptoms based on ICD-10 criteria.

Results: The total numbers of subjects were 150. The age of the patients ranged from 16 to 82 years. Out of 150 cases, 89 (59.4%) had experienced one or more anxiety symptoms. Our study also had the majority of female participants (60%) and major bulk of the age group was young patients belonging to 21 - 30 years (38.6%). The five most common anxiety symptoms in decreasing order were: numbness or tingling sensation (42%), palpitation (33.3%), sweating (28.6%), nausea and abdominal distress (26%), and fear of dying (13.3%).

Conclusions: Greater number of the study participants admitted that they had one or more anxiety symptoms. Majority of the participants were females and belonged to young age group. Somatic symptoms are more likely to be the presentation of anxiety.

INTRODUCTION
Anxiety is very likely to occur under stressful conditions. Persons undergoing any major surgery are not exceptions as well. Boker et al reported that 60% of patients who present for elective surgery are known to experience anxiety1.

Stress is basically defined as an internal state caused by physical demands on the body or by environmental and social situations which are evaluated as potentially harmful. Such physical, environmental and social causes of stress are known as stressors. Of the several stressors, physical demands on the body can occur due to diseased conditions. Based on the Social Readjustment Rating Scale, that measures the strength...
of stressors, major personal injury or illness is one of the top seven life events that are considered to be stressful. Several studies have shown that people undergoing surgery do develop preoperative anxiety symptoms that can lead to the need of higher amount of anesthetics, affects level of recovery and postoperative pain

The heart rate and systolic pressure rise, the skin is pale and often sweaty, and the veins are characteristically constricted. There may be ventricular ectopic beats or in extreme circumstances ventricular fibrillation. Greater distress or anxiety prior to surgery is associated with a slower and more complicated postoperative recovery. Pre-operative reassurance can only hope to be successful if it is appropriate, that the potential anxieties of the patient are discussed and that new anxieties are not introduced.

So the current study was carried out to determine the occurrence of anxiety symptoms among the preoperative patients scheduled to undergo elective surgery.

METHODS

This was a hospital based cross-sectional study conducted at Gandaki Medical College Teaching Hospital, a tertiary care centre in Western region of Nepal. It was a collaborative study between the Department of Anesthesia and Psychiatry. The duration of study was 3 months, from January to March, 2015.

After obtaining the ethical clearance, consenting adult elective surgical patients who fulfilled the inclusion criteria were recruited. Total cases included in the study were 150. All the subjects involved were requested to complete a proforma during the pre-anesthetic assessment, which was usually done on the evening before surgery. The checklist was administered to each one of the subjects by the same anesthetist. In cases of illiterate subjects, checklist was read to them by the same anesthetist. Its contents were basic demographic data followed by tick mark of presence of anxiety symptoms based on ICD-10 criteria.

Inclusion and exclusion criteria

Subjects included in the study were consenting adults (age between 16 to 82 years) undergoing various elective surgeries who were cognitively able to respond to questions. Patients with hypertension, chronic obstructive pulmonary disease, asthma, disease of the central nervous system, fever, known psychiatric illness and substance use, those on any type of anxiolytic medication and non-consenting subjects were excluded from the study.

Anxiety symptoms were based on ICD-10 criteria. According to ICD-10, anxiety symptoms are grouped under 4 categories. Those being: 1. Autonomic arousal symptoms, 2. Symptoms involving chest and abdomen, 3. Symptoms involving mental state, and 4. General symptoms.

Anxiety symptoms under group 1 are palpitations, sweating, trembling and dry mouth (not due to medication or dehydration).

Anxiety symptoms under group 2 are breathing difficulty, choking feeling, chest pain or discomfort and nausea or abdominal distress.

Anxiety symptoms under group 3 are feeling dizzy or unsteady or faint or light-headed, derealization or depersonalization, feeling of losing control or going crazy or passing out and fear of dying.

Anxiety symptoms under group 4 are hot flushes or cold chills and numbness or tingling sensations.

All the data were noted on the proforma developed for this particular study and later analyzed and discussed.

RESULTS

The total number of subjects were 150 after excluding those patients who refused to participate in the study despite fulfilling the inclusion criteria. The age of the patients ranged from 16 to 82 years. Out of 150 cases, 89 (59.4%) had experienced one or more anxiety symptoms.

Table 1: Showing various patients’ profile

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>60</td>
<td>40%</td>
</tr>
<tr>
<td>Females</td>
<td>90</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age groups in years</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 - 20</td>
<td>11</td>
<td>7.3%</td>
</tr>
<tr>
<td>21 - 30</td>
<td>58</td>
<td>38.6%</td>
</tr>
<tr>
<td>31 - 40</td>
<td>31</td>
<td>20.6%</td>
</tr>
<tr>
<td>41 - 50</td>
<td>19</td>
<td>12.6%</td>
</tr>
<tr>
<td>51 - 60</td>
<td>20</td>
<td>13.3%</td>
</tr>
<tr>
<td>61 - 70</td>
<td>8</td>
<td>5.3%</td>
</tr>
<tr>
<td>&gt; 70</td>
<td>3</td>
<td>1.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patients with anxiety symptoms</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>61</td>
<td>40.6%</td>
</tr>
<tr>
<td>One or more anxiety symptoms</td>
<td>89</td>
<td>59.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method of anesthesia</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal</td>
<td>36</td>
<td>24%</td>
</tr>
<tr>
<td>General</td>
<td>114</td>
<td>76%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Various surgical disciplines</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orthopedics cases</td>
<td>19</td>
<td>12.6%</td>
</tr>
<tr>
<td>ENT cases</td>
<td>33</td>
<td>22%</td>
</tr>
<tr>
<td>Gynae and Obst cases</td>
<td>33</td>
<td>22%</td>
</tr>
<tr>
<td>Surgery cases</td>
<td>65</td>
<td>43.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
Table 2: Showing frequency of anxiety symptoms based on ICD-10 criteria among 150 pre-operative cases

<table>
<thead>
<tr>
<th>Anxiety symptoms based on ICD-10</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group 1: Autonomic arousal symptoms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palpitations</td>
<td>50</td>
<td>33.3%</td>
</tr>
<tr>
<td>Sweating</td>
<td>43</td>
<td>28.6%</td>
</tr>
<tr>
<td>Trembling</td>
<td>12</td>
<td>8%</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>10</td>
<td>6.6%</td>
</tr>
<tr>
<td><strong>Group 2: Symptoms involving chest and abdomen</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breathing difficulty</td>
<td>8</td>
<td>5.3%</td>
</tr>
<tr>
<td>Choking feeling</td>
<td>17</td>
<td>11.3%</td>
</tr>
<tr>
<td>Chest pain or discomfort</td>
<td>19</td>
<td>12.6%</td>
</tr>
<tr>
<td>Nausea or abdominal distress</td>
<td>39</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Group 3: Symptoms involving mental state</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeling dizzy or unsteady or faint or light-headed</td>
<td>7</td>
<td>4.6%</td>
</tr>
<tr>
<td>Derealization or depersonalization</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Feeling of losing control or going crazy or passing out</td>
<td>8</td>
<td>5.3%</td>
</tr>
<tr>
<td>Fear of dying</td>
<td>20</td>
<td>13.3%</td>
</tr>
<tr>
<td><strong>Group 4: General symptoms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot flushes or cold chills</td>
<td>15</td>
<td>10%</td>
</tr>
<tr>
<td>Numbness or tingling sensations</td>
<td>63</td>
<td>42%</td>
</tr>
</tbody>
</table>

DISCUSSION

Preoperative anxiety is described as an unpleasant state of uneasiness or tension that is secondary to a patient being concerned about a disease, hospitalization, anesthesia and surgery, or the unknown. Preoperative anxiety and stress are common in patients awaiting surgical procedures. Anxiety in surgical patients is found to be associated with higher doses of anesthetic induction agents and postoperative analgesic drugs and slower and complicated recovery. Therefore, the most important single reason for pre-medicating patients before surgery is to reduce anxiety because if anxiety is sufficiently marked, it causes all the signs of sympathetic stimulation and stress. Proper management of fear and anxiety by anesthesiologists may provide better preoperative assessment, less pharmacological premedication, smoother induction and may be even better outcome.

The incidence of preoperative anxiety has been estimated to vary from 11 to 80% in the adults. The prevalence of preoperative anxiety further depends on the patient group. According to studies, a high prevalence is found in females, relatively young patients, patients who ask many questions about the surgery, and patients without prior surgery experience. Gender and age especially have a correlation with preoperative anxiety. In addition to that, the frequency can vary depending on the method used for measuring the anxiety. Pre-operative anxiety may be objectively evaluated by different methods. Mostly used questionnaires are Amsterdam Preoperative Anxiety Information Scale (APAIS), Spielberger’s State-Trait Anxiety Inventory (STAI-State), Hospital Anxiety and Depression Scale (HADS) and 100mm Visual Analogue Scale (VAS).

For our study purpose, we developed our own proforma to assess the anxiety symptoms. This method is likely to yield a different outcome as it lacks standardization of measuring scales. In our study we had looked into the occurrence of anxiety symptoms in pre-surgical cases of various surgical disciplines. What that needs to be cleared is that we are not dealing with anxiety disorder per se. Very few (5 cases) had fulfilled the diagnostic criteria of panic attack but those were not included in the study. Out of 150 cases, 89 (59.4%) had experienced at least one or more anxiety symptoms based on the checklist developed for the study.

In the study, subjects expressed varying symptoms of anxiety on which they were questioned. The five most common anxiety symptoms in decreasing order were numbness or tingling sensation (42%), palpitation (33.3%), sweating (28.6%), nausea and abdominal distress (26%), and fear of dying (13.3%). Thus, somatic symptoms are more likely to be the presentation of anxiety in preoperative cases.

Having discussed so far, it is needful to add that, the level of preoperative anxiety depends on several other factors. These are for example: (i) socio-demographic characteristics such as age, sex, current partnership and level of educational background, (ii) characteristics of the medical surgery such as the underlying illness, the expected success, possible complications, previous surgeries, duration of hospital stay, the kind of preoperative information or the method of anesthesia, and (iii) psychosocial variables, such as the general level of anxiety, personality characteristics, psychological or psychiatric comorbidity, sensitivity to pain, social support, life satisfaction or coping style.

CONCLUSIONS

Greater number of the study participants admitted that they had one or more anxiety symptoms. Majority of the participants were females and belonged to young age group. Somatic symptoms are more likely to be the presentation of anxiety.

Limitations

The study lacked the homogeneous participants in terms of gender, age group and types of surgical disciplines and the use of standardized questionnaire.
REFERENCES


Histological Changes in Liver and Kidney Following Feeding of *Periploca calophylla* in Rodents

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**ABSTRACT**

**Background:** *Periploca calophylla* (Wight Falconer) of family Asclepiadaceae, locally known as ‘shikari laharo’ is a trailing shrub. The plant is reported to have antiinflammatory, antipyretic and analgesic properties. The whole part of the plant is used as medicine in the Midhill district of Nepal. There is no published report yet regarding systematic study of effect of this plant despite its widespread use in Nepalese folk medicine as far as literature review is done till date.

**Objectives:** The aim of the present study is to establish the safety of the whole *Periploca calophylla* plant focusing on its histological changes in liver and kidney after feeding the plant to rodents for long duration i.e. one month.

**Methods:** 20 adult rodents (10 cases and 10 controls) out of which 10 cases were fed 2 grams of parts of *Periploca calophylla* like stalk and leaves per day for one month along with its normal diet and 10 controls were fed with normal diet only. After one month all 20 rodents were sacrificed. Gross morphology and histological features of liver and kidney were observed.

**Results:** There was reversal of histopathological changes both in liver and kidney as a mild toxicity of *Periploca calophylla*. There was reduction in urinary space dimension in renal cortex in experimental groups. In liver the histological observation revealed that there were indistinct cell boundaries, increased intracellular deposits in cytoplasm of hepatocytes and wide sinusoidal spaces in experimental groups.

**Conclusions:** There was reversal of histopathological changes both in liver and kidney as a mild toxicity of *Periploca calophylla* when given 2 gm per day.

**INTRODUCTION**

Two hundred *Periploca* species and around 60 genera are found in tropical and temperate regions of the world, in tropical Africa, Western Mediterranean, and Asian countries like Nepal, China, Turkey etc. In Chinese medicine, some of them are used in the treatment of tumors and cancer, especially *P. sepium*, *P. calophylla*, *P. nigrescens*, and *P. aphyll*. CNS stimulating drugs including *Periploca* species have been reported by Zhou and co-workers.

*Periploca calophylla* (Wight Falconer) of family Asclepiadaceae locally known as ‘shikari laharo’, is a trailing shrub having stalked leaves of size 3.5 - 8.5 cm long and 0.3 - 1.7 cm wide which are lanceolate, long acuminate, leathery and shiny. Flowers are pinkish in lax cymes and fruit a follicle,
cylindrical. It flowers in April – May, and fruits in November - January. It propagates by seeds and is distributed throughout Nepal at 1500 - 2100 meters in shady places, and also found in Northern India, Bhutan, Tibet and Central West China. 

Aryal et al reported that the whole part of the plant is used as medicine in the Midhill district of Nepal. The whole plant of *Periploca calophylla* locally known as Nai Jiang teng in Yunan province of China among Yao communities is used for injuries for falls, rheumaltalgia, poison score and red turgescence. The plant is reported to have antinfiammatory, antipyretic and analgesic properties.

Medicinal plants contain physiologically active principles that over the years have been exploited in traditional medicine for the treatment of various ailments. Different phytochemical studies have reported that the plant *Periploca calophylla* contains mainly pregnane-type diterpenes, which could be responsible bioactive compound in that plant. Three new triterpenoid acids of the oleanane series were isolated from twigs of *Periploca calophylla*. A new pregnane ester genin, plocigenin, and a new pregnane ester diglycoside, plocin were isolated from the dried twigs of *Periploca calophylla*. A new pregnane ester from diglycoside of ornogenin named plocicine was isolated from the dried twigs of *Periploca calophylla*. Calocinin was isolated from twigs of *Periploca calophylla* and its structure established as 3-O-β-L-2, 6-dideoxyfucopyranoside.

The traditional use of plant and plant resources has a long history in Nepal and its use is rapidly spreading due to the history in Nepal and its use is rapidly spreading due to the reactions and poisonings associated with the use of herbal medicines have increasingly been reported. Herbal use has been associated with organ toxicities of heart, liver, blood, kidneys, central nervous system, and skin and carcinogenesis. Despite widespread use of plant resources in traditional medicines, bioassay analysis of very few plant species have been conducted to investigate their medicinal properties, and to ascertain safety and efficacy of traditional remedies. There is no published report yet regarding systematic study of effect of this plant despite its widespread use in Nepalese folk medicine as far as literature review is done till date.

**OBJECTIVES**

The aim of the present study is to establish the safety of the whole *Periploca calophylla* plant focusing on its histological changes in liver and kidney after feeding the plant to rodents for long duration i.e. one month. To assess the effect of *Periploca calophylla* on liver and kidney by studying histological changes on those organs following feeding of *Periploca calophylla* (2 gm per day) to rodents.

**Research hypothesis**

*Periploca calophylla*, if fed 2 gm per day, has effect on liver and kidney.

**METHODS**

20 adult rodents (10 for cases and 10 for controls) out of which 10 cases were fed 2 grams of parts of *Periploca calophylla* like stalk and leaves per day for one month along with its normal diet i.e. Bengal grams and 10 controls were fed 2 grams of cabbage leaves along with normal diet i.e. Bengal grams. After one month, all 20 rodents were sacrificed by spinal traction method following anesthetizing with ether. Then dissection was carried out to procure liver and kidney. Gross morphology of liver and kidney were observed and noted down. Weight of liver and kidney were recorded and compared between cases and controls. Then tissues were cut into pieces and fixed in 10% formalin. Tissue processing was done step by step and histology slides were made for histological examination.

**Statistical analysis**

After completion of the study, data was compiled and double checked in the microsoft excel software program. Using the SPSS soft were appropriate statistical tool like student’s unpaired t-test was applied to determine the significance of difference of variables i.e. size of cells, body weight of rats and weight of kidneys and livers of rats between test animals and control animals. Statistical significance was considered as p<0.05.

**RESULTS**

20 adult rodents (10 for cases and 10 for controls) were used for the study. The body weight of all 20 rodents were taken before and after the experimental procedure (Table 1).

<table>
<thead>
<tr>
<th>S No</th>
<th>Parameter</th>
<th>Before procedure</th>
<th>After procedure</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body weight of controls (gm)</td>
<td>152± 11.2</td>
<td>156± 12.8</td>
<td>0.15</td>
</tr>
<tr>
<td>2</td>
<td>Body weight of cases (gm)</td>
<td>155± 10.5</td>
<td>130± 11.6</td>
<td>0.01</td>
</tr>
<tr>
<td>P value</td>
<td></td>
<td>0.14</td>
<td>0.01</td>
<td></td>
</tr>
</tbody>
</table>

The Table 1 reveals that there was no significant difference between mean body weight of controls and cases before the procedure (p>0.05) but there was significant difference between mean body weight of controls and cases after the procedure (p<0.05). Likewise there was no significant difference between mean body weight of controls before and after the procedure (p>0.05), however there was significant difference between mean body weight of cases before and after the procedure (p<0.05).
Morphological features of kidney and liver

The gross morphology of liver and kidney showed smooth surface texture, regular outline, soft consistency in both cases and controls.

Fig1: Wide urinary space dimension in renal cortex in controls as compared to that of experimental (cases) groups.

Histopathological features of kidney

Histopathological observation revealed that there was reduction in urinary space dimension in renal cortex in experimental (cases) groups as compared to that of controls (Fig1 and 2). Otherwise features of renal medulla, renal tubules showed normal histological features both in cases (experimental) and controls.

Histo-pathological features of liver

In liver, the histopathological observation revealed that there was indistinct cell boundaries, increased intracellular deposits in cytoplasm of hepatocytes and wide sinusoidal spaces in experimental (cases) group where as normal histological features were observed in control groups (Fig 3 and 4). PAS (Periodic acid Schiff) stain was positive for hepatocytes in liver of experimental groups indicating glycogen deposits (Fig 5).

Fig 3: Normal histological features were observed in liver of control groups.

Fig 4: Indistinct cell boundaries; increased intracellular deposits in cytoplasm of hepatocytes and wide sinusoidal spaces in experimental (cases) group.
Fig 5: PAS (Periodic acid Schiff) stain was positive for hepatocytes in liver of experimental groups indicating glycogen deposits.

**DISCUSSION**

As there was significant difference between mean body weight of controls and cases after the procedure (p<0.05) and there was also significant difference between mean body weight of cases before and after the procedure (p<0.05), the reason behind the loss of weight might be due to feeding of *Periploca calophylla* which caused loss of appetite in rodents. There was significant difference (p<0.05) in glomerular diameter and urinary space dimension between cases and controls. Case group showed increased glomerular diameter as compared to controls where as control groups exhibited increased urinary dimension as compared to case group. The reason behind this could be edematous swelling of glomerulus.

There was significant difference (p<0.05) in volume of liver between cases and controls. Volume of liver was increased in case group compared to control. The reason behind this finding could be due to dilatation of sinusoidal spaces. In liver, the histo-pathological observation revealed that there was indistinct cell boundaries, increased intracellular deposits in cytoplasm of hepatocytes. PAS (Periodic acid Schiff) stain was positive for hepatocytes in liver of experimental groups indicating glycogen deposits. These all proved that there was reversal of histopathological changes both in liver and kidney as a mild toxicity of *Periploca calophylla*.

A World Health Organisation survey indicated that about 70 - 80% of the world’s populations rely on non-conventional medicine mainly of herbal sources in their primary healthcare. This is especially the case in developing countries where the cost of consulting a western style doctor and the price of medication are beyond the means of most people. A large number of plants contain appreciable levels of biosynthetically produced chemical substances and many of these have either been reported to be toxic to humans or are predictably toxic based on extensive animal or *in vitro* studies. Different retrospective studies done over the last 20 years indicated that the incidence of deaths occurring due to exposure to plants (as a proportion of total patients poisoned by traditional plant medicine) was about 1.5% in France, 5% in Belgium, 6.5% in Italy, 7.2% in Switzerland, and 6% in Turkey. Therefore, the main problem to be addressed by this research project is to evaluate the toxicity caused by one of the extensively used herb in Nepal, India and Chinese medicine having potentiality to be used as an analgesic, anti-inflammatory and anti pyretic agent in the future based on documentation and previous research.

Toxic effects are defined as “harmful responses of a biological system to a toxic compound, and death of cells or the whole organism are the major response”. In all the cases, the toxic effects are usually manifested either in an acute or a chronic manner, and occur mostly as a result of an acute or chronic exposure to toxic compound by oral ingestion, inhalation or absorption following skin contact. The toxic effects are seen as i) signs or reflection of a disturbance of the normal activities of enzymes that perform essential biochemical roles in all forms of life, ii) alteration of the normal activities of plasma membrane that regulate the exchange of nutrients and metabolites between the cell and its surroundings, and iii) the disturbances of other...
normal cell activities e.g. RNA and DNA synthesis, growth, division and general metabolism at all levels of organization from sub-cellular to organ and organ system\textsuperscript{15}.

The purpose of the chronic toxicity test is to investigate the harmful effects of foreign compounds that are introduced to animals in repeated doses or in continuous exposure over an extended period of time that may produce\textsuperscript{16}. The dose levels of compounds used usually range from a very low fraction of the therapeutically effective dose (i.e. somewhere in the range of the ED\textsubscript{50} for the compound in that species, or of the same order as the anticipated human therapeutic dose range) to doses that approach the maximum non-lethal dose (as established in rodent acute toxicity studies)\textsuperscript{16,17}.

Organ weight changes have long been accepted as a sensitive indicator of chemically induced changes to organs. In toxicological experiments, comparison of organ weights between treated and untreated groups of animals have conventionally been used to evaluate the toxic effect of the test article.

Different phytochemical studies have been reported for the plant \textit{Periploca calophylla}. The plant contains mainly pregnane-type diterpenes, which could be responsible bioactive compound in that plant. Three new triterpenoid acids of the oleanane series were isolated from twigs of \textit{Periploca calophylla}\textsuperscript{7}. A new pregnane ester genin, plocigenin, and a new pregnane ester diglycoside, plocin were isolated from the dried twigs of \textit{Periploca calophylla}. A new pregnane ester from diglycoside of ornogenin named plocinine was isolated from the dried twigs of \textit{Periploca calophylla}\textsuperscript{8}. A new pregnane ester genin, plocigenin, and a new pregnane ester diglycoside, plocin were isolated from the dried twigs of \textit{Periploca calophylla}. The chemical and spectroscopic properties were consistent with the structures 12, 20-di-O-benzoylevrenogenin-D and 12, 20-di-O-benzoylevrenogenin-D-3-O-α-D-oleanerpyranosyl(1-4)-O-α-D-oleanopyranoside, respectively.

Three new triterpenoid acids of the oleanane series were isolated from twigs of \textit{Periploca calophylla} and partially characterized from chemical and spectroscopic properties. Thus, mono- and dihydroxyolean-12-ene-28-carboxylic acids, and 2, 3, 23-trihydroxyolean-12-ene-28-carboxylic acid were found\textsuperscript{7}.

A new pregnane ester genin, plocigenin, and a new pregnane ester diglycoside, plocin were isolated from the dried twigs of \textit{Periploca calophylla}. The chemical and spectroscopic properties were consistent with the structures 12, 20-di-O-benzoylevrenogenin-D and 12, 20-di-O-benzoylevrenogenin-D-3-O-α-D-oleanerpyranosyl(1-4)-O-α-D-oleanopyranoside, respectively.
structure established as 3-O-β-L-2, 6-dideoxyfucopyranoside.

Fig 4: Calocinin

A pregnane glycoside of boucerin named locin was isolated from the dried twigs of *Periploca calophylla* on the basis of chemical and spectroscopic evidence, its structure was established as boucerin-3-O-α-D-digitoxoside.

Fig 5: Locin

Nine compounds were isolated and identified as 4-hydroxy-3,5-dimethoxybenzaldehyde, 3-methoxy-4-hydroxybenzoic acid, ursolic acid, 2α-hydroxyursolic acid, daucosterol, lupeol acetate, α-amyrin acetate, 1,8-dihydroxy-3-methoxy-6-methylanthraquinone and β-sitosterol when the chemical constituents of *Periploca calophylla* were isolated and purified by chromatography technology and their structures were elucidated by physicochemical properties and spectroscopic methods. All the compounds were isolated first time from *Periploca calophylla*.

Seven compounds were isolated and identified as glycoside E, cleomiscosin A, sinapic acid, vanillin, salicylic acid, (6'-O-palmitoyl)-sitosterol-3-O-β-D-glucoside and 1-triacontanol, when chemical constituents were isolated from the roots and stems of *Periploca calophylla* by solvent extraction, silica gel and sephadex LH-20 column chromatography, and their structures were elucidated by physiochemical properties and spectral analysis. All the compounds were isolated for the first time from this plant.

Eight glycosides were isolated and identified as periplocin, kaempferol 3-α-D-arabinoside, kaempferol 3-O-β-D-glucoside, 3',4,5,7-tetrahydroxyflavon-2(S)-3'-O-β-D-glucopyranoside, (+)-syringaresinol-4'-O-β-D-monoglucoside, 1-sinapoylglucoside, erigesc C, 2,6-dimethoxy-4-hydroxyphenol 1-O-β-D-glucose from n-butanol extract from rhizome of *Periploca calophylla* when isolation and purification was performed by chromatography technology and structures were elucidated on the basis of physicochemical properties and spectroscopic methods. All the compounds were isolated first time from *Periploca calophylla*.

The absolute configuration of calogenin (isolated from *Periploca calophylla*) and its 20-keto derivative (isolated from *Hedemasus indicus*) has been established as pregn-5-ene-3β,14β,20R-triol containing a C-17 hydroxyethyl chain in α-configuration and pregn-5-ene-20-keto-3β,14β-diol containing a C-17 Me keto chain in β-configuration, respectively.

CONCLUSIONS

There was reversal of histopathological changes both in liver and kidney as a mild toxicity of *Periploca calophylla* when given 2 gm per day. Histopathological observation revealed that there was reduction in urinary space dimension in renal cortex in experimental (cases) groups. Otherwise features of renal medulla, renal tubules showed normal histological features both in cases (experimental) and controls.

In liver, the histo-pathological observation revealed that there was indistinct cell boundaries, increased intracellular deposits in cytoplasm of hepatocytes and wide sinusoidal spaces in experimental (cases) group whereas normal histological features were observed in control groups. PAS (Periodic acid Schiff) stain was positive for hepatocytes in liver of experimental groups indicating glycogen deposits.

REFERENCES


6. Adebajo AC, Adewumi CO, Essein EE. Antiinfective


INTRODUCTION

Urinary tract infections (UTIs) are a serious health problem affecting millions of people each year and are the most common infectious diseases diagnosed in outpatients. Women are especially prone to urinary tract infections and one woman in five develops a urinary tract infection during her lifetime.
Clinico-epidemiological and Bacteriological Study of Symptomatic Urinary Tract Infections and Antibiotic Susceptibility Pattern of Bacterial Isolates

Lot of research and investigations have been carried out for the last several decades and despite of having vast wealth of literature published on UTIs, and the wide range of available investigative procedures, diagnostic aids and therapeutic possibilities, the basic reason why symptomatic UTIs are so common, particularly in women, still remains to be elucidated. Moreover, knowledge of the antimicrobial resistance patterns of common bacterial species according to local epidemiology is essential for providing clinically appropriate, cost-effective therapy for urinary tract infections.

Therefore the present study is undertaken with an aim to study the prevalence and incidence of urinary tract infections among clinically diagnosed patients, and to study the correlation of UTIs with age, sex, socioeconomic status, locality (rural/urban) and occupation, and distribution of UTIs among patients with a urinary catheter, pregnancy, and diabetes mellitus, and to isolate and identify the aerobic bacterial species, and to evaluate their in vitro antibiotic susceptibility.

METHODS

The study was carried out on 200 clinically diagnosed patients of symptomatic UTIs, attending OPD and as well as inpatients at Prathima Hospital, Karimnagar, Telangana, India, during June 2008 to February 2009.

Table 1: Total number of inpatients and out patients taken for investigation

<table>
<thead>
<tr>
<th>Patients</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatients</td>
<td>89</td>
<td>44.5%</td>
</tr>
<tr>
<td>Outpatients</td>
<td>111</td>
<td>55.5%</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>100%</td>
</tr>
</tbody>
</table>

A detailed history of selected cases was recorded with regard to name, age, sex, address, occupation, socioeconomic status, duration of illness, and other complaints.

Midstream urine sample was collected by the clean-catch technique. The patients were instructed and educated in regard to aseptic collection of midstream urine sample into sterile wide-mouthed containers and covered with a tightly fitted lid. Samples were also collected by an indwelling catheter from patients those who were unable to produce midstream urine sample. Suprapubic bladder aspirations were used for collecting urine in infants. Urine samples were transported to laboratory and processed immediately. Since urine is an excellent supportive medium for the growth of microorganisms, they were immediately refrigerated.

The urine was examined macroscopically for color and appearance. Microscopic examination was done on wet films for the presence of pus cells, RBC, epithelial cells, casts and crystals. When 0.05 ml of urine was placed on to the middle of a microscopic slide and examined, the presence of one pus cell/7 HPF corresponds with 10⁴ leucocytes per ml and the findings of clearly large numbers than this indicate significant pyuria. Gram stained smear of a well-mixed urine sample was examined for pus cells and bacteria. Presence of at least one organism per oil immersion field (examining 20 fields) correlates with significant bacteruria (>10⁵ CFU/ml). Acid fast staining was done to detect tubercle bacilli.

A calibrated loop made of nichrome that delivers 0.004 ml of urine sample was inserted vertically into a well mixed urine sample and inoculated by touching the loop to the center of the culture plate, from which the inoculum was spread in line across the diameter of the plate, crossing the first inoculum streak numerous times, without flaming or reentering urine. The media used were MacConkey agar, cysteine-lactose electrolyte deficient (CLED) agar, and blood agar. Culture plates were incubated for 24 hrs at 35°C. In case of no growth, cultures were further incubated for until the next day. On incubation, the number of colonies were counted or estimated and this number used to calculate the number of viable bacteria per ml of urine. Thus, if a 0.004 ml loop full of urine yield 400 colonies, the count per ml of urine will be 10⁵ or just indicative of significant bacteruria. The isolates were identified by standard microbiological techniques. The bacterial isolates were tested for in vitro antibiotic susceptibility by disc diffusion (Kirby-Bauer) method using Mueller-Hinton agar medium for the antibiotics listed in Table 11.

RESULTS

Table 2: Age wise occurrence of symptomatic UTIs

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>No of patients (%)</th>
<th>Culture positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 10</td>
<td>22 (11.0%)</td>
<td>3 (15.5%)</td>
</tr>
<tr>
<td>11 - 20</td>
<td>24 (12.0%)</td>
<td>10 (41.6%)</td>
</tr>
<tr>
<td>21 - 30</td>
<td>43 (21.5%)</td>
<td>6 (13.9%)</td>
</tr>
<tr>
<td>31 - 40</td>
<td>32 (16.0%)</td>
<td>9 (37.0%)</td>
</tr>
<tr>
<td>41 - 50</td>
<td>35 (17.5%)</td>
<td>9 (28.8%)</td>
</tr>
<tr>
<td>51 - 60</td>
<td>25 (12.5%)</td>
<td>9 (36.0%)</td>
</tr>
<tr>
<td>61 - 70</td>
<td>12 (6.0%)</td>
<td>4 (33.3%)</td>
</tr>
<tr>
<td>71 - 80</td>
<td>7 (3.5%)</td>
<td>2 (28.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>200 (100%)</td>
<td>52 (26%)</td>
</tr>
</tbody>
</table>

All 200 symptomatic UTIs were occurring between the range of one year and 80 years of age. Highest incidence was seen in the age group of 21 – 30 years with 43 cases (21.5%) followed by the age group of 41 – 50 years with 35 cases (17.5%) and 31 – 40 years with 32 cases (16.0%). Least incidence was seen in the age group of 71 – 80 years with 7 cases (3.5%) followed by 61 – 70 years with 12 cases (6.0%). The number of cases in the age group of 51 – 60 years was 25 (12.5%), 11 – 20 year group 24 (12.0%), and 0 – 10 year group 22 (11.0%).
Table 3: Sex wise occurrence of symptomatic UTIs

<table>
<thead>
<tr>
<th></th>
<th>Females</th>
<th>Males</th>
<th>Total</th>
<th>Female : Male (Ratio)</th>
</tr>
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<tbody>
<tr>
<td>No of cases</td>
<td>119</td>
<td>81</td>
<td>200</td>
<td>1.7 : 1</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>59.5%</td>
<td>40.5%</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

The incidence of symptomatic UTIs was high in females with 119 cases (59.5%) than males 81 cases (40.5%) with female to male ratio 1.7 : 1.

Table 4: Distribution of symptomatic UTIs among different socioeconomic groups

<table>
<thead>
<tr>
<th>Socioeconomic groups</th>
<th>No of cases (%)</th>
<th>No of culture positive cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income</td>
<td>80 (40%)</td>
<td>25 (31.25%)</td>
</tr>
<tr>
<td>Middle income</td>
<td>70 (35%)</td>
<td>15 (21.4%)</td>
</tr>
<tr>
<td>High income</td>
<td>50 (25%)</td>
<td>12 (24%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200 (100%)</strong></td>
<td><strong>52 (26%)</strong></td>
</tr>
</tbody>
</table>

Out of 200 cases, 80 cases (40%) were from low socioeconomic status, 70 cases 35% were from middle income group and 50 cases (25%) were from higher income group (Low income – below Rs 5,000/ P.M. Middle income - Rs 5,000/ to Rs 10,000/ P.M. High income – above Rs 10,000/ P.M.)

Table 5: Incidence of symptomatic UTIs among patients with a urinary catheter

<table>
<thead>
<tr>
<th>No of days with a urinary catheter</th>
<th>No of patients</th>
<th>Culture positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 (1%)</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>6 (3%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>3</td>
<td>4 (2%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>4</td>
<td>2 (1%)</td>
<td>1 (50%)</td>
</tr>
<tr>
<td>5</td>
<td>2 (1%)</td>
<td>1 (50%)</td>
</tr>
<tr>
<td>6</td>
<td>1 (0.5%)</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>3 (1.5%)</td>
<td>1 (33.3%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20 (10%)</strong></td>
<td><strong>8 (40%)</strong></td>
</tr>
</tbody>
</table>

The symptomatic UTIs were identified in 20 (10%) patients with urinary catheters within 1 week. Among the patients with catheterization for 6 – 7 days, the culture growth was significantly less.

Table 6: Incidence of symptomatic UTIs in pregnancy

<table>
<thead>
<tr>
<th>Pregnancy</th>
<th>No of cases (%)</th>
<th>Culture positive (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Trimester</td>
<td>4 (2%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>2nd Trimester</td>
<td>6 (3%)</td>
<td>1 (33.3%)</td>
</tr>
<tr>
<td>3rd Trimester</td>
<td>4 (2%)</td>
<td>3 (75%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14 (7%)</strong></td>
<td><strong>6 (42.8%)</strong></td>
</tr>
</tbody>
</table>

The incidence of symptomatic UTIs in pregnancy was 14 cases (7%) out of a total number of 200 clinically diagnosed symptomatic UTIs. The incidence of symptomatic UTIs in pregnancy during first trimester was 4 (2%), second trimester 6 (3%), and third trimester 4 (2%).

Table 7: Incidence of symptomatic UTIs in diabetes mellitus

<table>
<thead>
<tr>
<th>Total No of patients</th>
<th>No of cases with diabetes mellitus</th>
<th>Culture positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>15 (7.5%)</td>
<td>-</td>
</tr>
</tbody>
</table>

The incidence of symptomatic UTIs in diabetes mellitus was 15 cases (7.5%).

Table 8: Microorganisms isolated from symptomatic UTI cases

<table>
<thead>
<tr>
<th>Isolate</th>
<th>No of isolates</th>
<th>Percentage (%) (n=200)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.coli</td>
<td>25</td>
<td>12.5%</td>
</tr>
<tr>
<td>Klebsiella pneumoniae</td>
<td>8</td>
<td>4.0%</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>4</td>
<td>2.0%</td>
</tr>
<tr>
<td>Staphylococcus saprophyticus</td>
<td>4</td>
<td>2.0%</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>2</td>
<td>1.0%</td>
</tr>
<tr>
<td>Citrobacter freundii</td>
<td>2</td>
<td>1.0%</td>
</tr>
<tr>
<td>Staphylococcus epidermidis</td>
<td>2</td>
<td>1.0%</td>
</tr>
<tr>
<td>Candida albicans</td>
<td>2</td>
<td>1.0%</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>Streptococcus pyogenes</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>Mycobacterium tuberculosis</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
<td><strong>26%</strong></td>
</tr>
</tbody>
</table>

Out of 200 cases, 52 cases (26%) were culture positive with significant growth. E.coli was commonest species isolated 25 (12.5%), followed by Klebsiella pneumoniae 8 (4.0%), Staphylococcus aureus 4 (2.0%), Staphylococcus saprophyticus 4 (2.0%), Proteus mirabilis 2 (1.0%), Citrobacter freundii 2 (1.0%), Staphylococcus epidermidis 2 (1.0%), Candida albicans 2 (1.0%), Pseudomonas aeruginosa 1 (0.5%), Streptococcus pyogenes 1 (0.5%), and Mycobacterium tuberculosis 1 (0.5%).

Table 9: Patients with and without antibiotic treatment

<table>
<thead>
<tr>
<th>Patients already on antibiotics</th>
<th>No of cases (46.5%)</th>
<th>Culture positive (21 (19.5%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients without prior antibiotic treatment</td>
<td>107 (53.5%)</td>
<td>31 (33.1%)</td>
</tr>
</tbody>
</table>

Out of a total of 200 cases of symptomatic UTIs examined, 93 cases (46.5%) were already on prior antibiotic therapy out of which 21 (19.5%) cases were culture positive yielding significant growth. Whereas 107 cases (53.5%) were not on antibiotics out of which 31 (33.1%) cases were culture positive with significant growth.
A correlation was made between direct microscopy results and culture findings. Out of 200 cases of symptomatic UTIs, pus cells were seen (pyuria) by direct microscopy in 65 cases (32.5%) out of which 45 cases (70%) were culture positive yielding significant growth and 20 cases (30%) were culture negative.

In 135 cases (67.5%), pus cells were not found under direct microscopy, out of which 7 cases (5.2%) were culture positive with significant growth and 128 cases (94.8%) were culture negative.

Table 11: Antibiotic sensitivity pattern of bacterial isolates from symptomatic UTI cases

<table>
<thead>
<tr>
<th>Antimicrobial</th>
<th>E.coli (%)</th>
<th>Klebsiella pneumoniae (%)</th>
<th>Coagulase negative (%)</th>
<th>Staph aureus (%)</th>
<th>Proteus mirabilis (%)</th>
<th>Pseudomonas (%)</th>
<th>Streptococcus (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imipenem</td>
<td>25 (100)</td>
<td>7 (75)</td>
<td>3 (84)</td>
<td>1 (75)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>2 (100)</td>
</tr>
<tr>
<td>Cefepime</td>
<td>10 (40)</td>
<td>5 (50)</td>
<td>Nil</td>
<td>1 (75)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Gentamycin</td>
<td>9 (36)</td>
<td>2 (22)</td>
<td>4 (67.2)</td>
<td>2 (100)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>1 (100)</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>7 (28)</td>
<td>2 (22)</td>
<td>Nil</td>
<td>1 (75)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Ofloxacin</td>
<td>6 (24)</td>
<td>1 (10)</td>
<td>Nil</td>
<td>1 (75)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Cotrimoxazole</td>
<td>6 (24)</td>
<td>2 (22)</td>
<td>Nil</td>
<td>1 (75)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Polymyxin-B</td>
<td>5 (20)</td>
<td>Nil</td>
<td>Nil</td>
<td>1 (75)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Ampicillin/sulbactam</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Nitrofurantoin</td>
<td>16 (64)</td>
<td>6 (60)</td>
<td>Nil</td>
<td>1 (75)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Cefotaxime</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>1 (75)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Gentamicin</td>
<td>5 (20)</td>
<td>2 (20)</td>
<td>Nil</td>
<td>1 (75)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Nitritin</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Oxacillin</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Polymyxin-B</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Mupirocin</td>
<td>13 (52)</td>
<td>6 (100)</td>
<td>4 (100)</td>
<td>4 (100)</td>
<td>2 (100)</td>
<td>Nil</td>
<td>Nil</td>
</tr>
</tbody>
</table>

All 25 isolates (100%) of *E.coli* were sensitive to imipenem, and penicillin/tazobactam, whereas 16 isolates (64%) were sensitive to nitrofurantoin, 13 isolates (52%) were sensitive to prulifloxacin, 10 isolates (40%) were sensitive to cefepime, 9 isolates (36%) were sensitive to gentamycin, 8 isolates (32%) were sensitive to cotrimoxazole, 7 isolates (28%) were sensitive to ciprofloxacin, 6 isolates (24%) were sensitive to ofloxacin, 5 isolates (20%) were sensitive to cefazolin.

All 8 isolates (100%) of *Klebsiella pneumoniae* were sensitive to prulifloxacin, 6 isolates (75%) were sensitive to imipenem, 5 isolates (68.5%) were sensitive to ofloxacin, and cotrimoxazole, 4 isolates (50%) were sensitive to cefepime, 2 isolates (25%) were sensitive to nitrofurantoin, and 1 isolate (12.5%) sensitive to gentamycin. All 8 isolates (100%) were resistant to ampicillin/subbactam, and cefazolin.

All 6 isolates (100%) of coagulase negative staphylococci were sensitive to nitrofurantoin, and prulifloxacin, 5 isolates (84%) were sensitive to imipenem, and ciprofloxacin, 4 isolates (67.2%) were sensitive to gentamycin, and 1 isolate (16.8%) was sensitive to cefazolin. All 6 isolates (100%) of coagulase negative staphylococci were resistant to cefepime, cotrimoxazole, and cefoperazone.

All 4 isolates (100%) of *Staphylococcus aureus* were sensitive to nitrofurantoin, and prulifloxacin, whereas 3 isolates (75%) were sensitive to imipenem, cefepime, 2 isolates (50%) were sensitive to gentamycin, and cotrimoxazole. All 4 isolates (100%) of *Staphylococcus aureus* were resistant to ciprofloxacin, and oxacillin.

All 2 isolates (100%) of *Citrobacter freundii* were sensitive to imipenem, cefepime, gentamycin, nitrofurantoin, and polymyxin-B, and resistant to ciprofloxacin, cefazolin, and prulifloxacin.

All 2 isolates (100%) of *Proteus mirabilis* were sensitive to imipenem, gentamycin, nitrofurantoin, and prulifloxacin, whereas 1 isolate (50%) was sensitive to ciprofloxacin. All 2 isolates (100%) of *Proteus mirabilis* were resistant to cefepime, ofloxacin, ampicillin/sulbactam, and polymyxin-B.

The only 1 isolate (100%) of *Pseudomonas aeruginosa* was sensitive to imipenem, and ofloxacin, and resistant to cefepime, gentamycin, ciprofloxacin, cotrimoxazole, nitrofurantoin, polymyxin-B, and prulifloxacin.

The only 1 isolate (100%) of *Streptococcus pyogenes* was sensitive to imipenem, gentamycin, ciprofloxacin, nitrofurantoin, netilin and prulifloxacin, and resistant to cefepime, oxacillin, and cotrimoxazole.

**DISCUSSION**

In this study symptomatic UTIs were more common among females and in the age group of 21 – 30 years. The reasons may be short urethra and its proximity to anus and vagina in females. Sexual intercourse may lead to introduction of bacteria and trigger infection. Similar observations were made by Nicolle et al., and Foxman. Buckley et al. demonstrated a transient increase in bacterial counts of bladder urine as a result of sexual intercourse. Kunin reported the prevalence of bacteriuria in school age girls of 5 – 14 years was 40 times greater than the school age boys. Sweet and Stamm demonstrated that UTI is 14 times more common in women than men, due to anatomical and physiological factors.

It has been observed in this study that the most important risk factors for developing symptomatic UTIs appears to be urinary catheterization, followed by diabetes mellitus, female gender, pregnancy, and advancing age. Lipsky made an observation that prevalence of bacteria is increasing with increasing age in elderly women than in elder men.

Hooten and Bjorg reported that hormonal changes and shifts in the position of the urinary tract during pregnancy make it easier for bacteria to travel up the ureters and recommended periodic testing of urine during pregnancy. Merchant demonstrated the effects of pregnancy and gestational
agents on urinary tract. Hanson S and Jones reported that neonates and children younger than two years of age with UTIs usually have nonspecific symptoms, including failure to thrive, vomiting and fever.

Dobbs reported that urinary catheters, especially indwelling ones, are a risk factor for UTI, similar to the present observation. Clavín reported that catheter associated urinary infections account for about 40% of all nosocomial infections and increase the duration of hospital stays, the costs, and mortality.

Our study shows the presence of pus cells under direct microscopy coincides with the symptomatic UTIs. Thysell made similar observations and reported that the presence of at least one organism per oil immersion field correlates with significant bacteriuria. Pollock found that the Gram stained smears of uncentrifuged urine were reliable when a smaller number of bacteria are detected. It was found 94% sensitivity and specificity of 98%. Bulger reported that if uncentrifuged urine shows 2 or more leucocytes/HPF then it is associated with significant bacteriuria.

Kass’s comparison of catheter and voided specimens allowed a distinction to be made between contamination with urethral or perineal bacteria, usually with Gram positive cocci, and true infection of the bladder, usually with Gram negative bacilli. Quantitative bacterial counting in both unselected and selected groups of the population showed that when the urine contained over 1,000,000 bacteria/ml indicated significant bacteriuria. Most patients with clinical infection had counts of over 1,000,0000 bacteria/ml, but a few patients had bacterial counts of this magnitude, even when there were no symptoms. Thus, the concept of symptomless (Asymptomatic) bacteriuria was established. Its association with the development of clinical disease and renal damage is well recognized.

Johnson, and Sharma reported that E. coli is the commonest causative organism of UTI and responsible for 50 – 80% of acute infections, which is similar to the observation made by present study. Saxena reported that Gram negative bacilli such as Proteus spp and Pseudomonas spp are responsible for about 80 – 90% of UTIs. Lee, and Almeida reported that Staphylococcus aureus, Staphylococcus saprophyticus, Staphylococcus epidermidis are also responsible for 23% of hospital acquired UTIs. Lauria reported that certain yeasts such as Candida albicans are also associated with UTIs.

CONCLUSIONS

Symptomatic UTIs were very common in the third decade of life with highest incidence in the age group of 21 – 30 years. It may be attributed to sexual intercourse, which may lead to introduction of bacteria. Symptomatic UTIs were more common among females. The reasons may be short urethra and its proximity to anus and vagina in females. The incidence was high among people of low socioeconomic status.

The most important risk factors for developing symptomatic UTIs appears to be urinary catheterization, followed by diabetes mellitus, female gender, pregnancy, and advancing age.

Among the patients with catheterization for 6 – 7 days, the culture growth was significantly less. This may be due to microorganisms such as Chlamydia, Ureaplasma that can not grow on conventional bacteriological media.

E. coli is the most commonest organism responsible for vast majority of UTIs. The demonstration of pus cells by direct microscopy coincides with the symptomatic UTIs. All bacterial isolates were sensitive to imipenem, gentamycin, and nitrofurantoin. A high degree of multidrug resistance was observed in Pseudomonas aeruginosa, followed by Proteus mirabilis. All isolates of Staphylococcus aureus were resistant to methicillin (MRSA) and coagulase negative staphylococci were also methicillin resistant.

REFERENCES


A Correlational Study on Emotional Intelligence and Scholastic Performance of Secondary Level Students in Selected Schools

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ABSTRACT

Background: Adolescents represent powerful future contributors to a country’s national development. In the recent years, emotional intelligence has been linked to academic success, school dropout, or the development of emotional and behavioral problems in children and their performance.

Objectives: The objectives of the study were to 1. Determine emotional intelligence of secondary level students, 2. Determine the scholastic performance of secondary level students, 3. Find out the correlation between emotional intelligence and scholastic performance, 4. Find out the association between emotional intelligence and scholastic performance with baseline variables of secondary level students.

Methods: Non-experimental descriptive survey approach with a descriptive correlation design was used to collect data from 108 samples using stratified random sampling technique. Modified Schutte’s self report scale (r=0.98) and self constructed scholastic performance scale (r=0.98) was used to assess emotional intelligence and scholastic performance respectively.

Results: The emotional intelligence and scholastic performance of secondary level students was found to be positively correlated with r=0.54 (p<0.05), and with df = 106. Age, grade, birth order, religion, occupation of father and emotional intelligence were significantly associated. Significant association was found with birth order, religion, size of family, education of father, education of mother, occupation of father and scholastic performance.

Conclusions: Early identification of low emotional intelligence would help to implement corrective actions through life skills training and scientific guidance right in the school age to improve the emotional intelligence of adolescents.
underestimate the importance of developing the students’ abilities to adapt and to get along with people, however, students’ learning ability depend on their experience of adaptation ability and coping with people.

The term emotional intelligence was coined by Peter Salovey from University of Yale and John Mayer from University of New Hampshire in 1990. Emotional Intelligence (EI), often measured as an Emotional Intelligence Quotient (EQ), describes ability, capacity, skill or a self-perceived ability, to identify, assess, and manage the emotions of one’s self, of others, and of groups. Components of emotional intelligence are a) Self-awareness b) Managing emotions c) Motivating self d) Empathy, and e) interpersonal skills.

Goleman mentions that EQ accounts for 80% success and it outperforms IQ which contributes only 20% in predicting scholastic achievement. Thus, Goleman clarifies: IQ washes out when it comes to predicting who, among a talented pool of candidates within an intellectually demanding profession will become the strongest leader; so traditional measures of intelligence, such as the IQ test, fail to fully explain cognitive ability. The higher the EQ, the greater is the ability to manage feelings and deal effectively with others, the greater is the chance for a happier life and success.

Student life is said to be the best period for any person as the foundations for emotional intelligence, self-esteem, happiness and success in life are laid in childhood and adolescence. Educational scholars have to give importance for the emotional intelligence in the scholastic performance of the students.

OBJECTIVES

The objectives of the study were to:

1. Determine emotional intelligence of secondary level students in selected schools using modified bar on EQ-I scale.
2. Determine scholastic performance of secondary level students in selected schools using scholastic performance rating scale.
3. Find the correlation between emotional intelligence and scholastic performance of secondary level students.
4. Find the association between emotional intelligence and scholastic performance and demographic variables of secondary level students.

METHODS

The study was carried out in 108 secondary level students from 3 randomly selected schools in Mangalore, Karnataka, India on August 2013. Equal number of students were divided into 3 strata i.e. Class 8, class 9 and class 10. The students were chosen using systematic random sampling technique using the roll call register. Modified Schutte’s self report scale (r=0.98) and self constructed scholastic performance scale (r=0.98) was used to collect data to assess emotional intelligence and scholastic performance respectively. The collected data was analysed using descriptive and inferential statistics. Frequency and percentage of data was calculated to describe baseline variables. Mean, mean percentage and standard deviations were used to determine emotional intelligence and scholastic performance. The correlation between EI and scholastic performance was found using Karl-Pearson’s correlation coefficient formula. Analysed data was presented in tables, graphs and figures.

RESULTS

Majority (63.9%) of the samples were in the age group of 12 - 14 years. Most of the samples were males (59.3%) and females were 40.7%. Most of the samples (48.1%) were first child. Most (60.2%) of them were Hindus. Majority (91.7%) of the samples were residing in urban locality. Majority (77.8%) had nuclear families and most (50.9%) were having small families. Most fathers (41.7%) and most mothers (37%) of the samples were housewives. Most of the samples family had more than Rs. 15,000 income per month (38.9%).

Fig 1: The cylinder diagram shows percentage distribution of emotional intelligence of secondary level students

Data in Fig 1 shows that 42.6% of the participants had average emotional intelligence and 57.4% had good emotional intelligence, and none (0%) had poor emotional intelligence.

Table 1: Frequency and percentage of scholastic performance of secondary level students (n=108)

<table>
<thead>
<tr>
<th>Range of score</th>
<th>Percentage of score</th>
<th>Level of scholastic performance</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 - 93</td>
<td>0 - 33.1%</td>
<td>Poor</td>
<td>2</td>
<td>1.9%</td>
</tr>
<tr>
<td>94 - 147</td>
<td>33.2% - 66.3%</td>
<td>Average</td>
<td>56</td>
<td>51.9%</td>
</tr>
<tr>
<td>148 - 200</td>
<td>66.4 - 100%</td>
<td>Good</td>
<td>50</td>
<td>46.2%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>108</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 1 shows that almost half of the samples (51.9%) had average scholastic performance and most (46.2%) had good scholastic performance, and least (1.9%) had poor scholastic performance.
Correlation between emotional intelligence and scholastic performance of secondary level students was found to be positively correlated with $r=0.54$ ($p<0.05$) with $df=106$. Hence null hypothesis was rejected.

Table 2 shows that the calculated chi-square value of age, grade, birth order, religion and occupation of father is greater than the tabulated value 0.05 level of significance. Hence null hypothesis was rejected. So there is significant association between age, grade, birth order, religion and occupation of father and emotional intelligence. Whereas, with gender, residence, type of family, size of family, education of father, education of mother, occupation of mother, monthly income of family chi-square value is less than the tabulated value at 0.05 level of significance. So there is no significant association with emotional intelligence.

Table 3 reveals that the calculated chi-square value of birth order, religion, size of family, education of father, education of mother and occupation of father is greater than the tabulated value at 0.05 level of significance. Hence null hypothesis was rejected. So there is significant association between birth order, religion, size of family, education of father, education of mother and occupation of father and scholastic performance. Whereas, with age, grade, gender, residence, type of family, occupation of mother, monthly income of family chi-square value is less than the tabulated value at 0.05 level of significance. So there is no significant association with scholastic performance.

**DISCUSSION**

In the present study emotional intelligence score showed that the majority of the secondary level students 62 (57.4%) had good emotional intelligence, 46 (42.6%) had average emotional intelligence and none had poor emotional intelligence. A similar study done in 300 adolescents of secondary schools of Haryana found 136 (45.3%) had moderate level of emotional intelligence while 94 (31.3%) had low and a small percentage...
A Correlational Study on Emotional Intelligence and Scholastic Performance of Secondary Level Students in Selected Schools

70 (23.3%) had high emotional intelligence.

The findings of the present study showed that majority of secondary level students 56 (51.9%) had average scholastic performance, most 50 (46.2%) had good and least 2 (1.9%) had poor scholastic performance. A similar study done in 295 students of Bangalore Urban district with TMMS for EI and percent of marks obtained in last academic year for scholastic performance showed 41.4% has scored ≥75% while 98 (33.2%) scored 60 - 74% and 75 (25.4%) scored 60%.

The findings of the present study showed that the score of emotional intelligence of secondary level students had positive correlation with scholastic performance with \( r=0.54(p<0.05, \ df=106) \). The findings of the present study were consistent with the correlational study done on 321 higher secondary students to assess correlation between emotional intelligence and scholastic performance. The results showed a positive significant correlation \( (r=0.25, \ p<0.05) \) between emotional intelligence and scholastic performance. In a study done with 246 adolescent students in Pakistan also agree that emotional intelligence plays an important role in predicting scholastic performance.

In contrary, a study done in randomly selected 400 students studying IX and X in Kanyakumari district using Trait Emotional Intelligence Questionnaire short form and academic achievement test questions found that there is no significant correlation with \( r=0.165 \ (d^2=398) \).

Significant association was found between age, grade, birth order, religion and occupation of father and emotional intelligence whereas, with gender, residence, type of family, size of family, education of father, education of mother, occupation of mother, monthly income of family had no significant association with emotional intelligence.

This study result corresponds to the study conducted in 595 students in Islamabad where variables like age, mother’s education, father’s education and income showed significant association with EI while gender and residence didn’t show significant association.

No significant association of EI was found with gender. This study results are in agreement with the results of studies done in random 250 students from Udhampur district and also in Islamabad which found no significant association with sex. In contrary, a study done in Malaysia showed low correlation between sex differences and EQ level (\( \chi^2 = 12.79, \ p<0.05 \)) and girls seem to have a higher level of EQ compared to boys. The results of this study didn’t find significant association with residence contrary to the outcomes of study where urban adolescents had comparatively better emotional intelligence against rural counterparts. Income of the family was found to be associated with EI. These results are in agreement with the results of the study with 100 students of Dryigam.

The study revealed significant association between birth order, religion, size of family, education of father, education of mother and occupation of father and scholastic performance. Whereas, with age, grade, gender, residence, type of family, occupation of mother, monthly income of family had no significant association with scholastic performance. The result of association with age in this study is in term with the study done in 61 school children in Germany. However, it contradicts the findings of a study done in Texas with 368 students which revealed significant association of gender and income of the family with scholastic performance.

CONCLUSIONS

The study concludes that emotional intelligence is positively correlated with scholastic achievement. The ability to read and manage emotions is very essential while interacting with students. Students should be taught to recognize their abilities and capacities instead of feeling low and develop ability to work and study in adverse emotional conditions of life. Teachers should also be competent enough to identify changing emotional classroom environment and have ability to empathize, encourage and connect with students on emotional level. As it affects student achievement, it is imperative for schools to integrate it in their curricula and pedagogical activities, hence raising the level of student success. Educational methodologies for the development of emotional intelligence abilities need to be developed and tested.

Training courses for teachers to know and adopt methods which foster emotional intelligence should be promoted. It is important that school authorities manage learning environment, students and teachers in a way that encourage culture of emotional intelligence values.

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Prevalence of Hypertension Among School Children

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ABSTRACT

Background: Hypertension in children and adolescents has become increasingly common. Blood pressure studies in children and adolescents provides important information which might help in controlling the risk factors of cardiovascular diseases.

Objectives: This study aims at investigating the prevalence of hypertension among school children in Udupi Taluk, Karnataka, India and to find the association of blood pressure level with age, gender and BMI.

Methods: A total of 1188 students (592 boys and 596 girls) studying at secondary level (class 8 - 10) in the schools of Udupi Taluk were involved in the study. Height (in cm) and weight (in kg) were recorded along with the blood pressure measurements using auscultation method. Blood pressure was measured twice among the students who were found to have elevated blood pressure (more than 90th percentile for age, sex and height percentile) during the first time reading. BMI was classified based on the Reference growth charts (5 - 19 years) designed by WHO. The evaluations of hypertension were done as per the recommendations of “Fourth Report by Task Force on High Blood Pressure in Children and Adolescents Working Group, 2004”.

Results: Overall, the prevalence of hypertension in children was found to be 4.4% (males 2.2% and females 6.5%). The prevalence of hypertension was found more among the participants aged 14 years. The prevalence of systolic and diastolic hypertension was found to be 2.9% and 2.7% respectively. The prevalence of obesity was found as 6.2% (males 7.1% and females 5.4%). The statistically significant association was observed between blood pressure level and BMI level (P<0.0001).

Conclusions: We found that prevalence of hypertension was more among females than in males. The prevalence of hypertension was more among obese students, thus interventions related in reducing modifiable risk factors should be encouraged to the students.

INTRODUCTION

Non-communicable diseases (NCDs) are now becoming a major public health problem in developing countries. Unhealthy lifestyles and unhealthy dietary habits, lack of physical activity, obesity etc. are largely responsible for NCDs¹. Hypertension affects about 30% of the world’s adult population, both in developing and developed countries². Hypertension is most common disease which is associated with high cardiovascular morbidity and mortality as shown by the 7th Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure³. Several longitudinal studies has revealed that there has been an evidence that hypertension has its origin in childhood⁴. The blood pressure level in children provides a reliable indicator of the blood pressure level in adulthood⁵. In a meta-analysis done in 2008, more than 50 studies demonstrated the tracking of blood pressure from childhood to adulthood⁶. Blood pressure studies in children and adolescents provide
important information which might help in controlling the risk factors of cardiovascular diseases.

In late childhood and adolescents, hypertension is of mainly primary or essential. It has been recognized that the factors such as salt intake, stress and obesity play a role in developing hypertension. It is seen that, with the increase in prevalence of obesity in children and adolescents, there is a rise in prevalence of pediatric hypertension. According to the fourth report by National High Blood Pressure Education Working Group on High Blood Pressure in Children and Adolescents (2004), blood pressure in children should be measured from the age of 3 years and above at all medical encounters.

There exist different risk factors for hypertension among children of South Asia. Within India, a regional difference in blood pressure was observed among the children aged 13 years and above. Various studies done in India reported the prevalence of hypertension in children from 0.46% to 10.58%.

The purpose of the study was to investigate the prevalence of hypertension among school children in Udupi Taluk, Karnataka and find the association of blood pressure level with age, gender and BMI.

METHODS

This is a descriptive cross sectional study conducted between March to August, 2012 among secondary level students (Class 8 - 10) from schools in the Udupi Taluk, Karnataka, India. For calculating the sample size, an expected prevalence (p) of 5.9%, 95% confidence level (Z=1.96), margin of error (d) as 2 percentage points, non-response rate of 10% and design effect of ‘2’ was considered, and the sample size was calculated to be 1174. But the data from 1188 students were collected. Thus, the final sample size for the study was 1188. The schools list was obtained from the Block Education Office, Udupi Taluk, Karnataka, India. The schools were then stratified into Government, Aided and Un-Aided schools. Cluster random sampling technique was used to select the study subjects. For each stratified group, the number of schools were selected using proportional allocation method. All the students from class 8 - 10 were considered for the study. The schools were selected till the minimum number of the students required in each group were obtained. A total of 9 schools were selected for the study.

The data collection was carried out during a single visit. Height was recorded to the nearest centimeter using a stadiometer with the child standing upright barefoot with feet parallel; heels, buttock, shoulder touching the upright rod and head in Frankfurt plane. Head piece of the device was gently lowered and measurement was recorded to the nearest centimeter.

Height was then classified in height percentile for age and sex according to the guidelines by Center for Disease Control and Prevention (CDC), National Center for Health Statistics (NHCS).

Weight was recorded without wearing the footwear using the calibrated and standardized digital weighing scale. BMI was then calculated using the formula:

\[ \text{BMI} = \left( \frac{\text{Weight in Kg} \times 10000}{\text{Height in cm}^2} \right) \]

Then, Z-score was calculated for each individual using the formula

\[ Z = \left( \frac{\text{Calculated BMI} - \text{Median BMI}^*}{\text{Standard Deviation}} \right) \]

*Median BMI of the same age group as that of calculated.

A child was classified into nutritional status according to the growth charts designed by WHO, in which, overweight was defined as Z-Score (+1SD to +2SD) and obesity as Z-Score (>+2SD).

Blood pressure measurements were recorded by mercury sphygmomanometer using auscultation method. A cuff with an inflatable bladder, which had a width of at least 40% of the arm circumference and length which covered at least 80% of the arm circumference, was tied at a point midway between the olecranon and the acromion. Efforts were made to eliminate the factors which affect blood pressure like anxiety, exercise etc. Therefore, children were told to take a rest of at least ten minutes before the blood pressure was measured. Blood pressure of the children was recorded in the seated position with the right arm resting on the table supported at heart level. The point at which onset of Korotkoff sound (Phase 1, K.1) is heard corresponded to systolic blood pressure and the disappearance of Korotkoff sound (Phase 5, K.5) was taken as a measure of diastolic blood pressure. If the children were found to have elevated blood pressure (more than 90th percentile for age, sex and height percentile) the first time reading, the children were again told to take rest for at least ten minutes and the second measurement was recorded. Blood pressure was recorded as per the recommendations of “Fourth report by Task force on Diagnosis, Evaluation and Treatment of High Blood Pressure in Children and Adolescents by the United States National High Blood Pressure Education Program (NHBPEP), Working Group in 2004”. Hypertension in children and adolescents was defined as systolic blood pressure and/or diastolic blood pressure that is at or above the 95th percentile for age, sex and height percentile.

The collected data was analyzed using statistical software, SPSS Version 16.0. Frequencies and proportion was reported. Chi-square test was done to test the significance of the difference across the groups and P-value <0.05 was considered statistically significant.
RESULTS

The distribution of the study participants by age and gender is shown in Table 1. Of the 1188 student participants included in the study, 592 (49.8%) were males and 596 (50.2%) were females. The age ranged from 11-18 years for males and 12-16 years for females. Majority of the study participants belonged to age group of 13 and 14 years (64.7%).

Table 1: Distribution of study participants by age and gender (N=1188)

| Age (Years) | Males       | Females     | Total       |
|            | Frequency (%) | Frequency (%) | Frequency (%) |
| 11          | 1 (0.2)      | -           | 1 (0.1)     |
| 12          | 60 (10.1)    | 74 (12.4)   | 134 (11.3)  |
| 13          | 171 (28.9)   | 217 (36.4)  | 388 (32.7)  |
| 14          | 203 (34.3)   | 177 (29.7)  | 380 (32)    |
| 15          | 144 (24.3)   | 115 (19.3)  | 259 (21.8)  |
| 16          | 12 (2)       | 13 (2.2)    | 25 (2.1)    |
| 18          | 1 (0.2)      | -           | 1 (0.1)     |
| Total       | 592 (49.8)   | 596 (50.2)  | 1188 (100)  |

The prevalence of hypertension during first screening was 7.7% and reduced to 4.4% during second screening. The distribution of blood pressure level with respect to gender and age is shown in Table 2. Overall, the prevalence of hypertension among males was 13 (2.2%) and females 39 (6.5%). Among males, 7 (1.2%) and among females, 28 (4.7%) were found to have systolic hypertension. The prevalence of diastolic hypertension among males and females was 13 (2.2%) and 19 (3.2%) respectively. The prevalence of hypertension was seen more among the participants aged 14 years which was 5.5%. Among males, the prevalence was seen highest among the participants aged 14 years (2.8%) and in females, it was seen more among the participants aged 15 years which is 8.7%. Among both males and females, diastolic hypertension was seen most common in the age 14 years with the prevalence of 3.4%. The prevalence of systolic hypertension (2.9%) was found to be greater than diastolic hypertension (2.7%). There was a statistically significant association between blood pressure levels and gender (P=0.001).

Table 2: Distribution of blood pressure (BP) level by gender and age (N=1188)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Normal</th>
<th>Pre-hypertension</th>
<th>Systolic hypertension</th>
<th>Diastolic hypertension</th>
<th>Hypertension (Systolic or diastolic or both)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Frequency (%)</td>
<td>Frequency (%)</td>
<td>Frequency (%)</td>
<td>Frequency (%)</td>
<td>Frequency (%)</td>
</tr>
<tr>
<td>Males</td>
<td>11</td>
<td>1 (100)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>59 (98.3)</td>
<td>1 (1.7)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>158 (92.4)</td>
<td>10 (5.8)</td>
<td>3 (1.8)</td>
<td>3 (1.8)</td>
<td>3 (1.8)</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>182 (89.7)</td>
<td>14 (6.9)</td>
<td>3 (1.5)</td>
<td>7 (3.4)</td>
<td>7 (3.4)</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>127 (88.2)</td>
<td>14 (9.7)</td>
<td>1 (0.7)</td>
<td>3 (2.1)</td>
<td>3 (2.1)</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>11 (91.7)</td>
<td>1 (8.3)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>1 (100)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>539 (91)</td>
<td>40 (6.8)</td>
<td>7 (1.2)</td>
<td>13 (2.2)</td>
<td>13 (2.2)</td>
<td>13 (2.2)</td>
</tr>
<tr>
<td>Females</td>
<td>12</td>
<td>70 (94.6)</td>
<td>2 (2.7)</td>
<td>1 (1.4)</td>
<td>2 (2.7)</td>
<td>2 (2.7)</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>191 (88)</td>
<td>13 (6)</td>
<td>10 (4.6)</td>
<td>7 (3.2)</td>
<td>13 (6)</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>147 (83.1)</td>
<td>16 (9)</td>
<td>9 (5.1)</td>
<td>6 (3.4)</td>
<td>14 (7.9)</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>95 (82.6)</td>
<td>10 (8.7)</td>
<td>8 (7)</td>
<td>4 (3.5)</td>
<td>10 (8.7)</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>13 (2.2)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>516 (86.6)</td>
<td>41 (6.9)</td>
<td>28 (4.7)</td>
<td>19 (3.2)</td>
<td>39 (6.5)</td>
<td>39 (6.5)</td>
</tr>
</tbody>
</table>

Table 3 shows the classification of blood pressure levels with respect to BMI classification. The prevalence of obesity was found to be 6.2% (males 7.1% and females 5.4%). The prevalence of hypertension among obese students was 8.1%. The prevalence of hypertension among students having normal BMI and overweight was 4.2% and 3.9% respectively. The blood pressure level was found to be statistically significant with BMI level (P<0.0001).

Table 3: Classification of blood pressure (BP) level with respect to BMI classification (N=1188)

<table>
<thead>
<tr>
<th>BMI Level</th>
<th>Blood pressure level</th>
<th>Total</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal Frequency (%)</td>
<td>Pre-hypertension Frequency (%)</td>
<td>Systolic hypertension Frequency (%)</td>
</tr>
<tr>
<td>Underweight</td>
<td>1 (100)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Normal</td>
<td>895 (90.9)</td>
<td>49 (5)</td>
<td>41 (4.2)</td>
</tr>
<tr>
<td>Overweight</td>
<td>107 (83.6)</td>
<td>16 (12.5)</td>
<td>5 (3.9)</td>
</tr>
<tr>
<td>Obese</td>
<td>52 (70.3)</td>
<td>16 (21.6)</td>
<td>6 (8.1)</td>
</tr>
<tr>
<td>Total</td>
<td>1055 (88.8)</td>
<td>81 (6.8)</td>
<td>52 (4.4)</td>
</tr>
</tbody>
</table>

*P<0.05, Statistically Significant*
The classification of systolic and diastolic blood pressure level with respect to BMI level is shown in Table 4. The prevalence of diastolic and systolic hypertension was seen more among obese student participants which is 5.4% and 6.8% respectively. The prevalence of systolic and diastolic hypertension was found to be same across the overweight students which was 2.3%. Both, the systolic and diastolic blood pressure levels were found to be statistically significant with BMI categories (P<0.0001 for systolic BP level, and P=0.003 for diastolic BP level).

Table 4: Classification of systolic and diastolic blood pressure level with respect to BMI classification (N=1188)

<table>
<thead>
<tr>
<th>BMI Level</th>
<th>Systolic hypertension</th>
<th>P-Value</th>
<th>Diastolic hypertension</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency (%)</td>
<td></td>
<td>Frequency (%)</td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>28 (2.8)</td>
<td>Exact test</td>
<td>24 (2.4)</td>
<td>Exact test</td>
</tr>
<tr>
<td>Normal</td>
<td>3 (2.3)</td>
<td>P&lt;0.0001*</td>
<td>3 (2.3)</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>4 (5.4)</td>
<td></td>
<td>5 (6.8)</td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>Total 35 (2.9)</td>
<td></td>
<td>32 (2.7)</td>
<td></td>
</tr>
</tbody>
</table>

*P<0.05, Statistically Significant

**DISCUSSION**

Though in adults, the definition of hypertension is based upon the outcomes like myocardial infarction and stroke, with their burden increasing linearly with blood pressure levels, however in children and adolescents, understanding the blood pressure is far from being complete and its long term natural history in this age group is still not well understood. Also one of the reasons is the absence of hypertension related outcomes during childhood. Although the prevalence of hypertension in childhood is lower than in adulthood, but this condition is not rare. The prevalence of hypertension in children appears to be increasing.

The prevalence of hypertension was found more among females than in males which is 6.5% and 2.2% respectively. Harrabi I et al24 and Monyeki KD et al25 reported the prevalence of hypertension to be more in females than in males. In our study, the prevalence of systolic and diastolic hypertension was found to be more in females than in males, similar to the findings noted by Nichols S et al. (2006)26, and Bugaje MA et al27 in their studies. Taksande A et al28 in their study, found systolic BP and diastolic BP increased with age among females, and the same was noted in our study. The prevalence of hypertension among females aged 14 years was found to be 7.9% in our study. Anjana et al29 in their study found that the prevalence of hypertension among females aged 14 years to be 6.38%. In our study, the prevalence of hypertension was more among children aged 14 - 15 years. Kamath V et al30 reported the prevalence of hypertension to be more in children aged 14 - 16 years. Jafar TH et al31, Subhi MD et al32, Mahyar A et al33, and Akgun C et al34 in their studies reported that the prevalence of systolic hypertension to be greater than diastolic hypertension, similar to our findings. The significant statistical association between gender and blood pressure level as noted in our study was also noted by Rahman AM et al35 in their study in Bangladesh.

In children, the etiology of hypertension is primarily associated with the obesity35,36. With the increasing prevalence of childhood obesity, hypertension in children has undergone an epidemiological shift. In our study, the blood pressure level was found to be statistically significant with BMI level (P<0.0001), and a similar association was reported by Rahman AM et al36, Sharma A et al37, Kamath V et al, Salman Z et al38 in their studies.

In our study, the prevalence of systolic hypertension among overweight individuals was found to be 2.3%. Chu NF et al39 in their study noted that the prevalence of abnormal systolic blood pressure among overweight students to be 2.2%. Both, the systolic blood pressure level (P<0.0001) and diastolic blood pressure level (P=0.003) was found to be statistically significant with BMI categories in our study, and similar association was observed by Jafar TH et al31, and Nanaware NL et al40, who reported the significant positive correlation of BMI with systolic and diastolic blood pressure. Kamath V et al30, in their study reported that the BMI level was significant with systolic blood pressure level.

Elevated blood pressure in children and adolescents may be an early indicator of essential hypertension in adulthood. Children with essential hypertension are likely to be asymptomatic as the symptoms of childhood hypertension are largely non-specific. Because of the belief and lack of routine blood pressure examination in children that hypertension in children is rare, many children would have been missed to receive the diagnosis of hypertension.

**CONCLUSIONS**

The results indicate that the prevalence of hypertension reduced from 7.7% during first screening to 4.4% during second screening. Prevalence of hypertension was found higher among females than in males. We also found out that the prevalence of hypertension was more among obese students. High blood pressure was associated with high BMI. The schools should conduct routine blood pressure screening among students as an early marker of risk for future cardiovascular events. Health education regarding healthy diet, nutrition education and health promotion to be given to the students and students should be encouraged for interventions related to modifiable risk factors such as encouragement of physical activities and health dietary habits.
Prevalence of Hypertension Among School Children

Limitations

Application of international reference standards of blood pressure levels in an Indian setting may be one of the limitations of the study. Also, this study is limited to only two blood pressure measurements wherein second measurement was done for the individuals who had elevated blood pressure (BP greater than 90th percentile for age, sex and height percentile) during the first reading.

REFERENCES


Prevalence and Factors Associated with Anxiety Disorder among Secondary School Adolescents of Dang District, Nepal

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²Lecturer, Department of Public Health, School of Health & Allied Sciences, Pokhara University, Pokhara, Nepal

ABSTRACT

Background: An anxiety disorder is a serious mental illness. For people with anxiety disorders, worry and fear are constant and overwhelming, and can be crippling. 

Objectives: The aim of this study was to find out the prevalence and associated factors of anxiety among secondary and higher secondary school adolescents.

Methods: Four schools from private and four from public from Dang district were selected randomly and stratified clusters technique was used to calculate the total sample size of adolescents. The data was collected during 30th October to 7th November 2014. Statistical tests used were mean, SD, chi-square and logistic regression.

Results: The prevalence of anxiety among the adolescents was found to be 46.5%. Sex, grade and school were found to be associated with anxiety in bi-variate logistic regression. However, in multivariate logistic regression, males were found to be having 1.5 times more anxiety than females. Grade nine students were having 0.477 times less anxiety than grade 12 students; grade 10 were having nearly two times more anxiety than grade 12 students. The public school students were having two times more anxiety than private school students.

Conclusions: Almost one in every two adolescent students of grade 9 to 12 was suffering from anxiety disorder. Male students and from grade ten and private schools were more anxious than female students, grade 9, 11 and 12, and public school students.

INTRODUCTION

An anxiety disorder is a serious mental illness. For people with anxiety disorders, worry and fear are constant and overwhelming, and can be crippling. A study was conducted to find out the global prevalence of anxiety disorder. A systematic review and meta-regression was conducted to find out the prevalence of anxiety and to identify the factors which can influence these estimates. It is estimated that current prevalence of anxiety ranged between 0.9% and 28.3% and past year prevalence was between 2.4% to 29.8%. Substantive factors such as gender, age, culture, conflict and economic status, and urbanization accounted for the greatest proportion of variability. The global current prevalence of anxiety disorders ranged from 5.3% (3.5 - 8.1%) in African cultures to 10.4% (7.0 - 15.5%) in Euro/Anglo cultures.

One of the evidence shows that approximately one out of every 16 children meets criteria for at least one anxiety disorder and researchers have found that anxiety disorders are among the most prevalent psychological disorders in children. One
potential risk factor for the development of anxiety disorders is the experience of being bullied. Students who were bullied in multiple forms endorsed higher social anxiety levels than those who reported one form of victimization. Overt victimization (i.e., experiencing attempts or threats to harm one’s physical well being), and relational victimization (i.e., experiencing attempts or threats to harm one’s peer relationships), were both associated with raising levels of social anxiety for males and females aged 13 - 16. Boys of 14 - 18 years of age who were bullied by calling ‘gay’ have the high chance of being anxiety disorder than by other reasons. Thus, being called ‘gay’ seemed to be more strongly linked to anxiety than other forms of victimization².

Anxiety, the most common of all mental disorders currently affects about one in 13 people (7.3%). Anxiety disorders were more commonly reported in Western societies than in non-Western societies, even those that are currently experiencing conflict. Clinical anxiety affected around 10 percent of people in North America, Western Europe, and Australia/New Zealand compared to about 8% in the Middle East and 6% in Asia¹.

METHODS

A cross sectional analytical study was designed to assess the prevalence and factors associated with anxiety. A quantitative study was done among grade 9 to 12 school adolescents in selected schools of Dang district, which was purposively selected. Sample size was calculated applying formula $n = \left(\frac{Z_{\alpha/2}}{pq/d}\right)^2$ and design effect of 1.5, in which, prevalence (p) was taken as 0.319 from American adolescent’s lifetime anxiety disorder³. Similarly, ‘Zα/2’ as 1.96, and ‘d’ as 0.05. Cluster sampling was applied, which calculated the total of 538 from the district, four each of public and private schools that were selected randomly. Out of 538, only 533 students were found to be in adolescent period and further analyzed. The data was collected from 30th October to 7th November, 2014. Written permission from the Department of Public Health and written consent from the respondents as well as from their parents was taken. Statistical tests such as mean, SD, chi-square and logistic regression were used.

The information was collected through self-administrable proforma. A set of questionnaire was designed and it was provided to the targeted students at school. The questionnaire contained a set of 21 items of beck anxiety inventory⁴ and socio-demographic factors. Those students who are above 20 years were excluded from this study.

RESULTS

The results include the socio-demographic profile of the study population such as age, sex, religion, educational status in descriptive methods. Factors associated to anxiety have been presented with inferential analyses in tables along with its interpretation.

Table 1: Socio demographic characteristics of the respondents

<table>
<thead>
<tr>
<th></th>
<th>Frequency (n=533)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early adolescence</td>
<td>49</td>
<td>9.2%</td>
</tr>
<tr>
<td>Middle adolescence</td>
<td>395</td>
<td>74.1%</td>
</tr>
<tr>
<td>Late adolescence</td>
<td>89</td>
<td>16.7%</td>
</tr>
<tr>
<td>Mean ±sd</td>
<td>16.2±1.3</td>
<td></td>
</tr>
<tr>
<td><strong>Sex of the students</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>281</td>
<td>52.7%</td>
</tr>
<tr>
<td>Females</td>
<td>252</td>
<td>47.3%</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>511</td>
<td>95.9%</td>
</tr>
<tr>
<td>Buddhist</td>
<td>2</td>
<td>0.4%</td>
</tr>
<tr>
<td>Muslim</td>
<td>6</td>
<td>1.1%</td>
</tr>
<tr>
<td>Christian</td>
<td>13</td>
<td>2.4%</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.2%</td>
</tr>
<tr>
<td><strong>School category</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>285</td>
<td>53.5%</td>
</tr>
<tr>
<td>Private</td>
<td>248</td>
<td>46.5%</td>
</tr>
<tr>
<td><strong>Student’s running grade</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 9</td>
<td>83</td>
<td>15.6%</td>
</tr>
<tr>
<td>Grade 10</td>
<td>156</td>
<td>29.3%</td>
</tr>
<tr>
<td>Grade 11</td>
<td>144</td>
<td>27%</td>
</tr>
<tr>
<td>Grade 12</td>
<td>150</td>
<td>28.1%</td>
</tr>
<tr>
<td><strong>Student’s status of living</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hostel</td>
<td>8</td>
<td>1.5%</td>
</tr>
<tr>
<td>With parents</td>
<td>448</td>
<td>84.1%</td>
</tr>
<tr>
<td>With other relatives</td>
<td>26</td>
<td>4.9%</td>
</tr>
<tr>
<td>In rent/bahal</td>
<td>48</td>
<td>9%</td>
</tr>
<tr>
<td>Others</td>
<td>3</td>
<td>0.6%</td>
</tr>
<tr>
<td><strong>Severe events</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>467</td>
<td>87.6%</td>
</tr>
<tr>
<td>Yes</td>
<td>66</td>
<td>12.4%</td>
</tr>
</tbody>
</table>

Almost three-fourth (74.1%) were middle adolescents while 9.2% were in early adolescence and 16.7% were in late adolescence (Table 1). Similarly more than half (52.7%) were males where as 47.3% were females. Most of the respondents were Hindus (95.9%). Similarly more than half (53.5%) were from public schools and 46.5% were from private schools. Out of 533 respondents more than three-fourth (84.1%) were living with their parents followed by students living in rent were 9% and 0.6% were living with others. Similarly about more than three-fourth (87.6%) students do not have family history of death in last one week where as students those who have family history of death in last one week were 12.4%.
Prevalence and Factors Associated with Anxiety Disorder among Secondary School Adolescents of Dang District, Nepal

Table 2: Association of variables with anxiety

<table>
<thead>
<tr>
<th>Age</th>
<th>Minimal n (%)</th>
<th>Mild n (%)</th>
<th>Moderate n (%)</th>
<th>Severe n (%)</th>
<th>χ²</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA and MA</td>
<td>239 (83.9)</td>
<td>153 (51.8)</td>
<td>56 (17.8)</td>
<td>10 (3.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA</td>
<td>46 (16.1)</td>
<td>25 (15.2)</td>
<td>16 (22.2)</td>
<td>2 (16.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>137 (48.1)</td>
<td>108 (65.9)</td>
<td>35 (48.6)</td>
<td>1 (8.3)</td>
<td>1.893</td>
<td>0.595</td>
</tr>
<tr>
<td>Females</td>
<td>148 (51.9)</td>
<td>56 (34.1)</td>
<td>37 (51.4)</td>
<td>11 (91.7)</td>
<td>23.794</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>Severe events</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>258 (90.5)</td>
<td>138 (84.1)</td>
<td>61 (84.7)</td>
<td>10 (83.3)</td>
<td>4.803</td>
<td>0.187</td>
</tr>
<tr>
<td>Yes</td>
<td>27 (9.5)</td>
<td>26 (15.9)</td>
<td>11 (15.3)</td>
<td>2 (16.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Running grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 9</td>
<td>59 (20.7)</td>
<td>14 (8.5)</td>
<td>10 (11.9)</td>
<td>83 (15.6)</td>
<td>25.470</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>Grade 10</td>
<td>67 (23.5)</td>
<td>61 (37.2)</td>
<td>28 (33.3)</td>
<td>156 (29.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 11</td>
<td>72 (25.3)</td>
<td>54 (32.9)</td>
<td>18 (21.4)</td>
<td>144 (27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 12</td>
<td>87 (30.5)</td>
<td>35 (21.3)</td>
<td>28 (33.3)</td>
<td>150 (28.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School category</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public schools</td>
<td>130 (45.6)</td>
<td>105 (64)</td>
<td>42 (58.3)</td>
<td>8 (66.7)</td>
<td>15.937</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>Private schools</td>
<td>155 (54.4)</td>
<td>59 (36)</td>
<td>40 (41.7)</td>
<td>15 (33.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindus</td>
<td>277 (97.2)</td>
<td>155 (94.5)</td>
<td>68 (94.4)</td>
<td>11 (91.7)</td>
<td>2.930</td>
<td></td>
</tr>
<tr>
<td>Non Hindus</td>
<td>8 (2.8)</td>
<td>9 (5.5)</td>
<td>4 (5.6)</td>
<td>1 (8.3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Bivariate and multivariate logistic regression of variables with levels of anxiety

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>P value</th>
<th>Unadjusted OR (95% CI)</th>
<th>P value</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>0.021*</td>
<td>1.496 (1.062-2.108)</td>
<td>0.031*</td>
<td>1.520 (1.040-2.222)</td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 12</td>
<td></td>
<td>1</td>
<td>&lt;0.001**</td>
<td>1.987 (1.405-2.812)</td>
</tr>
<tr>
<td>Grade 9</td>
<td>0.049*</td>
<td>0.562 (0.316-0.998)</td>
<td>0.014*</td>
<td>0.477 (0.264-0.863)</td>
</tr>
<tr>
<td>Grade 10</td>
<td>0.009**</td>
<td>1.834 (1.166-2.887)</td>
<td>0.018*</td>
<td>1.770 (1.099-2.850)</td>
</tr>
<tr>
<td>Grade 11</td>
<td>0.169</td>
<td>-</td>
<td>0.679</td>
<td>-</td>
</tr>
<tr>
<td>School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td></td>
<td>1</td>
<td>&lt;0.001**</td>
<td>2.377 (1.645-3.435)</td>
</tr>
<tr>
<td>Public</td>
<td>&lt;0.001**</td>
<td>1.987 (1.405-2.812)</td>
<td>&lt;0.001**</td>
<td>2.377 (1.645-3.435)</td>
</tr>
</tbody>
</table>

Table 3 shows that there is an association between sex, grade, school and anxiety, while applying bivariate logistic regression and in multivariate regression. Males have 1.520 times more anxiety than females. Similarly grade 9 students have 0.477 times less anxiety than grade 12 and grade 10 students have nearly two times more anxiety than grade 12 students. Similarly public school students have two times more anxiety than private school students.

**DISCUSSION**

In this study, the prevalence of anxiety was found to be 46.5%. In this study, gender was found to be a very significant predictor for anxiety (p-value <0.001) which is similar to one of the study conducted in Iranian middle school students. Similar study conducted in Iran found the prevalence of anxiety to be 73.4% and another study conducted by Pochard F, Azoulay E et al found 69.1%, which are higher compared to this study.

Similarly, males were 1.5 times more likely to have anxiety than females in this study. However, unlike, similar study showed that depression and anxiety symptoms are more in girls than in boys. The findings of this study showed that grade 10 students are more likely to have anxiety than students from any other grade (Grade 9, 11 and 12). The possible cause for high anxiety in this grade might be due to high pressure in study, because in Nepal the grade 10 has remained as an iron gate for students.

A study was conducted in China which shows that lower family income, lower self-esteem, and hostility were significantly associated with social interaction anxiety among adolescents while sex, grade and school type were associated factors of anxiety in this study.
A study conducted by Barron ML et al found that women who reported irregular cycles were three times more likely to have current Attention Deficit Hyperactivity Disorder (ADHD; OR = 3.05, 1.31 – 7.10) and less than one-half are likely to have a current anxiety disorder compared to those who reported regular cycles10. But this study did not show any association between menstruation and anxiety disorder.

CONCLUSIONS

Almost one in every two school adolescents of grade 9 to 12 suffer from anxiety disorder. Sex, grade and type of school were found to be associated with anxiety in bivariate logistic regression. In multivariate logistic regression, males were having more anxiety; grade 9 students were having less anxiety whereas grade 10 students were having more anxiety. The public school students were having two times more anxiety than private school students.

Acknowledgements

We would like to thank all the school students of Dang district, who participated in the survey. The Principals and school families of the selected schools are also highly acknowledged. We also appreciate all the helping hands that directly and indirectly supported in this research. Finally, we would like to thank Mr. Tek Bahadur Chhetri, Lecturer of Pokhara University, for his contribution in translation of the inventory.

REFERENCES


Challenges and Opportunities in Cancer of the Larynx

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Key words: Head and neck cancers, Laryngeal cancers, Tumor markers.

ABSTRACT

Laryngeal cancers are quite incapacitating due to loss of function, and marked deformity. Considerable variations exist in the incidence of this disease between various countries. Several factors appear to affect the management of this disease in one setup, as compared to other developed countries. Such factors include the time of presentation, diagnosis, co-morbid status, and availability of finance, consent, treatment options and the problems of follow-up. Therefore, the management of cancer of larynx is a challenge, because the optimal outcome requires-intensive specialized evaluation, coordinated multimodality treatment, supportive care and rehabilitation. Strong difference of opinion exists as to the incidence, indications, techniques of surgery and results of surgery. It is important to decide the protocol of treatment for each patient. Functional preservation of the larynx remains a challenge. Here, we review and highlight the challenges in the management of this disease.

INTRODUCTION

Incidence of head and neck cancers varies between 10 - 30% of total body cancers in different regions. In India, head and neck cancers accounts for about 23% of all cancers in males and 6% in females¹. It can have devastating effects on the lives of patients; the treatment can be disfiguring and often makes normal speech and eating impossible. The majority of these cancers arise from the mouth, lip and tongue (oral cavity), the upper part of the throat and pharynx, and larynx (voice-box)². Other upper aero-digestive tract sites include the salivary glands, nose, sinuses and middle ear, but these cancers are relatively rare; cancer which originates in the nerves and bone of the head and neck is even rarer². Maximum number of cases are seen in 4th and 5th decades of life and in males (70%) but Chelleng et al³ reported incidence in younger population due to more chewing habits of tobacco, zarda, supari etc.

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Cancer of the larynx is the second most common form of head and neck cancer (Oral cancer being the first most common). Virtually all cancers of the larynx are squamous cell carcinomas. Within the larynx, the glottis (the area containing the vocal cords) is most frequently affected⁴. The most common early symptom of laryngeal cancer is chronic hoarseness. Other symptoms include pain or problems with swallowing (dysphagia), lump in the neck, sore throat, ear ache, or a persistent cough.

Laryngeal cancers constitute the most common nearly 16% of head and neck cancers. Considerable variations exist in the incidence of this disease between various countries. Several factors appear to affect the management of this disease in our environment, compared to other developed countries. Such
factors include the time of presentation, diagnosis, co-morbid status, finance, consent, treatment options and the problems of follow-up. It is important to decide the protocol of treatment for each patient. Functional preservation of the larynx remains a challenge. Therefore, this review is undertaken to highlight the challenges in the management of this disease.

INCIDENCE

In UK, laryngeal cancer accounts for 1% of all new cases of cancer. In 2011, there were 2,360 new cases of laryngeal cancer in the UK

In India, head and neck cancers comprises 22 - 36% in males, and 13 - 15% in females, much higher than Western Countries. Cancer of larynx constitutes 1 - 2% of total cancers. In our study in Punjab state retrospective study showed incidence to be 6.66% while prospective study showed 16.36%. In retrospective study, maximum cases were from supraglottic region (60%) while in prospective study nearly 50% cases were of glottis cancer. Lymphatic metastasis was seen in more than 50% cases - occult in only 4% patients due to better diagnostics. Incidence of cancer of larynx according to sites in another study was: Supraglottis - 21%, AE fold - 7%, false cords - 5%, epiglottis - 9%, glottis – 78%, true cords - 73%, arytenoids - 2%, anterior commissure - 2%, posterior commissure - 1%, and subglottis - 1%. Iwamotto H, Gupta et al, and Bhatia et al in their study in clinic-pathological study of head and neck cancers, provided sufficient data for comparative analysis

Head and neck cancers are common in developing countries due to Nonexistent or poor infrastructure in place to prevent cancer. No facilities for early diagnosis, no plans and systems to cope with cancer, unhealthy diet habits, lack of basic services and no control of vices of tobacco/alcohol. Mouth and tongue cancer is common in Indian subcontinent. In a survey done in Bihar, out of total 173 histopathologically proved cancer cases, larynx malignancy was seen in 73 cases (42%), oral cavity/oropharynx 59 cases (34%), nose and PNS 25 cases (14.4%), neck 7 cases (4%), ear 6 cases (3.4%), salivary glands 3 cases (1.73%). Out of these 96% were squamous cell carcinomas. Male to female ratio was 3 : 1.

RISK FACTORS

Various risk factors are attributed to causation of larynx cancer: Genetic predisposition, cigarette smoking, chewing tobacco (with or without areca/betel nut), high alcohol consumption.
For heavy drinkers who are also heavy smokers, the risk of oral cancer and laryngeal cancer is over 35 times that for those who neither smoke nor drink. Poor diet associated with heavy smoking and alcohol use can result in malnutrition, exacerbates the risk of cancer. Frequent consumption of fruits and vegetables is associated with reduced risk. Occupational and environmental exposure to asbestos, formaldehyde, nickel, isopropyl alcohol, sulfuric acid mist, diesel fumes, and radiation have been linked with laryngeal cancer. Infection by human papilloma viruses (HPV) and herpes viruses have been implicated in the development of some cancers of oral cavity, pharynx, and larynx. Immunodeficiency, and presence of pre-cancerous lesions such as leukoplakia/erythroplakia and solitary papilloma may also lead to laryngeal cancer. Jussawala et al, Gangadharan et al, and Tuli BS et al has corroborated smoking habit in causation of cancer larynx.

Fig 2: Smoking: A risk factor for laryngeal cancer

DIAGNOSIS

Diagnosis of cancer of larynx is always done by taking the history of patient, clinical investigations such as examination of affected area such as neck and larynx, radiological examination, and histological examination. Tumor markers are most useful for monitoring response to therapy and relapse.

T.N.M. Staging describes size, extent and spread to lymph nodes and distant places. Staging is important to estimate prognosis, determine best course of therapy, and facilitate investigations.

TREATMENT

Most head and neck cancers are treated with surgery or radiotherapy or a combination of both. Plastic or reconstructive surgery is often needed. Patients need considerable help and support with nutrition and communication, both during and after treatment. People who have been treated for cancers remain at high risk, both of developing recurrent disease and of new cancers in the head and neck region and other parts of the body. Careful follow-up for a specialist assessment and treatment are therefore essential.

Treatment Protocol - Decision making depends on extent of...
tumor, site of tumor, histology of tumor, neck nodes, distant metastasis, expertise of surgeon, and facilities available.

**Treatment plan for cancer of larynx** must meet 3 objectives:
1. To eradicate the neoplasm completely,
2. To give the best functional result, and
3. Good cosmetic result.

**Various modes of treatment**¹⁸,¹⁹

- Surgery which may be conservative or radical
- Radiotherapy/chemotherapy/combination of any of the above (CCRT)
- Finzi Harmer therapy (Radio-active gold implantation)

**Radical surgery**, a traditional approach leads to loss of function and marked deformity.

**Conservative approach**

Surgical procedure when combined with other modalities gives the same results as radical procedure with preservation of function like partial epiglottectomy/ partial cordeectomy/ partial laryngectomy/ supraglottic laryngectomy/ vertical hemilaryngectomy/ supracricoid or subtotal laryngectomy/ near total laryngectomy.

Fig 5: 62 year old female patient with cancer of larynx- laryngectomy with a permanent tracheostome

Fig 6: 60 year old male patient with laryngeal carcinoma with tracheostomy

Fig 7: Cancer of larynx with secondaries neck

Fig 8: Indirect laryngoscopy - growth arising from anterior half of vocal cords from its edge or upper surface

Fig 9: Anterior commissure growth/ transcricoid growth
Outcome and Prognosis

- Outcome in malignant tumor of the larynx is by 5-year survival rates.
- Supraglottis: stage I - 59%, stage II - 59%, stage III - 53%, stage IV - 34%
- Glottis: stage I - 90%, stage II- 74%, stage III - 56%, stage IV - 44%
- Subglottis: stage I - 65%, stage II - 56%, stage III - 47%, stage IV - 32%

Cancer of Larynx: Research goals /Future Prospects

Recommendations

- Clinical, epidemiological and scientific research on cancer in Nepal should be encouraged.
- The studies should include defining the possible causes of cancer, prevention, methods of achieving early diagnosis and improvement in therapy, and changing lifestyles of the population.
- The roles of the Nepal Research Council, the Medical Universities of Nepal, and the Institutes of Health and the National Cancer Registry need to be coordinated in this respect by creation of a Clinical Research Council.

CONCLUSIONS

Head and neck cancer is the major problem due to its associated morbidity and mortality. Poor nutrition combined with consumption of tobacco, tobacco products, bad orodental hygiene, alcohol and smoking make the population more vulnerable to head and neck cancer. Easy availability of these products and advertisements in the print media and TV has adversely affected the younger generation leading to more consumption of these carcinogens. Health education and general awareness by the doctors, Non-Government organizations and other social organizations are of great importance for educating people on the ill effects of tobacco, alcohol and other carcinogens. Vast majority of patients with cancer are treatable but not curable. Operation and rehabilitation must be discussed with patient. Conservative approach is better than radical.

REFERENCES


In case of placenta acreta the chorionic villi grow into the basal deciduas. In placenta increta the chorionic villi penetrate into the uterine musculature and in case of placenta percreta chorionic villi pass through the myometrium, the urinary bladder and the bowel leading to very serious complications. There are few predisposing factors for abnormal placentation which include prior cervical dilatation and curettage, endometritis, submucus fibroid, uterine scar and placenta previa.

Placenta percreta is very rarely diagnosed before birth. Ultrasonography imaging and color Doppler, and MRI are the tests frequently performed but they also rarely confirm the diagnosis. It is suggested that if the diagnosis of placenta percreta is to be made then high level of scrutiny is required to rule it out. When this diagnosis is made, one needs to be prepared for massive transfusion and cesarean hysterectomy.
often with multidisciplinary approach. It is very challenging for the surgeon operating on primipara who still has to complete her family.

Case Report

A 30 year old lady, G3P2L1A0, in 18 weeks of gestation presented in the hospital emergency with acute onset of severe abdominal pain.

On examination her general condition was poor, she was pale, had pulse- 120 beats per minute, and blood pressure- 80/0 mmHg. She was in the state of shock.

Per abdominal examination showed generalized tenderness with distention of abdomen of 24 weeks size.

Per vaginal examination showed un-effaced cervix and os closed.

Resuscitation was done. Ultrasonography showed 18 weeks gestation with single intra-uterine dead fetus and hemoperitoneum.

Intra-operatively there was massive hemoperitoneum and thinned out fundus. There were two completely eaten up areas of about 4 X 3cm and 2 X 2 cm size on the fundus of uterus thorough which amniotic sac and fetus could be nicely visualized.

The fetus was delivered after incising the tissue between the two thinned out areas to join them together. The umbilical cord was directly attached to the uterine surface. There was no placenta. The baby had cleft lip and cleft palate.

Since the paper thin uterus wall remained atonic subtotal hysterectomy had to be performed.

OBJECTIVES

We report a case of this potentially life threatening condition in 18 weeks of pregnancy in an otherwise healthy woman having no history of predisposing factors for abnormal placentation.

The occurrence of severe abdominal pain and presence of a large quantity of fluid in abdominal cavity (hemoperitoneum) demanded an emergency laparotomy which revealed uterine rupture with placenta percreta. On review of literature on placenta percreta, a case of spontaneous rupture of an unscarred uterus in early pregnancy indicated that the reported case can be considered extremely rare. This case report aims to contribute to the insight and knowledge of this rare complication of pregnancy.

METHODS

Observational, cross-sectional (Prevalence with individuals as unit of study).

RESULTS

Although the abdomen was opened with the working diagnosis of hemoperitoneum of unknown cause with IUFD, peroperatively she was found to have ruptured placenta percreta as the cause of hemoperitoneum. Histopathological report of the excised uterus came out as chorionic villi (chorionic migratory cells) in the inner layer of myometrium.

Fig 1: Blood removed from peritoneum

Fig 2: Site for ruptured Placenta Percreta in Early Pregnancy
Fig 3: Bleeding from site of ruptured

Fig 4: Sites of ruptured

Fig 5: Fetus with cleft lip and palate

Fig 6: Blood and fetus after surgery
CONCLUSIONS

The literature does not show the incident of placenta percreta along with rupture of unscarred uterus\(^1\). The literature shows the association between placenta percreta and uterine rupture in the presence of risk factors\(^4\). This case had no risk factor for the uterine rupture presenting itself as occurring in a very rare situation.

Medical treatment is possible in only those cases where there is no post partum hemorrhage and the patient desires to have future pregnancy\(^2\). It is a great challenge to medical science where there is placenta percreta and hemoperitoneum and patient desires to have future pregnancy.

In this case we could not save the uterus but the patient was saved.

Disclosure

No conflicts in this work.

No violation of human rights and safety.

Funding nil.

REFERENCES


A Case Report on Prolonged Apnea Following Succinylcholine Injection during ECT in a Patient with Suicidal Attempt by Organophosphorus Poison

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²Consultant Anesthesiologist, Fishtail Hospital, Pokhara, Nepal
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ABSTRACT
Organophosphorus pesticides have been used commonly for suicidal attempts. This can affect plasma cholinesterase activity. This case was a 27 years old male hospitalized due to suicidal attempt by swallowing agricultural poison. He was a known case of recurrent depressive disorder with severe psychotic symptoms and was posted for electroconvulsive therapy (ECT). The ECT was conducted uneventfully till patient developed apnea for about 2 hours. He had received propofol 100 mg and succinylcholine 40 mg. The patient was intubated and after restoration of adequate respiratory rate and depth, was extubated. Thus in cases with history of suicidal attempts, history of organophosphorus poisoning should be taken before anesthetizing for ECT.

INTRODUCTION
Organophosphorus (OP) compounds are used as pesticides and chemical warfare agents. Acute poisoning by these agents is a major global problem. OP toxicity is generally caused by intentional use or accidental exposure to agricultural products or pesticides. The toxicity of these pesticides leads to irreversible inhibition of acetylcholine enzyme leading to accumulation of acetylcholine and subsequent overactivation of cholinergic receptors. Inhibition of plasma cholinesterase can cause increased sensitivity to drugs hydrolysed by the enzyme for example succinylcholine, mivacurium, chloroquine. Thus patients who have been exposed to poison should be carefully taken into consideration before anesthetizing for any procedure.

Case Report
The case was a 27 years old male, resident of Doti and a student by occupation. He was staying in a hostel for his studies, away from home and parents. Three years back, he had started talking less, had developed insomnia, hallucinations, loss of appetite and decreased performance in his studies. Then, he was referred to the psychiatrist who started him on anti-depressants but he was under irregular medication and thus had multiple suicidal attempts.

On 1st May 2015, he was brought to Emergency Department of Fishtail Hospital by general public in a state of semi-consciousness. He had frothy secretion from mouth and his breathe smelt like kerosene, however, his heart rate and blood pressure were within normal limits. Organophosphorus poisoning could not be ruled out and hence he was managed in intensive care unit (ICU) in the line of the said poison. He was admitted for five days in ICU and few days in General Ward. On discharge, his electrolytes and blood tests were normal.

Since the symptoms like drowsiness, sleep disturbance did not improve even with revised antipsychotic drugs, he was posted for ECT in the same hospital on 10th May, 2015. In 1st session of
ECT, he developed prolonged respiratory apnea after receiving 100 mg propofol and 40 mg of succinylcholine. The patient was intubated and shifted to ICU for mechanical ventilation. After two hours of induction he started breathing but with inadequate depth and rate. He was thus not extubated until 5 hours from induction when he completely regained consciousness and started breathing with adequate depth, volume and rate.

DISCUSSION

Organophosphorus compounds poisoning is important clinical problem in rural regions of developing world. Three million people are exposed to OP poison each year and up to 3,00,000 fatalities are said to occur. Deliberate injection is the most common mode of poisoning. These compounds are basically used as pesticides and anti-parasites. It is known to inhibit various esterases like acetylcholinesterase and plasma cholinesterase (pseudocholinesterase) following which there is accumulation of acetylcholine at the central and peripheral cholinergic sites. Fasiculations and other neuromuscular signs and symptoms may develop with depression of acetylcholinesterases in excess of 80% and risk of death is four folded with depression of 90% or more.

Prolonged apnea following succinylcholine administration has been observed in patients with severely decreased level of acetylcholinesterase. In normal individuals, succinylcholine is metabolized rapidly by pseudocholinesterase leading to its short duration of action of approximately 2 - 5 minutes. The depolarizing block attained with succinylcholine is prolonged in pregnancy, in certain disease states like cirrhosis, malnutrition and in presence of atypical pseudocholinesterase. Plasma cholinesterase recovers in around 4 weeks whereas RBC acetylcholinesterase takes a little longer and may not function normally for months.

ECT is indicated for depressed patients especially those who have not responded to antidepressants or those who have suicidal attempts. Waghmare et al noted prolonged apnea following succinylcholine for ECT in patients who had committed suicide with organophosphates. In our patient as well, we noticed prolonged apnea even with one third dose of succinylcholine used for ECT. In Sener’s study, administration of succinylcholine was followed by apnea for 7 hours. However, the duration was a little less in our case due to one week interval between OP exposure and succinylcholine administration. There is a negative correlation between cholinesterase activity and duration of succinylcholine induced neuromuscular blockade. Altered neuromuscular function has been observed up to 2 years from exposure to the poison.

Succinylcholine can be used safely to achieve neuromuscular block of short duration after poisoning if very small dose is administered. Our patient was ventilated for almost 5 hours till he gained full respiratory muscle power. Continuous mechanical ventilation until complete restoration of muscle tone is the safest approach for apnea induced by succinylcholine.

CONCLUSIONS

A depressive patient with acute exposure to OP compounds provides challenge to both psychiatrist and anesthesiologist. Hence, the way to proper management of such patient is proper history taking and screening. There should adequate ventilation and intensive care back up for such patients.

REFERENCES


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