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Journal of BP Koirala Institute of Health Sciences
A Peer Reviewed Official Bio-Medical publication of BP Koirala Institute of Health Sciences

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ABOUT THE JOURNAL

Mission and Scope: Journal of BPKIHS (JBPKIHS) is a scientific, biomedical publication of B. P. Koirala Institute of Health Sciences, Dharan, Nepal. JBPKIHS is published as a continuation of Health Renaissance as per the decision of the 23rd Academic Committee meeting of BPKIHS held on the 1st February, 2016. The change coincides with a print and online redesign and integration into a more cohesive global online network. It is to emphasize that the mission and scope are essentially the same as that of Health Renaissance for which it had stood for and worked towards over the past thirteen years.

The main mission of the journal is to act as a means of for improving the quality of health care and medical education, particularly in the context of developing countries with limited resources. It aims to achieve the above mission by providing a standard platform to the physicians, scientists, administrators and educators all over the world in various fields of health profession and medical education for sharing their experiences and views and for disseminating the results of scientific researches related to these fields.

JBPKIHS would be of interest to all those who are involved in patient care, biomedical research, education of health professionals and administration of health services and community at large. The journal accepts original articles, review articles, case reports, brief communications and letters to the editor. The journal agrees to use the "Uniform Requirements for Manuscripts submitted to Biomedical Journals". All materials submitted to this Journal should confirm to these requirements. Detailed guidelines for submitting a manuscript to the journal have been given at the end of this issue. Authors are requested to follow these guidelines carefully while preparing the manuscript, for quicker acceptance and publication of the same in the journal.

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## CALL FOR PAPERS
A significant part of a day and entire life of an individual of this era is spent in his/her work place, station or field. There are factors in particular office, workplace or field which exert protective effect to the holistic health of the related stakeholders and empower them. Similarly, there may be some risk factors leading to ill health, lost peace and failure in life. These factors not only affect body, but also mind and brain, mental direction, psychological state and mental health as a whole. The circumstances, environment and exchanges in the work place interact not only psycho-socially, but also biologically in a complex way, either to protect or risk an individual from ill health. Mental illness affects a significant proportion of any population but many of them remain undetected and unattended.

The morbidity, disability and mortality due to suicide and neglect of overall health because of psychiatric illness remain high. The unattended/ untreated illness also results in reduced working capacity and skills, decline in economical status and overall productivity. The cost incurred due to chronic illness also contributes to economic drop. Mental disorder spares none of us; staff, workers, teachers, students, farmers, managers, leaders, policy makers and all. It affects though in some varying proportions depending on the risk and protective factors within and around us, including those in our workplace. Hence, there is a need for an employee, employer, manager and organization to closely observe this interaction. Are we conscious and concerned enough about this issue? Here, we intend to raise and draw attention of related stakeholders towards this often forgotten (in our context) but important issue.

Our institute, B. P. Koirala Institute of Health Sciences (BPKIHS) was established on Jan 18, 1993 with main objective of developing socially responsible and competent health workforce, providing health care and involving in innovative health research. This has been work place directly to a total of 1648 staff including faculty, other teachers, administrative and other staff (1008 on permanent, 99 performance, 541 contract basis) and an educational centre for a total of 1598 students of various programs and levels in this academic year.

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of 2017/18 AD (BPKIHS, December 2017). These stakeholders; not only the buildings, roads, lands here are the basis of the direction of, move towards, progress and achievement of these objectives. Only with this complementing appreciation and accordingly the behavior among the stakeholders (authority, staff, workers, teachers, students), we will be able to achieve the goal.

Medical and education fields, both are sensitive and stressful. Now, it is high time to look into our local contexts, circumstances and stressor status of both medical and non-medical staff of this institute. We, as a part of this institute, leading in the country should strive to set an example in the direction of mental health friendly work place. For this need of the era, let’s unite and work step by step.

First thing, we need to start in this direction, is the information and data regarding overall health status including mental disorder and stressor, health indicators, local contexts and circumstances, risk and protective factors. Realistic analysis, sincere approach and appropriate management are as equally important as timely increment of salary for the rise of happiness index and quality of life here. Time has come now for all the related sides; the institute, authority, teachers, staff and students to take their respective role of resource mobilization, coordination, research conduction and participation for generation of such operational research data.

Second equally important component is mental health friendly policy and plans. Whole country is involved these days in writing and revising the Constitution of Nepal. Let’s not forget that only with mental peace and health of its stakeholders, we will be able to move this institute forward.

It is not only important to bear respective role at institute level, but also at individual level. Lets we teachers, health professionals, staff, students, all service providers introspect ourselves whether we have open and healthy communication, respectful and civilized manners, empathetic and supportive behaviors among ourselves and with service users. Are we encouraging behaviors or cultures inviting ill health, like rampant use of alcohol, cannabis or displaying wasteful expenses in parties and celebrations? Are we excluding ourselves and our children sparing from our healthy cultures,
festivals, occasions and traditions, and indiscriminately indulging in internet and social media in the name of modernity and advancement?

No one from outside will bother whether our working environment, residential settings and places are safe (e.g. humps with no coloring and adequate light), healthy, peaceful; free from pollution (noise, air, water, soil) or having adequate lighting and comfortable temperature etc. and free from or with minimum of occupational hazards. There is no alternative to our own sincere concern.

We have enough evidences indicating that many and many people are affected by mental agony, ailments and stress. We are not the exception. But, are we well informed, aware, alert and concerned about this? Let’s consider and accept this fact and develop positive attitude. We need regular awareness raising programs for all stakeholders. Let’s review whether we have a mechanism, process and unit to ensure that our needy people (with stress, problem, issue or disorder) are appropriately heard, attended and helped. Are we adopting compatible view to our colleagues in our own work place struggling or recuperating from stress and mental illness?

Continuous review is required regarding whether our departments, units and offices are compatible to the interest, skill, subjects, training, post/ designation of its staff. Transparent review on the equitable distribution and provision of opportunity for training, education and career development is paramount for both individual and academic organization. At organizational levels, let’s consider whether our work place, burden and schedules are overburdened and stressful or whether less stimulating, too boring or too leisurely. At individual level, let’s be watchful whether any of us are displaying warning signs of stress, ill health or mental disorder. Let’s help each other and facilitate seek help from the expert. It’s the high time now to think sincerely about mental health at workplace. May we not be left behind!

The intention of raising this issue here in this journal is to support brain storming, introspection, reflection, and motivation for clear direction, expression and execution of mental health friendly workplace philosophy.
References

Editorial

A change in name: Health Renaissance is now Journal of BPKIHS

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As you must have noticed that the name of our journal has changed; we are now Journal of B. P. Koirala Institute of Health Sciences (JBPKIHS in short) in place of Health Renaissance from the issues of 2016 onwards as per the decision of the senate of the B. P. Koirala Institute of Health Sciences. We are aware that brand identity is considered important in the present day world. But, often rebranding is attempted to better reach the customers. As such there seems no problem with the name; but it is believed by many of us that the masthead Health Renaissance despite connoting much wider perspectives with holistic health concepts could not continue to get enough contributions from authors to substantiate the title. Our predecessor editorial teams attempted to approach various indexing bodies for indexing the journal; they have received feedbacks from such bodies also suggesting that our articles have not substantiated the name of the journal. Many contributing scholars of the journal have also suggested for a change in the name of the journal. And now, ultimately the name has been changed.

A feeling exists among many scholars associated with BPKIHS that BPKIHS itself has remained a brand name in Nepal and some parts of neighboring South Asia but has not been able to maintain its journal’s brand name up to the mark. Now, since the journal name includes BPKIHS in it, we may expect it to better reflect the publisher and thereby, help add its publicity and authenticity.

We know that biomedical journals are considered quite influential in shaping clinical practices, public health policies and researches. Despite popular belief, many journals, including the influential ones, have become non-influential in due course of time. The entire biomedical field warrants keeping the journal literature up-to-date. In order to keep up with the time, many journals resort to various changes, including the journal’s title. Indeed journals are more permanent entities than papers but they are also subject to changes and sometimes so to major extents. A study has shown that only seven out of 27 general medical journals could continuously publish with their initial name from starting of the circulation in a span of 50 years.1 Recently, the American

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Medical Association changed the names of its nine research journals with the prefix “Archives of” with “JAMA” in the name (for example, Archives of Psychiatry was changed to JAMA Psychiatry).2

We find that journals generally change their names for different reasons; major ones such as: merger of journal, split of journal or major change in the scope of journal; or minor incremental adjustments such as audience, frequencies or format of publications. But, it is important to remember that change of journal name have different implications for the entire academic community and even may be perceived negatively by many.3,4 The change of name of the journal can confuse the librarians, the authors and the readers an can ultimately lead to the loss of continuity.5 Further, there can be erroneous referencing and loss of citations that can snowball through the layers of scientific communities magnifying the problems even further.6 We must remain cautious about these possibilities.

We look forward to publishing scientifically useful and interesting articles in health sciences from Nepal and abroad. I would like to inform all concerned that there has been no change in the scope of the journal and request the contributors to submit their manuscripts to JBPKIHS for publishing. Our being the last editorial team of Health Renaissance would like to thank the previous editorial teams for their contributions in bringing the journal to the level that we took over. I would like to thank the members of our editorial team for the effort in attempting to make the journal title page impressive.

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2. Coyle JT. Much more than a name change. JAMA Psychiatry 2013; 70:8
3. Monroe FC. Title changes: another view. Serials Librarian 1992; 23: 71-83,
Blunt trauma head injuries and time to death in the cases autopsied at a tertiary care centre

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Abstract

Background: In developing countries, accident rates in general and traumatic head injuries in particular are increasing as traffic increases besides other factors like industrialization, falls and ballistic trauma. Most injury related deaths and disabilities are preventable.

Objective: To find out the relationship between the extent and severity of fatal blunt trauma injuries in head region with duration of survival (time to death), place of death, hospitalization status and intoxication status.

Methods: This was a hospital based, cross sectional and analytical study done on the cases brought for postmortem examination at a mortuary of B. P. Koirala Institute of Health Sciences, Dharan, Nepal over one year period (13th April 2012 to 13th April 2013). Appropriate statistical test was used to compare the Injury Severity Score (ISS) with duration of survival, place of death, hospitalization status and intoxication status.

Result: Significant difference was present between ISS of hospitalized cases and not hospitalized cases, of cases who died within half an hour (spot death) and between half hour and 6 hour (death at emergency) but there was no significant difference among other different cases who were hospitalized and between intoxicated and not intoxicated at the incident.

Conclusion: This study has shown the time to death in blunt trauma head injury cases with higher ISS is less as compared to those with less ISS. The ISS is also significantly different for hospitalized and not hospitalized cases. This shows us to focus more on preventive strategies of such injuries.

Keywords: Autopsies, Blunt Head injuries, Injury Severity Score

Introduction

Injuries are the third leading cause of death worldwide, causing more than five million deaths annually.\(^1\) Injuries constitute the leading cause of death among children, adolescents and young adults aged 1 to 44 years.\(^2\) Indeed, almost 50 percent of all injury related deaths are among 15-44 years old.
years age group. Each year, injury accounts for more than five million deaths globally. The overall burden of injury in terms of morbidity and mortality is underestimated; while ignoring the number of survivors of injuries, many of whom suffer life-long health consequences. Traffic collisions, falls, drowning, burns and deliberate acts of violence against oneself or others are among the causes of these injuries. In developing countries; accident rates in general and traumatic head injury in particular are increasing as traffic increases besides other factors like: industrialization, falls and ballistic trauma. Most injury related deaths and disabilities are preventable.

This study is done with the view to guide policy makers for prioritizing between preventive strategies and therapeutic strategies. For this purpose, this study is done with objective to find out the relationship between the extent and severity of fatal blunt trauma injuries in head region with duration of survival (time to death), place of death, hospitalization status and intoxication status from detail of death scene investigations, history, medical case sheets of hospitalized cases and of the medico-legal autopsy findings. This will also enhance the knowledge of the medical faculty in the field of early diagnosis and management of such injuries.

Materials and Methods
This was a hospital based, cross sectional and analytical study done on the cases brought for postmortem examination at a mortuary of B. P. Koirala Institute of Health Sciences, Dharan, Nepal over one year period (13th April 2012 to 13th April 2013). A routine medico-legal autopsy of these cases was performed and the injuries were noted. The injuries in all the body parts were noted and allotted the Abbreviated Injury Scale (AIS) score as described in the Abbreviated Injury Scale 2005, Update 2008 scale book published by the Association for the Advancement of Automotive Medicine. The injuries with their respective scores were entered into a simplified chart; the 3 highest AIS scores in the 3 among the 6 different body regions were squared and were added to obtain the ISS of the case. If the AIS score in any of the 6 body regions was 6, then the ISS was automatically scored 75. Normal distribution of ISS was checked and then appropriate statistical test was used to compare the ISS with duration of survival, place of death, hospitalization status and intoxication status. The probability of significance was set at 5% and 95% confidence limits.

Inclusion and exclusion criteria:
Cases with head injury produced by blunt trauma were included in the study while the cases with unclear cause of trauma and
decomposed body cases were excluded from the study.

**Data Collection and Statistical Method:**
Data were collected systematically in a detailed proforma developed for the postmortem evaluation of blunt trauma injuries. The detailed information’s about the cases were collected from different sources including the inquest report and other relevant papers brought by the investigating officer, interviewing the investigating officer, the relatives, neighbors, friends or other persons accompanying the dead body, autopsy examination findings, relevant clinical history and findings found upon admission in hospital and subsequently. All collected data were compiled and entered into the Excel (Microsoft). Statistical Package for Social Sciences (SPSS) version 11.0 was used for analysis. Observations were recorded, analyzed and discussed. Ethical clearance was taken from the Ethical Committee of B. P. Koirala Institute of Health Sciences.

**Results**
Out of 496 autopsies, 76 cases were of fatal blunt trauma head injury and different causes of these blunt trauma are shown in the table I. The duration of survival for those who died at the spot was less than 30 minutes, who died at emergency was between 30 minutes and 6 hours, who died at ward or Intensive Care Unit (ICU) was between 6 hours to 3 days and who died after discharge was more than 3 days as shown in table II. A Shapiro-Wilk’s test \( p<0.05 \) and a visual inspection of histogram, normal Q-Q plot and box plot showed that Injury Severity Score (ISS) for head injury cases with a skewness of 0.5 (Standard Error: 0.276) and a kurtosis of -1.451 (Standard Error: 0.545) was not normally distributed. Mann Whitney U test was used to compare the ISS with respect to different factors and it was found that there was significant difference between ISS of those who were hospitalized and those who were not hospitalized as shown in table II. There was no significant difference between ISS of those who were intoxicated to those who were not intoxicated as shown in table II.

**Table I: Cause of Trauma**

<table>
<thead>
<tr>
<th>Cause of Trauma</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Assault by</td>
<td>8 (10.5)</td>
</tr>
<tr>
<td>Blunt Weapon</td>
<td></td>
</tr>
<tr>
<td>Collapse of Roof</td>
<td>1 (1.3)</td>
</tr>
<tr>
<td>Fall from Height</td>
<td>13 (17.1)</td>
</tr>
<tr>
<td>Road Traffic Accident</td>
<td>54 (71.1)</td>
</tr>
</tbody>
</table>
Table I: Comparison of ISS with Hospitalization and Intoxication Status

<table>
<thead>
<tr>
<th>Head Injury Cases</th>
<th>Number (%)</th>
<th>Median ISS (IQR)*</th>
<th>P value**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalized</td>
<td>36 (47.4)</td>
<td>20 (17-28.25)</td>
<td>0.001</td>
</tr>
<tr>
<td>Not-Hospitalized</td>
<td>40 (52.6)</td>
<td>75 (33-75)</td>
<td></td>
</tr>
<tr>
<td>Intoxicated at Incident</td>
<td>26 (34.2)</td>
<td>37 (19.25-75)</td>
<td>0.282</td>
</tr>
<tr>
<td>Not-Intoxicated at Incident</td>
<td>49 (64.5)</td>
<td>26 (17.5-62.5)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>1 (1.3)</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

*ISS is Injury Severity Score and IQR is Interquartile range  
**Test of significance is 0.05

Hospitalized cases were further subdivided into the cases who died at emergency, at ward or ICU and after discharge. It was found that there was no significant difference between ISS of emergency fatal cases and of ward/ICU fatal cases, between ISS of ward/ICU fatal cases and of discharged fatal cases but there was significant difference between ISS of who died within 30 minutes at the spot and of those who died at emergency as shown in table III. The median ISS with interquartile range (IQR) for all cases was 31.5 (18.5-75) whereas median ISS with IQR for the cases who were hospitalized and who were not hospitalized, who were intoxicated and who were not intoxicated at the time of incident is shown in table II and median ISS with IQR for the cases with different duration of survival and different place of death is shown in table III.

Table II: Comparison of ISS with Duration of Survival and Place of Death

<table>
<thead>
<tr>
<th>Duration of Survival</th>
<th>Place of Death</th>
<th>Number (%)</th>
<th>Median ISS* (IQR)*</th>
<th>P value**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1/2 Hour</td>
<td>Spot Death</td>
<td>39 (51.3)</td>
<td>75 (33-75)</td>
<td>0.001</td>
</tr>
<tr>
<td>1/2 Hour - 6 Hours</td>
<td>Emergency</td>
<td>17 (22.4)</td>
<td>20 (17-27.5)</td>
<td></td>
</tr>
<tr>
<td>1/2 Hour - 6 Hours</td>
<td>Emergency</td>
<td>17 (22.4)</td>
<td>20 (17-27.5)</td>
<td>0.891</td>
</tr>
<tr>
<td>6 Hours -72 Hours</td>
<td>Ward/ICU*</td>
<td>9 (11.8)</td>
<td>17 (17-41.5)</td>
<td></td>
</tr>
<tr>
<td>6 Hours -72 Hours</td>
<td>Ward/ICU</td>
<td>9 (11.8)</td>
<td>17 (17-41.5)</td>
<td>0.967</td>
</tr>
<tr>
<td>&gt;72 Hours</td>
<td>Discharged</td>
<td>10 (13.2)</td>
<td>20.5 (16.25-30.75)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>Spot Death</td>
<td>1 (1.3)</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

*ISS is Injury Severity Score, IQR is Interquartile range and ICU is Intensive Care Unit
Discussion
This study done with objective to find out the relationship between ISS with other factors especially time to death has shown that the injury severity score for the cases who died prior to hospitalization is significantly different from that of hospitalized cases and this finding is supported by the study done in Singapore\textsuperscript{11} where there was a significant difference between the ISS of those who died pre hospital compared to those who died in hospital. In the same study, the mean injury severity score was 38.7, 42\% of the victims were pronounced dead at the time of accident, 15\% in the emergency, 2\% in the operating theater and 41\% in ward which is also similar to our findings.\textsuperscript{11} Common causes of trauma in our study are road traffic accidents and fall from height which is similar to the study done by Ghimire A et al.\textsuperscript{12}

In our study, the portion of death at the spot that is 52.6\% and the findings of significant difference between ISS of spot death and that of death at emergency but of no significant difference among ISS of death at emergency, at ward or ICU and after discharge support us to give more priority to the preventive strategies over the therapeutic measures. This view of our study findings is strongly supported by the findings in a study done by Muhammad Tahir Khadim et al\textsuperscript{13} where out of 57 head injury cases, 40 (70.2\%) injured persons died on spots and 17 (29.8\%) were received alive in various nearby hospitals. Seven (12.3\%) patients died within 5 hours, 2 (3.5\%) between 5-10 hrs, 4 (7\%) could stay alive for 21-24 hrs and 1 (1.8\%) each for 2 days, 5 days, 10 days and 14 days respectively. Akash Jhanjee\textsuperscript{14} found that 19.67\% were spot dead and brought dead each whereas 59.02\% succumbed to their injuries after some duration of hospital stay which is different from our study finding. In the same study\textsuperscript{14}, it was found that in victims with low ISS (21-30 and 31-40, ISS score ranges), survival was more as compared to the victims with high ISS (51-60, 61-70 and 71-75, ISS score ranges) which is similar to our study. Majority of the victims with associated body injuries to two or more body regions were spot dead (18 cases) and brought dead (17 cases) while remaining cases had very short survival period.\textsuperscript{14} Victims with associated injuries of the chest had long survival period as compared to victims with associated head injuries. Mean ISS\textsuperscript{14} was 44 whereas in our study median ISS is 31.5. In a study from Malaysia\textsuperscript{15}, it was also found that victims with low ISS had a longer survival period as compared to those with high ISS which is similar to our study finding. It was also noted that
victims with two or more region injuries either were spot dead or brought dead. Results of the study emphasize the need to improve the pre-hospital care with provision of trauma services at site and to establish neurosurgical facilities with trauma registry. Limitation of our study is to involve only the cases who are brought to our institute and only of one year.

Conclusion
This study has shown the time to death in blunt trauma head injury cases with higher ISS is less as compared to those with less ISS. The ISS is also significantly different for hospitalized and not hospitalized cases but not significantly different for the cases who were hospitalized depending upon their duration of survival and place of death. This shows that there is a need to give priority to preventive measures for such injuries.

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I would like to thank Dr. Nuwadatta Subedi, Dr. Sharmila Gurung, Dr. Sanjay Sah, Dr. Abdul Sami Khan, Dr. Prakash Chandra Panjiyar, Mr. Navin Sah, Mr. Rampriti Sah, Mr. Ugranarayan Yadav, Mr. Jitendra Uraw, Mr. Jay Prakash Uraw and Mr. Ram Prasad Uraw for their help during my study. My heartfelt thank is for the deceased’s on whom this study was done and their relatives who gave me permission for this study.

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Effectiveness of education intervention programme on life support measures for the nurses working in emergency unit of BPKIHS: a pre-experimental study

U Yadav, RS Mehta
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Abstract

Introduction: Lack of resuscitation skills of nurses in basic life support (BLS) and advanced life support (ALS) has been identified as a contributing factor to poor outcomes of cardiac arrest victims.

Objective: To assess the effectiveness of education intervention programme to improve the knowledge and thereby the quality of Emergency service; especially in the area of Basic Life Support, Advance Life Support and Triage system.

Method: Pre-experimental research design was used to conduct the study among the nurses working in Emergency unit of BP Koirala Institute of Health Sciences where CPR is very commonly performed. Using convenient sampling technique, a total of 24 nurses agreed to participate and to give consent were included in the study. The theoretical, demonstration and re-demonstration sessions were arranged, involving the trained doctors and nurses during the three hours educational programme. Post-test was carried out after education intervention programme. The 2010 BLS and ALS guidelines were used as guide for the study contents. The collected data were analyzed using SPSS-15 software.

Result: It was found that there is significant increase in knowledge after education intervention in the components of life support measures (BLS/ALS) i.e. ratio of chest compression to ventilation in BLS (P= 0.001), correct sequence of CPR (p< 0.001), rate of chest compression in ALS (P= 0.001), the depth of chest compression in adult CPR (p< 0.001), and position of chest compression in CPR (P= 0.016). The participating nurses well appreciated the programme and requested to continue in future for all the nurses.

Conclusion: Educational intervention programme certainly improves the knowledge of the working nurses, and thereby the quality of Emergency service; especially in the areas of Basic Life Support, Advance Life Support and Triage System.

Key words: Nurses, Basic Life support, advanced life support, Resuscitation

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Introduction

It is well known that in the event of a person suffering a cardiac arrest, successful outcome is dependent on the
time taken for resuscitation to commence. In cases of in-hospital cardiac arrest, the most important predictor of a successful outcome is the ‘time to defibrillation’ interval. Although all health care providers in contact with patients should be proficient at basic life support (BLS), nurses in particular should be competent at BLS, being the health care providers most likely to be the first respondents to an in-hospital cardiac arrest. BLS proficiency includes the use of an automated external defibrillator (AED) and it is, therefore, expected that nurses trained in BLS should be able to use this device. BLS knowledge and skills tend to degrade and regular refresher training and practice is recommended. Despite these international guidelines, studies have shown that, in the developed world, nurses’ BLS skills can be surprisingly poor. Limited studies in the Asian environment have yet been published with regard to BLS competency among nursing staff.

**Objective**

The objective of the study was to assess the effectiveness of education intervention programme to improve knowledge level among the working nurses which is expected to improve the quality of Emergency service; especially in the area of Basic Life Support, Advance Life Support and Triage system.

**Method**

The study was a pre-experimental design and participation was voluntary. Total 24 nurses working in the Emergency units were included in the study. A questionnaire included 10 questions regarding the knowledge and skills involved in BLS and ALS. Pre-test was obtained and baseline data was collected. After pre-test, the training was arranged on 30th June, 2015 from 8 AM to 5 PM. The aspects on which they were interrogated were about the ratio of chest compression ventilation in BLS, components of BLS, correct sequence of CPR, rate of chest compression in ALS, the drug of choice in ALS, the depth of chest compression in adult CPR, position of chest compression in CPR, frequency of giving Adrenaline in ALS and intervention after cardiac arrest. The education programme was arranged with the help of trained doctors and nurses. It was one day session including demonstration and return demonstration after theoretical sessions in demonstration room using all the resources needed for the training, including CPR dummy. The level of knowledge of BLS/ ALS was assessed via the number of correct responses to questions regarding ALS and BLS. After excluding the incomplete response forms, the data was analyzed using SPSS-15 Software package. Permission was taken.
from all the heads before involving the nurses in the programme. The results were analyzed using an answer; keys were prepared from the advanced cardiac life support manual.

**Results**

Majority of the participants (55%) were of age group of 18-21 years followed by 22-25 years (20%). Only 10% participants had previously taken training on life support measures. In all the components of life support measures, there is significant increase in knowledge and skills at 0.05 level of significance. The details are given in Table 1 and Table 2.

**Discussion**

It was found that most of the participants (55%) were of age group of 18-21 years with mean age of 23.80, SD= 5.88 and range 18-40 years. Only 10% participants had previously taken the life support (BLS/ALS) training. The study conducted by Almeida\(^9\) among nurses on CPR reported that only 5.5% received ALS and 23.3% received BLS training, which is nearly similar to this study. A systematic review of 64 articles done by Ryynanen\(^10\) reported that outcome of BLS in pre-hospital is poor, which clearly demonstrates the need of BLS in hospital setting.

After the education intervention programme, there is significant increase in knowledge and skill components of life support measures like: ratio of chest compression to ventilation in BLS (p= 0.001), sequence of CPR (p< 0.001), maneuver avoided for airway maintenance in head and cervical injury (p= 0.001), rate of chest compression in ALS (p= 0.001), the depth of chest compression in adult CPR (p= 0.016) and intervention after cardiac arrest (p= 0.004). The study conducted by Almeida\(^9\) reported that more than 60% nurses do not know appropriate compression ventilation ratio and average score on Zero to Ten was 5.2 (±1.4), which is similar to this study.

Study conducted by Keenan\(^11\) among nurses on BLS reported correct responses of ratio of chest compression to breath in 27.7% and only 8.2% responded the use of clinical defibrillation correctly, which is similar to this study. Similarly, study conducted by Chandrasekran\(^12\) on BLS found 84.82% Health workers scored less than 50% scores on BLS and ALS, and also reported severe lack of BLS and ALS knowledge; which is similar to this study. Similar findings were reported by Josipovic\(^13\); 34% nurses do not have knowledge about ventilation compression. Similar findings were reported by Moul\(^14\) and Harmond\(^15\) too.

Opinion was collected from the participants and found the programme implemented was highly effective and
useful. Most of the (95.7%) participants evaluated the overall programme as very good, all the respondents (97.8%) reported contents used were good; 95.7% reported the level of understanding was very good and 78.3% reported the knowledge and skill learned is very useful in daily life. Study conducted by Harmon15 found that after 18 months, 75% participants passed the practical skills of ALS, which clearly illustrates the training needs of ALS and BLS for nurses.

**Conclusion:** The training certainly improves the knowledge of the working nurses, and thereby help to improve the quality of Emergency service; especially in the areas of Basic Life Support, Advance Life Support and Triage System.

**Table 1. Differences in Knowledge on Life Support Measures before and after Education Intervention Programme**

<table>
<thead>
<tr>
<th>SN</th>
<th>Knowledge of ALS &amp; BLS</th>
<th>Pre-Test Score (%)</th>
<th>Post-Test Score (%)</th>
<th>Percentage Difference</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ratio to chest compression to ventilation in BLS</td>
<td>40</td>
<td>95</td>
<td>55</td>
<td>0.001</td>
</tr>
<tr>
<td>2</td>
<td>Components of BLS</td>
<td>50</td>
<td>65</td>
<td>15</td>
<td>0.109</td>
</tr>
<tr>
<td>3</td>
<td>Correct sequence of CPR</td>
<td>25</td>
<td>95</td>
<td>70</td>
<td>0.001</td>
</tr>
<tr>
<td>4</td>
<td>Maneuver avoided for airway maintenance in head and cervical injury</td>
<td>25</td>
<td>75</td>
<td>50</td>
<td>0.001</td>
</tr>
<tr>
<td>5</td>
<td>Rate of chest compression in ALS</td>
<td>25</td>
<td>100</td>
<td>75</td>
<td>0.001</td>
</tr>
<tr>
<td>6</td>
<td>The drug of choice in ALS</td>
<td>65</td>
<td>100</td>
<td>35</td>
<td>0.016</td>
</tr>
<tr>
<td>7</td>
<td>The depth of chest compression in adult CPR</td>
<td>15</td>
<td>95</td>
<td>80</td>
<td>0.001</td>
</tr>
<tr>
<td>8</td>
<td>Position (Place) of chest compression CPR</td>
<td>60</td>
<td>95</td>
<td>35</td>
<td>0.016</td>
</tr>
<tr>
<td>9</td>
<td>Frequency of giving Adrenaline during ALS</td>
<td>20</td>
<td>60</td>
<td>40</td>
<td>0.057</td>
</tr>
<tr>
<td>10</td>
<td>First intervention after cardiac arrest</td>
<td>50</td>
<td>95</td>
<td>45</td>
<td>0.004</td>
</tr>
</tbody>
</table>

**Note:** McNemar Chi Squire test was used to find out the differences in pre-test Post-test score.
Table 2. Evaluation of the Training Programme

<table>
<thead>
<tr>
<th>SN</th>
<th>Areas of Evaluation</th>
<th>Very Good/Very Useful</th>
<th>Good/Useful</th>
<th>Average/All Right</th>
<th>Poor/Not Useful</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overall Evaluation of the Programme</td>
<td>35 (76.1%)</td>
<td>9 (19.6%)</td>
<td>2 (4.3%)</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Teaching Learning Methods and Media Used</td>
<td>23 (50%)</td>
<td>21 (45.7%)</td>
<td>2 (4.3%)</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Contents Covered in training</td>
<td>30 (65.2%)</td>
<td>15 (32.6%)</td>
<td>1 (2.2%)</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>How useful in Daily Life</td>
<td>36 (78.3%)</td>
<td>9 (19.6%)</td>
<td>1 (2.2%)</td>
<td>0</td>
</tr>
</tbody>
</table>

Acknowledgement
We want to express heartfelt thanks to UGC Grant Committee for financial support and HOD, Department of General Practice and Emergency Medicine for his presence and providing the experts for the training during the theoretical as well as demonstration sessions.

References
7. Nyman J, Sihvonen M. Cardio-pulmonary resuscitation skills in


**Original Article**

**Endoscopic medial maxillectomy for sinonasal inverted papilloma**

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**Abstract**

**Background:** Traditionally, medial maxillectomy was performed through lateral rhinotomy or mid facial degloving approach for inverted papilloma. Endoscopic medial maxillectomy, since reported first in 1992, has advanced tremendously and has been advocated by a number of authors for the fact that it prevents the morbidity of open approach with a similar recurrence rate. We present our experience of endoscopic medial maxillectomy for sinonasal inverted papilloma.

**Aims and Objective:** To highlight the treatment of inverted papilloma through transnasal endoscopic approach.

**Methods:** This study is a retrospective chart review of 18 patients out of 23 patients of which 5 were lost on follow-up with inverted papilloma who were treated during the last 2 years. Preoperative diagnosis was made on histopathological examination and Krouse staging in CT scans of paranasal sinus was used to estimate the extent of the disease. Then, surgical approach was decided. Post-operative follow up was done by performing direct nasal endoscopy. All patients were followed up for a minimum period of 1 year.

**Results:** Among the 18 patients who underwent endoscopic medial maxillectomy, sex (male : female) ratio were 1.25: 1, age ranged from 24 yrs to 69 yrs with average being 41.7 yrs. According to Krouse staging, 2 patients were in Stage I, 9 patients in Stage II and 7 patients in Stage III. The laterality of the lesion was more on the right. The commonest site of attachment was found to be the lateral wall of nose. The average duration of hospital stay was 4 days. The commonest complication was nasal crusting and the recurrence rate was 11.11%.

**Conclusion:** This work confirms the results described in recent literature and further supports transnasal endoscopic surgery to manage inverted papilloma.

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**Key Words:** Inverted Papilloma, Endoscopic medial maxillectomy.
Introduction
Sinonasal inverted papilloma is a benign tumour, accounting for 0.5% to 4.0% of all primary nasal tumours.\(^1\) Surgical resection is the treatment of choice as this tumour has the propensity to erode bones, recur and associates with malignancy.\(^1,2\) Various surgical techniques have been employed for resection of this tumour, traditionally being open approach.\(^3\) Today, endoscopic techniques have the central role in the surgical management of inflammatory conditions of the sinonasal tract. However, the role of endoscopy in the surgical treatment of sinonasal neoplasms is evolving. The use of endoscopes has several distinct advantages by providing excellent visualization, no scars, less morbidity and preserving the function of nasal mucosa. We present our series of eighteen cases where we performed endoscopic medial maxillectomy for sinonasal inverted papilloma.

Material and Methods
A retrospective study was conducted in the Department of Otorhino-laryngology and Head & Neck Surgery from 25\(^{th}\) September, 2013 to 24\(^{th}\) September, 2015. The number of cases was collected after retrospective chart review, taking the inclusion and exclusion criteria into consideration. The inclusion criteria were: all diagnosed cases of inverted papilloma who underwent endoscopic medial maxillectomy, not lost on follow-up. The exclusion criteria were: patients undergoing medial maxillectomy except for inverted papilloma, patients undergoing medial maxillectomy by any other approach except Endoscopic approach and patients contraindicated for surgery. Krouse staging for inverted papilloma was applied to stage the tumour. All surgeries were performed by consultants of the department with taking informed written consent. After surgery, patients were kept in ward and discharged after removal of nasal packs. Post-operatively, patients were followed up for direct nasal endoscopy on 7\(^{th}\) post operative day, 21\(^{st}\) post operative day, at 6 months and 1 year.

Results
A total of 18 patients were included in the study out of 23 as 5 patients could not meet the inclusion criteria over the period of 2 years; they were lost on follow-up. There were 8 males and 10 females with age ranging from 24 yrs. to 69 yrs. with average being 41.7 yrs. (Table 1). The most common presenting symptoms were nasal obstruction, rhinorrhea and anosmia (Table 2). According to Krouse, 2 patients were in stage I, 9 patients in stage II, and 7 patients in stage III (Table 3). The laterality of the lesion was more on the right (Figure 1). The commonest site of tumour involvement was found to be in
lateral wall of the nose (Table 4). All patients were managed endoscopically. In the post-operative period, nasal crusting was the most common complications seen on all follow up (Table 5). Average duration of hospital stay was 4 days (Table 7). On progressive follow up till 1 year, there was 11.11% recurrence.

**Table 1: Age distribution**

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency (n= 18)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20 yrs</td>
<td>NIL</td>
<td>NIL</td>
</tr>
<tr>
<td>20- 29 yrs</td>
<td>5</td>
<td>27.70%</td>
</tr>
<tr>
<td>30- 39 yrs</td>
<td>3</td>
<td>16.60%</td>
</tr>
<tr>
<td>40- 49 yrs</td>
<td>7</td>
<td>38.80%</td>
</tr>
<tr>
<td>50- 59 yrs</td>
<td>1</td>
<td>5.50%</td>
</tr>
<tr>
<td>60- 69 yrs</td>
<td>2</td>
<td>11.11%</td>
</tr>
</tbody>
</table>

**Table 2: Presenting Symptoms**

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Presenting (n= 18)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unilateral Nasal obstruction</td>
<td>14</td>
<td>77.77%</td>
</tr>
<tr>
<td>Rhinorrhea</td>
<td>12</td>
<td>66.66%</td>
</tr>
<tr>
<td>Epistaxis</td>
<td>4</td>
<td>22.22%</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>3</td>
<td>16.66%</td>
</tr>
<tr>
<td>Facial pain</td>
<td>2</td>
<td>11.11%</td>
</tr>
<tr>
<td>Loss of sense of smell</td>
<td>4</td>
<td>22.22%</td>
</tr>
<tr>
<td>Frontal headache</td>
<td>6</td>
<td>33.33%</td>
</tr>
</tbody>
</table>

**Table 3: Krouse staging of tumour**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Frequency (n= 18)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>2</td>
<td>11.11%</td>
</tr>
<tr>
<td>Stage II</td>
<td>9</td>
<td>50.00%</td>
</tr>
<tr>
<td>Stage III</td>
<td>7</td>
<td>38.89%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Complication</th>
<th>Number of Cases (n= 18)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lid Odema</td>
<td>1</td>
<td>5.50%</td>
</tr>
<tr>
<td>Epiphora</td>
<td>2</td>
<td>11.11%</td>
</tr>
<tr>
<td>Nasal crusting</td>
<td>13</td>
<td>72.20%</td>
</tr>
<tr>
<td>Infection</td>
<td>4</td>
<td>22.22%</td>
</tr>
<tr>
<td>Synechae</td>
<td>3</td>
<td>16.60%</td>
</tr>
</tbody>
</table>

**Discussion**

Medial maxillectomy involves complete resection of the lateral nasal wall with the inferior boundary being the nasal floor; superiorly the cribriform plate and fovea ethmoidalis; anteriorly up to the anterior maxillary wall, including the nasolacrimal duct and posteriorly within 5 mm of the eustachian tube.⁴
The first reported endoscopic resection of inverted papilloma was in the year 1992 by Waitz and Wigand.\textsuperscript{5} Since then, it has advanced tremendously and we share our experiences with the endoscopic medial maxillectomy for inverted papilloma.

All the patients underwent endoscopic medial maxillectomy by consultants. In our study, female patients outnumbered male which was in contrast to the other studies.\textsuperscript{3,6} Perhaps, it may be because of small sample size of this study.

The average age of presentation was 41.7 years showing a preponderance of older age group, other literature studies showed a little higher age presentation between the range of 50 to 60 years.\textsuperscript{7,8}

The most common clinical symptom in the present study was unilateral nasal obstruction, nasal discharge and epistaxis which was in agreement with the study done by Lyngdoh NC et al.\textsuperscript{8}

Krouse\textsuperscript{9} and Cannady\textsuperscript{10} are the commonly used staging systems for inverted papilloma and on the basis of Krouse’s classification, we observed 9 cases in stage II followed by 7 in Stage III and 2 cases in stage I respectively, which was similar to the finding by Jurado-Ramos A et al.\textsuperscript{11}

Localization of the site of attachment can be predicted preoperatively by CT scan of paranasal sinus which shows focal hyperostosis and therefore, helps in the surgical planning. Intra-operatively the attachment of all the inverted papilloma was found to be on the lateral wall of the nose as seen in other studies.\textsuperscript{12,13}

On post operative follow up; nasal crusting was commonly encountered, the reason being physiological crusting due to drying of nasal discharge secondary to roomy operated cavity.

As there was no external wound, average hospital stay was 4 days as compared to 7 days the patient would stay for open approach in our institution. Sautter et al in their study observed similar results.\textsuperscript{14}

The recurrence rate was 12\% for the endoscopic subgroup and 20\% for the nonendoscopic subgroup in a meta-analysis study by Busquets et al.\textsuperscript{2} which was quite similar to the present study showing 11.11\% recurrence.

**Conclusion**

Complete surgical excision is the ideal modality of management of inverted papilloma. Endoscopic medial maxillectomy is a good surgical option in the management of sinonasal lesions. This work confirms the results described in recent literature and further supports transnasal endoscopic surgery to manage inverted papilloma.
References


Original Article

Pattern of hematological malignancies diagnosed by peripheral smear examination
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Abstract

Background: Leukemia is a malignant neoplasm of the hematopoietic stem cells. Examination of the peripheral blood smear is an inexpensive but powerful diagnostic tool in both children and adults suffering from leukemia because it provides rapid, reliable access to information about a variety of hematologic disorders.

Objectives: To study the various patterns of leukemia, clinicoepidemiological profile and hematological features of leukemia

Materials and Methods: This is a cross sectional study conducted in the Hematology section of Department of Pathology of a tertiary care hospital. This study included all consecutive cases of leukemia diagnosed by peripheral blood smear examination from 1st June 2013 to 30th May 2014. The demographic indices were noted in a proforma. Investigations including haemoglobin estimation, total leucocyte count and platelet count were done for the study of hematological features. The morphological sub-typing was done according to the FAB classification system for leukemia.

Results: Out of total 52 cases, majority of cases were of acute leukemia (65.38%), followed by chronic leukemia (26.92%) and lymphoma spill/ acute leukemia (7.69%). The age range was 2 to 90 years. Mean age was 37.6 year. Majority were male. Mean hemoglobin count for AML and ALL was 6.8 and 5.3 gm/dl respectively.

Conclusion: The finding of this study reflects the pattern of leukemia at BPKIHS. Majority of acute leukemia constituted of acute myeloid leukemia (36.53%) cases and majority of chronic leukemia constituted of chronic myeloid leukemia (17.30%) cases.

Key words: Hematological malignancy, peripheral smear, pattern, hematological features.
Introduction
Hematological malignancy (leukemia) is a malignant neoplasm of the hematopoietic stem cells characterized by diffuse replacement of the bone marrow and/or peripheral blood by neoplastic cells. It was identified as a separate malignancy in 1889.\textsuperscript{1}

Leukemia is part of a broader group of neoplasms which affect the blood, bone marrow and lymphoid system, known as tumors of the hematopoietic and lymphoid tissues.\textsuperscript{2,3}

Examination of the peripheral blood smear is an inexpensive but powerful diagnostic tool in both children and adults suffering from Leukemia. It provides rapid, reliable access to information about a variety of hematologic disorders.\textsuperscript{4} The role of the blood smear in the diagnosis of leukemia and lymphoma is to suggest a likely diagnosis or range of diagnoses, to indicate which additional tests should be performed and to provide a morphologic context without which immune-phenotyping and other sophisticated investigations cannot be interpreted.\textsuperscript{4}

Peripheral blood analysis by complete blood count and thin smear analysis are first steps to detect most hematologic malignancies which have emerged as a major cause of morbidity and mortality.\textsuperscript{4} The diagnosis involves a multiparameter approach including morphologic examination and phenotypic or genotypic studies.\textsuperscript{5} However; the smear offers a window into the functional status of the bone marrow, the factory producing all blood elements. Review of the smear is an important adjunct to other clinical data. In some cases, the peripheral smear alone is sufficient to establish a diagnosis.\textsuperscript{4}

This study has been done to find out the pattern of leukemia, its clinic-epidemiological profile and hematological features.

Materials and Methods
This Descriptive, Cross Sectional study was conducted in the Hematology section of Department of Pathology. The study period was of one year. Ethical clearance was obtained from the Institutional Review Committee. This study included all consecutive cases of Leukemia diagnosed during a study period by peripheral blood smear examination.

The haematological malignancies diagnosed from 1\textsuperscript{st} June 2013 to 30\textsuperscript{th} May 2014 were included. The demographic indices and the clinical details provided by the various departments were noted in a proforma. Investigation in all cases of leukemia including haemoglobin estimation, total leucocyte count and platelet count were done. After staining at least 2 well made smears by Jenner’s Giemsa stain, the peripheral blood smears were analyzed by the Pathologists. When peripheral smear is not sufficient for the diagnosis, a cytochemical stains were performed. Peripheral smears were analyzed considering the type of leukemia,
age, sex. The morphological sub-typing was done according to the FAB classification system for leukemia using morphologic and cytochemical criteria to characterize the blast cells, wherever possible. The entire samples positive for malignancy in peripheral smears were included in the study till the total sample size is achieved. All collected data were entered in Microsoft Excel 2010 spread sheet and converted into SPSS (Statistical Package for Social Sciences) version 17 program for statistical analysis. For descriptive statistical analysis; mean, standard deviation, proportion, percentage, median inter quartile range were calculated and tabular and graphical presentation were made.

Results
Out of total 52 cases (as shown in Table 1), 34 (65.38%) cases were of acute leukemia (AL) and 14 (26.92%) cases were of chronic leukemia (CL). Among total cases of acute leukemia, acute myeloid leukemia (AML) was found to be the frequently diagnosed AL comprising of 19 (36.53%) cases followed by 11 (21.15%) cases of AL only because of morphologic overlap and 4 (7.69%) cases of acute lymphoblastic leukemia (ALL). Among total cases of CL, chronic myeloid leukemia (CML) was the commonest type of CL comprised of 9 (17.30%) cases followed by 4 (7.69%) cases of chronic lymphocytic leukemia/ prolymphocytic leukemia (CLL/PLL) and only 1 (1.92%) case of chronic lymphocytic leukemia (CLL). Rest 4 (7.69%) cases of acute leukemia/ lymphoma spill (AL/LS) could not be further categorized due to morphological overlap and non specific staining pattern of cytochemical stains. Biopsy of lymph nodes and bone marrow aspiration was advised by our side to confirm the diagnosis but patient lost for follow up. Peripheral smear (PS) examination of AML revealed more than 20% myeloblasts having enlarged nuclei, opened up chromatin, irregular nuclear membrane and 2-3 prominent nucleoli (Figure 1). Some of them contain auer rod and faggots as well.

Table 1. Hematological pattern of leukemia at BPKIHS

<table>
<thead>
<tr>
<th>Type of Leukemia</th>
<th>Total number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute Leukemia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AML</td>
<td>19</td>
<td>36.53</td>
</tr>
<tr>
<td>AL</td>
<td>11</td>
<td>21.15</td>
</tr>
<tr>
<td>ALL</td>
<td>4</td>
<td>7.69</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>34</td>
<td>65.38</td>
</tr>
<tr>
<td><strong>Chronic Leukemia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CML</td>
<td>9</td>
<td>17.30</td>
</tr>
<tr>
<td>CLL/PLL</td>
<td>4</td>
<td>7.69</td>
</tr>
<tr>
<td>CLL</td>
<td>1</td>
<td>1.92</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>14</td>
<td>26.92</td>
</tr>
<tr>
<td><strong>AL/LS</strong></td>
<td>4</td>
<td>7.69</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>52</td>
<td>100</td>
</tr>
</tbody>
</table>
Diagnosis of acute leukemia only could be possible in 11 cases because of non-specific staining pattern of cytochemical stains and patient immediately being referred to cancer hospital. PS showed blasts having morphologic overlap between AML and ALL. Based only on morphology of blast cells diagnosis of acute leukemia was made. PS of CML revealed leucocytosis with left shift of white blood cells (WBC) along with presence of blasts and basophilia (Figure 2). PS of ALL revealed more than 20% of lymphoblasts with condensed nuclei, inconspicuous to single nucleoli, irregular nuclear membrane and scant amount of cytoplasm (Figure 3). PS of CLL/PLL showed mature appearing lymphocytes and few larger cells having central prominent nucleoli and scant amount of basophilic cytoplasm (Figure 4).

**Figure 1:** AML revealing myeloblasts having enlarged nuclei, opened up chromatin, irregular nuclear membrane and 2-3 prominent nucleoli (JG, 100X)

**Figure 2:** CML revealing leucocytosis and left shift of WBC along with presence of blasts and basophilia (JG, 100X)

**Figure 3:** ALL revealing lymphoblasts with condensed chromatin, inconspicuous to single nucleoli, irregular nuclear membrane and scant amount of cytoplasm (JG, 100X)

**Figure 4:** CLL/PLL revealing mature appearing lymphocytes and few larger cells having central prominent nucleoli and scant amount of basophilic cytoplasm (shown by arrow) (JG, 100X)
Overall the age range for all the hematological malignancies was from 2-90 years. Mean age was 37.6 year. Majority of Leukemia were seen in two peaks. First peak was from 1-10 years of age and 2\textsuperscript{nd} peak was from 31-40 years of age. Out of total cases, 54\% were males and 46\% were females. Fever (83\%), weakness (83\%) and pallor (63\%) were the most frequently observed clinical features. Organomegaly was found in 40.4\% of cases. Out of 40.4\% of organomegaly, liver and spleen was found to be the predominant organ to be enlarged. Hemoglobin count range from 2.4 to 11.0 gm/dl and the mean was 7.1 gm/dl. Total leucocyte count ranged from 2000 to 128000/mm\textsuperscript{3} and the mean was 31,054/mm\textsuperscript{3}. Platelet count ranged from 10000 to 4000000/mcl and the mean was 1, 50,326 /mcl.

Hematological features and age group distribution of AML, ALL, acute leukemia, CML and CLL/PLL are shown in table 2.

Table 2. Hematological features and age group distribution in AML, ALL, acute leukemia, CML and CLL/PLL

<table>
<thead>
<tr>
<th>Type of leukemia</th>
<th>Values</th>
<th>Age (in year)</th>
<th>HB ( gm/dl)</th>
<th>TLC ( / mm\textsuperscript{3})</th>
<th>Platelets (/mcl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AML</td>
<td>Min</td>
<td>6.5</td>
<td>4</td>
<td>2000</td>
<td>10000</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>64.0</td>
<td>10</td>
<td>44000</td>
<td>236000</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>30.5</td>
<td>6.85</td>
<td>22178.95</td>
<td>54315.79</td>
</tr>
<tr>
<td>ALL</td>
<td>Min</td>
<td>3</td>
<td>2.6</td>
<td>10000</td>
<td>10000</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>4</td>
<td>10.0</td>
<td>46000</td>
<td>140000</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>3.5</td>
<td>5.3</td>
<td>27500.00</td>
<td>59500</td>
</tr>
<tr>
<td>Acute leukemia</td>
<td>Min</td>
<td>2</td>
<td>2.4</td>
<td>2000</td>
<td>12000</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>85</td>
<td>11.0</td>
<td>93600</td>
<td>154000</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>36.45</td>
<td>6.555</td>
<td>31296.36</td>
<td>63000</td>
</tr>
<tr>
<td>CML</td>
<td>Min</td>
<td>32</td>
<td>6</td>
<td>19000</td>
<td>20000</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>70</td>
<td>11</td>
<td>128000</td>
<td>40000</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>49.78</td>
<td>8.844</td>
<td>62777.78</td>
<td>146222.22</td>
</tr>
<tr>
<td>CLL/PLL</td>
<td>Min</td>
<td>61</td>
<td>9</td>
<td>10000</td>
<td>60000</td>
</tr>
<tr>
<td></td>
<td>Max</td>
<td>75</td>
<td>11</td>
<td>37000</td>
<td>150000</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
<td>119200</td>
</tr>
</tbody>
</table>

Hb: hemoglobin; TLC: total leucocyte count; Min: minimum; Max: maximum
Discussion

Laboratory diagnosis of acute leukemia in modern hematology practice is increasingly relying on guidelines that require the availability of relatively expensive machines. Therefore, where these expensive machines are not available, the laboratory diagnosis would mostly depend on more basic laboratory techniques that should at least include complete blood count (CBC) and peripheral blood morphology, followed by cytochemistry. For the diagnosis of AML/ALL, FAB classification of acute leukemia should be applied in under-resourced laboratories where the only available routine techniques for diagnosis are morphology and cytochemical stains.

In the WHO classification of acute leukemia, the diagnosis is based on an arbitrary cut-off point of 20% blasts as a percentage of bone marrow total or non-erythroid cells or as a percentage of peripheral blood cells. This exact percent is also applied nowadays in under-resourced laboratories where the FAB classification is used.

This 20% blasts cut-off point seems to be universally accepted and for the time being, it represents the best known tool for defining acute leukemia.

CML is often suspected on the basis of a complete blood count which shows increased granulocytes of all types, typically including mature myeloid cells. Basophils and eosinophils are almost universally increased.

The diagnosis of CML is basically based on the pathologic findings of peripheral blood and Philadelphia chromosome in bone marrow cells.

CLL is usually first suspected by the presence of a lymphocytosis, an increase in one type of white blood cell, on a complete blood count (CBC) test. This feature is an incidental finding on a routine outpatient department visit. Most often the lymphocyte count is greater than 4000 cells per microliter of blood, but can be much higher. The presence of a lymphocytosis in an elderly individual should raise strong suspicion for CLL.

This study includes those cases which were diagnosed on the basis of peripheral smear.

Patterns of leukemia

In this study, out of total 52 cases studied, based on morphology and cytochemistry, acute leukemia comprised of 34 cases and 14 cases were of chronic leukemia. Diagnosis of AML and ALL was made in 19 and 4 cases respectively. Diagnosis of CML and CLL/PLL could be possible in 9 and 4 cases respectively. Only acute leukemia (AL) was made in 11 cases. A study conducted by Ghartimagar et al among 123 cases of leukemia in a span of 11 years, 96 cases were acute leukemia.
which included 80 cases of AML and 16 cases of All, 27 were diagnosed as CML and 7 cases of CLL.\textsuperscript{14} Another study conducted by Weldetsadik AT et al for 4 years; out of total 67 patients, CML comprised of 17/67, 13/67 CLL and 15/67 AML.\textsuperscript{15}

Of the 198 cases diagnosed in five years by Kulshrestha R at this hospital in 2003, 121 cases were of acute leukemia and 75 of chronic leukemia. CML constituted the single largest group comprising of 69/198 followed by AML constituting 56/198 cases.\textsuperscript{16}

Similarly, another study conducted by Idrish M et al where 60 patients with hematological malignancies were studied, showed that about 35.9\% had AML, while 19.15\% patients had ALL. Non Hodgkin’s lymphoma was seen in 15.39\% cases. Among chronic leukemia, CLL outnumbered CML.\textsuperscript{17}

Pattern of hematological malignancies has been compared with various studies within Nepal and across the globe (Table 3)

<table>
<thead>
<tr>
<th>Country Duration (D)</th>
<th>AML (%)</th>
<th>CML (%)</th>
<th>ALL (%)</th>
<th>CLL (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current study, Nepal D: 1 year</td>
<td>36.53</td>
<td>17.30</td>
<td>7.69</td>
<td>1.92</td>
</tr>
<tr>
<td>Hamal P, Nepal\textsuperscript{22} (TUTH, 1993) D: 8 years</td>
<td>33</td>
<td>29.5</td>
<td>55.5</td>
<td>0</td>
</tr>
<tr>
<td>D’ Costa G et al. India\textsuperscript{18} (1989) D: 10 years</td>
<td>21.9</td>
<td>38.4</td>
<td>35.95</td>
<td>2.89</td>
</tr>
<tr>
<td>Rani S et al. India\textsuperscript{23} (1982) D: 10 years</td>
<td>29.7</td>
<td>45.4</td>
<td>19.3</td>
<td>5.71</td>
</tr>
<tr>
<td>Hassan K, Pakistan\textsuperscript{24} (1997) D: 8 years</td>
<td>AL- 62.8</td>
<td>CL- 37.2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Al-Bahar S et al. Kuwait\textsuperscript{25} (1994) D: 10 years</td>
<td>32.4</td>
<td>14.8</td>
<td>44.2</td>
<td>8.6</td>
</tr>
<tr>
<td>Khan MQ et al. Riyadh\textsuperscript{26} (1991) D: 1 year</td>
<td>37.54</td>
<td>19.11</td>
<td>24.23</td>
<td>18.77</td>
</tr>
<tr>
<td>Hansen NE et al. Denmark\textsuperscript{28} (1983) D: 34 years</td>
<td>AL- 40</td>
<td>20</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Kwiatkowski A, Poland\textsuperscript{29} (1994) D: 23 years</td>
<td>AL- 50</td>
<td>15</td>
<td>UL- 10</td>
<td>25</td>
</tr>
</tbody>
</table>

UL: undifferentiated leukemia; AL: acute leukemia; CL: chronic leukemia
Sub-typing of Acute Myeloid Leukemia

Sub-typing of AML could be possible in only 8/19 cases in this study. Out of 8 cases, 5 were sub-typed as AML, M2 and 3 were sub-typed as AML, M3. According to the FAB classification of AML, there were 11/52 cases which could not be categorized as AML/ALL and was diagnosed as Acute Leukemia only, this could be due to non specific staining pattern of cytochemical stain and morphological overlap between AML/ALL.

Among FAB subtypes of AML; the commonest was M2, followed by M1, M4 and M3 in the study conducted by Ghartimagar D et al.14 The other study conducted by D’Costa G et al. also showed M1 and M2 to be comprised of maximum cases, followed by M3 and M4.18

Age range in all types of leukemia

The overall age range for all the hematological malignancy was from 2-90 years and mean age was 37.6 year in this study. Similarly, in the study done by Kulshrestha R et al., the age range was from 11 day old to 81 years old.16 In the study done by Weldestsadik AT et al., the mean age for the same was 42 years.15 Similarly, in the study conducted by D’Costa G et al., the youngest patient of the series was three weeks aged female and the oldest patient was eighty years old.18 These findings are consistent with our study.

Male: Female ratio in all types of leukemia

In this study, 54% were males and 46% were females. Similarly, in the study conducted by Kulshrestha R et al., male preponderance was observed, with M: F ratio of 1.8:1.16 Males were affected more by leukemia than females in a ratio of 1.2:1.15 Male to female ratio was 1.4:1 in the study conducted by Idrish M et al.17 In the study by D’costa G et al. also, the overall M: F ratio was 2.7:1.18 These findings are consistent with our study.

Age range and mean age of Acute Myeloid Leukemia

The incidence of AML increases with age; the median age at diagnosis is 63 years. AML accounts for about 90% of all acute leukemias in adults, but is rare in children. AML is slightly more common in men, with a male: female ratio of 1.3:1.15 The age of patients with AML ranged from 2-82 years with a mean of 38 years in a study conducted by Ghartimagar D et al.14 This finding is consistent with our study.

Hematological features of acute leukemia

In this study, hemoglobin (Hb) count ranged from 2.4gm/dl to 11gm/dl, TLC ranged from 2000 to 93600/mm3 and platelet count ranged from 10000 to
236000/mcl in case of acute leukemia. In the study by D’ Costa G, Hb < 5 gm/dl was found in 25% cases, while others had Hb 5-10 gm/dl. The incidence of moderate and severe anemia was equal in ALL and AML.18

AML patients (n= 80) showed a wide variation in Hb, TLC and platelets. 69 patients had anemia (Hb< 10 gm/dl) and 65 patients had low platelets (< 10^4/cmm). Interestingly, 48 patients had normal or low TLC.15

**Age distribution of CML, phases and its hematological features**

CML is often divided into three phases based on clinical characteristics and laboratory findings.18 In this study, out of 9/52 CML cases, 6 were in chronic phase, 2 in accelerated phase and single case in blast crisis. In the study by Ghartimagar D et al, out of 20 CML cases, 16 cases were in chronic phase, 4 in accelerated phase and they did not encounter any case in blast crisis.14

Various studies showed that CML is common in males than in females.15,16,18 In the study done by Provan D et al., the male to female ratio was 1.4:1 and appears more common in the elderly with a median age at diagnosis of 65 years.19 However, in the study done by D’ Costa G et al. the oldest patient diagnosed with CML was 80 years old.18

Mean age of CML in this study was 49 years and male predominance was seen, as observed in other studies.14-16,18

Organomegaly was the most common presenting clinical feature. Most patients are diagnosed during the chronic phase which is most often asymptomatic. These findings are consistent with the study done by Besa EC et al.20

Mean hemoglobin, TLC and platelet count was found to be 8.8 gm/dl, 62,777 /mm^3 and 1,46,222/mcl, respectively in this study in a case of CML. Similarly, the total count of more than 1,00,000/mm^3 was a more frequent finding in CML in the study done by D’ Costa G.18

All patients with CML had high WBC and majority had anemia and high platelets in one more study.14

**Chronic Lymphocytic Leukemia**

CLL is a disease of adults. Most (> 75%) people newly diagnosed with CLL are over the age of 50, and the majority are men.12,13 This finding is similar to the finding seen in our study. However, in rare cases, it can occur in teenagers and occasionally in children (inherited). Most people are diagnosed without symptoms as the result of a routine blood test that returns a high white blood cell count, but, as it advances, CLL results in swollen lymph nodes, enlarged spleen, and liver, and eventually anemia and
infections. In this study also, the most common clinical manifestation was lymphadenopathy.

In this study, most of the cases were clinically diagnosed as anemia, fever, organomegaly and pancytopenia. However, only 13 cases were clinically diagnosed as hematological malignancy and in 8 cases, clinical diagnosis was not provided.

Thus, peripheral smear in under resourced laboratory like ours has a significant role in the diagnosis of hematological malignancies even when clinically the diagnosis could not be made.

Conclusion

This is a small study conducted on a hospital based sample at BPKIHS, a tertiary level hospital. All 52 hematological malignancies were diagnosed with the help of peripheral smear examination during a period of one year and acute leukemias were confirmed with cytochemistry.

AL comprises of 65.38% whereas CL comprises of 26.92% and 7.69% cases were of LS/AL. AML was the commonest type of hematological malignancy among all ALs and CML among all CLs.

Overall, the age range for all the hematological malignancies was from 2-90 years. Mean age was 37.6 year. Out of total cases, 54% were males and 46% were females. Hemoglobin count ranged from 2.4 to 11.0 gm/dl and the mean was 7.1 gm/dl. Total leucocyte count range from 2000 to 1,28,000/mm³ and the mean was 31,054 /mm³. Platelet count range from 10,000/mcl to 40,00000/mcl and the mean was 1,50,326/mcl.

References

Randomized controlled trial comparing cefazolin with ceftriaxone in perioperative prophylaxis in orthopaedic surgeries

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Department of Orthopaedics
BP Koirala Institute of Health Sciences, Dharan

Abstract

Background: Surgical site infection is one of the most dreaded complications faced by an orthopaedic surgeon. In spite of cefazolin being recommended as perioperative antibiotic, many orthopaedic surgeons continue to use ceftriaxone as perioperative antibiotic.

Objective: To compare the effectiveness of cefazolin and ceftriaxone as perioperative prophylactic antibiotics in the prevention of surgical site infection in clean elective orthopaedic surgeries.

Methods: We conducted a randomized controlled trial in 197 patients undergoing clean elective orthopaedic surgeries. The patients were divided into two groups. One group received intravenous prophylactic antibiotics cefazolin and gentamicin and the other group received ceftriaxone and gentamicin in standard doses for 48 hours. Both groups were followed by oral Cephadroxyl for 7 days. The patients were followed up for three months.

Results: There was no significant difference in the rate of surgical site infection among the two groups.

Conclusion: We conclude that there is no difference in the effectiveness of prevention of surgical site infection between cefazolin and ceftriaxone.

Keywords: Cefazolin, ceftriaxone, prophylactic antibiotics, surgical site infection.

Introduction

Surgical site infection is one of the most dreaded complications faced by an orthopaedic surgeon. In an era of evidence-based medicine, it is in the interest of the patient and the surgeon to follow practices backed by basic and clinical sciences.\(^1\) There are multiple studies which recommend cefazolin as prophylactic antibiotic in clean elective orthopaedic surgery.\(^2\)\(^-\)\(^4\) Using inappropriate antibiotics may contribute to the surgical site infection and development of antimicrobial resistance.\(^5\)\(^-\)\(^7\) Many of the orthopaedic surgeons continue to use ceftriaxone in practice as prophylactic...
antibiotic in clean elective orthopaedic surgery. So, it has become necessary to validate in our conditions what the literatures in the developed countries have been advocating. This study was performed to see if there was any difference in the rate of infection among patients who received cefazolin and those who received ceftriaxone in our setting.

Methods

Randomized controlled trial was conducted in the Department of Orthopaedics, B. P. Koirala Institute of Health Sciences, Dharan, Nepal. The study population included a total of 197 clean elective cases operated by the authors with or without using implants in the Orthopaedic Routine Operation Theater from November 2014 to April 2015. Those patients who had earlier wounds whether healed or otherwise and those patients who had undergone earlier surgeries were excluded from the study. All types of orthopaedic surgeries performed in an orthopaedic operation theater like closed fracture fixation of extremities and spine, soft tissue surgeries like tendon reconstruction or transfers, excision of benign tumours and arthroplasties were included. The records of 2013 showed that the number of cases operated in routine OT from 1st November 2013 to 30th April 2014 was 250. Arbitrarily, it was decided to take 220 of the cases. The 220 patients were randomized into 2 groups using computer generated random number sequence. Patients belonging to Group A were administered 2 gm of injection cefazolin and 80 mg injection gentamicin within 60 minutes before incision. Postoperatively, injection cefazolin one gram and injection gentamicin 80 mg was repeated eight hourly for 48 hours. Patients belonging to Group B were administered injection ceftriaxone, all other remaining the same. It was followed with oral cefadroxil 500 mg twice daily for 7 days. When the duration of surgery exceeded two hours or when there was excessive bleeding, one dose of each antibiotic was repeated intra-operatively. The study was approved by the Ethical Review Board of B. P. Koirala Institute of Health Sciences. Informed consent was taken from all patients included in the study. The authors did not receive any outside funding. The proforma for each patient included information about age, gender, duration of surgery (incision to closure), associated medical illness, preoperative hemoglobin level, preoperative albumin level, blood loss during surgery and preoperative admission days. The patients were discharged after 48 hours of surgery after wound inspection and change of dressing. The patients were followed up after 14 days, six weeks and three months to look
for signs of surgical site infection. The study was considered completed at three months for each patient if there was no infection or whenever an evidence of infection was observed before completion of three months. Our criteria for judging whether or not a wound infection occurred were as follows which has been modified from that of Pavel et al.8

1. If a wound drained purulent material irrespective of whether an organism was cultured or not, it was considered infected.

2. When a wound became red, painful or tender, swollen and hot for more than 48 hours, the wound was considered infected.

3. When the patient had fever for more than 48 hours and no other cause could be traced, the wound was considered infected.

4. If the patient had a stitch abscess with a small amount of purulence directly around a suture, but without any signs of inflammation or fever, the wound was not considered infected.

Although some may argue with our criteria, we considered them to be stringent enough not to miss any wound infection.

Data were entered into Microsoft Office Excel program and analyzed using SPSS (Statistical package for social sciences) version 17.0 software. Preliminary analysis was performed by calculating percentage, mean and standard deviation to get an idea about the proportion, central tendency and dispersion respectively. Chi-square and Mann-Whitney tests were applied to find the association of surgical site infection with the antibiotic administration after adjusting the rest of explanatory variables. A p-value < 0.05 was considered significant.

**Results**

Of the 220 patients we included in the study, 23 were lost to follow up. So, the proforma of 197 patients were analyzed. There were 100 patients in Group A and 97 in group B. Out of the 197 patients, 137 were males and 60 were females. The variables such as: age, sex, duration of surgery, preoperative haemoglobin, preoperative albumin level, blood loss during surgery and preoperative admission days were compared between the two groups and was found to be statistically comparable showing that randomization was appropriate (Table1 and 2).
Table 1: Sex distribution

<table>
<thead>
<tr>
<th>Sex</th>
<th>Group</th>
<th>Total</th>
<th>$\chi^2$ (chi square value)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>69 (69%)</td>
<td>68 (70.1%)</td>
<td>137 (69.5%)</td>
<td>0.028</td>
</tr>
<tr>
<td>Female</td>
<td>31 (31%)</td>
<td>29 (29.9%)</td>
<td>60 (30.5%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100 (100%)</td>
<td>97 (100%)</td>
<td>197 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Comparison of age, preoperative hemoglobin and albumin, perioperative variables

<table>
<thead>
<tr>
<th>Group</th>
<th>Age (years)</th>
<th>Duration of Surgery (min)</th>
<th>Preop Hb (gm/dL)</th>
<th>Preop Albumin (gm/dL)</th>
<th>Blood Loss (mL)</th>
<th>Preop admission day</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error of Mean</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Mean</td>
<td>33.02</td>
<td>80.02</td>
<td>12.071</td>
<td>4.001</td>
<td>223.50</td>
<td>4.59</td>
<td>100</td>
<td>20.978</td>
<td>2.098</td>
<td>0.533</td>
</tr>
<tr>
<td></td>
<td>Std. Deviation</td>
<td>53.314</td>
<td>1.9634</td>
<td>.7011</td>
<td>225.395</td>
<td>5.601</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Std. Error of Mean</td>
<td>5.331</td>
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<td>.0716</td>
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<td>0.560</td>
<td></td>
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</tr>
<tr>
<td>B</td>
<td>Mean</td>
<td>35.30</td>
<td>75.89</td>
<td>12.095</td>
<td>3.874</td>
<td>208.40</td>
<td>4.18</td>
<td>97</td>
<td>22.692</td>
<td>2.304</td>
<td>0.533</td>
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<tr>
<td></td>
<td>Std. Deviation</td>
<td>48.303</td>
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<td>.7012</td>
<td>170.934</td>
<td>5.254</td>
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<td>Std. Error of Mean</td>
<td>4.930</td>
<td>.1806</td>
<td>.0735</td>
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<td>.533</td>
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<td>Mean</td>
<td>34.14</td>
<td>77.99</td>
<td>12.083</td>
<td>3.939</td>
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<td>197</td>
<td>21.813</td>
<td>1.554</td>
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<td>50.833</td>
<td>1.8698</td>
<td>.7022</td>
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<td>5.423</td>
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<td>Std. Error of Mean</td>
<td>3.631</td>
<td>0.1332</td>
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<td>.386</td>
<td></td>
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<tr>
<td>P value</td>
<td>0.533</td>
<td>0.692</td>
<td>0.910</td>
<td>0.400</td>
<td>0.872</td>
<td>0.250</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The most common medical illness that we encountered was hypertension, followed by diabetes mellitus (Table 3). The associations of presence of associated illness in the two groups were not significant.

Table 3: Associated Illness

<table>
<thead>
<tr>
<th>Associated Illness</th>
<th>Group A</th>
<th>Group B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anemia</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Asthma</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Hypertension</td>
<td>8</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Rheumatoid Arthritis</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rickets</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>SLE</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cushing’s Syndrome</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>COPD</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>11</td>
<td>21</td>
</tr>
</tbody>
</table>

The percentages of infection in both groups were uniformly high. Nine (9%) out of 100 were infected in Group A. Similarly there were three out of 97 (3.1%) infection in Group B. The mean percentage of infection was 6.1% (Table 4).

Table 4: Comparison of infection rate in two groups

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th>Total</th>
<th>$\lambda^2$ (chi square value)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Present</td>
<td>9</td>
<td>3</td>
<td>12</td>
<td>6.1%</td>
</tr>
<tr>
<td>Absent</td>
<td>91</td>
<td>94</td>
<td>185</td>
<td>93.9%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>97</td>
<td>197</td>
<td></td>
</tr>
</tbody>
</table>
Discussion

Postoperative infections have been shown to significantly increase morbidity, extend the patients hospital stay, drastically increase the cost of the medical system and cause severe physical limitations that diminish the quality of life. Decreasing the incidence of surgical site infection is a matter of utmost interest to both the patients and surgeons. Literature is flooded with articles that relate surgical site infection to a variety of factors of which some are modifiable; some are not. The use of prophylactic antibiotics is one of the most important factors in decreasing infection and one that all surgeons are concerned about. The clinical use of prophylactic antibiotics in orthopaedic surgery was not always supported. Early poorly designed studies found that perioperative use of antibiotics in clean orthopaedic cases was associated with increased infection rates. Despite these unfavorable results, investigations continued into the use of prophylactic antibiotics in orthopaedic surgery. Orthopaedic Surgeons in Nepal believe in using prophylactic antibiotics but there are discrepancies in the choice of antibiotics. Available literature recommends cephazolin as the prophylactic antibiotic. Though the infection rate among patients who received cephazolin was higher than those who received ceftriaxone, it was statistically insignificant (p value 0.083). Similar study comparing cephazolin vs ceftriaxone was done in abdominal hysterectomy surgery by Natacha Phoolcharoenin et al. in Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand. They also concluded that there is no difference between the use of single-dose preoperative ceftriaxone and cefazolin in preventing infectious morbidity among patients undergoing hysterectomy.

Factors like: duration of surgery, associated medical illness, preoperative haemoglobin status, preoperative serum albumin level, amount of blood loss during surgery and preoperative admission days would be expected to influence the incidence of infection. Malnutrition is a known risk factor for deep infection after a variety of orthopaedic surgical procedures. A serum albumin level of less than 3.5 g/dl has been associated with an increase in wound complications. In our study, 11% of the patients had serum albumin less than 3.5 g/dl. We found only the duration of surgery had a statistical association with the incidence of infection. Longer the duration of surgery, more was the chance of surgical site infection. Perhaps our sample size was not large enough. The mean infection rate in our study was 6.1% which must be considered...
high. We do not know the infection rate of other institutions in Nepal. The infection rate in a study by Pavel et al.\(^8\) in which the patients received cephaloridine was 2.85% and the study by Henley et al.\(^\text{16}\) in which the patients received cefamandole was 1.6%. Postoperative infection has been estimated to occur following 1% to 2% of all total hip arthroplasties and 2% to 4% of all total knee arthroplasties in the United States.\(^\text{17,18}\) In our study, there was no statistical difference between the rate of infection among those who received cephazolin and those who received ceftriaxone. This shows the futility of administering expensive antibiotics (ceftriaxone) instead of cheaper one e.g. cephazolin. The use of cheaper antibiotics like cephazolin instead of ceftriaxone for 48 hours saves Rs 30,00,000 per 10,000 patients.

**Conclusion**

We conclude that in clean elective orthopaedic surgeries, there is no difference in the rate of infection among patients who received cephazolin and those who received ceftriaxone in our setting.

**References**


Original Article

Questionnaire survey on methods of determining the relationship of the mandibular canal and third molars

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College of Dental Sciences, Nepal Medical College, Atterkhel, Jorpati

Abstract

Background: Clinicians should assess and monitor mandibular canal (MC) to achieve an uneventful and successful final result. Two dimensional techniques like panoramic radiography, intra oral periapical radiographs are commonly used for assessment of MC, along with three dimensional techniques like cone beam computed tomography (CBCT).

Objectives: To assess the radiologic modalities and assessment criteria used by clinically practicing dental surgeons when determining the proximity of MC to third molars.

Method: A questionnaire based study was carried out among national and international oral maxillofacial surgeons and general dental practitioners. Data were fed to SPSS software version 21 for descriptive statistics.

Result: Most of the participants (54.7%) in the study preferred combination of panoramic radiograph and CBCT for determining the relationship of mandibular canal and third molars measures.

Conclusion: Initial screening can be carried out using panoramic radiograph which is a popular method in determining the relation between the third molar and mandibular canal in spite of some limitations. Cone Beam Computed Tomography is an important three-dimensional imaging technique which is a preferred method amongst most dental surgeons.

Key Words: Mandibular canal, Third molar, Imaging modality

Introduction

Mandibular canal is a vital structure which passes inferior to the roots of the posterior teeth.1 Third molar extraction is one of the most common surgeries in oral and maxillofacial procedures. The most common complication associated with this surgery is injury to the mandibular canal.1 A number of radiographic modalities are available to
evaluate the proximity of the apices of third molar to mandibular canal (MC).\textsuperscript{2} Various types of imaging modalities are available for assessment of proximity of mandibular third molars to mandibular canal. Some of the common modalities are panoramic, periapical and lateral oblique radiographs. Panoramic radiography is the standard two dimensional diagnostic tool for assessment of the positional relationship between the mandibular third molar and MC.\textsuperscript{3} Previous studies have assumed that most clinicians use panoramic radiographs with a series of radiologic criteria as an indicator of the relationship and the risk of postoperative complications like dysesthesia.\textsuperscript{1} Common nine criteria used for assessment of the relationship between the inferior alveolar nerve and the lower third molars include increased radiolucency of the root(s) of the mandibular third molar, loss of mandibular border, change in mandibular canal direction, mandibular canal narrowing, root narrowing, root deviation, bifid apex, superimposed root and radiolucent band.\textsuperscript{2,4} The inferior alveolar nerve can be damaged as a result of direct or indirect forces to the mandibular canal which is one of the most serious postoperative complications.\textsuperscript{5,6,7,8} Clinicians use various radiographic markers to indicate such relationships. If the radiological markers of the panoramic radiograph indicate a close proximity, additional investigations may be recommended to verify the relationship in a three dimensional view like Computed Tomography (CT) scan and Cone Beam Computed Tomography (CBCT). CBCT has been introduced to overcome the drawbacks of conventional CT as it reduces the radiation dose delivered to patients.\textsuperscript{8,9} The objectives of this study were to assess the radiologic modalities and assessment criteria used by clinically practicing dental surgeons when determining the proximity of MC to third molars.

**Materials and Methods**

Ethical clearance was taken from Nepal Medical College- Institutional Research/Ethical Review committee (NMC-RERC) before starting the study. The questionnaire study was initiated only after validation of the questionnaire for reliability and the study was carried out between November 15, 2015 to July 15, 2016. The questionnaire was in English and was designed to assess the radiologic modalities and assessment criteria used by clinically practicing dental surgeons when determining the proximity of MC to third molars. Convenient sampling was taken for sample size determination. Informed verbal consent was taken from each participant before administration of the questionnaire. Clinically practicing Nepalese dentists (BDS/ MDS), currently practicing in teaching dental institutions with minimum of 1 year experience were included.

International dentists who participated in a conference organized in Kathmandu were
also included in the study. Questionnaires were also mailed to some international oral maxillofacial surgeons. Exclusion criteria included dentists who did not give consent to participate. Dental specialists other than oral maxillofacial surgeons were not target populations as they did not carry out extraction procedures routinely. Willing participants were informed in detail by the investigators about the research project through face-to-face interviews, telephonic conversations and email correspondence. Privacy of the dentists was ensured during filling of questionnaires.

A series of questions determining the types of imaging modalities, combinations used, the number of cases investigated over the previous 1 year and whether the modalities provided relevant information in determining the relationship between the MC and the roots of third molars were asked. The nine radiologic criteria commonly used for assessment of the relationship between the mandibular canal and the lower third molars were used. Furthermore, the participants were asked to record the preferred radiologic criteria for diagnosing the MC/ third molar relationship in each panoramic image.

The questionnaire was subjected to statistical analysis. Data were fed to SPSS software version 21.0 and were analyzed statistically using descriptive analysis and Chi-square test, p <0.05 was considered to be significant with a confidence interval of 95%.

**Results**

The total sample size was 150, out of which 100 were Nepalese dentist and 50 were international dentists. Of the 100 Nepalese dentists, 45 were oral maxillofacial surgeons with the rest being general practitioners (Table 1). Most of the participants (54.7%) in the study preferred combination of panoramic radiograph and CBCT for determining the relationship of mandibular canal and third molars (Table 2 and 3). Around 61% of participants advised more than 100 radiographic investigations over that last 12 months and most of them advised panoramic radiographs (38%) followed by CBCT. Around 45% of the participants considered all the nine radiologic criteria important for determining the relationship between mandibular canal and third molars. Change in mandibular direction (70.7%), root deviation (84.7%) were some of the radiologic criteria they used to indicate close relation of the mandibular canal/ third molar relationship in each panoramic image (Table 4).Around 47% of the participants considered all the nine radiologic criteria important for advising CBCT for determining the relationship between mandibular canal and third molars. Most of the participants felt mandibular canal narrowing (92%), root deviation (90.7%) and Contact mandibular canal (79.3%) as the important radiologic criteria that indicated the need for CT/ CBCT (Table 4). There was a significant statistical difference in the
modality preferred in determining relation between mandibular canal and third molar by national and International dental surgeons (Table 5). Significant difference was also seen in the modality advised in determining relation between mandibular canal and third molar by national and International dental surgeons (Table 6).

Table 1: Nationality Gender and specialist distribution of dental surgeons

<table>
<thead>
<tr>
<th>Participants</th>
<th>Male</th>
<th>Female</th>
<th>Oral and maxillofacial surgeons</th>
<th>General Practitioners</th>
<th>Total Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nepali</td>
<td>70</td>
<td>30</td>
<td>45</td>
<td>55</td>
<td>100</td>
</tr>
<tr>
<td>International</td>
<td>30</td>
<td>20</td>
<td>39</td>
<td>11</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 2: Modality preferred in determining relation between mandibular canal and third molar (n=150)

<table>
<thead>
<tr>
<th>Imaging Modality</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panoramic</td>
<td>34</td>
<td>22.7</td>
</tr>
<tr>
<td>Peri-apical</td>
<td>15</td>
<td>10.0</td>
</tr>
<tr>
<td>CT/ CBCT</td>
<td>19</td>
<td>12.7</td>
</tr>
<tr>
<td>Combination (Panoramic and CBCT)</td>
<td>82</td>
<td>54.7</td>
</tr>
</tbody>
</table>

Table 3: Combinations preferred (n=150)

<table>
<thead>
<tr>
<th>Imaging modality</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periapical and Panoramic</td>
<td>18</td>
<td>5.3</td>
</tr>
<tr>
<td>Periapical and CT/ CBCT</td>
<td>15</td>
<td>12.0</td>
</tr>
<tr>
<td>Panoramic and CT/ CBCT</td>
<td>109</td>
<td>72.7</td>
</tr>
</tbody>
</table>

Table 4: Radiologic Criteria used to indicate close relation of the mandibular canal/ third molar relationship in each panoramic radiograph (n=150) and radiologic criteria that indicates the need of CBCT (n=150)

<table>
<thead>
<tr>
<th>Radiologic Criteria</th>
<th>Indicates close relation of the mandibular canal/ Third molar relationship in each panoramic radiograph (n=150)</th>
<th>Indicates the need of CBCT (n=150)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td>Radiolucent Band</td>
<td>50</td>
<td>33.3</td>
</tr>
<tr>
<td>Loss of mandibular border</td>
<td>77</td>
<td>51.3</td>
</tr>
<tr>
<td>Contact mandibular canal</td>
<td>77</td>
<td>51.3</td>
</tr>
<tr>
<td>Mandibular canal narrowing</td>
<td>97</td>
<td>64.7</td>
</tr>
<tr>
<td>Root narrowing</td>
<td>40</td>
<td>26.7</td>
</tr>
<tr>
<td>Root deviation</td>
<td>127</td>
<td>84.7</td>
</tr>
<tr>
<td>Bifid apex</td>
<td>123</td>
<td>82.0</td>
</tr>
<tr>
<td>Superimposition</td>
<td>77</td>
<td>51.3</td>
</tr>
<tr>
<td>Change in mandibular canal direction</td>
<td>106</td>
<td>70.7</td>
</tr>
</tbody>
</table>

Table 5: Modality preferred in determining relation between mandibular canal and third molar by national and International dental surgeons (n=150)
Questionnaire survey on methods of determining the relationship of
the mandibular canal and third molars

Table 6: Modality advised in determining relation between mandibular canal and third molar by national and International dental surgeons over the previous 12 months (n= 150)

<table>
<thead>
<tr>
<th>Participants</th>
<th>Panoramic</th>
<th>Periapical</th>
<th>CBCT</th>
<th>Panoramic and CBCT</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nepali</td>
<td>15</td>
<td>12</td>
<td>14</td>
<td>59</td>
<td>100</td>
<td>0.002*</td>
</tr>
<tr>
<td>International</td>
<td>12</td>
<td>5</td>
<td>10</td>
<td>23</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

*Statistically significant at p< 0.005

Discussion

Radiographs in dentistry help in a proper diagnosis, correct treatment planning, and are an important tool in intra-operative procedures and outcome assessments.\(^\text{10}\) The knowledge of the precise relationship between the inferior alveolar nerve and the roots of the mandibular third molar is crucial in allowing the appropriate planning of the procedure.\(^\text{8}\) This study revealed that all surgeons used panoramic radiograph as it was easily available and useful for initial screening purposes and planning of the surgical procedure which was consistent with the study done by boot et al.\(^\text{2}\) Though most surgeons used panoramic radiograph, only few considered it sufficiently accurate in determining the relationship between the mandibular canal (MC) and the third molar root.\(^\text{8}\) The fact that most surgeons preferred using a combination of panoramic and CBCT as seen in this study justifies the advantages of three-dimensional radiograph as seen in this study. The surgeons used a varying extent of radiologic criteria on a panoramic radiograph with most of the surgeons using root deviation and change in mandibular canal to determine the relationship. A further review of research of this relationship in a study carried out by Rood et al (1990) revealed presence of a significant anatomical variation in mandibular canal.\(^\text{5}\) Around 45% of the participants considered all the nine radiologic criteria important for determining the relationship between mandibular canal and third molars which was consistent with a study carried out by Koong et al (2006).\(^\text{2}\) Because of this high variation in MC/ third molar relationship, a detailed pre-operative
radiographic assessment was suggested to identify both the position (buccal, lingual or inferior) and approximation of MC to third molar to minimize the risk of postoperative dysaesthesia.\textsuperscript{5,6,7,8} The need for three-dimensional imaging is increasing in dentistry. CBCT has been a promising tool in all countries, including a developing country like Nepal.\textsuperscript{11} Apart from indications like localization of impacted tooth, visualization of oral and maxillofacial pathologic entities, TMJ related problems, craniofacial fractures, endodontics, periodontal assessments and Oral implantology, CBCT has added benefit of accurate visualization of mandibular canal and also detecting anatomical aberrations.\textsuperscript{11,12} CBCT has been introduced in an effort to overcome the shortcomings of the conventional CT as well like higher radiation dose, lower spatial resolution and the higher costs. In addition, with the use of three-dimensional-image-based planning software, the course of the mandibular canal can also be marked at different locations depicting anatomical variations more clearly and thus minimizing damage to MC.\textsuperscript{13}

**Conclusion:**
For third molar assessment, initial screening can be carried out using panoramic radiograph, which is a popular method in determining the relation between the third molar and mandibular canal in spite of some limitations. Since CBCT provides a reliable insight in the three-dimensional relationship of the mandibular third molar root with the mandibular canal for optimal surgical procedure to remove third molar teeth, CBCT alone or a combination of CBCT and panoramic can be advised for evaluating third molar and MC relationship. However; availability, cost and radiation exposure issues should be taken into consideration. Literature review reveals no researches in Nepal on methods of determining the relationship of the mandibular canal and third molars and we believe this may be of value to dental practitioners when assessing mandibular third molars for surgical treatment. The limitation of this study was that all dentists could not be included in this study and therefore, we recommend similar study to be carried out in future including more number of dentists and including other specialists too other than only oral and maxillofacial surgeons.

**Acknowledgement:**
We would like to thank all the national and international oral maxillofacial surgeons and general practitioners who participated in this study and Mr. Prem Prasad Panta, Lecturer of Biostatistics, Nepal Medical College for his guidance in statistical analysis.

**References**
1. Denio D, Torabinejad M, Bakland LK. Anatomical relationship of the mandibular canal to its surrounding


Original Article

Vaginal administration of isosorbide mononitrate for cervical ripening prior to induction of labor for postdated pregnancy: a randomized controlled trial

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BP Koirala Institute of Health Sciences, Dharan

Abstract

Introduction: Induction of labor is commonly practiced intervention in modern Obstetrics. The aim of induction of labor is to initiate labor when maternal and fetal conditions necessitate delivery before the onset of spontaneous contraction with purpose to achieve safe vaginal delivery. Induction of labor is one of the most commonly practiced interventions in the Department of Obstetrics and Gynecology every day. The success of this obstetric practice is highly dependent upon the condition of the cervix which is assessed with Bishop’s score and it is well known that unfavorable cervix is associated with failure of induction and cesarean section. In the recent years, there has been a considerable interest in the use of nitrous oxide donors for cervical ripening and labor induction.

Objective: To evaluate whether isosorbide mononitrate administered vaginally prior to induction in postdated pregnancy is effective for pre-induction cervical ripening and thus, improves the process of induction of labor.

Methods: One hundred and twenty women scheduled for labor induction were recruited and assigned randomly to isosorbide mononitrate or placebo followed by misoprostol 25µg. The efficacy of the medication was evaluated by predetermined outcome variables for cervical ripening and induction of labor and delivery.

Results: The groups were comparable with respect to age, gestational age and Bishop’s score. Women receiving isosorbide with misoprostol didn’t show any improvement in the Bishop’s score compared to misoprostol and placebo. There was no significant difference between the two groups regarding time of delivery and onset of active stage of labor from induction. Cesarean delivery rates were similar between the two groups; however, the indications of the cesarean section were different between the two groups which were significant statistically. Neonatal outcome were similar between the two groups.

Conclusion: The addition of vaginal isosorbide mononitrate to vaginal misoprostol for cervical ripening and labor induction did not reduce time to vaginal delivery and didn’t help in improving pre-induction cervical score.

Key words: Postdated pregnancy, induction of labor, isosorbide mononitrate.
Introduction

Induction of labor is an intervention to expedite delivery when there is concern about pregnancy and is usually performed when the benefits to the mother outweigh the risk of continuing pregnancy. Since the late 1960’s prostaglandins have been used for the induction of labor at term, and their analogs have been administered by various routes to induce labor with mostly comparable results.\(^1\) Although several other agents have been proposed to be useful in inducing labor and cervical ripening like: oxytocin, corticosteroids, estrogen, relaxin and nitric oxide donors (NOD),\(^1,2\) the standardized cervical priming and induction of labor is predominantly achieved by means of Prostaglandins administration. However, in the last years, there has been a considerable interest in the use of misoprostol\(^3,5\) and NOD\(^6,7\) for cervical ripening and labor induction. NOD have been shown to stimulate prostaglandin production in the human cervix after topical administration.\(^8\)

Similar kind of study done by Rameez et al. have shown that vaginally administered isosorbide mononitrate was effective for pre-induction cervical ripening.\(^9\) Another study done by Abdellah MS et al.\(^10\) have also concluded that isosorbide and misoprostol is more efficient than misoprostol alone in terms of fast cervical ripening and shortening of induction-labor interval. Nitric oxide appears to be safe in term pregnancy but do affect maternal and fetal hemodynamics when applied vaginally, albeit without clinical significance.\(^11\)

The present study was undertaken with an objective of evaluating the efficacy of Nitric oxide donor i.e.; isosorbide mononitrate for cervical ripening prior to induction of labor. If the result of the study comes positive, then, there will be less number of patients undergoing cesarean section for failed Induction.

Methods

This study was a prospective, randomized, single blinded, placebo-controlled and was carried out at the Department of Obstetrics and Gynecology, B. P. Koirala Institute of Health Sciences, Dharan, from October 2013 to September 2014. This study was granted approval from the institute ethical review board before its initiation.

This study considered 95% Confidence interval and 80% power for sample size calculation. According to the study done by Abdellah MS et al.,\(^10\) it was found that women receiving isosorbide plus misoprostol showed significant changes in the Bishop score compared to misoprostol plus placebo (8.57±1.46 vs 7.6±1.39) Standard deviation was found to be 1.42.

Now using the formula that is T test for 2 sample mean
n = 2x (S.D)^2 x (Z_α/2)^2 / (Mean1-Mean1)^2
= 2x (1.4)^2 x (0.842+1.96)^2 / (8.57-7.6)^2
= 36

For reducing various types of bias, we added 10% in sample size, so, the sample size became 40 in each arm. But, this study considered 60 in each arm, that is case and control arm. To recruit this number of patients, a 12 month inclusion period was anticipated.

So, a total number of 120 women scheduled for labor induction were recruited in this study. Sixty patients were recruited in misoprostol group and 60 patients were recruited as control group received pyridoxine.

**Inclusion Criteria**
- Nulliparity
- Postdated pregnancy (>41 weeks)

**Exclusion Criteria**
- Pre labor rupture of membrane
- Oligohydramnios (AFI≤5cm)
- Preeclampsia
- IUGR

The study took place in the Antenatal ward of Department of Obstetrics and Gynecology at BPKIHS. All the patients who were eligible for the study on the basis of inclusion criteria were enrolled in the study.

All the participants were fully informed about the nature and scope as well as potential risk of the study. After consenting for the study, patients were randomized according to computer generated random number table to receive either isosorbide mononitrate (40mg) or placebo (pyridoxine 40mg) 1 day prior to planned induction with misoprostol. The patient did not know whether they are receiving the treatment or placebo, only the doctor randomizing the patient knew about whether the patient was receiving treatment or placebo. Randomization was done by on duty doctor and Bishop’s score was documented.

Maternal pulse and blood pressure were assessed every 30 minutes during the 1st two hours after instilling isosorbide mononitrate, then, every 4 hourly, it was measured by the same doctor who randomized the patient. Any adverse or side effects were documented. The next day, all the patients were induced with misoprostol 25µgm, Bishop’s score was documented again. The next day, the randomized patients were induced with misoprostol. Three doses of misoprostol were given every 4 hourly. Patients not entering into active phase of labor after 4 hours of last dose of misoprostol were diagnosed as failed induction and cesarean section was carried out. Those patients who progressed after any dose of
misoprostol was managed according to labor room protocol. The efficacy of the medication was evaluated by predetermined outcome variables for cervical ripening and induction of labor and delivery. Cervical ripening was assessed by the change in Bishop’s score found 16 hours after the initial application. Labor induction was assessed by measuring time from initial dose to beginning of the active phase of labor and time from initial dose to delivery.

Maternal safety was evaluated by the occurrence of various adverse effects: Tachy-systole (> 5 contractions in 10 min), uterine hypertonus, headache and hypotension. Fetal safety was evaluated by Apgar score and need for neonatal intensive care unit admission.

Statistical analysis was done using the SPSS software for windows, version 11.5. The $t$ test and Chi-square test were applied to find out the significant difference for inferential statistics. $P< 0.05$ was considered statistically significant.

Figure 1: Consort diagram of the trial

Assessed for eligibility (n=120)  
\begin{center}
\begin{tikzpicture}[node distance={25mm,between origins},
  decision/.style={diamond, draw, thick, text width=6.5em, text badly centered, node distance=3.5cm, inner sep=0pt},
  io/.style={trapezium, trapezium left angle=70, trapezium right angle=110, minimum height=4em, draw, text width=14em, text centered, node distance=6cm, inner sep=0pt},
  decision2/.style={diamond, draw, thick, text width=6.5em, text badly centered, node distance=3.5cm, inner sep=0pt},
  io2/.style={trapezium, trapezium left angle=70, trapezium right angle=110, minimum height=4em, draw, text width=14em, text centered, node distance=6cm, inner sep=0pt},
]
\node (start) {Assessed for eligibility (n=120)};
\node (random) [io] {Randomized (n=120)};
\node (allocation) [decision] at (allocation -| start) {Allocation};
\node (intervention) [io] at (intervention -| start) {Allocated to intervention isosorbide mononitrate + misoprostol group (n=60)};
\node (control) [io] at (control -| start) {Allocated to control pyridoxine + misoprostol group (n=60)};
\node (total) [io2] at (total -| start) {Total vaginal deliveries n=34 (56.66%)};
\node (cesarean1) [io2] at (cesarean1 -| start) {Cesarean rate n=26 (43.33%)};
\node (cesarean2) [io2] at (cesarean2 -| start) {Cesarean rate n=31 (51.66%)};
\node (total1) [io2] at (total1 -| start) {Total vaginal deliveries n=29 (48.33%)};
\draw[->] (start) -- (random);
\draw[->] (random) -- (allocation);
\draw[->] (allocation) -- (intervention);
\draw[->] (allocation) -| (control);
\draw[->] (intervention) -- (total);
\draw[->] (intervention) -- (cesarean1);
\draw[->] (control) -- (total1);
\draw[->] (control) -- (cesarean2);
\end{tikzpicture}
\end{center}
Results
A total of 120 women who gave consent for the study were enrolled in study. The two groups were comparable with respect to age, parity, gestational age, indication for induction and Bishop’s score. All the patients were primi gravida according to inclusion criteria and indication for induction of labor was postdated pregnancy. The baseline characteristics are shown in table 1.

Table 1: Baseline Characteristics of both groups

<table>
<thead>
<tr>
<th></th>
<th>Misoprostol plus IMN (n= 60)</th>
<th>Misoprostol plus placebo (n= 60)</th>
<th>P values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>23.25 ± 2.7</td>
<td>22.73 ± 3.07</td>
<td>0.336</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td>41.1 ± 0.399</td>
<td>41.1 ± 0.44</td>
<td>1.000</td>
</tr>
<tr>
<td>Initial Bishop’s Score</td>
<td>3.07 ± 0.312</td>
<td>3.20 ± 0.632</td>
<td>0.146</td>
</tr>
</tbody>
</table>

Values are given as mean ±S.D

Women receiving IMN plus misoprostol didn’t show significant changes in the Bishop’s score 1 day after administration when compared with misoprostol plus placebo (3.08 ± 0.334 vs. 3.35 ± 0.732, P= 0.120). The median time from initial dose to beginning of active labor and time from initial dose to delivery remained statistically insignificant (table 2).

Table 2: Outcome Variables

<table>
<thead>
<tr>
<th></th>
<th>Misoprostol plus IMN (n= 60)</th>
<th>Misoprostol plus placebo (n= 60)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bishop’s score before induction</td>
<td>3.08 ± 0.334</td>
<td>3.35 ± 0.732</td>
<td>0.120</td>
</tr>
<tr>
<td>Time from initial dose to beginning of active labor (hour)</td>
<td>9.189 ± 3.4</td>
<td>8.7 ± 3.3</td>
<td>0.561</td>
</tr>
<tr>
<td>Time from initial dose to delivery (hour)</td>
<td>12.78 ± 4.03</td>
<td>14.33 ± 4.69</td>
<td>0.550</td>
</tr>
</tbody>
</table>

Values are given as mean ±S.D
There were no significant differences in the incidence of maternal adverse effects. No significant differences were found in the incidence of cesarean delivery in the two groups. However, regarding indications of cesarean section, fetal distress and meconium stained liquor were more common in isosorbide group and failed induction was more common in placebo group which was statistically significant (P= 0.013). There was no statistical difference between the neonatal outcomes and neonatal Intensive care admission between the two groups.

**Discussion**

Labor induction in the presence of unfavorable cervix is a common indication for the use of prostaglandins. Prostaglandins and their analogues have been used for induction of labor since 1960s.

Recently nitric oxide donors such as isosorbide mononitrate have been shown to stimulate prostaglandin production in the human cervix after topical administration.\(^8\) Therefore, a combination of both should accelerate the process of cervical ripening and labor induction and possibly potentiate the efficacy of each agent alone without major maternal and fetal adverse effects. The study was conducted to find out whether the addition of isosorbide to the routine administration of misoprostol is more efficient for cervical ripening than misoprostol alone in our setup.

The present study was a randomized controlled trial. One hundred and twenty patients were enrolled in the study and randomized into isosorbide and placebo groups. All subjects in the study received the assigned treatment. All of the 120 patients completed the study.

Till date many studies have shown that Nitric Oxide donor like isosorbide can induce cervical ripening and thus, helps in improving the pre-induction cervical Bishop’s score. Nunes et al.\(^{12}\) found that length of induction to delivery was reduced from approximately 27 to 22 hours when inpatient administration of glyceryl trinitrate, a nitric oxide donor, was combined with vaginal prostaglandin dinoprostone. However, the present study fails to show any benefit for cervical ripening and labor induction in terms of reducing the length of time to vaginal delivery by addition of vaginal isosorbide mononitrate with misoprostol for induction of labor.

This is in agreement with study conducted by Justin P. Collingham et al.\(^{13}\) who concluded that addition of isosorbide mononitrate to misoprostol for cervical ripening and labor induction did not
reduce time to vaginal delivery and was associated with a greater incidence of headache. However, they had given oral misoprostol which was different from this study. In the present study, we have chosen vaginal misoprostol because the duration between the use of isosorbide mononitrate and misoprostol was one day which will eliminate the potential for pharmacological interaction between vaginal misoprostol and vaginal isosorbide mononitrate.

Study done by Ekerhovd et al.\textsuperscript{7} showed statistically significant reductions in maternal blood pressure and increase in maternal pulse with isosorbide mononitrate use at term though clinically insignificant. This study found no difference in the incidences of maternal tachycardia or hypotension between the two groups which is consistent with the findings of Nunes et al.\textsuperscript{12} Headache is one of the most commonly reported symptoms in patient who had received isosorbide mononitrate for cervical ripening in other studies. However, in this study, only one patient complained of headache in isosorbide group which was clinically not significant. This may be because only one dose of isosorbide mononitrate was used.

**Conclusion**

In conclusion, the present study shows that addition of nitric oxide donor like Isosorbide mononitrate to misoprostol for pre-induction cervical ripening has no advantage of improving cervical findings in terms of Bishop’s score and neither does it helps in reducing induction to delivery time, suggesting a limited role for isosorbide mononitrate in in-patient cervical ripening and labor induction.

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intravaginal misoprostol and
dinoprostone for induction of labor.
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mononitrate and misoprostol for
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ripening: a randomized controlled trial
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dinoprostone for cervical ripening and
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labor induction. Obstet Gynecol. 2010
Ziehl Neelsen vs. Auramine staining technique for detection of acid fast bacilli
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Department of Microbiology,
BP Koirala Institute of Health Sciences, Dharan

Abstract
Background: The culture and molecular test are the best methods for isolation and identification of *Mycobacterium tuberculosis* in developed countries. But, in developing countries like Nepal with a significant number of tuberculosis (TB) cases and limited resources, the diagnosis of TB relies primarily on smear microscopy for Acid fast bacilli (AFB).

Objective: To compare the results of direct sputum examination for AFB stained by Ziehl Neelsen and Auramine technique.

Method: Cross sectional comparative study was conducted in tuberculosis research laboratory, BPKIHS from April to June 2013. A total of 100 sputum samples were collected randomly. Four slides were smeared and labeled for each as neat ZN, neat Auramine, concentrate ZN and concentrate Auramine. Slides were processed as per WHO laboratory guidelines.

Results: The findings of this study revealed that 3% positive with neat Auramine was negative for ZN stain. Similarly, 5% positive cases with Auramine concentrate were negative with ZN concentrate technique. Auramine stain was able to detect all ZN positive as positive but only 83 cases were detected as negative among 88 case of ZN negative. Both concentration techniques showed 12% of positive with significant relationship. With this; Auramine showed 100% sensitivity, 94.6% specificity, positive predictive values and negative predictive values 70.5, 100% respectively.

Conclusion: Auramine stain stands efficient on comparison and can be used as an alternative to ZN stain, with added value of allowing a large number of sputum specimens to be examined in a given time as low power is used for examination.

Key words: Identification, *Mycobacterium tuberculosis*, sputum examination.

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**Introduction**
Tuberculosis (TB) remains one of the major public health concerns in the WHO South-East Asia Region (SEAR). The Region accounts for 39%
of the global burden of TB in terms of incidence, and India alone accounts for 26% of the world’s TB cases. In Nepal, 45% of the total population is infected with TB, out of which 60% are in the productive age group (15-45). Every year, 40,000 people develop active TB, of whom 20,000 have an infectious pulmonary disease. It is estimated that nearly one billion people of the world will be infected with TB, 200 million develop the disease and 35 million will die with it during 2000-2020.

At present, mostly, the sputum staining is done by two methods, viz. Ziehl-Neelsen (ZN) or Auramine fluorochrome. Its staining techniques are based on the relatively unique property of Mycobacterium species to retain the primary stain even after exposure to strong acid-alcohol, thus the term, AFB. Although, culture is viewed as to be the gold standard for diagnosis of TB, despite its enhanced sensitivity and specificity, it is of impractical laboratory use, because of associated cost, labour intensive procedure, time factors and specialized safety measures. Hence, this study was conducted focusing mainly on two most commonly used sputum staining technique (ZN and Auramine stain) to compare and evaluate their sensitivity and specificity in detecting AFB.

Methods
In this cross-sectional comparative study, a total of 100 sputum samples were collected according to the National tuberculosis guidelines and examined in Tuberculosis research laboratory at Department of Microbiology, B. P. Koirala Institute of Health Science (BPKIHS), Dharam during April to June 2013. BPKIHS TB Laboratory receives approximately 20 samples each day, out of those, five samples were selected using simple random technique on every fourth day for convenience. Samples collected using not standard procedure and less than 2ml of the amount were excluded considering insufficient amount for processing the procedure. The purpose of the study was clearly explained and verbal consent was obtained from each patients.

Processing
Following exclusion criteria, all the samples were collected, recorded into study log book using their allocated laboratory numbers and processed in a biosafety cabinet. Four slides were labeled for each sample as a neat ZN, neat Auramine, concentrate ZN and concentrate Auramine. Initially, neat smears were prepared and then, remaining sputum samples were processed by modified Petroff’s method to prepare smear for concentrate slides.
Smear preparation, staining technique and Microscopy reporting was done according to Laboratory services in Tuberculosis control guidelines. Analysis

The generated data were compiled in a data entry form and also stored in Microsoft Office Excel programme and later, exposed to SPSS 17.0 version software of windows for analysis. Kappa test of an agreement was calculated from SPSS to establish the relationship between two stains. McNemar’s chi-square test was calculated from ‘EPI info software 2000’ to demonstrate any relationship between discordant results shown by the stains.

Results

The results showed that 3% of the samples that were positive with neat Auramine was negative when ZN techniques were performed. Similarly, the percentage of case that was negative with Auramine but positive with ZN was zero. It shows that Auramine was able to detect all positive cases detected by ZN (total 9) correctly; in addition, it could detect 3 more positive cases which were missed by ZN technique.

However, there was a significant relationship (i.e. very good agreement for \( \kappa \)) for neat techniques in the performance of Auramine when compared to ZN (\( p=0.05 \)). Details are shown in table 1 and their statistical values are given in table 3.

This study also found that 5% positive cases with Auramine concentrates were negative with ZN concentrates. Also same is the case with concentrate technique that no case found where negative with Auramine but positive with ZN i.e. Auramine able to detect all ZN positive as positive but could only detect 83 as negative among 88 cases of ZN negative (true negative). However, both preparations for concentration showed 12% of positive (true positive) with significant relationship (i.e. good agreement for \( \kappa \)) between both techniques (\( p=0.05 \)). Details are shown in table 2 and their statistical values are given in table 3.

This study also included testing of the discordant variable for establishing any kind of relationship. For this McNemar’s \( \chi^2 \) test was used which showed ‘Not significant’. This implies that the discordant result shown by these two satins (shown in table 1 and 2) was just due to chance variation which strongly suggests that both Auramine and ZN stains are strongly related. Details are shown in table 3.

This study also included the comparison between concentrate ZN with neat ZN
(table 3) and between concentrate Auramine with neat Auramine (table 4).

Table 3 revealed 2 cases which were negative with neat ZN but positive with concentrate ZN but such case increases to 5 which are negative with neat Auramine but positive with concentrates Auramine. However, no difference is recorded in detecting negative (true negative) cases by neat preparation compared with concentrates of both techniques. Data are shown in table 4 and 5.

Table 1: Comparison of neat ZN and neat Auramine techniques

<table>
<thead>
<tr>
<th></th>
<th>Neat ZN preparation</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive (%)</td>
<td>Negative (%)</td>
</tr>
<tr>
<td>Neat Auramine</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>preparation</td>
<td>0</td>
<td>88</td>
</tr>
<tr>
<td>Total (%)</td>
<td>9</td>
<td>91</td>
</tr>
</tbody>
</table>

Table 2: Comparison of concentration ZN and concentration Auramine technique

<table>
<thead>
<tr>
<th></th>
<th>Concentration ZN preparation</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive (%)</td>
<td>Negative (%)</td>
</tr>
<tr>
<td>Concentration Auramine</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>preparation</td>
<td>0</td>
<td>83</td>
</tr>
<tr>
<td>Total (%)</td>
<td>12</td>
<td>88</td>
</tr>
</tbody>
</table>

Based on above table 2

- Sensitivity of Auramine: 100(%)
- Specificity of Auramine: 94.31818(%)
- Positive predictive value: 70.58824(%)
- Negative predictive value: 100(%)
Table 3: Performance of different preparation on different tests

<table>
<thead>
<tr>
<th>Test</th>
<th>For value</th>
<th>strength of Agreement</th>
<th>95% C.I*</th>
</tr>
</thead>
<tbody>
<tr>
<td>k test</td>
<td>Table 1 0.841</td>
<td>very good</td>
<td>0.66-1</td>
</tr>
<tr>
<td></td>
<td>Table 2 0.799</td>
<td>Good</td>
<td>0.63-0.97</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test</th>
<th>For value</th>
<th>P-Value</th>
<th>Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>McNemar χ²</td>
<td>table 1 1.33</td>
<td>0.25</td>
<td>NS**</td>
</tr>
<tr>
<td></td>
<td>table 2 3.2</td>
<td>0.07</td>
<td>NS**</td>
</tr>
</tbody>
</table>

* Class interval
** Not significant

Table 4: Comparison of neat and concentration ZN preparation

<table>
<thead>
<tr>
<th>Concentration ZN preparation</th>
<th>Positive (%)</th>
<th>Negative (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>neat ZN preparation</td>
<td>9</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Positive (%)</td>
<td>2</td>
<td>89</td>
<td>91</td>
</tr>
<tr>
<td>Negative (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (%)</td>
<td>11</td>
<td>89</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 5: Comparison of neat and concentration Auramine preparation

<table>
<thead>
<tr>
<th>Concentration Auramine preparation</th>
<th>Positive (%)</th>
<th>Negative (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>neat Auramine preparation</td>
<td>12</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Positive (%)</td>
<td>5</td>
<td>83</td>
<td>88</td>
</tr>
<tr>
<td>Negative (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (%)</td>
<td>17</td>
<td>83</td>
<td>100</td>
</tr>
</tbody>
</table>

Discussion:
According to the national guidelines for tuberculosis control, a patient with more than three weeks history of a cough should be screened for PTB with smear microscopy for AFB.8,9 Because the clinical signs and symptoms of PTB are not specific, the accurate performance of acid-fast microscopy is vital for the early recognition of PTB patients for the adequate treatment, respiratory isolation, and contact investigation. Although acid-fast microscopy is more than 100 years old, it still remains the initial and most rapid step in the diagnosis of tuberculosis. Acid-fast microscopy is simple to perform and therefore, could be applied successfully in any laboratory.10
The added advantage of sputum smear microscopy is that it has very close relation with infectiousness: a patient who is sputum smear positive and culture positive are more likely to be infectious than culture positive but smear negative.  

At the moment in the developing countries like Nepal where tuberculosis is a major health problem, sputum microscopy is carried out widely for microscopic examination of sputum smears stained by ZN method. This study aimed to compare Auramine stain with conventional ZN stain and to prove statistic relationship in between the two.

This study found a significant relationship in the performance of Auramine staining when compared to ZN technique that agrees with the finding of other previous studies which concluded that both ZN and fluorescence staining can be used for the diagnosis of TB.  

The present study showed 3% and 5% of false positivity of Auramine in comparison with ZN for neat and concentrate technique respectively which may be due to non-specific fluorescence dye binding. This is usually the disadvantage of the fluorescent microscopy technique which, in turn, caused the decrease in specificity. But, it stood 100% sensitive in detecting the positive cases (along with 100% PPP) against the ZN. The false yielding of Auramine can be prevented by over-staining the smear by ZN method (a more specific one) for bright-light microscopy. These findings are also in accordance with various studies when they compared the sensitivity of both with culture as a gold standard, the result showed even greater sensitivity of Auramine than ZN. This may be taken as Auramine stains better when talking about detection of positive cases.

When the present study compares the data on neat vs. neat and concentrate vs. concentrate for both ZN and Auramine as given in table 4 and 5, the results showed that there were 2% and 5% cases which were negative with neat ZN and neat Auramine respectively but came positive with respective concentrate techniques. This may be taken as the significance of following concentration method (Petroff’s method as in this study). This is also in accordance with the previous study.

From all the result obtained in this study shown above, there was a good relationship (κ values) between these two stains and even comparing the disagreement data on McNemar’s chi-square showed they were not significant, this again added that disagreement results were due to by chance only. This is again in accordance with previous studies.

**Conclusion**

The present study showed reliably a good relationship (κ values) between the two
stains also concluded the discordant result were just due to chance as suggested by McNemar chi square values.

Overall, it can be concluded that Auramine stain stands efficient on comparison and can be used as an alternative to ZN with added advantage of allowing a large number of sputum specimens to be examined in a given time as low power is used for examination. It is better technique in detection of paucibacilli (more sensitive) against a dark background, no use of oil immersion, time effective but yet it is not economical technique in rural areas of developing country because of its associated cost and equipment maintenance.

References:
7.


Histopathological spectrum of upper gastrointestinal endoscopic biopsies
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²Department of Surgery, Bir Hospital, Kathmandu, Nepal

Abstract

Background: Upper gastrointestinal tract disorders are one of the most commonly encountered problems in the clinical practice. A variety of disorders can affect the upper gastrointestinal tract. Endoscopy, in combination with biopsy, plays an important role in the exact diagnosis for further management.

Objectives: To determine the spectrum of histopathological lesions of upper gastrointestinal tract.

Methods: A prospective study was conducted in the Department of Pathology, Kathmandu Medical College and Teaching Hospital, Nepal from January 2015 to December 2016 (2 years).

Results: A total 243 endoscopic biopsies were evaluated. Out of which, 219 cases were from gastric, 15 were from esophagus and 9 were from duodenum. Among the gastric biopsies, 77 cases (35.16%) were chronic active gastritis and 27 cases (12.33%) were malignant. The most common malignancy was adenocarcinoma. Among the 15 oesophageal biopsies, 12 cases (80%) were of non-neoplastic and 3 cases (20%) were of neoplastic nature. The most common malignancy was squamous cell carcinoma. Among 9 cases of duodenum biopsies, all were non-neoplastic, of which chronic non-specific duodenitis (66.66%) was the commonest.

Conclusion: Endoscopy is incomplete without histopathological examination of biopsy and so, the combinations of methods play an important role in diagnosis and management of upper gastrointestinal tract disorders.

Keywords: Endoscopic biopsy, histopathology, Non-neoplastic and neoplastic lesions of upper gastrointestinal tract.

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Introduction
Upper gastrointestinal tract (GIT) disorders are one of the most commonly encountered problems in the clinical practice with a high degree of morbidity and mortality and endoscopic biopsy is common procedure performed in the hospital for a variety of benign and malignant lesions.¹

The upper gastrointestinal flexible fiber optic endoscopy was first used in 1968 and proved to be a major breakthrough in the diagnosis of gastrointestinal tract lesions.² There is a wide range of pathologic lesions which may affect upper GIT like: infectious diseases, inflammatory disorder, mechanical, toxic and physical reactions including radiation injury and neoplasm.³

Upper gastrointestinal endoscopy in combination with biopsy play an important role in the early diagnosis of gastrointestinal lesions.⁴

Endoscopic biopsy examination followed by histologic assessment is a convenient procedure and current gold standard for accurate objective assessment of patients with symptoms of upper GIT. It is not only used to diagnose malignant and inflammatory lesions but also for monitoring the course, extent of disease, response of the therapy and early detection of complications. This is reflected by a rising trend in obtaining mucosal biopsies from upper GIT.⁵

This study was undertaken to determine the spectrum of histopathological lesions of upper gastrointestinal tract.

Methods
This prospective study was conducted in the Department of Pathology, Kathmandu Medical College and Teaching Hospital, Nepal from January 2015 to December 2016 (2 years). A total 243 endoscopic biopsies were evaluated. All the biopsy samples were fixed in 10% formalin, followed by conventional tissue processing and embedding. Five micron thick sections were cut and slides were prepared. Each section were stained with Haematoxylin and Eosin and studied. Additional sections were stained with Giemsa to observe H. Pylori and Periodic Acid Schiff (PAS) stain were performed wherever necessary. Grading for gastric and duodenal biopsies was done according to updated revised Sydney and modified marsh classification. All tumors were classified according to the WHO classification.

Results
In this present study, out of 243 cases, 138 (56.8%) were males and 105 (43.2%) were females with male to female ratio of 1.76:1. The mean age of presentation was 52 years. The youngest patient was 16 year male with chronic active gastritis and the oldest patients was 84 years male with poorly differentiated adenocarcinoma.
The results of site distribution of upper GI biopsies shown in (Figure 1). Among the 243 endoscopic biopsies, gastric biopsies constituted of higher incidence (219 cases-90.12%).

Figure 1: Site distribution of upper GI biopsies

Figure 2: Histopathological spectrum of upper GI lesions

Figure 3: Chronic Gastritis (H&E, 40X)

Figure 4: Helicobacter pylori (Giemsa stain, 100X)

Figure 5: Poorly differentiated adenocarcinoma, stomach (H&E, 40X)
Table 1: Histopathological findings in esophageal biopsies

<table>
<thead>
<tr>
<th>Lesions</th>
<th>No. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic non-specific esophagitis</td>
<td>8</td>
<td>53.33%</td>
</tr>
<tr>
<td>Benign esophageal ulcer</td>
<td>3</td>
<td>20.00%</td>
</tr>
<tr>
<td>Barret’s esophagus</td>
<td>1</td>
<td>6.67%</td>
</tr>
<tr>
<td>Squamous cell carcinoma</td>
<td>3</td>
<td>20.00%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 2: Histopathological findings in gastric biopsies

<table>
<thead>
<tr>
<th>Lesions</th>
<th>No. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic active gastritis with H. Pylori positive</td>
<td>66</td>
<td>30.14%</td>
</tr>
<tr>
<td>Chronic active gastritis with H. Pylori negative</td>
<td>20</td>
<td>9.13%</td>
</tr>
<tr>
<td>Chronic gastritis with H. Pylori positive</td>
<td>41</td>
<td>18.72%</td>
</tr>
<tr>
<td>Chronic gastritis with H. Pylori negative</td>
<td>36</td>
<td>16.44%</td>
</tr>
<tr>
<td>Chronic gastritis with H. pylori positive and intestinal metaplasia</td>
<td>10</td>
<td>4.57%</td>
</tr>
<tr>
<td>Benign gastric ulcer</td>
<td>8</td>
<td>3.65%</td>
</tr>
<tr>
<td>Polyps</td>
<td>11</td>
<td>5.02%</td>
</tr>
<tr>
<td>Gastric adenocarcinoma</td>
<td>27</td>
<td>12.33%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>219</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 3: Histopathological findings in duodenal biopsies

<table>
<thead>
<tr>
<th>Lesions</th>
<th>No. of cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic non-specific duodenitis</td>
<td>6</td>
<td>66.67%</td>
</tr>
<tr>
<td>Benign ulcer</td>
<td>2</td>
<td>22.22%</td>
</tr>
<tr>
<td>Inflammatory polyp</td>
<td>1</td>
<td>11.11%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Table 4: Site wise distribution of endoscopic biopsies in different studies

<table>
<thead>
<tr>
<th>Sites</th>
<th>Jaynul Islam SM et al. (9)</th>
<th>Sandhya PG et al. (4)</th>
<th>Memon F et al. (3)</th>
<th>Krishnappa R et al. (5)</th>
<th>Present study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach</td>
<td>66.36%</td>
<td>84.85%</td>
<td>51.3%</td>
<td>68%</td>
<td>90.12%</td>
</tr>
<tr>
<td>Esophagus</td>
<td>20.00%</td>
<td>6.25%</td>
<td>39.0%</td>
<td>25%</td>
<td>5.76%</td>
</tr>
<tr>
<td>Duodenum</td>
<td>13.64%</td>
<td>5.62%</td>
<td>9.7%</td>
<td>7%</td>
<td>4.12%</td>
</tr>
</tbody>
</table>
Table 5. Comparison of non-neoplastic and neoplastic lesions in esophageal biopsies in different studies

<table>
<thead>
<tr>
<th>Esophageal Biopsies</th>
<th>Krishnappa R et al. (5)</th>
<th>Abilash SC et al. (10)</th>
<th>Sandhya PG et al. (4)</th>
<th>Present study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-neoplastic</td>
<td>56%</td>
<td>52.26%</td>
<td>83.33%</td>
<td>80%</td>
</tr>
<tr>
<td>Neoplastic</td>
<td>44%</td>
<td>47.74%</td>
<td>16.67%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Table 6. Gastric adenocarcinoma in different studies

<table>
<thead>
<tr>
<th>Gastric Biopsies</th>
<th>Jaynul Islam SM et al. (9)</th>
<th>Jeshtadi A et al. (12)</th>
<th>Sandhya PG et al. (4)</th>
<th>Abilash SC et al. (10)</th>
<th>Memon F et al. (3)</th>
<th>Present study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastric Adenocarcinoma</td>
<td>45.20%</td>
<td>43.67%</td>
<td>6.58%</td>
<td>14.70%</td>
<td>4.9%</td>
<td>12.33%</td>
</tr>
</tbody>
</table>

On histology assessment, the total numbers of diagnosed malignant cases were 30, of which 27 (90%) cases were gastric and 3 (10%) cases were esophageal. Duodenal malignancy was not seen in our study (Figure 2).

Among 15 cases of esophageal biopsies, 12 cases were of non-neoplastic and 3 cases were of neoplastic nature (Table: 1). Out of 219 cases of gastric biopsies, 192 were non-neoplastic and 27 were neoplastic cases. Among the 192 non-neoplastic cases, majority of were chronic active gastritis (77 cases- 35.16%). Eleven cases were polyps, of which 7 were hyperplastic polyps, 2 were fundic gland polyps and 2 were inflammatory polyps (Table: 2). Out of 27 (12.33%) malignant cases, site wise distribution revealed 20 cases from pyloric antrum (74.08%) followed by 4 cases from cardia (14.81%) and 3 cases from corpus (11.11%). All the 27 neoplastic cases were histologically diagnosed as adeno-carcinoma, out of which, 8 were well differentiated adenocarcinoma, 12 were moderately differentiated adenocarcinoma and 7 were poorly differentiated adenocarcinoma (Figure 5).

Among 9 cases of duodenum biopsies, all were non-neoplastic, of which chronic non-specific duodenitis (6 cases- 66.66%) was the commonest (Table: 3).

Discussion

According to National Cancer Registry, gastric and esophageal cancers are the most common cancers found in men, while esophageal cancer ranks third among women after breast and cervical cancers. Hence, there is a need to detect these malignant lesions at an early stage and
differentiate them from the various benign and inflammatory conditions that afflict the upper GI tract and may give rise to an overlapping symptomatology.

Histopathological study of endoscopic biopsy specimens is used to confirm the endoscopic diagnosis in case of suspected malignancy or to make the diagnosis of a benign condition, thus allowing an early therapeutic decision without unnecessary delay. The gender ratio favoring males could be reflective of fact that males are exposed to more risk factors than female and gastrointestinal malignancies are more common in male. Most of the biopsies were from fourth to fifth decade. The youngest patient was 16 years old and the oldest patient was 84 years old. The age related difference could be due to varied exposure to the risk factors among the different age groups, especially in relation to dietary habits of both qualitative and quantitative.

The most common site for upper gastrointestinal endoscopic biopsy is from the stomach, followed by esophagus and duodenum, which is concordant with the similar studies shown in Table: 4. Among the 15 esophageal biopsies, non-neoplastic lesions (80%) were more common than neoplastic lesions (20%). These results are comparable with similar studies as shown in Table: 5. Majority of cases were inflammatory or benign in nature and chronic non-specific esophagitis (53.33%) was the commonest diagnosis. All neoplastic cases (20%) were squamous cell carcinoma, similar to studies done by Krishnappa R et al., Abilash SC et al. and Sheikh BA et al. In our study, gastric biopsies constituted the majority of cases (90.12%). Out of total 219 cases, 192 (87.67%) were non-neoplastic lesions whereas 27 (12.33%) were malignant lesions. The most common non-neoplastic lesions observed were chronic active gastritis 77 (35.16%), which correlated histologically with presence of neutrophils and lymphocytes in the lamina propria. H. pylori was positive in 66 (30.14%) (Figure 4) cases out of 77 (35.16%) cases of chronic active gastritis. H. pylori negative chronic active gastritis cases could be due to intake of proton pump inhibitors prior to endoscopic biopsy or failure to see H. pylori in the tissue specimens. Similar findings were observed in studies done by Shultz M et al. and Thapa R et al. Twenty seven cases of gastric malignancies were diagnosed on
histopathology as gastric adenocarcinoma in line with other studies (Table: 6). The common site of involvement was antrum of the stomach similar as in the other studies.\textsuperscript{15-17}

With respect to differentiation of adenocarcinoma, moderately differentiated adenocarcinoma was more common than the well differentiated carcinoma, which was also in concordance with other studies.\textsuperscript{18,19,20} Alcohol consumption, dietary factors, smoking and social habits have been proposed as risk factors for gastric cancer.\textsuperscript{21}

There were only nine cases of duodenal biopsies in our study and all were non-neoplastic lesions. The commonest lesions being chronic non-specific duodenitis 6 (66.67%), similar to studies done by Abilash SC et al.,\textsuperscript{10} Hussain et al.\textsuperscript{22} and Neil A Shepherd et al.\textsuperscript{23}

**Conclusion**

A variety of non-neoplastic and neoplastic lesions were reported in the present study across a wide range of age and site distribution. The commonest site of upper gastrointestinal lesions was stomach. The commonest non-neoplastic lesion was chronic active gastritis (35.16%) and neoplastic lesion was adenocarcinoma (12.33%). Endoscopy with combination of histopathological examination of biopsy plays an important role in early detection of lesions and further management.

**References**

Introduction: Pentazocine is an opioid analgesic introduced in 1967 which was purported to have no addictive potential. However, in the subsequent years, several reports have shown it to have abuse potential and cutaneous complications of pentazocine abuse have been reported.\textsuperscript{1} We report a case of cutaneous complications of pentazocine abuse in a 32-year-old male presenting with multiple ulcers.

Case report: A 32 years old male restaurateur presented with the complaints of multiple ulcers over lower extremities for the last two years. He admitted to abusing a variety of drugs including pentazocine. He self-administered pentazocine injections over upper and lower extremities on a daily basis, intravenous as well as subcutaneous, usually in combination with buprenorphine, phenargan and diazepam for the last 5 years. At the site of injection, there was itching followed by formation of a nodule which would burst leading to thin serous yellow discharge with formation of ulcer in one to two weeks. The ulcers healed in a few weeks leaving hyperpigmented scars. Patient had been abstinent for 15 days at presentation following which he developed irritability, loss of appetite, disturbed sleep, low confidence and one episode of suicidal ideation. He was treated for deep vein thrombosis due to the intravenous injections one year back.

On examination there were multiple ulcers irregularly shaped, of varying size, with indurated hyperpigmented margins, oozing of serous fluid from some of the ulcers along with multiple hypopigmented/ hyperpigmented macules and plaques symmetrically distributed over the thighs and legs at the sites of previous ulcers. In addition, there was a background of ill-defined hyper-pigmentation with thickened skin distributed symmetrically over both legs (Fig 1). The patient was admitted, managed conservatively for ulcers and counseled regarding drug abuse. The patient was motivated to overcome the addiction, hence a psychiatric consultation was sought and the patient was started on mirtazapine and zolpidem.
His serology was negative for hepatitis B, C and HIV. Venous Doppler of the lower Limbs showed mild diffuse thickening of wall of distal part of left common femoral vein, the proximal part of superficial femoral vein and sapheno-femoral junctions with slight luminal narrowing possibly a sequel of previous thrombosis or thrombophlebitis and mild cellulitis around both legs.

**Discussion:**
The exact pathogenesis of cutaneous complications of pentazocine is not known. It has been suggested that if not rapidly absorbed, pentazocine may get precipitated, which may then initiate a chronic inflammatory response.\(^2\) Clinical presentations may vary and include ulcers, sinus, nodules, puffy hand syndrome, thrombophlebitis, hyper-pigmentation and induration of skin or scars along veins.\(^3\) Awareness of the complications of pentazocine and a forthcoming history of use of pentazocine will not pose much diagnostic difficulty. In our patient, the history was known and ulcers developed at the sites of injections, hence the diagnosis was not difficult. However, in cases where the patient is holding back the history, the ulcers may be misdiagnosed as vasculitis, panniculitis, pyoderma gangrenosum or
cutaneous tuberculosis. Institution of treatment for these conditions may actually result in more harm, as for all the above conditions except tuberculosis, immunosuppressive treatments are used. Hence, the diagnosis in such cases requires high index of suspicion and exclusion of other commoner causes of leg ulcers such as vasculitis, pyoderma gangrenosum or cutaneous tuberculosis. Investigations to establish the presence of pentazocine in urine are very useful in making the diagnosis, but their limited availability is a disadvantage.¹

References:
Wernicke’s encephalopathy- a case report
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Department of Psychiatry
BP Koirala Institute of Health Sciences, Dharan

Abstract
Wernicke’s encephalopathy is a neuropsychiatric disorder characterized by acute onset, nystagmus and oculomotor abnormalities, and a confusional state. Chronic alcohol intake is still the most common reason. Wernicke’s encephalopathy, if not recognized and treated, can become irreversible. Common findings in Magnetic Resonance Imaging (MRI) include: symmetric T2 Weighted Image (T2) hyperintensities in peri-aqueductal gray matter, dorsal medial thalamus and mammillary bodies. This case highlights neurological deficits, persistent memory and disorientation.

Key words: Alcohol use, Wernicke encephalopathy, MRI findings

Introduction
Wernicke, in 1881, had first described this condition in two chronic alcoholics and one case of persistent vomiting after sulfuric acid poisoning.1 Although it can occur in non-alcoholic cases, long term alcohol use is the commonest cause. The classic triad of confusion, ataxia and oculomotor abnormalities may be present in one third of the cases only.2 In those cases where typical signs and symptoms are not present, lately, MRI findings are reported to be useful in the diagnosis.3 Given some variations in presentation and persistent of memory symptoms, it is hoped that this case will help in early identification and treatment of such cases.

Case report
A 52 years male presented in emergency department with visual hallucination, persecutory idea, restlessness and non-fluctuating disorientation for 4 days. He had multiple episodes of vomiting 9 days back for 2 days. He had weakness in lower limbs, inability to walk, ataxic gait and forgetfulness for last three months. He was mostly bed-ridden and he complained of double-vision, dizziness and burning or tingling sensation of lower limbs.

He had history of alcohol consumption for last 25 years with average daily consumption of more than 1 liter of alcohol. He demonstrated craving, tolerance, loss of control, withdrawal features at least for last 2 years. There was no history suggestive of complicated withdrawal. The food intake in last one year was significantly decreased.
During admission, vitals were stable with normal systemic examination. He showed mild intentional tremor, symmetrical mild weakness, diminished deep tendon reflexes in all limbs, horizontal nystagmus, impaired finger-nose and heel-shin test, and dysdiadokinesia. Cranial nerves and sensory test were within normal limit. He was confused at the time of presentation but no fluctuating sensorium. Concentration was impaired.

Disorientation to time and place was present. Memory was impaired. He had poor insight. Signs of alcohol withdrawal were not noticed.

His liver enzymes were elevated including gamma glutamyl transferase (504 U/l).

His magnetic resonance imaging of brain showed ‘symmetrical area of T2 and Fluid-attenuated Inversion Recovery (FLAIR) hyper-intensity in bilateral mammillary bodies, medial thalami and peri-aqueductal grey matter with mild diffuse brain atrophy’.

He was admitted in psychiatry department and treated with parental thiamine 500 mg a day for two days followed by 100 mg three times a day, along with intravenous fluids. The nystagmus, double-vision, incoordination, weakness of lower limbs, ataxia improved but memory problems, disorientation and loss of insight remained.

**Discussion**

Alcohol does not have thiamine although it has some calories. Moreover, alcohol impairs absorption of thiamine, storage in liver, decreases its phosphorylation to its active metabolite and increases thiamine need for the metabolism of alcohol. With less food intake and no supplementation, the thiamine begins to get deficient. The body storage capacity for thiamine is 30-50 mg and with average daily need of 1-2 mg, it is expected to deplete in about a month. It has been argued, therefore, that some patients have already sustained irreversible brain damage at the time of presentation who progress to Korsakoff’s syndrome and it is likely that our patient fell into that category due to decreased food intake, continued alcohol drinking, and without thiamine supplementation for nearly a year.

Thiamine is an important co-enzyme for pyruvate dehydrogenase to be used in Krebs cycle. It is hypothesized that thiamine deficiency results in focal lactic acidosis and increased blood-brain-barrier permeability coupled with excitotoxic effects of N-methyl-D-Aspartate activation with resultant cell death, proliferation of astrocytes and activation of microglia causing symmetrical damage in the thalamus, mammillary bodies, cerebellum, and pons. These symmetrical features are commonly seen in MRI as hyperintensities.
in these areas. In a review of MRI findings in Wernicke’s encephalopathy, the typical areas of T2 and FLAIR hyperintensities were reported to be thalami, mammillary bodies, tectal plate and peri-aqueductal regions. In keeping with this, our patient’s MRI findings revealed similar symmetrical area of T2 and FLAIR hyperintensities in bilateral mammillary bodies, medial thalami and peri-aqueductal gray matter.

The predisposing factors to thiamine deficiency are weight loss in past year, reduced body mass index, general clinical impression of nutritional status, high carbohydrate intake, recurrent episodes of vomiting in past month and co-occurrence of other nationally related conditions. The predisposing factors to neurotoxicity of alcohol are genetic predisposition to alcohol dependence, frequency of alcohol use, severity of dependence, frequent episodes of acute intoxication, withdrawal symptoms, concurrent use of cocaine and alcohol-related liver damage. And, the early signs and symptoms of thiamine deficiency were considered as loss of appetite, nausea/vomiting, fatigue/weakness/apathy, giddiness/diplopia, insomnia/anxiety/difficulty in concentration and loss of memory. Our patient had general clinical impression of poor nutritional status, vomiting in last few days in predisposing factors to thiamine deficiency; all predisposing factors to neurotoxicity except concurrent use of cocaine and all symptoms described as early signs and symptoms of thiamine deficiency described above.

The operational criteria developed by Caine et al. (1997) for Wernicke’s encephalopathy required two out of the four signs, namely: dietary deficiencies, oculomotor abnormalities, cerebellar dysfunction and either altered mental state or mild memory impairment. Our patient exhibited the symptoms from all four domains. The frequencies of signs and symptoms of WE in different studies were summarized by Thomson et al. The range of frequencies of signs were as follows: 34-100% for confusion, 12.5-37% for ataxia or staggering, 8-100% for nystagmus, 32-75% for apathy/lethargy, 5-50% for disorientation, 4-16.5% for diplopia and oculomotor abnormalities except ophthalmoplegia and 12.5-52% for peripheral neuropathy. Another study noted horizontal nystagmus in 18%, cerebellar ataxia in 21% and absence of deep tendon reflexes in eighty two percent. Among the symptoms described, our patient had confusion, lethargy, loss of appetite, horizontal nystagmus, diplopia, diminished tendon reflexes, cerebellar signs, hallucination, impaired concentration, disorientation and impaired
memory, however with no ophthalmoplegia and cranial nerve involvement.

**Conclusion**

This case highlights decreased food intake for a year with continued drinking; development of the gradually increasing weakness, unsteadiness, and memory difficulties; precipitation of Wernicke’s encephalopathy by vomiting; persistence of memory dysfunction, polyneuropathy, and disorientation despite parenteral thiamine supplementation.

**References**

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