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Editorial Message

Greetings!

It gives me immense pleasure and pride to write the editorial message to this issue. We have been publishing this journal since 2008, and I am pleased to be associated with this prestijious journal since 2011. I would like to thank the management of Gandaki Medical College Teaching Hospital & Research Centre Pvt. Ltd., who have put their trust in me and have considered me worthy of handling this position.

We came across lots of changes since its first publication in 2008, but we are in continuous effort to publish our journal and establish high academic and scientific standards. Good original research articles based on the genuine research work carried out in our institutions are the need of the hour. Proper planning, collaboration, and execution required for good research and its publication in the form of original research articles.

We invite all medical, dental and nursing faculties to participate actively by contributing original research articles, review articles, case reports, viewpoint and letters to editor.

We have introduced a Medical Education section, in which articles pertinent to education process in the medical field, particularly about teaching-learning process will be published. We hope to receive articles under this section from clinical subjects also.

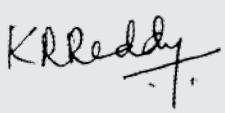
Similarly, we have also introduced a students' section to encourage our student doctors to imbibe scientific values to enable them to pursue research in their medical and academic profession. Students, particularly interns and postgraduate students can present original research articles, case reports or articles on education, medical profession, careers, viewpoint etc.

We are glad to inform you that we have initiated the process of indexing/ listing our journal with several indexing/ listing systems/ directories and scientific bodies.

We would like to thank you profusely for choosing our journal as a scientific platform and evincing continuing interest in our work.

Any suggestions are most welcome.

Warm Regards



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Zika Virus Infection: An Emerging Public Health Concern

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In May, 2015, the Pan American Health Organization (PAHO) issued an alert regarding the first confirmed Zika virus infection in Brazil. On 1st February, 2016, the WHO declared the Zika virus infection, a public health emergency of International concern, as evidence grew that Zika virus can cause birth defects as well as neurological problems. The virus can be transmitted from an infected pregnant woman to her fetus can cause microcephaly and other severe brain anomalies in the infant. Zika virus infections in adults can result in Guillain–Barré syndrome

Clinicians worldwide need to be aware of Zika virus infection owing to International travel and the presence of potentially competent day time biting, urban dwelling mosquito vector *Aedes aegypti.* It can also be spread by the *Aedes albopictus* (Asian tiger) mosquito.

The Zika virus (ZIKV) was first isolated in April 1947 from the blood of a Rhesus Macaque monkey that had been placed in a cage in the Zika forest of Uganda, near Lake Victoria, by the scientists of the Yellow Fever Research Institute, during their study on yellow fever. A second isolation from the mosquito *Aedes africanus* followed at the same site in January 1948. When the monkey developed a fever, researchers isolated from its serum a transmissible agent that was first described as Zika virus in 1952. It was later identified in humans in 1953 for the first time in Nigeria.

Zika virus remained in relative obscurity for nearly 70 years; then, within the span of just one year, Zika virus was introduced into Brazil from the Pacific Islands and spread rapidly throughout Americas.

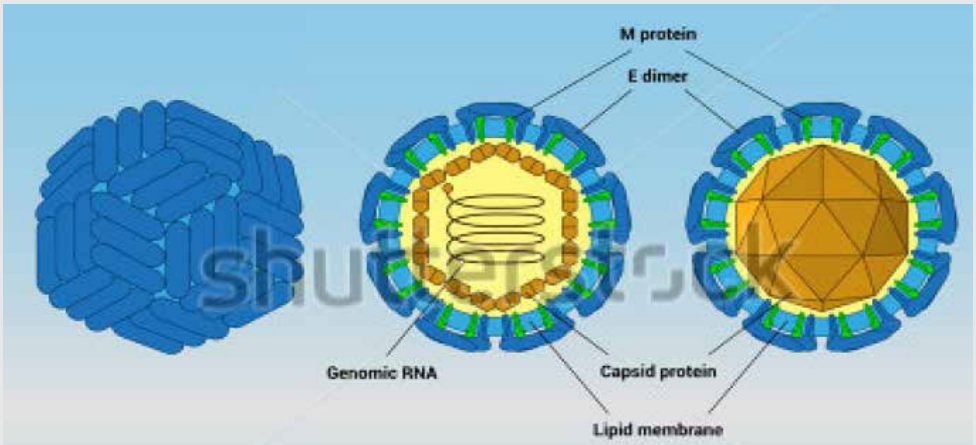
The first major outbreak, with 49 confirmed and 59 probable cases, was reported in 2007 in the Yap Islands, caused by a strain of Asian lineage. A further outbreak occurred with a closely related Asian lineage strain in French Polynesia in 2013 in which 294 cases were confirmed by RNA detection over a 10 week period. Locally acquired cases (people with no history of travel to known endemic areas within the recognized incubation period) on Easter Island in 2014 marked the first arrival of Zika virus in the Americas. This was followed in May 2015 by confirmation of cases in North-East Brazil, where again the Zika virus sequence belonging to the Asian lineage was found, and the country is currently experiencing the

largest epidemic ever recorded with around 1.5 million cases reported by the Brazilian authorities. In October, 2015, Colombia reported first autochthonous transmission of Zika virus outside Brazil, and by March 3, 2016, a total of 51,473 suspected cases of Zika virus had been reported in that country.

By March, 2016, the virus had spread to at least 30 countries and territories in the Americas. As of mid-2016, a widespread epidemic of Zika fever, caused by the Zika virus, is ongoing in the Americas and the Pacific.

Zika virus is an Arbovirus (*Ar*=arthropod; *bo*=borne), a member of *Flaviviridae* family genus *Flavivirus*, which includes dengue, chikungunya, yellow fever and West Nile viruses. Zika virus is enveloped, ssRNA (+ve sense) virus. The genome contains 10,794 nucleotides encoding 3,419 amino acids. The virion is approximately 40 nm in diameter with surface projections on envelope, that measure 5 - 10 nm. Nucleocapsid is 25 - 30 nm in diameter and possesses icosahedral symmetry. Envelope contains envelope proteins E and M (Fig 1).

Fig 1: Zika virus structure (Source: www.shutterstock.com)



There are two major lineages of ZIKV, the African lineage and the Asian lineage. In Africa, Zika virus is thought to have largely maintained in a cycle involving transmission between non-human primates (such as monkeys and apes) and mosquitoes, with humans as occasional unintentional hosts. In areas outside Africa, however, humans have probably become the main host. A mutation in the Asian lineage may have led the virus to adapt to the human (as opposed to non-human primate) host.

ZIKV can migrate between humans through sexual intercourse and it can also cross the placenta, from mother to fetus during pregnancy (transplacental transmission), affecting unborn fetus. A mother already infected with Zika virus near the time of delivery can pass on the virus to her new-born around the time of birth (perinatal transmission), but this is rare. To date, there are no reports of infants getting ZIKV through breastfeeding. Transmission of the virus through blood transfusion has been reported.

ZIKV is transmitted by day time actve mosquitoes and has been isolated from a number of species in the genus *Aedes*, such as *Aedes aegypti* (fig 2), *Aedes albopictus,* and arboreal mosquitoes such as *Aedes africanus*, *Aedes apicoargenteus*, *Aedes furcifer*, *Aedes hensilli*, *Aedes luteocephalus*, *Aedes taylori*, and *Aedes vittatus*. Studies show that the extrinsic incubation period in mosquitoes is about 10 days. These are the same mosquitoes that transmit dengue fever, chikungunya, and yellow fever.

Fig 2: *Aedes aegypti* mosquito (Source: www.livemint.com))

In humans ZIKV causes an illness known as Zika fever, Zika, or Zika disease. Zika virus infections seem either to be subclinical (possibly in as many as 80% of infections) or to cause a mild illness after an incubation period of three to 12 days. Symptoms, which last for approximately two to seven days include fever, conjunctivitis (pink eye), arthralgia, myalgia, and widespread skin rash (exanthema), which may be itchy. Headache, retro-orbital pain, peripheral edema, and gastrointestinal disturbance (vomiting) have also been identified.

Limited literature exists on the pathogenesis of the Zika virus to help understand the clinical disease spectrum and to target treatments to minimize or prevent tissue damage. Zika virus replicates readily in skin immune cells, and a large number of receptors are able to mediate entry of the virus into cells. Studies on the capability of the virus to replicate in neuronal cells are warranted to further investigate the link with neuronal disorders. Flaviviruses generally replicate in the cytoplasm, but Zika virus antigens have been found in infected cell nuclei.

Zika virus affects people travelled to affected tropical areas and have bitten by an infected mosquito. During 2014 - 2016, these areas included the Pacific Islands, South East Asia, Central and South American countries. It is estimated that only about one in five people carrying the virus actually develop symptoms from Zika virus infection.

Guillain-Barré syndrome, an autoimmune disease, is a rare, rapid-onset form of paralysis, is often triggered by Zika virus infection. The first case of Zika virus infection complicated by Guillain-Barré syndrome was reported from French Polynesia in March 2014, and others have occurred in Brazil. Death is rare.

Brazil has reported an increase in birth defects in babies born during the recent Zika virus epidemic, specifically fetal microcephaly (small head), intracranial calcifications (Calcium deposits in the brain). Zika virus RNA has been identified in the amniotic fluid of mothers whose fetuses had cerebral abnormalities detected by ultrasonography, and viral antigen and RNA have been identified in the brain tissue and placentas of children who were born with microcephaly and died soon after birth. From November 2015 to February 2016, 5280 suspected cases of microcephaly and/or central nervous system malformation, including 108 deaths, were reported by Brazil.

Substantial evidence now indicates that Zika virus can be transmitted from the mother to fetus, particularly in the first trimester of pregnancy. The pregnant mothers with suspected Zika virus infection, or recently travelled to an infected zone, should see their doctor and undergo testing for Zika virus infection. CDC recommends serial ultrasound

examination to monitor fetal growth and anatomy and referral to a maternal fetal medicine or infectious disease specialist with expertise in pregnancy management. Amniocentesis may be considered after 15 weeks of gestation.

CDC recommends both molecular and serologic testing of infants who are being evaluated for evidence of Zika virus infection. Paediatric health care providers should work closely with obstetric providers to identify infants whose mothers were potentially infected with Zika virus during pregnancy (based on travel to or residence to an area with Zika virus transmission) and review fetal ultrasounds and maternal testing for Zika virus infection.

The Pan American Health Organization of WHO has issued a **provisional case definition** for suspected acute Zika virus infection, intended for use in countries with ongoing local transmission.

- Rash or increase in body temperature (>37.2^{0}C), with any of the following not explained by other conditions:
    1. Arthralgia or myalgia
    2. Non-purulent conjunctivitis
    3. Conjunctival hyperemia
    4. Headache
    5. Malaise

Diagnosis is guided by history (countries of travel, sexual contacts, and contact with other cases of infection) and examination. The symptoms and clinical signs do not have sufficient positive or negative predictive value, and therefore laboratory testing is needed for reliable diagnosis.

Definitive diagnosis is based on detection of Zika virus RNA in blood (serum or EDTA treated plasma) by RT-PCR. In acute phase, IgM-ELISA is used to detect specific IgM antibody in serum samples against Zika virus. After the acute phase, diagnosis by antibody detection is compromised by considerable cross reactivity with antibodies to other flaviviruses. No commercial tests for Zika virus available. Zika virus testing is performed at CDC. Recently, in India, National Institute of Virology (NIV) developed a diagnostic test kit.

Treatment and management of congenital Zika virus infection is supportive, symptomatic, and should address specific medical and neurodevelopmental issues for the infant's particular needs. Investigations are ongoing to better understand what services will be most effective for these children as they grow.

Mothers are encouraged to breastfeed even in areas where Zika virus is found, as available evidence indicates the benefits of breastfeeding outweigh any theoretical risks associated with Zika virus transmission through breast milk.

No specific antiviral treatment or vaccine against Zika virus is available. The only way to prevent congenital Zika virus infection is to prevent maternal infection, either by avoiding areas where Zika virus transmission is ongoing or avoiding mosquito bites.

People should make every effort to eradicate mosquitoes from their living and working environment, and to avoid being bitten by mosquitoes. Emptying standing water from containers around house that can become breeding grounds for mosquitoes, wearing long-sleeved shirts, using mosquito repellents, and condom use sexual intercourse are but some of the many efforts that individuals can undertake.

There is no case of Zika reported from Nepal yet. However, the possibility of viral circulation in Nepal cannot be ruled out due to the presence of its vector. In India, there are reports of seropositive cases who demonstrate anti-Zika antibodies in their serum sample.

Evaluation of Ovarian Masses by Sonomorphology and Color Flow Doppler Imaging

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Keywords
Color Doppler sonography, Histopathological diagnosis, Ovarian masses, Pelvic ultrasound, Sonographic scoring systems.

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ABSTRACT

Objectives: This study aimed to determine the accuracy of subjective ovarian mass assessment through the use of pelvic ultrasound with Sassone and Lerner scoring system and Color Doppler sonography in the prediction of the histopathological diagnosis of benign and malignant ovarian masses.

Methods: The setting of this study was a Tertiary Hospital, accredited for training, teaching and services in Obstetrics and Gynecology. A total of 68 patients who were diagnosed in Fatima University Medical Centre, Philippines to have ovarian masses by pelvic ultrasound from January 2006 to December 2011 were included in this study. All patients were sonographically examined by the same sonographer using two scoring systems (Sassone and Lerner) and Color Doppler sonography of the tumors. Cross sectional-descriptive study was the design used in this study. Percentages, mean and standard deviation were used to interpret the numerical data. Sensitivity, specificity and predictive value were used to measure or quantify the diagnostic accuracy of the pelvic ultrasound and histopathology. The gold standard was the histopathological classification of the mass as benign or malignant.

Results: Sixty eight patients with ovarian tumors (Benign 66, and malignant 2) were included in the study. By Sassone scoring system the sensitivity, specificity, positive predictive value, and negative predictive value were of 100%, 80%, 13%, and 100% respectively and by Lerner scoring system, the sensitivity, specificity, positive predictive value, and negative predictive value were of 100%, 71%, 9.5% and 100% respectively.

Conclusions: Subjective evaluation of sonographic morphology with the use of the two sonographic scoring systems and Color Doppler sonography have high accuracy in differentiating between benign and malignant ovarian tumors.

INTRODUCTION

Before the advent of ultrasound, any persistent palpable adnexal mass had to be removed surgically, because that was the only way of excluding malignancy[1]. Today, we can make a fairly confident diagnosis of a pelvic mass on the basis of its ultrasound image[1]. This possibility allows us to offer individual optimal treatment of women with a palpable pelvic mass. Pelvic ultrasound has been shown to be highly accurate in the evaluation of ovarian tumors. Differentiation between benign and malignant ovarian tumor is of main importance to both the patient and the

gynecologist[2].

There are three main clinical routes by which ovarian tumors may be detected. First, women with symptoms may have ovarian tumors detected as part of their evaluation for those symptoms, either by physical exam or radiographic imaging. Because ovarian cancer often presents with vague abdominal symptoms, we would consider any evaluation for symptoms to be in symptomatic women. Second, the mass may be detected as part of a routine health maintenance examination. Finally, it is possible that asymptomatic mass could be detected during imaging done for another indication[3].

At present, several parameters are available for distinguishing benign from malignant ovarian tumors. The gray scale two-dimensional sonographic parameters that are used most frequently are tumor diameter or volume, septation and presence of papillary projections, echogenicity, and the presence of free fluid. Sassone *et al* indicated that the sensitivity of transvaginal ultrasound is around 100; its specificity is around 83% which is higher than the transabdominal ultrasound which has a sensitivity and specificity of over 80%. In 1994, Lerner *et al* attempted to improve discriminatory ability in evaluation of adnexal masses and to simplify the scoring system by excluding the parameter of wall thickness from Sassone scoring system and added another important parameter especially shadowing in order to discriminate teratoma from malignant adnexal masses and to improve positive predictive value. The cut-off score for Lerner scoring system is three[10].

Similar to characterizing masses by their morphology, color doppler sonography can be performed using either abdominal or vaginal probes. The blood flow of ovarian tumor can be evaluated by Color Doppler ultrasonography and wave form analysis. The resistance to flow is lower in malignant than in benign tumors. Frequently used Doppler parameters are resistance index, pulsatility index, and peak systolic velocity[14]. It requires multiple parameters that need to be evaluated which includes vessel location, relative impedance, velocities, notch in the waveform during diastole. The notch indicates momentary resistance to forward flow and is usually a sign that a vessel has a muscular coating. This notch is often absent in malignancies[12].

Subjective assessment in general practice, as well as in this study, is based on the pattern recognition, which may be summarized as follows.

1) Benign tumor: Absence of solid components and no irregularity
2) Malignant tumor: Presence of solid components and irregularity
3) Dermoid cyst: White ball within a cyst, echogenic lines and prominent echogenic dots in fluid, shadowing
4) Endometrioma: Ground glass appearance of cyst contents, wall nodularities
5) Hemorrhagic corpus luteum cyst: Spider-web-like contents, bizarre blood clots
6) Paraovarian cyst: Cyst clearly separate from a normal ovary
7) Fibroma, fibrothecoma: Echo pattern similar to that of leiomyoma, i.e. solid, round, lobular or oval tumor with a smooth outline and a regular stripy echogenicity[4].

A study by Eriksson *et al* demonstrated that two-thirds of the cystic ovaries that required surgery were found to be 'functional cysts' (luteal mass or simple cyst)[5]. Surgical management of these cysts may not be beneficial in comparison with either medical treatment in the case of a luteal mass or expectant management in cases of a simple cyst[6]. In this context, it is important to remember that the diagnosis of simple cyst is based purely on ultrasound findings. A simple cyst is a unilocular, round, anechogenic cyst with a regular and thin wall with a maximum diameter of five cm[7]. For these types of cysts, even in post-menopausal women, it is extremely unlikely to be malignant[7]. Finally, spill of the cystic contents of an ovarian abnormality may result in severe morbidity, especially in cases of a dermoid cyst[8].

However, today's liberal use of pelvic ultrasound also presents many problems to the clinicians. Many ovarian tumors that would almost certainly have remained undetected before the ultrasound era are now found incidentally at transvaginal ultrasound examination of women without symptoms of an ovarian tumor[11]. The natural history of incidentally detected pelvic masses with benign ultrasound morphology is not known[11]. Since the different benign ovarian masses do have distinct sonographic characteristics, transvaginal ultrasound may be able to differentiate these ovarian tumors pre-operatively and allow for proper treatment[12].

The objective of this study was to determine the accuracy of subjective ovarian tumors assessment through the use of pelvic ultrasound with Sassone and Lerner sonographic scoring system and Color Doppler sonography in the prediction of the histopathological diagnosis of benign and malignant ovarian tumors. Specifically this study aimed to determine if these two sonographic scoring systems can be reliably used to differentiate ovarian

tumors as to being benign or malignant and to verify the results through the use Color Doppler sonography

METHODS

This is a cross sectional-descriptive study including 68 patients of Fatima University Medical Centre, Philippines, who were diagnosed with ovarian masses by pelvic ultrasound and who had surgery in the Department of Obstetrics and Gynecology of the Tertiary Hospital under study between January, 2006 to December, 2011.

The inclusion criteria were clinical or sonographic diagnosis of a pelvic mass of probable ovarian origin. Detailed clinical history and clinical examination were done. Pelvic ultrasound was performed according to International guidelines (ACOG Technical bulletin) by skilled and specially trained sonographer. Pelvic ultrasound was performed with a multifrequency vaginal probe (5–7.5 MHz) and state of the art ultrasound machines (Toshiba Xario Ultrasound System, SSA-680A-Georgia). During each scan, attention was given to the size, locularity, echogenicity, papillary structures and internal surface of the tumor. The assessment was based on sonographic morphology of ovarian tumors and each mass was subjectively classified as malignant or benign using the two sonographic scoring systems (Sassone and Lerner) and Color Doppler sonography. Comparisons of the preoperative sonographic and final histopathologic diagnoses were performed and data was analyzed. Percentages, mean and standard deviation were used to interpret the numerical data. Sensitivity, specificity and predictive value were used to measure or quantify the diagnostic accuracy of the pelvic ultrasound and histopathology.

Table 1: Sassone scoring system

Morphology	1	2	3	4	5
Inner wall structure	Smooth	Irregularities ≤3 mm	Papillarities >3 mm	Not applicable, mostly solid	-
Wall thickness	Thin (≤3 mm)	Thick (>3 mm)	Not applicable, mostly solid	-	-
Septa	None	Thin (≤3 mm)	Thick (>3 mm)	-	-
Echogenicity	Sonoluscent	Low echogenicity	Low echogenicity with echogenic core, mixed echogenicity	-	High echogenicity

Table 2: Lerner scoring system

Parameters	0	1	2	3
Wall structure	Smooth/ irregularity <3 cm	-----	Solid or non applicable	Papillarity ≥3 cm
Shadowing	Yes	No	----	------
Septa	None or thin (<3 cm	Thick (≥3 cm)	----	------
Echogenicity	Sonoluscent/ low level	----	----	Mixed or high

RESULTS

Sixty eight patients with ovarian tumors were examined by pelvic ultrasound and underwent exploratory laparotomy between January, 2006 to December, 2011. The patients' age ranged from 12 to 78 years with a mean of 37.89 years (Table 3).

Table 3: Demographic data

Characteristics	Results
Age (year)	37.89 ±14.42 (12 - 78)
Symptoms at presentation	
Abdominal pain or discomfort	29 (42.65%)
Vaginal bleeding or discharge	17 (25%)
Palpable abdominal mass	22 (32.35%)
Gravidity	
Nulligravid	26 (38.24%)
G1P1(1001)	9 (13.24%)
G1P0 (0010)	4 (5.88%)
G2P1 (1011)	3 (4.41%)
G2 P2 (2002)	6 (8.82%)
Multiparous	11 (16.18%)
Multigravid	9 (13.24%)

Pelvic ultrasound was performed because of abdominal pain or discomfort 29 (42.65%), irregular vaginal bleeding or discharge 17 (25%), palpable abdominal mass 22 (32.35%) as shown in Table 3. It was also found out that ovarian tumors were frequently found in nulligravid patients.

Table 4: Histopathological diagnosis

Ovarian tumors	Number (%) (N=68)
Benign ovarian tumors	66 (97%)
Simple cyst	27 (41%)
Teratoma	21 (31.8%)
Mucinous Cyst	7 (10.6%)
Endometriotic cyst	5 (7.6%)
Serous cyst	4 (6.9 %)
Fibroma	2 (2.94%)
Malignant	2 (2.94%)

According to histopathology reports, the rate of a malignant condition was two in 68 patients and these were correctly identified by ultrasound. Simple epithelial cyst was the most common benign ovarian tumor, accounting for 41% of all tumors, followed by teratoma (31.8%), mucinous cyst (10.6%), endometriotic cyst (7.6%), serous cyst (6.9%), fibroma (3%), and malignat ovarian tumors (mucinous cystadenocarcinoma) revealed 2.94% (Table 4).

Table 5: Comparison between Sassone scoring system and histopathology

Score	Diagnosis based on histopathology		Total
	Malignant	Benign	
Malignant (9 - 15)	2 (2.94%)	13 (19.12%)	15 (22.05%)
Benign (0 - 8)	0	53 (77.94%)	53 (77.94%)
Total	2	66	68 (100%)

Of the 15 (22.06%) ovarian tumors suspicious to be non-benign in nature by sonologic features, 13 (19.12%) were proven to be benign and only two (2.94%) were proven to be malignant by histopathology. All the benign ovarian tumors diagnosed by sonographic scoring system were proven to be benign by histopathology (Table 5). Benign ovarian tumors were distinguished from malignant lesions with sensitivity, specificity, positive predictive value, and negative predictive value of 100%, 80%, 13%, and 100% respectively. A correct sonographic diagnosis was obtained in 49 of 68 patients who underwent ultrasound.

Table 6: Comparison between Lerner scoring system and histopathology

Score	Diagnosis based on histopathology		Total
	Malignant	Benign	
Malignant (3 - 8)	2 (2.94%)	19 (27.94%)	21 (30.88%)
Benign (0 - 2)	0	47 (69.12%)	47 (69.12%)
Total	2	66	68 (100%)

Of the 21 (30.88%) ovarian tumors suspicious to be non-benign in nature by sonologic features, 19 (27.94%) were proven to be benign and only two (2.94%) were proven to be malignant by histopathology. All the benign ovarian tumors diagnosed by sonographic scoring system were proven to be benign by histopathology (Table 6). The sensitivity, specificity, positive predictive value, and negative predictive value were 100%, 71%, 9.5% and 100% respectively. The accuracy of subjective assessment in this study is consistent with most Western studies, in which the reported sensitivity of pattern recognition is varied.

Table 7: Comparison of efficacy of Sassone and Lerner's scoring system

Statistical Parameters	Scoring Systems	
	Sassone Scoring System	Lerner's Scoring System
Sensitivity	100%	100%
Specificity	80%	71%
Positive predictive value	13%	9.5%
Negative predictive value	100%	100%

In Table 7, it shows that the two sonographic scoring systems can accurately identify which among the subjects under study had the ovarian tumors; specificity of 71-80% accurate in identifying which among the subjects had the malignant or benign ovarian tumors. Positive predictive value was only 9.5 - 13%, which connotes that scoring systems were useful in some selected cases, especially in ovarian tumors without typical sonographic characteristics of a certain disorder and was difficult to predict subjectively.

Table 8: Scores of ovarian masses by Sassone scoring system

Sonological diagnosis	No of Masses	Range of Sassone scores	Masses with Sassone score ≥9
Simple cyst	34	-	-
Endometriomas	4	6 - 10	2
Benign ovarian neoplasms	29		
Teratomas	15	6 - 14	8
Serous	7	5 - 8	0
Mucinous	4	8 - 10	2
Fibroma	2	8 - 10	1
Malignant ovarian neoplasm	2	10 - 12	2
Total	68		15

In Table 8, it was found out that benign ovarian tumors like mature teratomas, endometriomas, mucinous tumors and fibromas had high scores because of their high echogenicity. This finding was consistent with that observed by Sassone *et al* (1991). In mature cystic teratoma it was observed that there was a focal or diffused high amplitute echoes which attenuated the sound (shadowing echodensity). The tissues most responsible for generating these high-amplitude echoes are calcified structures such as bone and teeth, clumps of hair in a cystic cavity, and fat in a Rokitansky protuberance.

Table 9: Scores of ovarian masses by Lerner scoring system

Sonological diagnosis	No of Masses	Range of Lerner Scores	Masses with Lerner scores ≥ 3
Simple cyst	34	-	-
Endometriomas	4	1 - 2	-
Benign ovarian neoplasms	29		
Teratomas	15	3 - 5	15
Serous	7	2 - 4	1
Mucinous	4	2 - 4	2
Fibroma	2	2 - 6	1
Malignant ovarian neoplasm	2	3 - 6	2
Total	68		21

This scoring system concentrated on the four parameters of wall structure, shadowing, septa and echogenicity, with weighing of the values for each variable then summing of scores with range of possible scores of 0 - 8 points. The cut off score for Lerner scoring system is three. In Table 9, it was found out that teratomas, serous and mucinous cyst had scores of ≥3 because of their mixed or high echogenicity, as well as fibroma because of their solid wall structure and mixed echogenicity.

Additionally, most cases of false positive results were associated with benign solid mass without typical findings of particular tumors. In such a condition, the mass should always evoke suspicion of malignancy. Benign solid ovarian tumors often mistaken for malignancy included ovarian fibroma, thecoma, fibrothecoma, and thecofibroma. Furthermore, papillary projections considered a strong sign of malignancy are more common in borderline ovarian tumors than in invasive cancers but may also be seen in benign ovarian tumors, for example, in adenofibromas.

Table 10: Doppler color flow mapping

	Cyst						Total
	Endometriosis	Dermoid cyst	Serous cyst	Mucinous cyst	Fibroma	Malignant	
Criteria							
Presence of flow	-	-	-	-	-	2	2
-normal	-	-	-	-	-	-	
-Increased	-	-	-	-	-	2	2
Vessel arrangement	-	-	-	-	-	2	2
-Regular	-	-	-	-	-	1	1
-Random		-	-	-	-	1	1
Vessel Location		-		-			
-peripheral	-	-	-	-	-	-	
-septal	-	-	-	-	-	-	
-per+sep	-	-	-	-	-	2	2
-per+sep+ central	-	-	-	-	-	-	
RI ≤0.4	-	-	-	-	-	2	2
PI ≤1.0	-	-	-	-	-	2	2
Psv ≥15 cms	-	-	-	-	-	-	

Color Doppler sonography was done in this study to verify the result of the two sonographic scoring systems.

In Table 10, it was found out, that benign ovarian tumors like endometriosis, mature cystic teratoma, mucinous cystadenoma and fibroma had absence of color flow mapping although they had non-benign sonologic features by the sonographic scoring systems.

Fig 1: A case of a 77 y/o, with a huge pelvoabdominal mass probably ovarian in origin measuring 12.9 cm x 10.9 cm x 10.2 cm

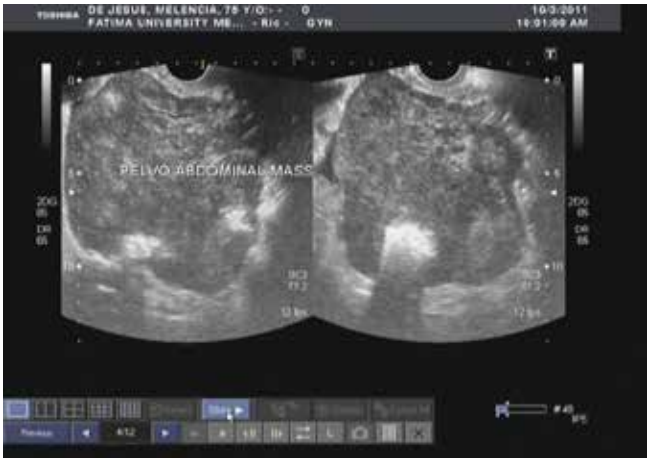


Fig 2: Color flow mapping revealed intratumoral RI: 0.13, PI: 0.08 (cut-off RI: 0.4, PI: 0.7) and Vm peak 11.5 cm/s

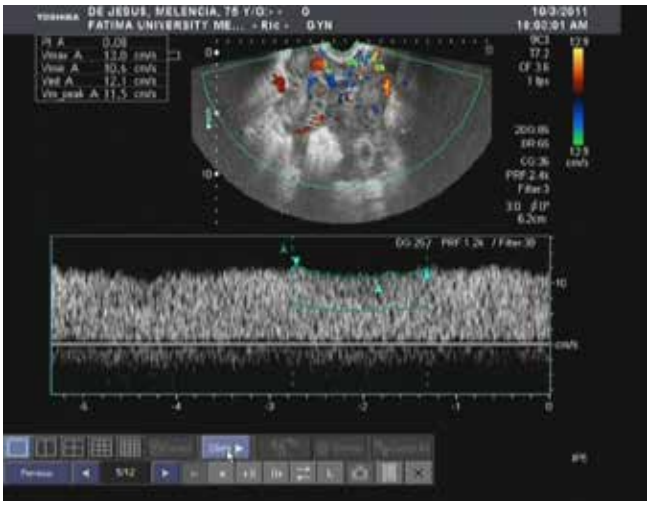


Fig 3: Teratoma cyst with typical "white ball", typical long echogenic lines and bright prominent spots representing hair in fluid, and typical shadowing

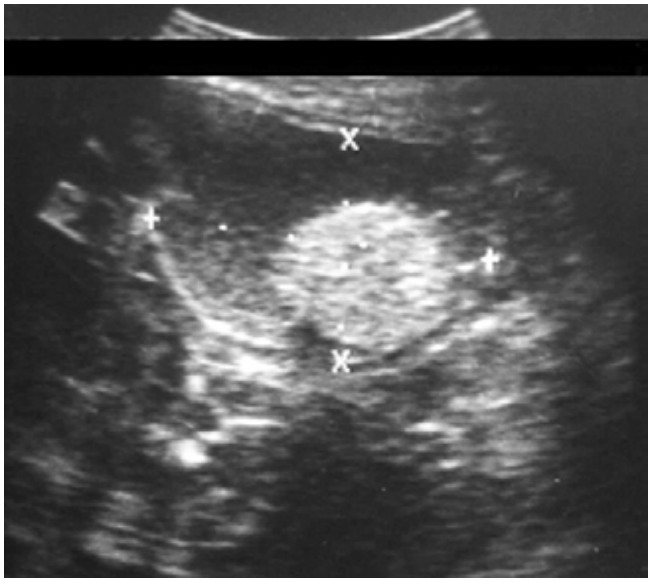


Fig 4: A case of a 51 year old, G8P6 (6026), with positive color flow doppler result

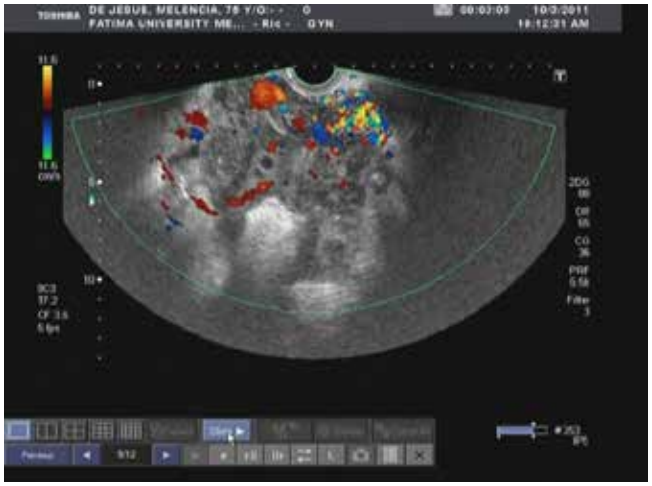
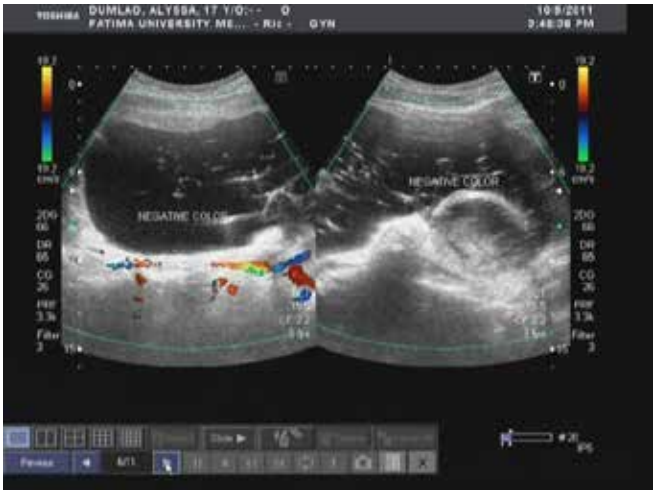


Fig 5: In this illustration it was noted that there was no bladder invasion. There was peripheral and septal vessel arrangement

Fig 6: Huge pelvoabdominal mass probably the right ovary, measuring 25 cm x 22.3 cm x 9.5 cm, thick walled (0.4 cm), multiseptated (0.7 cm), mixed echogenicity

Fig 7: An illustration of a negative color flow doppler imaging of a patient



DISCUSSION

One of the sonographic scoring system that was used in this study is the Sassone scoring. It was based on the visualization of inner wall structure and wall thickness, septae, solid parts and echogenicity. A mass with a score of nine was classified as a high risk mass (suspicious for malignancy). Any sonographic evaluation of adnexal mass begins with morphologic analysis. The mass should be characterized as predominantly cystic, complex or solid. Internal structures should be assessed for the presence of papillary projections, septations (presence and thickness of septa) and echogencity[9]. The researcher found out that this scoring system had sensitivity of 100%, specificity of 80%, positive predictive value of 13% and negative predictive value of 100% (Table 7). Ovarian tumors like mature teratomas, endometriomas and mucinous tumors although benign had high scores because of their high echogenicity (Table 7).

In 1994, Lerner *et al* attempted to improve discriminatory ability in evaluation of ovarian tumors and to simplify the scoring system by excluding the parameter of wall thickness from Sassone scoring system (Sassone *et al*, 1991) and added another important parameter especially shadowing in order to discriminate cystic teratoma from malignant ovarian tumors and to improve positive predictive value[10]. This scoring system concentrated on the four parameters of wall structure, shadowing, septa and echogenicity, with weighing of the values for each variable then summing of scores with range of possible scores of 0 - 8 points. The cut-off score is three[10]. This research revealed that it has a sensitivity of 100%, specificity of 71%, positive predictive value of 9.5%, and negative predictive value 100% (Table 7). Benign ovarian tumors like mature teratomas, serous and mucinous cyst had scores of ≥3 because of their mixed or high echogenicity, as well as fibroma because of their solid wall structure and mixed echogenicity (Table 8).

Color Doppler scanning[12] allows the assessment of tumor vascularity. Malignant neoplasms have active blood vessel creation (angiogenesis) compared to normal or benign neoplasms due, in part, to their increased metabolic activity. The most common flow criteria are the resistance index (RI), the pulsatility index (PI), and the maximum systolic velocity. Resistance index is defined as the difference between peak systolic and maximum end diastolic flow velocity, divided by peak systolic flow velocity. The cut-off value for malignancy is <0.4. Usually the lowest measured RI from a series of measurements is reported from different arteries. On the other hand, pulsatility index was devised to determine quantitative

energy in the oscillation of the wave form. It was defined as the difference between peak systolic and end diastolic flow velocity, divided by the time averaged flow velocity. The cut-off value for malignancy is <1. The maximum systolic velocity is the maximum flow recorded in any visualized artery. In order to make a measurement of either RI or PI or maximum systolic velocity, an artery must be identified on ultrasound. Overall, malignancies display an increased vascularity with decreased peripheral blood flow resistance and increased blood flow velocity compared with benign tissue. Doppler signal analysis can separate high-resistance and low-resistance vessels. Absence of muscular lining brought about high velocity flow and low resistance signal. Increased diastolic flow relative to systolic flow occurs due to a decrease in resistance to forward flow. This study revealed that ovarian tumors like endometriosis, mature cystic teratoma, mucinous cystadenoma and fibroma had absence of color flow mapping, although they had non-benign sonologic features by the sonographic scoring systems.

In reality, experienced sonographer can diagnose mature teratoma or endometrioma without difficulty. The characteristic sonographic features of some types of adnexal mass alone can predict the histology without using any scoring system at all. Adding Doppler ultrasound examination to subjective evaluation of the gray-scale ultrasound image does not seem to yield much improvement in diagnostic precision but it may increase the confidence with which a correct diagnosis of benignity or malignancy is made.

SUMMARY

The researcher found out that benign ovarian tumors specifically simple epithelial cysts were frequently found in nulligravid patients with mean age of 37.89 years, in which pelvic ultrasound was done because of abdominal pain or discomfort. Malignant ovarian tumors on the other hand, were found in elderly postmenopausal patients. The comparison of the two sonographic scoring systems and the histopathology revealed sensitivity of 100%, meaning that it can diagnose which among the subjects under study had the ovarian tumors; specificity of 71% - 80% accuracy in determining which among the ovarian tumors were benign or malignant; positive predictive value of 9.5% - 13%, meaning in case of malignancy it has only 9.5 % - 13% predictive value, that scoring systems were useful in some selected cases, especially in ovarian tumors without typical sonographic characteristics of a certain disorder and was difficult to predict subjectively, and negative predictive value of 100% respectively. Ovarian tumors like mature teratomas, endometriomas, mucinous tumors and fibromas were benign but scored high in the two sonographic scoring systems because of their high echogenicity. These benign tumors had absence of color flow mapping although they had non-benign sonologic features by the sonographic scoring systems.

CONCLUSIONS

In conclusion, subjective evaluation of sonographic morphology with the use of the two sonographic scoring systems and Color Doppler sonography have high accuracy in differentiating between benign and malignant ovarian tumors. Sonographic scoring systems were useful in some selected cases, especially in ovarian tumors without typical sonographic characteristics of a certain disorder and which were difficult to predict subjectively. An experienced sonographer can confidently discriminate between benign and malignant pelvic tumors in the adnexal region using the characteristic sonographic features of some types of ovarian tumors.

Proper ultrasound diagnosis could possibly eliminate the need for operative intervention and prevents unnecessary laparotomy and its complications. If ultrasound result was given much importance, there are patients who do not need to be operated immediately or need not be operated at all. This study suggests that sonographer should focus on recognizing the constituent morphological features of a mass, and not only on any particular scoring system.

Recommendations

The researcher further recommends using a bigger population for better sampling.

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Comparison of Intraperitoneal Bupivacaine and Intravenous Paracetamol for Postoperative Analgesia in Laparoscopic Cholecystectomy

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Keywords
Bupivacaine,
Laparoscopic cholecystectomy,
Paracetamol, Postoperative pain.

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ABSTRACT

Background: Postoperative pain management has been challenging and hence multiple drugs have been tried and tested. As laparoscopic cholecystectomy poses moderate pain postoperatively, this study was conducted to assess the effectiveness of paracetamol alone as an analgesic agent in comparison to bupivacaine.

Objective: Evaluation of intravenous paracetamol on postoperative pain in patients undergoing laparoscopic cholecystectomy.

Methods: Randomized double blind trial was conducted where 50 patients were enrolled. These patients were ASA I or II and were aged between 20 - 60 years. Group I received 0.5% bupivacaine as local intraperitoneal application and group II received one gram paracetamol intravenously every six hours for 24 hours. Postoperative VAS score, shoulder pain and requirement of rescue analgesia were noted.

Result: The pain score was lower in group II after eight hours of surgery however the consumption of rescue analgesia showed no significant difference.

Conclusion: Although paracetamol has shown to have a better patient satisfaction in postoperative cases, large scale studies have to be conducted to come to a definitive conclusion.

INTRODUCTION

Acute pain is a very common and sub optimally managed in postoperative setting[1,2]. Postoperative pain is associated with complication and poor outcomes such as longer time for ambulation, longer hospital stay, decreased patient satisfaction and medical complications as hospital acquired pneumonia, deep vein thrombosis etc[2,3].

Laparoscopic cholecystectomy is gold standard treatment for gall stone disease[4,5]. Postoperative pain after this surgery can be multifactorial – pain in incision site being somatic, pain in gall bladder bed being visceral in nature and finally shoulder pain due to diaphragmatic irritation secondary to residual carbondioxide[5]. Thus combined mode of analgesia is the best method of pain management.

Local anesthetic agents are used for pain management but blocking the neuronal pathway alone cannot suppress the humoral biochemical responses that occur during surgery hence the importance of using systemic

pharmacologic therapy[1,6]. Monotherapy with opioids have been the mainstay of treatment for many years however due to various adverse effects associated with it, multimodal analgesia have gained popularity over the past decade[6,7]. Intravenous paracetamol have been integrated into multimodal approach to optimize pain management especially in mild to moderate pain[8]. Most important advantage of paracetamol is its safety profile. It neither causes sedation, respiratory depression, ileus or constipation nor is it associated with risk of substance abuse or misuse[8,9]. It also does not compromise on renal function or increased risk for cardiovascular events[10].

Various studies over the years have shown that one gram paracetamol prior to termination of laparoscopic surgery lead to high patient satisfaction, good tolerance of the drug, significant improvement in VAS score, lower consumption of rescue analgesic agent and shorter hospital stay[4,6,11].

METHODS

This study was approved by local research ethics committee and written informed consent was obtained from the patients. Fifty patients belonging to American Society of Anesthesiologists (ASA) I and II and between 20 - 60 years of age and scheduled for laparoscopic cholecystectomy in Fishtail Hospital and Research Center, were enrolled into this study. Patients were divided into two groups of 25 patients each by block randomization. Group I patients received 0.5% bupivacaine (with dose not exceeding 2 mg/kg) as local intraperitoneal application and group II received one gram paracetamol intravenously every six hours for 24 hours. Patients with acute cholecystitis, inability to understand and use VAS, history of allergy to study drugs, ASA III/IV, patients requiring open surgery and patients' refusal were excluded from the study.

Pre-anesthetic evaluation was done and patients were instructed to point the intensity of pain in 0 – 10 cm scale (VAS). Zero end of the scale is taken as no pain and 10 as maximum pain possible. Alprazolam 0.25 mg was given a night before surgery per orally and same dose was given half an hour before the surgery as well. Intraoperatively, intravenous line was secured using 18 gauze intravenous cannula and crystalloid infusion was started. Electrocardiogram (ECG), non-invasive blood pressure (NIBP) and pulse oximetry (SpO_2) were attached and baseline readings were recorded pre-induction.

All patients were anesthesized with fentanyl (2 microgram/kg), propofol (2 - 2.5 mg/kg) and vecuronium (0.1 mg/kg). Anesthesia was maintained with oxygen and isoflurane. Ventilator was adjusted to maintain end-tidal carbondioxide between 30 - 35 mmHg. Intra-abdominal pressure was maintained between 10 – 12 mmHg. ECG, NIBP, SpO_2, end-tidal CO_2 were maintained during the surgery. After the gall bladder was removed, in group I, 0.5% bupivacaine 10 ml was instilled in right sub-diaphragmatic space and another 10 ml was infiltrated in the port sites whereas in group II, patients received one gram paracetamol just before the creation of pneumoperitoneum. Reversal and extubation of patient was done after antagonizing with neostigmine (0.5 mg/kg) and glycopyrrolate (0.1 mg/kg). The time of arrival in postoperative ward was defined as zero hour postoperatively.

Postoperatively patients were assessed for pain utilizing VAS, shoulder pain and number of rescue analgesia doses required. The above parameters were assessed at 0, 4, 8, 12 and 24 hours. Rescue analgesia consisted of injection ketorolac 30 mg intravenously when VAS was >6. Systolic, diastolic blood pressure, respiratory rate and oxygen saturation were assessed at above times.

Data analysis was done using students unpaired t-test in SPSS version 16. P value <0.05 was considered as significant.

RESULTS

Demographic data in the study like age, weight, preoperative hemodynamics and duration of surgery in both the groups were comparable as shown in Table 1.

Table 1: Demographic data of patients

	Group I	Group II	P value
Age (years)	37 ± 12.25	43.24 ± 8.97	0.076
Weight (kg)	62 ± 10.02	61.28 ± 8.22	0.253
Preop HR (beats/min)	70.76 ± 6.93	72.32 ± 7.39	0.498
SBP (mmHg)	119.40 ± 7.58	117.96 ± 8.39	0.521
DBP (mmHg)	68.48 ± 7.95	67.28 ± 7.66	0.579
RR(/min)	12.2 ± 1.27	12.44 ± 1.15	0.896
Duration of surgery (minutes)	48.80 ± 10.82	47.80 ± 10.21	0.665

The results of variables as shown in Figure 1 indicates that there is no significant difference in VAS score in first four hours postoperatively however the pain scores were significantly higher in Group I as compared to Group II and thus the requirement of rescue analgesia increased significantly after eight hours of surgery.

Fig 1: Comparison of mean visual analog scale scores between the two groups

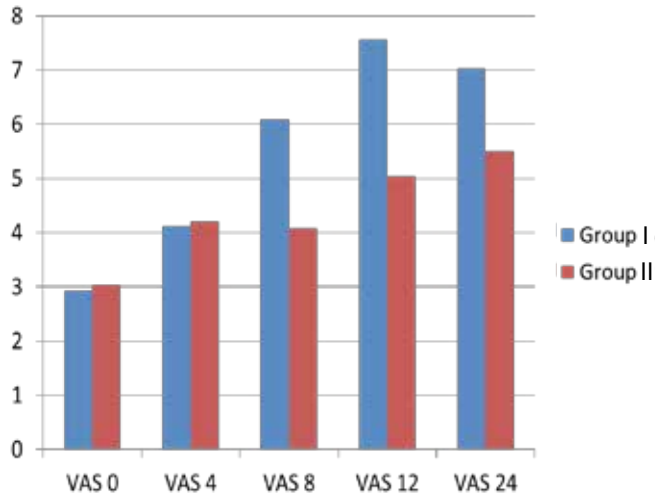
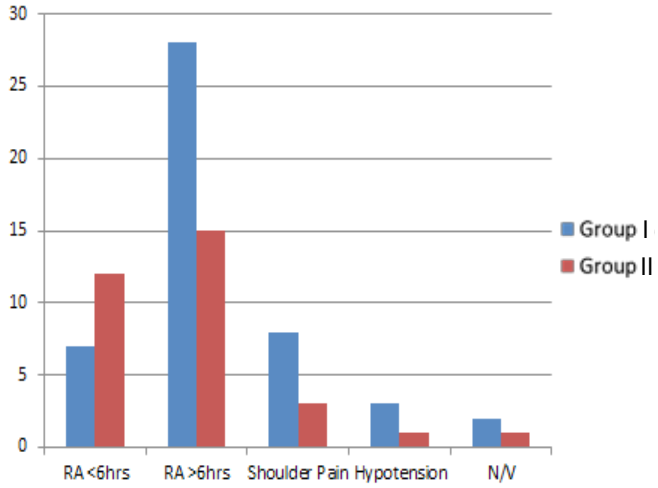


Fig 2: Comparison of variables between two groups



Postoperative complications such as shoulder pain, hypotension or nausea and vomiting were present in some of the patients included in the study however the incidence was not significant.

DISCUSSION

There are three types of pain following laparoscopic cholecystectomy: Incisional, visceral and shoulder pain and hence multimodal approach is essential. Postoperative pain management should begin in pre-operative period depending on age and the threshold of the patient. The result of our study demonstrates that in Group I intraperitoneal and visceral instillation of bupivacaine relieved pain and hence the VAS scores were low up to four hours post-surgery whereas the need of rescue analgesia increased after four hours in group I but VAS scores were significantly lower in group II where patient received paracetamol every six hourly.

Sayed *et al*[12] conducted a study where out of 30 patients, 15 patients received intravenous paracetamol one gram six hourly whereas the other 15 patients received only placebo. VAS was higher in second group and hence there was significant increase in the requirement of rescue analgesia morphine. Similarly, Salihoglu *et al*[11] evaluated 44 patients in which 22 patients received paracetamol after the start of the surgery whereas the rest 22 that is the control group received 100 milliliter of normal saline. VAS was lower in paracetamol group and first morphine requirement and total dose of morphine administered were decreased in paracetamol group.

Intravenous paracetamol has been tested in recent years as single dose one gram intravenously or one gram every six hourly for 24 hours. In our study, we studied one gram paracetamol intravenously just before the creation of pneumoperitoneum and every six hourly till 24 hours postoperatively similar to the study conducted by Upadya *et al*[4]. Thus sustained pain relief for 24 hours was present in paracetamol group and in bupivacaine group, good pain relief was achieved only for the initial four hours of postoperative period.

In the study done by Gregoire *et al*[13], five gram paracetamol was given over 24 hours but we restricted the dose to four grams which is below toxic level of the drug. Recently, Shukla *et al*[14] compared intraperitoneal bupivacaine along with dexmedetomidine or tramadol in combination for postoperative analgesia following laparoscopic cholecystectomy. This study concluded that VAS score was significantly lower in bupivacaine plus dexmedetomidine group as compared to bupivacaine plus tramadol or bupivacaine alone group.

Thus multiple studies are being conducted to achieve a better patient response and satisfaction for good postoperative outcome. No single modality has been found to be effective and hence multimodal approach is the best answer. We conclude that only bupivacaine as intraperitoneal instillation is inadequate. Intravenous paracetamol is better for overall satisfaction of the patient if given throughout the first post- operative day. However, larger study group has to be included for definitive conclusion.

CONCLUSION

Intravenous paracetamol infusion in immediate postoperative period after laparoscopic cholecystectomy has shown to be quite effective in obliterating pain. However multimodal approach to pain management is the best modality.

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Pattern of Echocardiography Profile in Gandaki Medical College Teaching Hospital, Pokhara, Nepal

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Keywords

Congenital heart disease, Cor-pulmonale, Echocardiography, Rheumatic heart disease.

Abbreviations

ASD	Atrial septal defect
PDA	Patent ductus arteriosus
RHD	Rheumatic heart disease
TOF	Tetralogy of fallot
VSD	Ventricular septal defect

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ABSTRACT

Background: Echocardiography is a noninvasive and important diagnostic tool for evaluation of cardiac abnormalities and for proper management of cardiac problems. We have wide varieties of cardiac abnormalities in population that can be detected by echocardiography.

Objectives: The objective of this study was to find out the various cardiac problems and its demographic patterns in Gandaki Medical College Teaching Hospital in Western Nepal.

Methods: A retrospective observational study was conducted at Gandaki Medical College Teaching Hospital to evaluate the echocardiography profile of 3960 patients who were included for echocardiography over the period of 2011 December to 2014 December. Data were collected from out-patient department (OPD) echocardiography register. Data analysis was done by using SPSS 16. Echocardiography was done by cardiologists from Gandaki Medical College Teaching Hospital with the help of GE echocardiography machine under the guidelines of American echocardiography society.

Results: Among the children 0 - 10 years of age, the commonest findings were VSD (23.95%), followed by RHD (22.08%) then PDA (15.6%). In young children, RHD is the most common problem followed by congenital heart disease and then hypertensive heart disease. Ischemic heart disease, cor-pulmonale, diastolic dysfunction are common conditions in middle age group, whereas hypertensive heart disease with diastolic dysfunction and ischemic heart disease were seen in elderly groups.

Conclusions: Wide variety of echocardiography reports were found in the Medical College Hospital. Rheumatic heart disease, congenital heart disease, ischemic heart disease, pericardial disease, cor-pulmonale and LV diastolic as well as systolic dysfunction and degenerative valvular heart disease were among the common findings in our study. Among them post streptococcal sore throat leading to rheumatic heart disease, hypertensive heart disease and ischemic heart disease were most common.

INTRODUCTION

In the diagnosis of various cardiovascular abnormalities, echocardiography is an important tool as it aids in estimation of cardiovascular risk and the prevalence of primary heart disease in general population[1,2,3]. It also helps to study the predisposing factors, prognostic importance and also helps to know the effects of therapeutic impact[4]. Echocardiography is non-invasive, comprehensive examination widely used in assessment of heart structure and its functions[2,5]. By the help of echocardiography clinicians can have gross idea of cardiac anatomy and hemodynamics and thus have detail information for clinical evaluation for the proper management of patients[1,6].

METHODS

Our study was a retrospective observational study carried out in Gandaki Medical College Teaching Hospital, Pokhara, Nepal (A Tertiary Care Medical College Hospital in Western region of Nepal). Echocardiography reports were collected from echocardiography register from 30th December 2011 to 30th December 2014. Echocardiography was performed by cardiologist from Gandaki Medical College Teaching Hospital. The instrument used was GE echocardiography machine and it was performed according to guidelines set by American society of echocardiography.

A total of 3960 reports were included from the register for study. The demographic profile of findings was also recorded. Among the study population, any patient may have had more than one echocardiographic findings. The age group is divided into four major groups: Children up to 10 years, adolescent and young from 11 - 40, middle age 41 - 60 and elderly more than 60 years.

Data analysis was done using SPSS 16. Student T-test, chi-square test was applied wherever required.

RESULTS

In our study patients were included from the first day of life to 92 years of age with mean age in 40 ±25 years. Among the total 3960 patients, 2435 were males and 1525 were females. They were statistically different in the presentation among various age groups. The highest number of patients were in the age group 41 - 45 years and the lowest number in 91 - 100 years.

Table 1: Distribution according to demographic pattern

Age	Males	Females	Total	P value
0 - 10	300	180	480	0.074
11 - 20	305	205	510	0.067
21 - 30	130	110	240	0.063
31 - 40	302	108	410	0.058
41 - 50	430	350	780	0.091
51 - 60	290	110	400	0.059
61 - 70	260	180	440	0.087
71 - 80	310	230	540	0.062
81 - 90	90	40	130	0.080
91 - 100	18	12	30	0.063

The most common echocardiographic finding in children was congenital heart disease followed by rheumatic fever and pericardial disease. In congenital heart disease, commonest was VSD 23.95% followed by PDA 15.6%, ASD 9.79% and TOF 2.5%.

Among the study population, rheumatic heart disease was common in young age group (22.08%) followed by pericardial disease and then hypertensive heart disease. In the middle age group, common findings were diastolic dysfunction, hypertensive heart disease and cor-pulmonale. Diastolic dysfunction, high blood pressure and cor-pulmonale were common in elderly group of people.

Table 2: Echocardiographic findings in children (0 - 10 years)

Echocardiographic Findings	Males	Females	Total	P value
Congenital heart disease				
ASD	10	37	47	0.105
VSD	75	40	115	0.071
PDA	30	45	75	0.063
TOF	28	32	60	0.058
Pericardial effusion	17	8	25	0.077
RHD	76	30	106	0.085
Others	20	32	52	0.065

Fig 1: Common echo findings in age groups (0 - 40 years)

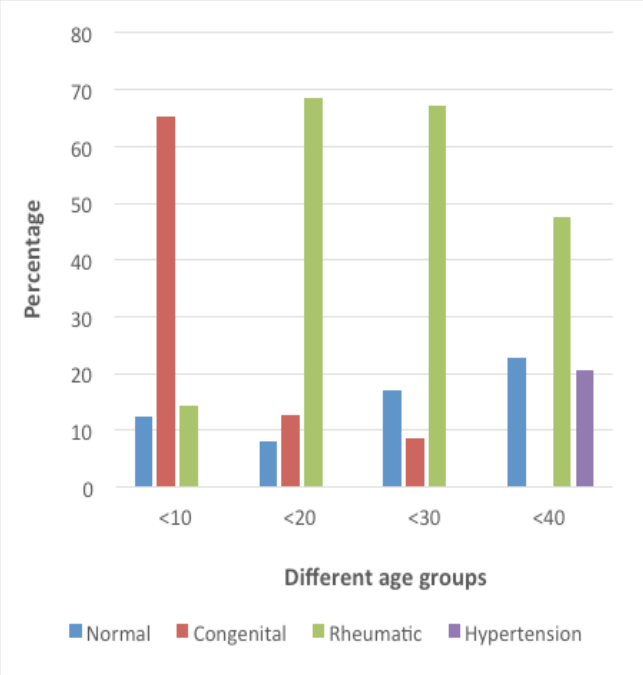
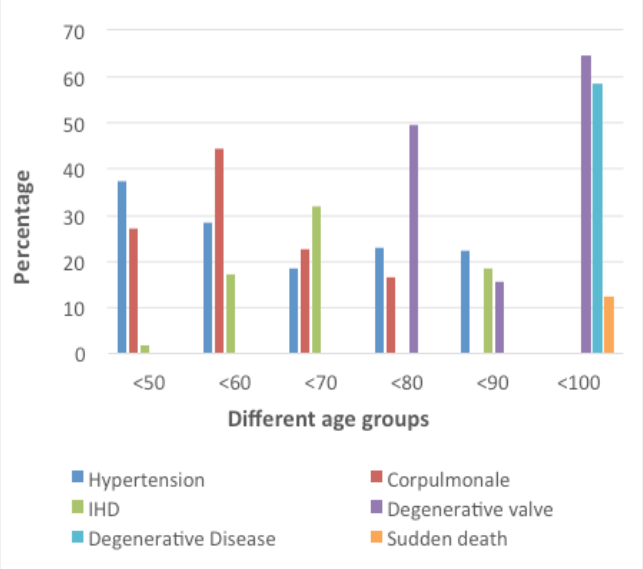


Fig 2: Common echo findings in age groups (41 - 100 years)



DISCUSSION

In our study, the male patients were predominantly higher than the female patients. However, in some conditions, female patients were more than males as in ASD and PDA[7,8]. In our study, VSD was the most common congenital heart disease (23.9%) but in some studies, ASD was common in children. This may be due to the ignorance of the problem as there was no definite screening program in our set up for school age group[9,10].

Rheumatic heart disease was the most common heart disease in young age which is similar to other studies in developed countries[11,12]. Cor-pulmonale was the most common finding in middle age group due to common chronic respiratory problem in developing countries. In elderly group, diastolic dysfunction, hypertensive heart disease and pericardial disease were common followed by degenerative valve disease and ischemic heart disease similar to other studies[1,13].

Our Gandaki Medical College Teaching Hospital, being a General Hospital, most of the patients visit as general patients for other problems. Cardiac problems are detected by echocardiography in multiple disciplines in our hospital rather than as a specialized cardiac centre[5,9].

CONCLUSIONS

In this study, we concluded that in a Tertiary Care Teaching Hospital, large number of cases in diversity of presentation can be found. Rheumatic heart disease was common due to common streptococcal infection and cor-pulmonale was common in middle age group due to common respiratory problem in our community. Besides hypertensive heart disease, ischemic heart disease in elderly age group is still a huge burden. This will help to improve our socio-economic and health awareness to our community from the proper diagnosis and management of the problem.

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Effect of Musically Guided Breathing Exercises on Their Ventilatory Function

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Keywords
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ABSTRACT

Introduction: Correct breathing leads to proper ventilation and oxygenation. Breathing exercise is used widely in clinical medicine as one of the methods of physiotherapy. It is also used in everyday life as a part of relaxation technique to alleviate stress and to regularize breathing pattern.

Objectives: To assess the effect of musically guided breathing exercises on their ventilatory function.

Methods: Fourty eight male and female students of 18 - 30 years were involved in the study of ventilatory function before and after musically guided breathing exercise. Pulmonary function tests were performed with the subject sitting in a comfortable chair. Initial measurement of tidal volume, inspiratory capacity, inspiratory reserve volume, expiratory reserve volume, forced vital capacity and timed vital capacity in one second were measured.

Results: There was significant increase in inspiratory reserve volume, expiratory reserve volume, vital capacity, forced expiratory volume in one second and forced vital capacity after musically guided breathing exercise.

Conclusions: Musically guided breathing exercise improves ventilatory function.

INTRODUCTION

Breathing is synonymous with being alive. Correct breathing leads to proper ventilation and oxygenation[1-5]. Breathing even though finely controlled by neural and chemical feedback mechanisms can be affected by many ways e.g. stress, anxiety, panic states abdominal and thoracic trauma and surgery apart from diseases of respiratory system[6-11]. Breathing exercise is used widely in clinical medicine as one of the methods of physiotherapy. It is also used in everyday life as a part of relaxation technique to alleviate stress and to regularize breathing pattern.

Certain guided breathing exercises are being used like yoga, pranayama and chants are advocated to improve pulmonary function. Respiratory muscles strengthening was tried using music therapy exercise. Effects of meditation and mental chanting of "OM" on certain physiological parameters has been studied by several workers. These studies show increased alertness, autonomic changes, physical relaxation, changes in oxygen consumption and basal metabolic rate. Large number of literature is available on the effects of music therapy. Listening to specific "ragas" is said to improve health, bring down elevated blood pressure, relieve headache and abdominal pains. No extensive study has gone into the mechanism of such therapy benefits.

Effect of musically guided breathing exercises on their ventilatory function has not been so far studied. The present investigation is to assess certain pulmonary functions before and after musically guided breathing exercise in young male and female students.

OBJECTIVE

To assess the effect of musically guided breathing exercises on their ventilatory function.

METHODS

Fourty eight students were involved in the study of ventilatory function before and after musically guided breathing exercise. Both male and female students were involved. The students were within 18 to 30 years. They formed a relatively homogenous population of the required age group.

Inclusion criteria

1. Subjects 18 - 30 years without respiratory problems.
2. Non-smokers
3. Subjects without history of chronic cardiovascular disease
4. Subjects without history of allergy that affects breathing

Exclusion criteria

1. Subjects with upper respiratory tract infections and any sort of other respiratory disorders
2. Subjects with smoking habits
3. Subjects with history of chronic cardiovascular disease
4. Subjects with history of allergy that affects breathing

All tests were done at the same time of the day to avoid possible diurnal variation. Informed consent was obtained from each volunteered student for this study.

Pulmonary function tests were performed in Knipping-open spirometer C. F. Palmer Ltd, London, England. Before each test, the subject was familiarized with the instrument and a detailed instruction cum demonstration up to the satisfaction was given. All the procedures were carried out in the post graduate laboratory, Physiology Department of Institute of Medicine (IOM).

During the test, the subjects were adequately encouraged to perform at their optimum level. The forced respiratory maneuvers were repeated at least five times and the highest values were considered for the analysis.

Pulmonary function tests were performed with the subject sitting in a comfortable chair. After reassurance, the procedure was explained. Initial measurement of tidal volume, inspiratory capacity, inspiratory reserve volume, expiratory reserve volume, forced vital capacity and timed vital capacity in one second measured. Breaths interrupted by swallowing or coughing were identified and discarded.

All terms and abbreviations used here are based on a report of the American College of Chest Physicians (ACCP) - American Thoracic Society (ATS) joint committee on pulmonary nomenclature.

Spirometry is a procedure that measures the volume of air an individual inhales or exhales as a function of time[1-11]. The measurement was performed with the subject in an upright position, usually seated. Procedure was demonstrated till subjects were clear regarding the technique. Subjects were given instruction to loosen their clothes that might restrict the movement of the chest and upper abdomen.

The measured volumes and their definitions are as follows.

Tidal volume (TV)

The tidal volume is the volume of air entering and leaving lungs each breath during quite breathing. Several tidal volumes were recorded (minimum five). Not more than eight tidal volumes were recorded with the subject rebreathing from the spirometer. The mean tidal volume was best obtained by dividing from the average of few breaths (four to six breaths).

Inspiratory reserve volume (IRV)

Forced inspiratory maneuvers are useful in diagnosis and monitoring airway obstruction. It is the maximum volume of air that can be breathed in over and above the volume normally breathed in at resting level. Inspiratory muscles have to be used to their maximum capacity to inhale the inspiratory reserve volume. After four to six normal breathings, inspiratory reserve volumes were recorded.

Inspiratory capacity

It is the maximum volume of air that can be breathed in starting with the resting in expiratory position. In other words, inspiratory capacity means tidal volume + inspiratory reserve volume.

Expiratory reserve volume

It is the maximum volume of air that can be breathed out and above the volume normally breathed out at quite breathing. Expiratory muscles have to be used to their maximum capacity to expel the expiratory reserve volume.

Vital capacity

Vital capacity is the maximum volume of air exhaled from point of maximal inhalation or the maximal inhalation or the maximal volume of air inhaled from a point of maximal exhalation can be measured with a slow exhalation or inhalation respectively. It is measured as one stage vital capacity. Vital capacity means inspiratory reserve volume + tidal Volume + expiratory reserve volume. A minimum

two acceptable vital capacity maneuver was obtained, with a maximum of four attempts. The largest vital capacity was obtained and data analysis.

The preparation of the subject

The procedure, including all special breathing maneuvers, was carefully explained to the individual students. It was emphasized that no particular effort would be required during quiet breathing. The subject inhaled maximally, inserts the mouthpiece just past his/her front-tooth, seals his/her lips around the mouthpiece, and breaths in and out of spirometer. The mouthpiece was inserted well into the mouth and the mouth was closed around the mouthpiece to ensure that air could not escape from the sides of the mouth. The test was carried in a sitting position on a chair and leaned forward during expiration (bending at the waist) because this movement helps to force the air out of the lungs.

Forced vital capacity (FVC)

The technique was demonstrated to each subject before the test. The subject inserted the breathing tube into his/her mouth, making sure his/her lips were sealed around the mouthpiece, and began the forced maneuver with minimal hesitation. It is imperative that the subject should have a complete inhalation before beginning the forced exhalation. The subject was asked to "blast", not just "blow" the air from their lungs; encouraged to fully exhale. Three acceptable forced vital capacity maneuvers were performed.

Timed vital capacity-FEV1

Forced expiratory volume in one second is the volume of air exhaled in one second during the performance of the forced vital capacity. Measuring forced expiratory volume in one second requires a spirometer capable of measuring volume of at least six liters. During forced expiratory volume measurement, the speed of drum was fixed in two cm per second (fast speed). It is now generally realized that the vital capacity alone is a poor index of ventilator capacity because volume is measured regardless of time. Much more significant than the vital capacity alone is the maximum volume, which can be excluded per unit of time.

Measurement of FEV1 and FEV1 percentage

Draw a horizontal line at the start of the vital capacity effort and another are at the end of the effort. Draw a vertical line at the onset of the start of the downward exhalation with a pair of dividers set equal the distance between vertical time lines in one second, and measure this distance to the left of line and draw a vertical line. Where this line intersects the exhalation line at is the amount of air exhaled in one second.

A normal individual is able to exhale at least 75% of the total vital capacity during the first second, 85% during the first two seconds, and 95% during the first three seconds of the vital capacity maneuver.

During recent years it has been increasingly emphasized that the flow pattern of maximally rapid, deep expirations is considerably greater interest than the total volume or vital capacity. This is because in obstructive ventilatory insufficiency there is primarily a reduction in the rate of flow, which can be maintained for the major part of the total expiration. Analysis of forced expiratory tracing is greatly facilitated by a recording at a high kymograph speed i.e., 2 cm/second.

The subject was well trained on how to perform a fast vital capacity. Then, with a mouth-piece in place, his/her breaths quietly through the spirometer for a few breaths, then takes a deep breath as possible and then exhales all the gas within the lungs as rapidly as forcefully as possible. Towards the end of the expiration the subject should be exhorted to continue the effort until no further gas is expired. This test was repeated two or three times and the best one was taken to analysis.

Musically guided breathing exercises session

After initial recording of the above tests, the musically guided breathing exercise was administered at evening time in small groups of six to eight people. All subjects were put through daily practice of "musically guided breathing exercise" for 15 minutes each day for 15 days.

A cassette named "sacred chants of Shiva" by Times Music was selected for the test. The cassette was played through a good quality cassette player. One side of cassette plays repetitive chants (Of Shiva) supported by music. The chant consists of repetitive phrases ("OM Nama Shivaya"). Six to eight students sat in quiet room in a comfortable position on chair, with eyes closed. The students listened quietly to this piece, matching the in and out breath with the pace of phrases. Listeners were instructed to regulate their breaths "on their own" according to music where music itself guided the inspiration, pause and expiration. No specific instructions regarding the timing of inspiration were given.

During the exercise session, students inhaled slowly and deeply through the nostril and mouth. At the end of inhalation, they held the breath according to music, exhaled slowly and quietly through the nose and mouth. At the end of exhalation completely, they held the breath according to music. Initially there was no attempt to establish a ratio of inspiration, pause and expiration but later students were found to establish a definite timing of inspiration, pause and expiration.

All the lung volume and capacities were estimated for the entire group of students after 15 days of breathing exercise session. The mean values of guided breathing exercises were compared with the mean values of the same parameters after breathing exercise using paired "t" test. P values of <0.05 was considered significant. Each subject acted as his own control.

Results were tabulated. Age, height and weight of each subject were recorded and body surface area was calculated.

RESULTS

Fourty eight students were involved in the study. The mean age of subject was 21.05 years. The mean height was 1.61 meters. The mean weight of students was 57.3 kg. The mean body surface area was 1.61 sq meter.

The values of the lung volume, capacities and percentage of FEV1/FVC parameters measured in subject before and after musically guided breathing exercise depicted in Table 1.

Table 1: Parameters of lung volume, capacities, FEV1 and percentage of FEV1/FVC

S No	Test	Parameter	Mean	SD±SE	T value	p value
1	Pre test Post test	IRV	1549.47 1695.34	454.5 ±65.6 491.5 ±70.9	4.57	0.0001*
2	Pre test Post test	ERV	1281.25 1440.62	391.8 ±56.5 450 ±64.9	3	0.004*
3	Pre test Post test	TV	505.72 489.06	145.4 ±20.9 114.7 ±16.5	-0.81	0.424
4	Pre test Post test	IC	2056.25 2173.95	507.5 ±73.2 584.8 ±84.4	2.84	0.007*
5	Pre test Post test	VC	2973.95 3271.87	683.2 ±98.6 733.8 ±105.9	3.36	0.002*
6	Pre test Post test	FVC	3007.39 3209.89	633.4 ±91.4 719.1 ±103.8	2.79	0.008*
7	Pre test Post test	FEV1	2398.60 2648.95	710.7 ±102.5 717.7 ±106.6	3.08	0.003*
8	Pre test Post test	% of FEV1/FVC	80.21 82.11	14.7 ±2.1 11.18 ±1.6	0.76	0.448

*p value significant as it is <0.05

The mean value of tidal volume before exercise was 505.7 ml but after musically guided breathing exercise it decreased up to 489 ml which was statistically insignificant (p>0.05).

Mean inspiratory reserve volume of total subjects was 1549 ml before exercise but after exercise it increased up to 1695 ml. Increment of inspiratory reserve volume was statistically significant (p<0.05).

The mean value of inspiratory capacity before exercise was 2056 ml but after musically guided breathing exercise it increased up to 2173 ml which was statistically significant.

The mean expiratory reserve volume of total subject was 1281 ml before exercise but after exercise it increased up to 1440 ml. The increment was statistically significant (p<0.05).

The mean value of vital capacity before exercise was 2973 ml but after musically guided breathing exercise it increased up to 3271 ml. The increments and p-value are significant.

The mean forced vital capacity of total subjects was 3007 ml before musically guided breathing exercise but after musically guided breathing exercise it increased up to 3209 ml.

The mean expiratory volume in one second was 2398 ml before exercise but after musically guided breathing exercise it increased up to 2648 ml which is highly significant.

The mean value of percentage of FEV1 was 80% before musically guided breathing exercise, it increased up to 82%. The values are however statistically non-significant.

DISCUSSION

Breathing exercises are being used in clinical medicine with varying purposes. All these have a common objective of improving the pulmonary function mainly the ventilation and oxygenation. These exercises are said to improve thoracic and lung expansion, confer better rib and spine mobility and improve air entry into alveoli. The rationale behind this work is based on the assumption that when breathing exercises are advocated as a part of relaxation techniques, these exercises are less stressful to learn. This thinking lead to the use of music as a guide to perform deep breathing exercises. In these exercise sessions, the subjects were asked to simply "go along" with the musically supported chants, adjusting their breaths on their own with the phrases of chants.

Tidal volume

During quiet breathing expiration is a passive process, and is brought about by relaxation of the inspiratory muscles

and lung recoil. Since contraction of the inspiratory muscles increases the size of the thoracic cage, relaxation of the same muscles decreases the size of the thoracic cage to the original. That is enough to generate positive pressure in the lungs to expel the normal tidal volume. Spirometric measurement of tidal volume varies from breath to breath.

Tidal volume was found to be less after musically guided breathing exercises. The mean value of tidal volume before exercise was 505.7 ml but after musically guided breathing exercise it decreased up to 489 ml which was statistically insignificant ($p>0.05$).

Inspiratory reserve volume and inspiratory capacity

Inspiratory reserve volume and inspiratory capacity depend upon the use of accessory muscles of respiration. These forced breathing maneuvers depend on the strength of inspiratory muscles. These muscles have to be used to their maximum capacity to inhale the inspiratory reserve volumes.

Mean inspiratory reserve volume of total subjects was 1549 ml before exercise but after exercise it increased up to 1695 ml. Increment of inspiratory reserve volume was statistically significant ($p<0.05$).

The mean value of inspiratory capacity before exercise was 2056 ml but after musically guided breathing exercise it increased up to 2173 ml which was statistically significant. Better use of inspiratory muscles following musically guided breathing exercise may be the reason for the increase in inspiratory reserve volume and inspiratory capacity.

Expiratory reserve volume

Expiratory muscles have to be used to their maximum capacity to expel the expiratory reserve volume. During forceful expiration abdominal muscles play an important role augmenting the expiratory pressure.

The mean expiratory reserve volume of total subjects was 1281 ml before exercise but after exercise it increased up to 1440 ml. The increment was statistically significant ($p<0.05$).

Better use of the expiratory muscles following musically guided breathing exercise may be the reason for the increase in expiratory reserve volume. Decreased airway resistance may be indirectly contributing in the increase to expiratory reserve volume.

Vital capacity

Vital capacity depends on the strength of respiratory muscles compliance of lung and chest wall, airway resistance, integrity of pleura and thoracic structures. The mean value of vital capacity before exercise was 2973 ml but after musically guided breathing exercise it increased up to 3271 ml. The increments and p-value are significant. Musically guided breathing exercises have resulted in increased values of vital capacity and forced vital capacity. This can be explained by better use of respiratory muscles, greater compliance and mobility of chest wall structures or decreased airway resistance following musically guided breathing exercise.

Forced vital capacity and forced expiratory volume in one second

The mean forced vital capacity of total subjects was 3007 ml before musically guided breathing exercise but after musically guided breathing exercise it increased up to 3209 ml.

The mean expiratory volume in one second was 2398 ml before exercise but after musically guided breathing exercise it increased up to 2648 ml which is highly significant. FEV1 depends on the airway resistance. It is a test to differentiate obstructive lung disease and restrictive lung disease. Increased FEV1 may be due to lesser airway resistance after musically guided breathing exercise.

The percentage of FEV1

The mean value of percentage of FEV1 was 80% before musically guided breathing exercise, and it increased up to 82%. The values are however statistically non-significant.

Several researchers claim effectiveness of music therapy, which may include improved pulmonary function, muscle relaxation, reduced anxiety levels. Combining music and breathing exercises may be a better therapeutic modality since the present study revealed improved ventilatory function following musically guided breathing exercises. This was evident from the increase in the value of inspiratory reserve volume, inspiratory capacity, vital capacity, expiratory reserve volume, forced vital capacity and forced expiratory volume in one second.

CONCLUSIONS

Fourty eight students were involved in the study of ventilatory function before and after musically guided breathing exercise. Both male and female students were involved. Pulmonary function tests were performed with the subject sitting in a comfortable chair. After reassurance, the procedure was explained. Initial measurement of tidal volume, inspiratory capacity, inspiratory reserve volume, expiratory reserve volume, forced vital capacity and timed

vital capacity in one second measured.

There was significant increase in inspiratory reserve volume, expiratory reserve volume, vital capacity, forced expiratory volume in one second and forced vital capacity after musically guided breathing exercise. It concludes that musically guided breathing exercise improves ventilatory function.

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Prevalence and Predictors of Micro/Macroalbuminuria among Type 2 Diabetic (T2DM) Nepalese Patients

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Keywords
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ABSTRACT

Background: The number of people with type 2 diabetes mellitus (T2DM) is increasing vividly throughout the world. Approximately 5 – 10% of T2DM patients with microalbuminuria develop diabetic nephropathy each year. Microalbuminuria among diabetic patients has been acknowledged as not only a predictor of development of diabetic nephropathy, but also a powerful independent risk factor for cardiovascular disease.

Objectives: The objectives of the study were to determine the prevalence of micro/macroalbminuria, and the predictors of micro/macroalbminuria among T2DM patients.

Methods: This was a cross sectional study conducted at Tertiary Care Medical College Hospital in Western region of Nepal. A total of 556 patients who fulfilled inclusion criteria were enrolled for study. First void morning midstream urine sample along with creatinine, LDL, HbA1c was collected. Those with positive urine results were repeated within one week. Patient's data including age, sex, race, presence or absence of hypertension, duration of diabetes, smoking history and education level were recorded and used for multivariate logistic regression analysis.

Results: Among 556 studied patients, 288 (51.7%) showed to have microalbuminuria while 23 (4.1%) had macroalbuminuria. Multivariate logistic regression analysis showed significant prevalence of micro/macroalbuminuria among patients with low education attainment ($p < 0.0001$), smokers ($p = 0.005$) and among patients with longer duration of diabetes ($p < 0.0005$). Likewise patients with high Hba1c ($p < 0.0001$) and with hypertension under medication or not ($p < 0.0001$) also had significant level of micro/macroalbuminuria

Conclusions: While most of the results of our study were comparable to other studies in Asian region, some predictors we studied were unique for the study. The main asset of the study lied in the awareness of primary health care professionals about the burden and importance regarding the early detection and treatment of diabetes and its related complications.

INTRODUCTION

The number of people with type 2 diabetes mellitus (T2DM) is increasing vividly throughout the world. At present 9% of the world population has diabetes, of which 90% are type 2. Each year 1.5 million deaths are attributed to diabetes and its complications. The World Health Organization predicts that the number of patients with diabetes will rise to 366 million by 2030[1]. The burden of diabetes is escalating particularly in developing countries. The causes are compound, but the increase in considerable part due to rapid increases in overweight and physical inactivity[1].

Approximately 5 – 10% of T2DM patients with microalbuminuria develop diabetic nephropathy each year[2]. The latest studies in Asia show that, as an etiology, diabetic nephropathy accounts for 64.5% of end stage renal failure[3], which was correlated with same findings of studies done at Western world[4,5].

Microalbuminuria among diabetic patients has been acknowledged as not only a predictor of development of diabetic nephropathy, but also a powerful independent risk factor for cardiovascular disease[6].

Without any interference, among T2DM about 20 – 40% with microalbuminuria progress to overt nephropathy and ultimately around 20% develop end stage renal failure[7,8].

Prior studies have shown that the risk factors correlated with the progression of nephropathy in persons with T2DM are blood pressure, lipid levels, obesity, cigarette smoking, glycemic control, and anemia[9,10].

Microalbuminuria is defined as a urinary albumin excretion of 30 to 300 mg within a 24-hour period or between 30 and 300 microgram of urine albumin per mg of urine creatinine in spot urine sample with the use of albumin creatinine ratio (ACR). Macroalbuminuria is defined as more than 300 mg of urinary albumin in respective tests[11,12].

American diabetes association suggested an annual screening of microalbuminuria and nephropathy in all patients with T2DM[13,14].

Since the probability of occurrence of microalbuminuria is on the rise among diabetic patients, the discovery of the role of its risk factors seems essential. In order to investigate the risk factors involved in microalbuminuria, a meta-analysis was conducted on 1,243 published academic articles (2000 - 2009). A relationship has been documented between microalbuminuria and a number of risk factors including fasting blood sugar (FBS), body mass index (BMI), glycosylated hemoglobin (HbA1c), the duration of diabetes, waist circumference, lipid profile, age, gender and smoking[15].

The Developing Education on Microalbuminuria for Awareness of Renal and Cardiovascular risk in Diabetes (DEMAND), a multinational cross-sectional clinic/center-based study, revealed that approximately 50% of type 2 diabetic patients had micro- or macroalbuminuria, and Asians had a higher prevalence of albuminuria compared with Caucasian patients[16].

The main risk factors identified in DEMAND were HbA1c, systolic blood pressure (SBP), ethnicity, retinopathy, and duration of diabetes, kidney function, body height and smoking.

Thus, studies on diabetes related complications are very important to estimate the consequence and burden of diabetes. The objectives of the present study were to determine the prevalence of/and factors associated with micro- and macroalbuminuria in persons with T2DM in our locale and to make aware health care personnel about this thriving burden and importance regarding the early detection and treatment of diabetes and its related complications especially micro/macroalbuminemia.

OBJECTIVES

The study was undertaken with the following objectives.

1. To determine the prevalence of micro/ macroalbminuria among T2DM patients.
2. To determine the predictors of micro/ macroalbminuria among T2DM patients.

METHODS

Study design and sampling

This was a cross sectional study conducted at Tertiary Care Medical College Hospital in Western region of Nepal.

Assuming that the prevalence of micro/macroalbuminuria among Asian T2DM patients is 50%[16] and estimating the proportion within 95% confidence interval with 5% error, the threshold sample size was 382.

Data collection

Patients presented at OPD of Gandaki Medical College Teaching Hospital and Research Centre, from February 2015 to January 2016, with T2DM and who satisfied inclusion criteria were enrolled in study.

Verbal consent was taken from all patients and participation was voluntary. Patients were requested to

collect first morning midstream urine sample to avoid orthostatic proteinuria[17]. Simultaneously creatinine, LDL and HbA1c level were also determined. Sample was analyzed via fully automated biochemistry analyzer "Cormay accent 200" using end point method for urine micro/macroalbumin, HbA1c, LDL cholesterol and UV kinetic method for creatinine. If the first urine sample showed positive result for micro- or marcoalbuminuria then second sample was collected within one week. Patients whose urine showed two consecutive positive results were only included in the study.

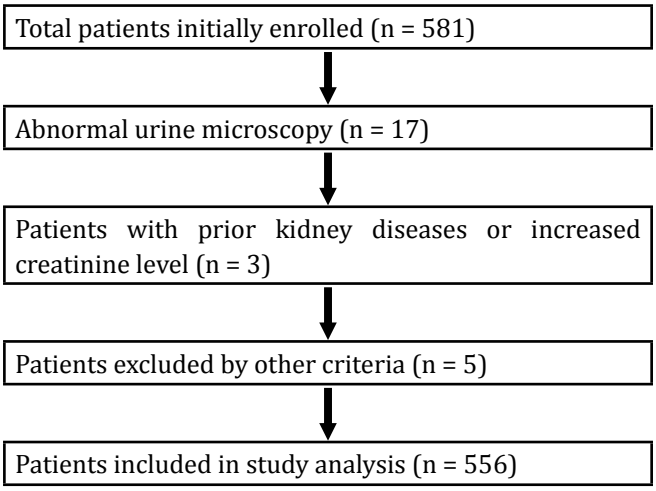
Patient's data including age, sex, presence or absence of hypertension, duration of diabetes, smoking history, education attainment as well as area of residence (urban or rural) was also recorded and used for multivariate logistic regression analysis.

Exclusion criteria

Following patients initially enrolled was excluded from study.

1. Patient s with urine microscopy >3 WBC/hpf
2. Patients with urine microscopy >1 RBC/hpf
3. Patients with creatinine level >2 mg/dl
4. Patients with fever or any other illness requiring antibiotics intake

Flow chart



Definition of terms[11,12]

Normoalbuminuria: Normoalbuminuria is defined as urinary albumin excretion of less than 30 mg within a 24 hour period or less than 30 microgram of urine albumin per mg of urine creatinine in spot urine sample with the use of albumin creatinine ratio (ACR).

Microalbuminuria: Microalbuminuria is defined as urinary albumin excretion of 30 to 300 mg within a 24 hour period or between 30 and 300 microgram of urine albumin per mg of urine creatinine in spot urine sample with the use of albumin creatinine ratio (ACR).

Macroalbuminuria: Macroalbuminuria is defined as urinary albumin excretion >300 mg within a 24 hour period or >300 microgram of urine albumin per mg of urine creatinine in spot urine sample with the use of albumin creatinine ratio (ACR).

Data Analysis

All data collected were entered in SPSS version 15. Descriptive (Central and dispersion) analyses were done for continuous variables and proportion was computed for categorical variables. Descriptive data was presented as frequency and percentage. Multiple logistic regression analysis was used to identify predictors of micro- and macroalbuminuria. Confidence interval was set at 95% and statistical significance was set at $P < 0.05$.

Continuous data were summarized as mean +/-SD.

RESULTS

A. Demographics

We studied 556 patients during the scheduled period. The demographic profile is depicted in Table 1. Among them 58.6% were males and 53.9% were younger than 50 years of age with mean age of 47.67 +/-12.29. Nearly 66% of our patients were from urban area. While 24.8% were illiterates and 32.7% completed graduate level.

Table 1: Demographic profile, frequency and percentage

Demographic profile	Frequency	Percentage
Sex		
Males	326	58.6%
Females	230	41.4%
Age (years)		
Mean Age ± SD		47.67 ±12.29
<50	300	53.9%
>50	256	46.1%
Address		
Urban area	368	66.1%
Rural area	188	33.8 %
Educational attainment		
None	138	24.8%
Elementary	87	15.6%
High school	149	26.8%
College and above	182	32.7%

B. Co-morbidities

Out of total patients 38.5% had hypertension and was on various medications, while 21.4% were smokers. About 63.5 % had HBa1c below seven and fasting LDL levels were less than 100 mg/dl among 32.2% patients only. Patients who had diabetes for more than 5 years were 58.6%.

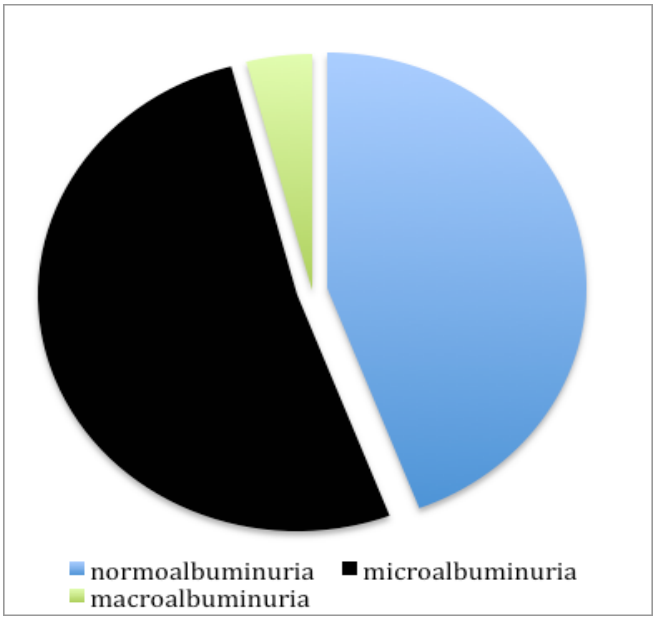
Table 2: Co-morbidities, frequency and percentage

Co-morbidities	Frequency	Percentage
Presence of hypertension	214	38.5%
Medication		
OHA	483	86.8%
Insulin	73	13.2%
HBA1c level		
<7%	353	63.5%
>7%	203	36.5%
LDL level		
>100 mg/dl	377	67.8%
<100 mg/dl	179	32.2%
Duration of Diabetes		
<5yr	230	41.3%
>5 yrs	326	58.6%
Smokers		
(Current or quit <10 years)	119	21.4%

C. Prevalence of micro/macroalbuminuria

Among 556 studied patients 288 (51.7%) showed to have microalbuminuria while 23(4.1%) had macroalbuminuria.

Fig 1: Prevalence of micro/ macroalbuminuria among type 2 diabetes patients



D. Predictors of micro/macroalbuminuria among diabetic Patients

Multivariate logistic regression analysis showed significant prevalence of micro/macroalbuminuria among patients with low education attainment (p <0.0001), smokers (p = 0.005) and among patients with longer duration of diabetes (p <0.0005). Likewise patients with high HBa1c value (p <0.0001) and with hypertension under medication or not (p <0.0001) also had significant level of micro/macroalbuminuria.

Table 4: Multivariate analysis of predictors

Variables	Frequency Total	Frequency with Micro/Macroalbuminuria	Odds Ratio (OR)	95% confidence interval	P value
Age >50 yrs	256	153	1.33	0.95 - 1.87	0.093
Sex (Males)	326	185	1.08	0.77 - 1.52	0.645
Education attainment illiterate or elementary	225	180	6.10	4.11 - 9.05	<0.0001
Smokers	119	53	0.55	0.37 - 0.83	0.005
Urban residence	368	216	1.39	0.97 - 1.98	0.067
Duration of diabetes >5 years	326	248	8.42	5.73 - 12.39	<0.0001
LDL > 100 mg/dl	377	203	0.78	0.54 - 1.12	0.188
HbA1c value >7%	203	161	5.06	3.40 - 7.53	<0.0001
Hypertension	214	141	2.28	1.61 - 3.2	<0.0001

DISCUSSION

Our study was conducted with desirability to aware primary care physicians as well as health care organizations and health care law makers about the booming burden of diabetes and its related complications mainly micro/macroalbuminiuria.

Our study showed the prevalence around 55%, which was higher than some other studies done in Southern Asian region[18], while some previous studies showed comparable results[19,20]. Studies, which showed lower prevalence of albuminuria, were probably due to enrollment of patients

who were already on ACEI or ARBs[18].

The predictors for micro/macroalbuminuria like old age (>50 years), higher HbA1c, duration of diabetes >5 years was also found to be significant in comparable studies[18,21]. In contrast to other studies, male gender did not prove itself as an independent predictor of micro/ macroalbuminuria[16]. Moreover, other parameters like smoking, the lower educational attainment and urban residence that were found to have important impact as predictors of micro/ marcoalbuminuria was not well studied in other studies and probably our study is first published paper in our region, which included these parameters.

Dyslipidemia mainly higher LDL level interestingly didn't have significant influence on nephropathy and this result was comparable with some studies done on Asian people[18,21].

Our study also recommended that T2DM patients with coexisting hypertension have a higher prevalence of albuminuria. As T2DM patients are likely to develop hypertension earlier than general population, it will be prudent for physicians to screen, control and treat diabetic nephropathy in T2DM patients early in the course of the disease[22].

CONCLUSION

On conclusion, the vulnerability of diabetes as a metabolic disease is more devastating among patients with micro/ macroalbuminuria. Preventing the progression of albuminuria is a key action in controlling nephropathy, retinopathy and cardiovascular diseases. The asset of this study lied in the medical novelty of tracing patients with micro/macroalbuminuria and emphasize on some of its predictors despite some limitations.

Limitations of Study

The following limitations have been identified in this study.

1. Locale of study: The study was performed only in one center of major Western City of Nepal, so basically focused on patients who have easy access to health care system. Authors recommend similar studies including more rural areas.
2. Follow up: Study limits further follow up of those patients who were found to have high risk of developing diabetic nephropathy. Study also lacks to show the influence of risk factor modification in the regression of micro/macroalbuminuria.
3. Study doesn't take consideration of other risk factors like obesity, high sensitive CRP, uric acid or homocysteine level.

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Pattern of Ocular Diseases in Gandaki Medical College Teaching Hospital, Pokhara, Nepal

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ABSTRACT

Objectives: This study was done to identify ocular morbidity among patients attending ophthalmology OPD. These data will be helpful for the hospital management to make improvements in the development of the department.

Methods: This is a retrospective study carried out at Gandaki Medical College Teaching Hospital and Research Centre to find out the ocular morbidity among patients attending ophthalmology OPD. All the patients attending the eye clinic were thoroughly examined, diagnosed and treated as according to the disease protocols. The patients requiring laser therapy and surgery for different retinal diseases were referred to the concerned center. Total of 32740 eyes of 16370 patients were included in the study. Age varied from few weeks to 98 years.

Results: Among 16370 patients examined in the ophthalmology OPD, 6126 patients had ocular disease and the remaining patients were referral from other departments for screening of retinopathies, ocular causes of headache and few others were for routine eye screening. The common eye diseases diagnosed were refractive error (7.57%), presbyopia (3.64%), conjunctivitis (4.92%), dry eye (3.89%), pterygium/ pinguecula (3.75%), cataract (1.92%), pseudophakia (0.89%), posterior capsular opacity (0.62%), glaucoma (0.29%), diabetic retinopathy (0.23%), dacryocystitis (0.22%). Out of 16370 patients, 10244 patients had no any ocular morbidity. They were referred for screening of retinopathy and other ocular diseases.

Conclusions: Refractive error was commonest eye disorder followed by conjunctivitis, dry eye syndrome, degenerative disease but the prevalence of leading causes of blindness like cataract, glaucoma, diabetic retinopathy, age related macular degeneration and external eye disease were very low. The Hospital requires awareness programs related to the awareness of the facilities for eye diseases in the Hospital in the Pokhara valley and the other areas surrounding it. This study on pattern of ocular diseases in Gandaki Medical College Teaching Hospital will help the ophthalmology team and also the management to improve service delivery in the clinic.

Keywords
Conjunctivitis, Gandaki Medical College Teaching Hospital, Ocular diseases, Refractive error.

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INTRODUCTION

The first global estimate of the extent of visual impairment in 1975 indicated that there were 28 million blind people. In the 1990s, it was estimated that the global population was likely to increase from 5.8 billion in 1996 to 7.9 billion by 2020, and most of the increase was expected to occur in the developing world. These population growth projections were used in turn to estimate the expected increase in the number of blind people. Estimates based on the 1990 world population indicated that there were 38 million blind people and almost 110 million with low vision. This estimate was later extrapolated, first to the 1996 world population (45 million blind and 135 million people with low vision) and then to the projected 2020 population (76 million blind). These estimates indicated that the global extent of visual impairment would double in the period 1990-2020[1].

The estimated prevalence of blindness in 1990 ranged from 0.08% of children to 4.4% of persons aged over 60 years, with an overall global prevalence of 0.7%. It was also estimated that at least seven million people become blind each year and that the number of blind people worldwide was increasing by one to two million per year[1].

Of the estimated 45 million cases of blindness by 1996, approximately 60% were due to either cataract (16 million people) or refractive error. A further 15% were due to trachoma, vitamin A deficiency, another 15% due to diabetic retinopathy or glaucoma. The remaining 10% of cases were attributable to age related macular degeneration (ARMD) and other eye diseases. In view of the proportion of treatable eye diseases or treatable causes of blindness, such as cataract, trachoma and some eye conditions in children, it was estimated that 75% of all blindness in the world could have been avoided[1].

The global estimates of treatable cause of blindness are similar to the different eye diseases of Nepal. Nepal is a developing country where health services are not accessible to majority of the population. The eye care facilities, number of eye care centers, the doctors, health care professionals in Nepal required for diagnosis and treatment of eye diseases is limited and not accessible to the required population.

Gandaki Medical College Teaching Hospital located in Pokhara City in Western region of Nepal has well established highly equipped eye clinic, qualified doctors, assistants and well maintained operating theatre.

The objective of the study was to find out current pattern of ocular morbidity in Gandaki Medical College Teaching Hospital and Research Centre and to make recommendations to the hospital management for improvements in the clinic in respect of equipment and manpower. Also the study aimed to prevent the preventable and treat the treatable causes of blindness so as to achieve the goal of vision 2020 act of World Health Organization.

METHODS

This was a retrospective study conducted in Gandaki Medical College Teaching Hospital and Research Centre, Pokhara, Nepal, done from 2012 January to 2015 January. Total 16370 patients were examined and 6126 had ocular morbidity.

All the patients who attended the eye clinic of the hospital were included and enrolled for the study. The data were collected from the register in the ophthalmology outpatient department and were analyzed retrospectively. The study was approved by ethical committee. An informed consent taken from each patient was also recorded.

All the patients were examined by two ophthalmologists who run clinic six days in a week. For each patient distance and near visual acuity was taken and recorded using Snellen or illiterate E chart and Near chart except when it was not possible e.g. in infants and pre-school children. Refractions were done by ophthalmic assistant, when vision was less than 6/6. The patients requiring spectacles were referred to the optical laboratories. Anterior segment was examined with the slit lamp bio microscope, torch and loupe. Posterior segment was examined using indirect lenses, direct and indirect ophthalmoscope with the pupils dilated. In patients requiring special additional investigations, they were carried out like Schirmer's test, tear film break up time, fluorescein staining of cornea, Goldmann applanation tonometry for measuring intraocular pressure, evaluation of ptosis and proptosis, syringing and probing to rule out lacrimal duct blockage, retinal function test and orthoptic tests. Patients requiring minor and major ocular surgical procedures were performed in Gandaki Medical College Teaching Hospital operating theatres. Patients requiring referrals to the higher centers especially for the laser and retinal surgeries were referred accordingly.

Also the patients requiring medical treatment and management of other health problems were referred to different departments according to the Hospital protocol. Statistical analysis was done using SPSS software 11.7 version. A statistician was consulted.

RESULTS

A total of 32740 eyes of 16370 patients were examined from 2012 January to 2015 January. Females patients were 9036 (55.2%) and males 7334 (44.8 %). Majority of patients (3558; 21.8%) were of age group between 21 and 30 years and 243 patients (1.48%) were above 80 years. Patients below 10 years of age were1139 (6.9%).

Table 1: Age distribution of patients in ophthalmology department of Gandaki Medical College Teaching Hospital and Research Centre from 2012 to 2015

Age group	Year 2012	Year 2013	Year 2014	Year 2015	Total
0 - 10	282	195	425	237	1139
11 - 20	758	607	911	484	2760
21 - 30	903	724	1299	632	3558
31 - 40	618	558	1016	491	2683
41 - 50	603	488	803	374	2268
51 - 60	508	372	622	257	1759
61 - 70	305	236	486	184	1211
71 - 80	151	142	344	112	749
81 - 90	51	46	97	40	234
>90		8		1	9
Total	**4179**	**3376**	**6003**	**2812**	**16370**

Table 2: Sex distribution of patients in ophthalmology department of Gandaki Medical College Teaching Hospital and Research Centre from 2012 to 2016

	2012	2013	2014	2015	Total
Males	1875	1587	2588	1284	7334
Females	2304	1789	3415	1528	9036
Total	4179	3376	6003	2812	16370

Table 3: Percentage distribution of patients in different age groups

Age group	Total patients (2012 to 2015)	Percentage
0 - 10	1139	6.9%
11 - 20	2760	16.9%
21 - 30	3558	21.8%
31 - 40	2683	16.4%
41 - 50	2268	13.8%
51 - 60	1759	10.7%
61 - 70	1211	7.43%
71 - 80	749	4.6%
81 - 90	234	1.42%
>90	9	0.05%
Total	16370	

Table 4 shows different ocular diseases diagnosed and managed in Gandaki Medical College Teaching Hospital and Research Centre. Among the eye diseases diagnosed majority had refractive error 7.57% (Males = 3.57% and females = 4%), 4.92% conjunctivitis (Males = 2.4% and females = 2.52%), 3.89% had dry eye syndrome (Males = 1.68% and females = 2.21%), pinguecula and pterygium 3.75% (Males = 2.1% and females = 1.65%), presbyopia 3.64% (Males = 2.1% and females = 1.54%), cataract 1.92% (Males = 0.67% and females = 1.25%), pseudophakia 1.7% (Males = 81% and females = 0.89%), hordeolum, chalazion, blepharitis, trichiasis and other external eye diseases 2.33%. Patients included in trauma including blunt trauma, laceration, abrasion and foreign body in the eye were 2.93%. Patients with retinal disease which included retinal detachment, age related macular degeneration (ARMD), vitreous floater, chorioretinal scar, hypertensive and diabetic retinopathy were 0.97%. Patients with glaucoma were 0.72% (Males = 0.43% and females = 0.29%). Patients with keratitis were 0.28% (Males = 0.2% and females = 0.08%). Patients with posterior capsular opacity were 1.19%. Patients who had no any ocular morbidity were 10244. Most of them were referred for routine eye screening to rule out refractive error, ocular causes of headache, diabetic and hypertensive retinopathy. Five patients had optic neuritis, three had color blindness and five had sight and life threatening papilledema.

Table 4: Pattern of ocular morbidity

Diseases	Males	Females	Total	Males %	Females %	Total %
Refractive error	585	635	1220	3.57%	4%	7.57%
Presbyopia	344	253	597	2.10%	1.54%	3.64%
Conjunctivitis	393	413	806	2.40%	2.52%	4.92%
Dry eye syndrome	276	363	639	1.68%	2.21%	3.89%
Pterygium/ Pinguecula	345	271	616	2.10%	1.65%	3.75%
Cataract	110	205	315	0.67%	1.25%	1.92%
Corneal foreign body	132	122	254	0.80%	0.74%	1.54%
Hordeolum/ Chalazion	71	96	167	0.43%	0.58%	1.01%
Pseudophakia	134	147	281	0.81%	0.89%	1.7%
Trauma	128	100	228	0.78%	0.61%	1.39%
Episcleritis/ Scleritis	32	31	63	0.19%	0.18%	0.37%
Glaucoma	72	48	120	0.43%	0.29%	0.72%
Keratitis	33	13	46	0.20%	0.08%	0.28%
Amblyopia	9	4	13	0.05%	0.02%	0.07%

Diseases	Males	Females	Total	Males %	Females %	Total %
Retinal detachment	7	11	18	0.04%	0.07%	0.11%
ARMD	24	14	38	0.14%	0.09%	0.23%
VItreous floater	8	3	11	0.05%	0.02%	0.07%
Chorioretinal scar	3	1	4	0.02%	0.01%	0.03%
Dacryocystitis	25	36	61	0.15%	0.22%	0.37%
Diabetic retinopathy	28	39	67	0.17%	0.23%	0.4%
Ophthalmia neonatarum	27	13	40	0.16%	0.08%	0.24%
Blepharitis/ Trichiasis/ Meibomitis	69	87	156	0.42%	0.53%	0.95%
Anterior uveitis	17	12	29	0.10%	0.07%	0.17%
Papilloedema	3	2	5	0.02%	0.01%	0.03%
Posterior capsular opacity	93	101	194	0.57%	0.62%	1.19%
Strabismus	39	12	51	0.24%	0.07%	0.31%
Retinitis pigmentosa	4	1	5	0.02%	0.01%	0.03%
Phthisis bulbi	4	1	5	0.02%	0.01%	0.03%
Aphakia	31	22	53	0.19%	0.13%	0.32%
Hypertensive retinopathy	11	5	16	0.07%	0.03%	0.1%
Color blindness	2	1	3	0.01%	0.01%	0.02%
Optic neuritis	2	3	5	0.01%	0.02%	0.03%
Total	3061	3065	6126			

DISCUSSION

Gandaki Medical College Teaching Hospital and Research Centre, located in the central and near busy road of Pokhara valley, Western region of Nepal. This hospital is easily accessible by the residences in and near Pokhara valley. So neither male nor female patients' has to be dependent on their spouses to approach the Hospital premises. This might be the reason for female preponderance in the study. Similar results were observed in the research done by Olukorede O Adenuga *et al* in Nigeria[2], a developing country like Nepal. Females were common in research done by national blindness survey where the survey took place at the rural areas thereby enabling the females for easy access to eye care services. Also a research performed in rural area of Western region of Nepal, nearby Pokhara valley by SaritaTuladhar[3] also had similar female preponderance. Similarly study done by Sapkota YD *et al* in Gandaki zone[4] and by A Sherchan *et al* in Lumbini and Chitwan districts of Nepal[5] had female preponderance of the total patients examined. The result of female patients more than males is different as compared to the studies done in the other Hospitals and research centers.

Most of the patients in the study were adults (21 - 50 age group). This might be due to the closeness of the hospital with the bank, shopping malls, different Government offices, and colleges. The study shows that the patients visiting the eye clinic belongs to working population. The results also showed that adults have more ocular problems than children[6]. Ajaiyeoba[6] reported a similar trend though differences observed in the study were not statistically significant. A likely explanation for this is that children may not be able to adequately articulate their problems and hence may not present to the hospital until the features are prominent enough to be noticed by their parents or guardians. Also the parents, school teachers and the children need awareness of sight threatening eye diseases and the importance of eye screening.

The study results 7.57% refractive error as a major ocular morbidity similar to the study by Bastola P[7] in the Western hilly region of Nepal. Similar results were shown in the study of Sarita Tuladhar *et al*[3] in the rural part of Western Nepal[8]. Ayaniniyi AA *et al*[6] explained in their study that the uncorrected refractive error constitute important ocular health problem across the globe. Refractive error has major impact on quality of life and has educational and socioeconomic consequences. Most of the patients approximately 56% included in the study were of 11 - 40 age group. Most were working population and the students of colleges and few from high schools. The impact of uncorrected refractive error and its impact on their education and work might have involved them in the study of the Hospital. This study differed from Nepal blindness survey as well as other studies conducted in Eastern Nepal because refractive error in the above mentioned studies accounted for minor proportion of ocular morbidity. This study has shown increased number of cases of refractive error, which shows changing pattern of ocular morbidity in Nepal from those days to the present era[7]. It might also be due to higher number of school and college going students with working population enrolled in the study.

Conjunctivitis which includes all viral, bacterial, allergic is the second commonest ocular disease in the study. Conjunctivitis was also commonest in the study performed in Gazipur by Murad MAU *et al*[9]. Allergic conjunctivitis was common followed by viral and then bacterial was

commonest in the study. Allergic conjunctivitis was the commonest in the study performed by Olukorede O Adenuga *et al* in Nigeria[2]. Few other studies done in Nigeria also have suggested allergic conjunctivitis as the leading cause of ocular morbidity. Pokhara being the second hugely populated city of Nepal is growing with more small industries, more financial sectors, more schools and colleges and above all it is increasing in the vehicle and pollution related to it. This explains the cause of more communicable viral conjunctivitis, infectious bacterial conjunctivitis and allergic conjunctivitis secondary to exposure to dust and polluted windy weather. This result agrees with the other Hospital based studies as well as school eye health surveys that have also reported it as either the commonest or the second most common cause of eye disease[10].

Presbyopia though included in the study (Table 4), is not an ocular disease; it is the natural process in which there is loss of accommodation of the lens. Only 593 patients among 5238 patients (40 - 70 age group) with males more than females presented to the eye OPD with presbyopia. Male preponderance is due to the male dominance in all the working sectors of Pokhara Valley.

Patients examined in the study having dry eye syndrome were 3.89% (Females = 2.21% and males = 1.68 %). Aqueous tear deficiency due to decrease in blinking rate, increase in exposure to different rays, hot and dry climatic conditions is the common causes of dry eye diseases. Degenerative conditions of conjunctiva like pterygium and pinguecula were (3.75%) the fourth common eye disease in this study. Pterygium and pinguecula is particularly prevalent in tropical and subtropical areas of the world with chronic ultraviolet light exposure attributed as a major cause. Similar high prevalence was also mentioned by Bastola P[7] in his study mentioning that more middle age group was examined; the exposure in the field for agriculture and other purpose might be the reason for higher prevalence.

External eye diseases, which include hordeolum, chalazion, meibomitis, blepharitis, and other eyelid disorders were detected in 2.33% of the patients. Anterior uveitis was seen in 0.17% and keratitis with corneal ulcer in 0.28%.

Ocular trauma has been given importance in recent days. As in the study performed by Asaminew T *et al* in Ethiopia[11], ocular trauma was the fourth leading cause of ocular morbidity. But in this study only 1.39% of patients admitted in the Hospital were due to ocular trauma. Trauma were eyelid laceration, corneal abrasion, blow out fracture, open globe injury, sclera corneal laceration. Majority of cases of eye trauma were due to blunt injuries.

Retinal diseases like retinal detachment was seen in 0.11% of patients, vitreous floater in 0.07%, chorioretinal scar 0.03%, hypertensive retinopathy in 0.1%, retinitis pigmentosa in 0.03%.

Blurring of vision due to optic neuritis was seen in 0.03%, due to aphakia in 0.32%, due to papilloedema in 0.03%, due to amblyopia in 0.07%. These results were very low in correlation with the different eye Hospitals of Nepal. This might be due to limited facilities and manpower in the hospital for this kind of eye diseases. Though many patients were referred to the Ophthalmology OPD of Gandaki Medical College Teaching Hospital, only few were diagnosed as diabetic retinopathy (0.4%). The Hospital has limited facilities for diagnosing and treating the retinal diseases. The Hospital lacks fluorescein angiogram, fundus photo, laser therapy and especially drugs like anti-VEGF compared to the other hospitals in the Pokhara valley which might be the reasons for lesser number of patients related to retina. Similarly though worldwide prevalence is higher, lesser number of patients were diagnosed and treated for age related macular degeneration (ARMD) due to lack of diagnostic optical coherence tomography.

Glaucoma, leading cause of ocular blindness worldwide[1] were detected in 0.72% in this study. This percentage is low as compared to the other eye hospital. One of the reason for low morbidity of glaucoma is the age group enrolled in the study. Most of the population enrolled in the study is younger age group and glaucoma is group of disorders with progressive optic neuropathy and usually diagnosed in the older age group more than 50 years old.

The prevalence of cataract in the study was found to be very low as compared to other studies, like Nepal blindness survey, where cataract was the commonest ocular morbidity as well as the commonest cause of blindness in Nepal. While the recent blindness surveys done in Nepal, like Gandaki blindness survey[4], as well as Lumbini blindness survey[5]; they all have found cataract is still the leading cause of ocular morbidity as well as the commonest cause of blindness in Nepal. This low prevalence rate of cataract similar to the study done by Bastola P[7] was probably due to younger age group of study population included. Also the low prevalence is due to many local and regional organizations working in coordination with the eye Hospitals for treating cataract and also due to different free eye surgical camps organized by the Hospitals in the regions near Pokhara valley.

No any cases of trachoma and vitamin A deficiencies might be due to national strategy and national programs for eradication of the disease.

CONCLUSIONS

Majority of the population in the study was of age group 11 to 50 years old. Refractive error was commonest eye disorder followed by conjunctivitis, dry eye syndrome, degenerative disease but the prevalence of leading causes of blindness like cataract, glaucoma, diabetic retinopathy, age related macular degeneration and external eye disease were very low. This indicates that the Hospital lack facilities and manpower required for diagnosing and treating these diseases. Also the Hospital requires awareness programs related to the awareness of the facilities for eye disease in the Hospital in the Pokhara valley and the other areas surrounding it. This study on pattern of ocular diseases in Gandaki Medical College Teaching Hospital will help the ophthalmology team and also the management to improve service delivery in the clinic. Also this study will serve as a source of revenue generation for the hospital.

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Accuracy of Birth Weight Prediction by Radiologist at Gandaki Medical College Teaching Hospital, Pokhara, Nepal

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Keywords
Fetal weight, Hadlock's formula, Ultrasound.

Abbreviations

ABW	Actual birth weight
EBW	Estimated birth weight

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ABSTRACT

Background: Knowledge of the weight of the fetus *in utero* is important for the obstetricians to decide the time and mode of delivery which in turn has significant bearing in the perinatal outcome.

Objectives: To compare the accuracy of sonographic methods of predicting fetal weights at term with actual birth weight.

Methods: This is the prospective hospital based study done at Gandaki Medical College Teaching Hospital, Pokhara, Nepal from July 2014 to December 2014. Total 150 women with full term singleton pregnancy leading to live birth were included in this study. A semi-structured proforma was developed to fill necessary data. Database of ultrasound prior to delivery was recorded for fetal weight estimate. Delivery charts were reviewed for actual birth weight. Inaccuracy in assessment was calculated using statistical software SPSS 21.

Results: The study revealed that fetal ultrasound using Hadlock's formula has error in estimation of fetal weight by about 290 gm ±240 gm. In 29.33% of the cases, there is an error of estimation by more than 10% compared to actual birth weight.

Conclusions: The error in sonographic estimation of fetal weight was 0.29 kg ±0.24 kg. Though it is not advisable to depend fully on ultrasound for the assessment of fetal weight but consultant radiologist could estimate close to actual birth weight. Combined with clinical examination the approximation index can be even superior.

INTRODUCTION

The fetus *in utero* is important for the obstetrician to decide on the mode of delivery. Assessment of fetal weight is vital and universal part of antenatal care, not only in the management of labor and delivery but often during the delivery management of high risk pregnancies and growth monitoring[1]. Birth weight of an infant is the single most important determinant of newborn survival[2,3], both low and excessive fetal weights at the delivery are associated with an increased risk of newborn complication during labor and puerperium.

Various formulae have been used ultrasonographically to assess fetal weight estimation. The Hadlock formula is pre-programmed in the ultrasound machine used in our department. This uses the fetal bi-parietal diameter, fetal head circumference, the fetal abdominal circumference

and the fetal femoral length in the equation to estimate the fetal weight. This formula has shown to be most predictive in studies[1,4]. Most recent a three dimensional ultrasound can be used to improve reliability of weight measurements[3]. Limiting the potential complications associated with the birth of both small and excessively large fetuses required that accurate estimation of fetal weight occurs before decision to deliver is made[5].

METHODS

This prospective hospital based study was carried out at the Department of Radiology with collaboration of Department of Obstetrics and Gynecology at Gandaki Medical College Teaching Hospital and Research Centre, Pokhara, Nepal. The study population was mothers with singleton term pregnancy in cephalic presentation, admitted either for normal vaginal delivery, elective cesarean section, or induction of labor. The participants had their ultrasound scan between 37 weeks of gestation to 41weeks of gestation.

Exclusion criteria included unbooked women, polyhydramnios, preterm labor, abnormal lie and presentation, multiple pregnancies, antepartum hemorrhage and eclampsia, obvious congenital anomaly, oligohydramnios, uterine fibroids, and poor visualization of fetal parts.

A total of 150 mothers participated in the study over a period of six months from July 2014 to December 2014. Information on the study was given to the participants who voluntarily decided whether or not to enroll on the study, after the approval by Hospital Research and Ethics Committee. Informed consent was obtained from all participants before the study.

The ultrasound machine used was real-time with abdominal sector 3.5 MHz transducer. The ultrasound machine formula for estimating fetal weight was that devised by Hadlock on the basis of biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC), and femoral length (FL**).** After delivery, the birth weights of the babies were determined within 30 minutes of delivery. All data obtained during the study period were entered into a semi structured proforma specifically designed for the study. Information on age, gestational age, and parity was obtained from participants and case files before delivery. All of the data analysis was done using Microsoft SPSS version-21, a windows based statistical program.

RESULTS

The study included 150 patients, with gestational age between 36 - 40 weeks and mean gestational age at delivery 38.17 (SD 1.08) weeks. The mean age was 25.03 (SD 4.59) years with age range 20 - 40 years. The range of actual birth weight was 1.5 - 3.9 kg with a mean of 2.95 (SD 0.42) kg (Table 1).

The mean error in the estimation of birth weight was 0.21 kg (CI: 0.17 - 0.24 kg) (Table 2). In 57% of the cases, fetal ultrasound overestimated the birth weight (Table 3). In average, ultrasound over estimated by 0.30 kg (CI: 0.24 - 0.36 kg) (Table 2). Fetal ultrasound underestimated the birth weight in 50% of the cases (Table 3). Fetal ultrasound underestimated the birth weight by 0.32 kg (CI: 0.24 - 0.39 kg) (Table 2). Forty four (29.33%) out of 150 estimated were more than 10% of actual birth weight (ABW).

Table 1: Maternal and infant demographics

Characteristics	Mean (Range)	Standard Deviation (SD)
Maternal age (In years)	25.03 (20 - 40)	4.59
Gestational age at delivery (In weeks)	38.17 (36 - 40)	1.08
Actual birth weight (In kgs)	2.95 (1.5 - 3.9)	0.42
Estimated birth weight (In kgs)	2.97 (2.20 - 4.00)	0.33

Table 2: Mean error in birth weight prediction

Characteristics	Mean (kg) ±SD	95% Confidence Interval (CI) (kg)
Overestimate	0.30 ±0.29	0.24 - 0.36
Underestimate	0.32 ±0.23	0.24 - 0.39
Accurate	0.29 ±0.24	0.28 - 0.30
Overall	0.21 ±0.24	0.167 - 0.244

Table 3: Error Estimation

Characteristics	Number (Percentage)
Birth weight estimation	
1. Overestimate	57 (38%)
2. Underestimate	50 (33.33%)
3. Accurate	43 (28.67%)
Estimation error ≥10% of ABW	44 (23.33%)

DISCUSSION

The accurate prediction of fetal weight has been a big challenge, it is well known that fetal weight cannot be measured directly; it has to be estimated from fetal and maternal anatomical characteristics. Thus various methods are available for assessment, however currently available methods for assessing fetal weight are subjected to predictive errors. Most of the studies compare the accuracy of clinical and ultrasound estimation of fetal weight, some about methods of weight estimation.

The mean of ultrasonic weight estimation was 2.97 ±0.34 kg, when the result was compared with actual birth weight, it was found that actual birth weight was not significantly different. Our study has found that USG has an error of about 0.21 ±0.24 kg in estimation of the fetal weight. In 29.33% of the cases, there is an error of estimation by more than 10% compared to actual birth weight, which is better when compared to another study[10]. Chauhan *et al* also showed that sonographic EBWs predicted correctly for 58% with estimation error ≥10% of the ABWs. He also reported a mean absolute weight error of 0.367 kg and mean absolute error of 10.3 which is higher than our study[11].

Determination of weight within 10% of actual birth weight is considered acceptable accuracy[7,8]. Our study has found that USG has an error of about 0.320 kg in estimating the fetal weight which is almost similar to the other study[3]. Ultrasound underestimated the actual weight in 36.67% of cases and overestimated 56% of cases.

CONCLUSIONS

The error in sonoghraphic estimation of fetal weight was 0.29 kg ±0.24 kg. Though it is not advisable to depend fully on ultrasound for the assessment of fetal weight this study shows that the consultant radiologist could make estimate close to the actual birth weight. Combined with clinical examination the approximation index can be even superior.

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A Study on Histopathological Spectrum of Upper Gastrointestinal Tract Endoscopic Biopsies and its Correlation with Endoscopic Findings

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ABSTRACT

Introduction: Upper gastrointestinal tract disorders are one of the most commonly encountered disorders in clinical practice and they account for great deal of morbidity and mortality. The use of endoscopes for the visualization of gastric mucosa has improved over times and in taking biopsy for histopathological confirmation. This study sets to determine the histopathological pattern of gastric pathology in dyspeptic patients and correlation with endoscopic findings.

Objectives: To determine the spectrum of histopathological lesions of upper gastrointestinal lesion to establish endoscopic biopsies as an effective tool in the proper diagnosis and management of various upper gastrointestinal tract lesions.

Methods: A total of 84 gastric biopsies were studied retrospectively over a period of 20 months from the period of April 2014 to November 2015.

Results: Of the total 84 cases 69 (82.1%) constituted non-neoplastic lesions and 15 (17.9%) had neoplastic pathology. The most common non neoplastic lesion was chronic antral gastritis 41(48.8%). The most common malignancy was adenocarcinoma.

Conclusions: In our study, the commonest site for upper GI endoscopic biopsy was from the stomach 95% with 82% non-neoplastic and 18% neoplastic lesions. Most common neoplasm of the stomach was adenocarcinoma. Out of the 84 cases, there was a consensus between endoscopic and histopathological diagnosis in 58.3% of the cases of antral gastritis. Whenever there was a disagreement, the histopathological appearances served to correct a mistaken endoscopic finding. We therefore conclude that endoscopy is incomplete without biopsy and so the combination of these methods provides a powerful diagnostic tool for better patient management.

Keywords
Biopsy, Endoscopy, Histopathology, Upper GIT.

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INTRODUCTION

Upper Gastrointestinal tract disorders are one of the most commonly encountered problems in our daily life. It is responsible for a great deal of morbidity and mortality. Endoscopic biopsy is common procedure performed in the hospital for a variety of benign and malignant lesions. Stomach can be affected with a wide variety of infections, inflammatory disorders, vascular disorders, mechanical conditions, toxic and physical reactions, including radiation injury and neoplasm[1].

The term gastritis is simply defined as inflammation of the gastric mucosa. It may be predominantly acute, with neutrophilic inflammation, or chronic, with lymphocytes and/or plasma cells predominating and associated with intestinal metaplasia and atrophy[2]. Gastritis has been classified in different ways microscopically. One of the most widely used system is Sydney system for the microscopic reporting of gastritis[2].

Since 1960, after the introduction of endoscopy, it has greatly improved the diagnostic facility because they are readily accessible and can easily be sampled for specific histopathological or microbiologic investigation. The procedure causes minimal discomfort and thus can be repeated. Histopathological study of biopsy specimens are used to confirm endoscopic diagnosis in suspected malignancy or to rule out in the endoscopically benign appearing lesion[3]. As a result, the reasons for obtaining mucosal biopsy from the upper gastrointestinal tract have increased and are no longer performed only for the detection of neoplasm.

After the discovery of *Helicobacter pylori* by Marshall and Warren in 1983 by using Warthin Starry Silver stain, the etiological understanding of chronic gastritis and associated lesions have been revolutionized[4]. *Helicobacter pylori* has been implicated in varied range of gastric lesions including gastritis, peptic ulcer, gastric adenocarcinoma and lymphomas[5]. The bacteria are slender, curved spirals in the superficial mucus layer, where they tend to attach to the epithelium at the site of intercellular junctions[6].

OBJECTIVES

1. To determine the spectrum of histopathological lesions of upper gastrointestinal tract.
2. To establish endoscopic biopsy as an effective tool in the proper diagnosis and management of various upper gastrointestinal tract lesions.

METHODS

The present retrospective study included 84 endoscopic biopsies received at Swastik Referral Laboratory. They were taken from patients who were clinically diagnosed to have an upper gastrointestinal tract lesion needing biopsy, during the period of April 2014 to November 2015. Biopsies obtained were put into a small labeled bottle containing 10% neutral formalin. These specimens were processed and embedded in paraffin wax and were cut into sections of five micrometre thickness. All the slides were stained with hematoxylin and eosin (H & E) and with Giemsa stain wherever required. All the statistical analysis was done using SPSS 16.0.

RESULTS

From April 2014 to November 2015, 84 upper gastrointestinal endoscopic biopsies were received and retrospectively included in this study. Among all the upper gastrointestinal tract biopsies, esophageal biopsy was one (1.3%), gastric biopsies were 80 (95.2%), and duodenal biopsies were three (3.6 %). Out of these 84 cases, 37 (44%) were males and 47 (56%) were females with a female to male ratio of 1.27:1. The age range of patients was from 18 to 87 with a mean age of 48.3 years.

Table1: Age and sex distribution of the study group

Age group	Sex of the patient		Total
	Females	Males	
<25	4	5	9 (10.7%)
26 - 35	5	6	11 (13.1%)
36 - 4 5	6	3	9 (10.7%)
46 - 55	13	2	15 (17.9%)
56 - 65	9	8	17 (20.2%)
66 - 75	6	6	12 (14.3%)
>76	4	7	11 (13.1%)
Total	47	37	84

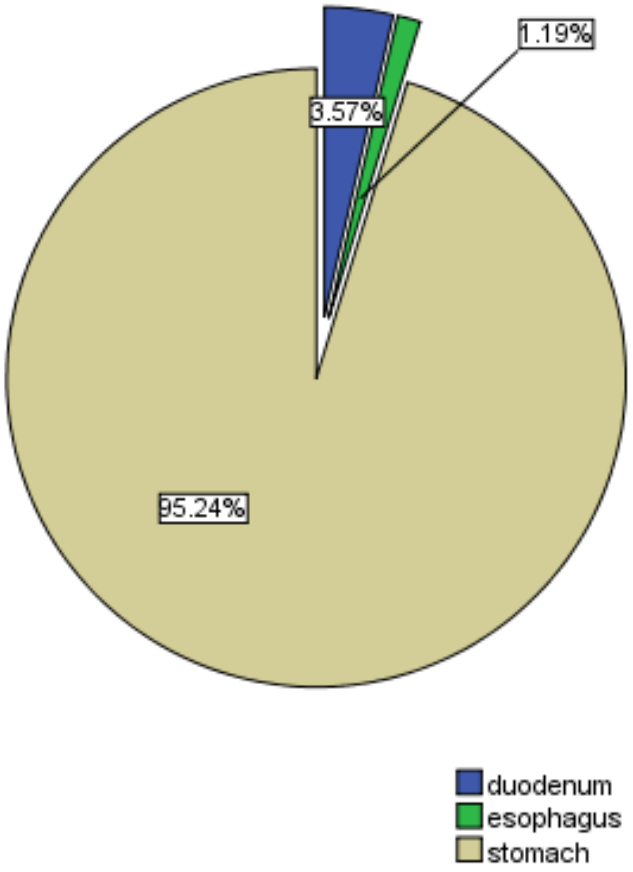
The highest incidence was seen in fourth and fifth decade and the lowest incidence in seventh decade. The youngest patient was 18 years old and the oldest patient was 87 years. Of all the 84 cases, 15 (17.9%) cases were neoplastic, and 69 (82.1%) were non-neoplastic.

Table 2: Distribution of all lesions

Nature of lesion	No of cases	Percentage
Non-neoplastic	69	82.1%
Neoplastic	15	17.9%
Total	84	100%

The common site for gastric biopsy was stomach followed by the duodenum and the esophagus.

Fig 1: Site wise distribution of endoscopic biopsies



The majority of the patients were biopsied for either gastritis or tumor of the stomach. Most common non neoplastic lesions noted were chronic antral gastritis 41 (48.8%), followed by chronic active gastritis 14 (16.7%). Chronic duodenitis was noted in six (7.1%) cases, hyperplastic polyp in four (4.8%) cases, adenomatous polyp was noted in two (2.4%) cases. Erosive gastritis was noted in six (7.1%) cases, gastric ulcer and acute gastritis was noted in one (1.2%) case each. *Helicobacter pylori* was present in 52 (61.9%) cases and absent in 32 (38.09%) cases. Dysplasia was noted in eight (9.52%) cases ranging from mild one (1.2%), moderate five (6.0%) and severe degree two (2.4%). Intestinal metaplasia was noted in five (6.0%) cases only.

Table 3: Age and sex distribution and various endoscopic diagnosis

Histopathological diagnosis	Sex of the patient		Total
	Females	Males	
Chronic active gastritis	4	10	14 (16.6%)
Chronic antral gastritis	25	16	41 (48.8%)
Acute gastritis	0	1	01 (1.2%)
Gastric ulcer	1	0	01 (1.2%)
Erosive gastritis	3	3	06 (7.2%)
Chronic duodenitis	4	2	06 (7.2%)
Hyperplastic polyp	3	1	04 (4.8%)
Fundic polyp	1	0	01 (1.2%)
Adenomatous polyp	2	0	02 (2.4%)
Positive for adenocarcinoma	4	4	08 (9.6%)
Total	47	37	84

Among the 15 neoplastic cases, malignant lesion exceeded the benign lesions. Of the total seven cases of benign lesions, there were four (4.8%) cases of hyperplastic polyp, two (2.4%) cases of adenomatous polyp and one (1.2%) case of fundic polyp. Among the malignant lesions, all eight (9.5%) cases were moderately differentiated adenocarcinoma.

Distribution of gastric lesions in different age groups is shown in Table 4. The peak age of incidence of gastritis was found in fifth and sixth decade. The highest number of patients were with gastric ulcer followed by erosion, antral gastritis, edematous mucosa and polypoidal growth.

Table 4: Distribution of gastric lesions as per age group

	Endoscopic findings											
Age group	Gastric outlet obstruction	antral gastritis	biliary reflux	circmuferential mass	duodenal ulcer	edematous mucosa	erosion	fungating growth	gastric ulcer	growth in the antrum	polyp	Total
<25	0	3	0	0	0	2	1	0	0	0	3	9
26 - 35	0	3	3	0	0	3	0	0	0	0	2	11
36 - 45	0	0	3	0	1	1	2	0	1	0	1	9
46 - 55	0	1	1	0	0	2	5	0	4	0	2	15
56 - 65	1	2	0	0	0	3	3	0	3	1	4	17
66 - 75	2	3	0	0	1	1	1	0	2	2	0	12
>76	1	0	0	1	2	0	1	1	5	0	0	11
Total	4	12	7	1	4	12	13	1	15	3	12	84

The correlation between endoscopic findings with the

histological findings is shown in Table 5. According to the endoscopic findings, out of 84 cases, 15 (17.9%) cases had gastric ulcer, 13 (15.6%) cases had erosion, 12 (14.3%) cases had antral gastritis, 12 (14.3%) cases had edematous mucosa, seven (8.3%) cases had biliary reflux, four (4.8%) cases had duodenal ulcer, three (3.6%) cases had growth in the antrum, and others had circumferential growth and fungating growth.

Table 5: Correlation between endoscopic and histopathological diagnosis

Endoscopic diagnosis	Histopathological diagnosis										
	Chronic active Gastritis	chronic antral gastritis	chronic duodenitis	Hyperplastic polyp	Positive for adenocarcinoma	Erosive gastritis	acute gastritis	Adenomatous polyp	gastric ulcer	Fundic polyp	Total
Gastric outlet obstruction	1	1	1	0	1	0	0	0	0	0	4
Antral gastritis	4	7	1	0	0	0	0	0	0	0	12
Biliary reflux	4	2	0	0	0	1	0	0	0	0	7
Circumferential mass	0	0	0	0	1	0	0	0	0	0	1
Duodenal ulcer	0	2	2	0	0	0	0	0	0	0	4
Edematous mucosa	5	7	0	0	0	0	0	0	0	0	12
Erosion	0	7	0	0	0	5	1	0	0	0	13
Fungating growth	0	0	0	0	1	0	0	0	0	0	1
Gastric ulcer	0	9	0	0	5	0	0	0	1	0	15
Growth in the antrum	0	3	0	0	0	0	0	0	0	0	3
Polyp	0	3	2	4	0	0	0	2	0	1	12
Total	**14**	**41**	**6**	**4**	**8**	**6**	**1**	**2**	**1**	**1**	**84**

Out of 13 cases of erosion, only five (6%) cases had histological features of erosive gastritis, one (1.2%) had acute gastritis and rest seven (8.3%) had chronic antral gastritis. Three (3.6%) cases diagnosed endoscopically as growth in the antrum had features of chronic antral gastritis microscopically. However, cases with circumferential growth and fungating growth correlated histologically with adenocarcinoma. Four (4.8%) cases diagnosed with gastric outlet obstruction (GOO) in endoscopy were diagnosed as chronic active gastritis, chronic antral gastritis, chronic duodenitis and gastric adenocarcinoma histologically.

Fig 2: Chronic gastritis (H & E stain 400x)

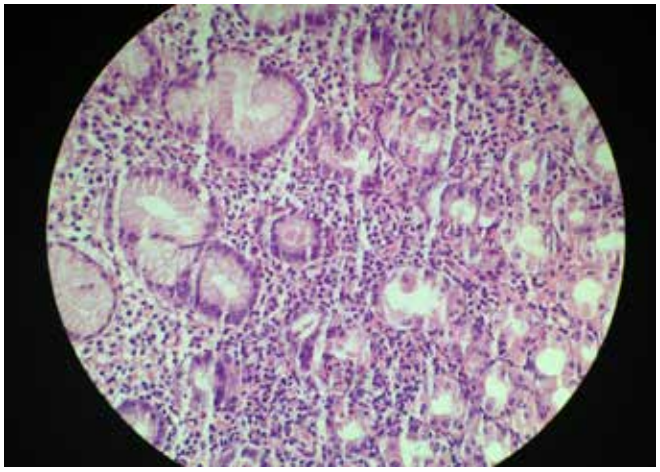


Fig 3: Chronic gastritis with *H.pylori* (Giemsa stain 1000x)

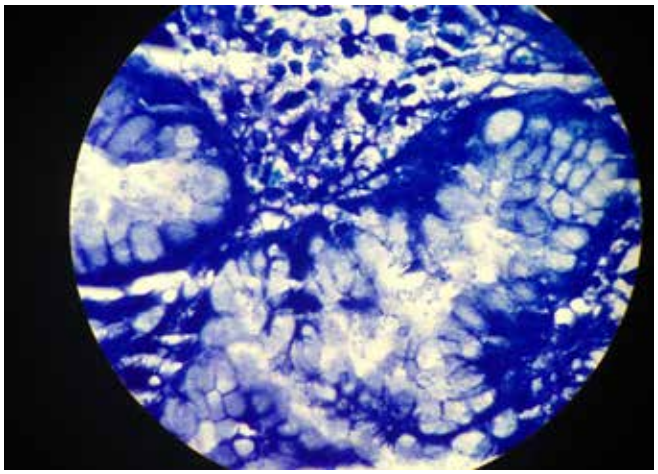
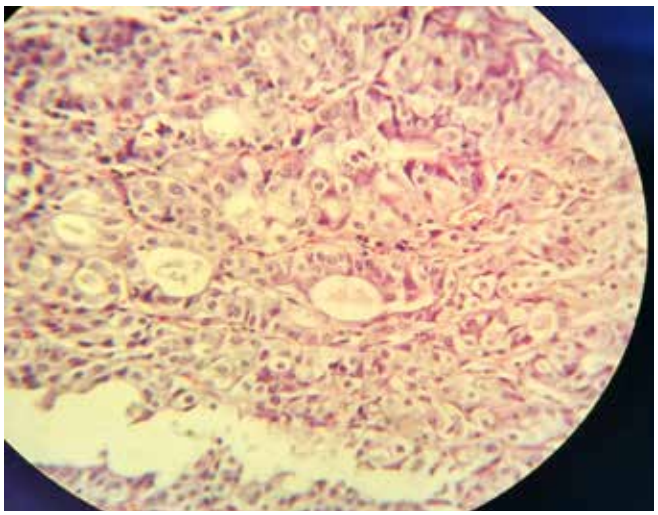


Fig 4: Moderately differentiated adenocarcinoma (H & E stain 400x)



DISCUSSION

The study was conducted from April 2014 to November 2015 and comprised of 84 gastrointestinal biopsies of which one (1.2%) case was esophageal biopsy, 80 (95.2%) cases were gastric biopsies and three (3.6%) cases were duodenal biopsies. The most common site for upper gastrointestinal endoscopic biopsies is from the stomach followed by duodenum and esophagus. The most common indication is to detect the various types of gastritis along with evidence of *Helicobacter pylori* status, gastric ulcer and different tumors.

Of the 84 patients, 37 (44%) were males and 47 (56%) were females with a female to male ratio of 1.27:1. This contradicted with another study done by Shennak MM *et al*[7].

The present study has shown the preponderance of non-neoplastic gastric lesions with 48.8% of chronic antral gastritis and 16.7% of chronic active gastritis which showed similar results with the study by Thapa *et al*[8].

Majority of our cases of chronic antral gastritis (48.8%) showed *Helicobacter pylori* infection and correlated with presence of neutrophils and lymphocytes in the lamina propria which showed similar results with the study by Afzal *et al*[9]. Similarly study by Schultz *et al* showed 87% cases having chronic antral gastritis which is much higher than in our study[10].

In the present study 61.9% cases of gastritis were positive for *Helicobacter pylori*. In other series of study done by Schults *et al***,** overall infectivity by *Helicobacter pylori* was 83% for adult population undergoing upper gastrointestinal endoscopic biopsies for various regions[10].

In the present study 6% cases showed intestinal metaplastic changes, similar with the study of Afzal *et al* which showed intestinal metaplastic changes in 10% of all the cases[9].

In the present study, endoscopic biopsies revealed malignant tumors in eight (9.5%) cases which were clinically also suspected of tumor. A diagnostic yield of over 95% has been claimed for endoscopic gastric biopsy undertaken for a suspicious neoplasm especially of the advanced stage. In a study done by Plummer *et al*, adenocarcinoma was found to be common gastric malignancy which is comparable with our study[11].

Out of 15 (17.9%) cases diagnosed as gastric ulcer in endoscopy, only one (1.2%) case was diagnosed histologically as gastric ulcer, nine (10.8%) had chronic antral gastritis and five (6%) cases were positive for adenocarcinoma. In this study, 58.3% of the cases diagnosed endoscopically as antral gastritis correlated with histological diagnosis. This finding is similar to the study of Levy N *et al*[12]. Their study showed 50% correlation between endoscopic and histological diagnosis of chronic antral gastritis and emphasized that endoscopy alone should not be relied in the diagnosis of gastritis[12].

In our study adenocarcinoma of stomach endoscopically presented as gastric ulcer in 62.5%, followed by gastric outlet obstruction (12.5%), circumferential growth (12.5%) and fungating growth (12.5%) which is similar to the study done by Qizilbash and Stevenson where ulcerative lesion constituted majority (70%) of the cases[13].

Gastric carcinoma is uncommon before the age of 40 years, but, thereafter, its incidence increases with the increasing age, with the peak in the seventh decade. The data reflects the global trend for most part, with the disease in our patients being commonest between 55 to 85 years of the age.

CONCLUSIONS

In our study, the commonest site for upper gastrointestinal biopsy was from the stomach 95.2% with 82.9% non-neoplastic and 17.9% neoplastic lesions. Among the non-neoplastic lesions, mild chronic gastritis was the commonest lesion and adenocarcinoma of the stomach was the commonest among the neoplastic lesions.

Out of the 84 cases, there was consensus between the endoscopic and histopathological diagnosis in antral gastritis in 58.3% of the cases. Whenever there was a disagreement, the histopathological appearances served to correct the endoscopic diagnosis. We therefore conclude that endoscopy is incomplete without biopsy and so the combination of both provides a powerful diagnostic tool for better patient management.

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Socio-demographic Characteristics of Medicolegal Cases: A Hospital Based Analysis in Western Nepal

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ABSTRACT

Background: Emergency Department in any hospital handles various types of emergency cases including the medicolegal ones.

Objectives: This study was undertaken to study the profile of medicolegal cases attended in the Emergency Department of Gandaki Medical College Teaching Hospital, Pokhara, Nepal.

Methods: The study was a retrospective descriptive analysis of all medicolegal cases that came to the Emergency Department of Gandaki Medical College Teaching Hospital, Pokhara, Nepal from 1st Baisakh 2072 (14th April 2015) to 30th Chaitra 2072 (12th April 2016). Information regarding gender, age, time of registration at emergency room, severity and underlying cause were collected from the medicolegal register book.

Results: In the year 2072, a total of 900 cases were registered as medicolegal. It was observed that majority of the cases were males with a male to female ratio of 1.9:1. The bulk of cases fell in the age group of 21 - 30 years (n=269; 29.9%) followed by 10 - 20 years (n= 208; 23.1%). Maximum cases were reported during the 16 - 22 hour interval, 376 cases (41.8%) with a close run by the 10 - 16 hour interval, 337 cases (37.4%). Road traffic accidents were the leading cause of all medicolegal cases registered with a number of 466 cases (51.8%) followed by physical assault, 152 cases (16.9%) and fall injury, 125 cases (13.9%). There were only three cases brought dead (0.3%), and eight (0.9%) cases with patients in unconscious state.

Conclusions: This study shows the profile of medicolegal cases seen at Emergency Department of Gandaki Medical College Teaching Hospital, Pokhara. It can be helpful to the stakeholders of various fields especially law enforcing agencies to outline proper laws and encourage to follow standard guidelines and protocols such that these mishaps though not totally prevented can be reduced in number with proper management in the coming future.

Keywords
Emergency department, Medico-legal case, Nepal.

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INTRODUCTION

Medicolegal case is defined as a case of injury or ailment where an attending doctor after taking history and clinical examination of the patient, thinks that some investigation by law enforcing agencies is essential, so as to fix the responsibility regarding the case in accordance

with the law of the land[1]. Common medicolegal cases include road traffic accidents, alleged cases of physical assault, sexual assault, burns, poisoning, criminal abortion, age estimation, snake/insect bite, industrial accidents, alcoholic intoxication, brought dead etc. Medicolegal cases are usually entertained in the emergency department of any hospital. Besides emergency, small numbers of these cases also make way through outpatient and inpatient departments of the hospital. This kind of studies have been done in different parts of India and Nepal where socio-demographical information regarding medicolegal cases load in Emergency Department have been already elucidated. Unlike other studies, we have attempted in collecting information regarding the state of the victim in such cases at the time of arrival at Emergency Department.

METHODS

The study was a retrospective descriptive analysis of all medicolegal cases that came to the Emergency Department of Gandaki Medical College Teaching Hospital, Pokhara, Nepal from 1st Baisakh 2072 (14th April 2015) to 30th Chaitra 2072 (12th April 2016). Information regarding gender, age, time of registration at emergency room, severity and underlying cause were collected from the medicolegal register. The data obtained were entered in Microsoft excel worksheet and then analyzed. Observations are depicted in tables and graphs.

RESULTS

Emergency Department of Gandaki Medical College Teaching Hospital received a total number of 900 cases throughout the year 2072, which were registered as medicolegal. There were 588 males (65.3%) and 312 females (34.7%) with a clear cut male preponderance by 30.6%. The majority of cases fell in the age group of 21 - 30 years, 269 (29.9%) followed by 208 (23.1%) cases in the 10 - 20 years. Maximum cases were reported during the 16 - 22 hour interval, 376 cases (41.8%) with a close run by the 10 - 16 hour interval, 337 cases (37.4%). Road traffic accidents were the leading cause of all medicolegal cases registered with a number of 466 cases (51.8%), followed by 152 physical assault cases (16.9%), 125 fall injury cases (13.9%), and 57 cases of natural calamities (6.3%). Only one poisoning case (0.1%) was registered throughout the year. There were only three brought dead cases (0.3%) and eight cases (0.9%) with patients in unconscious state.

Fig 1: Gender wise distribution of medicolegal cases (n=900)

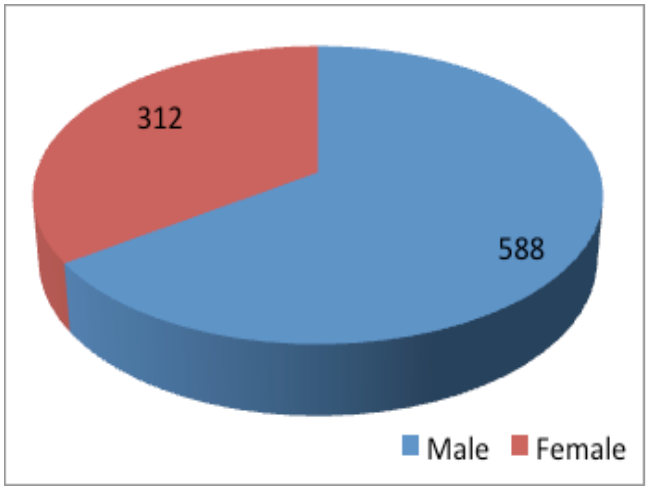


Fig 2: Age wise distribution of medicolegal cases (n=900)

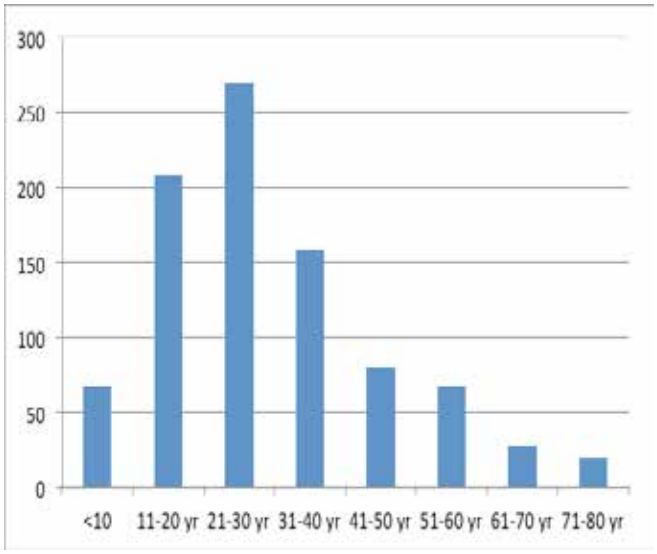


Fig 3: Time interval wise distribution of medicolegal cases (n=900)

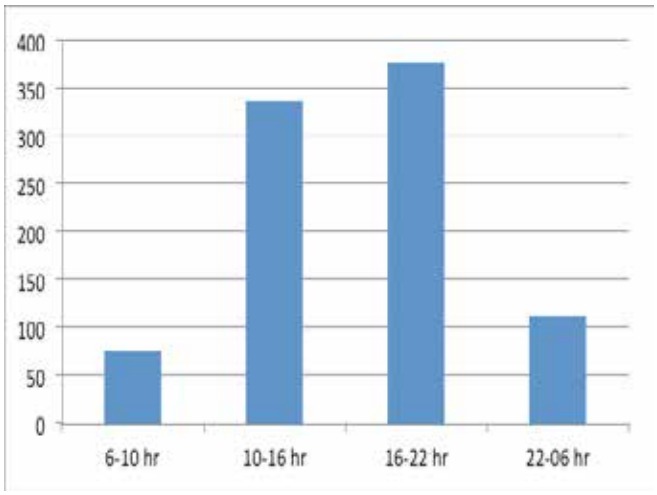


Table 1: Cause wise distribution of medicolegal cases (n=900)

Cause	Total	Percentage
Physical Assault	152	16.9%
Road Traffic Accident	466	51.8%
Natural calamities	57	6.3%
Substance abuse	5	0.6%
Burn	17	1.9%
Poisoning	1	0.1%
Fall injury	125	13.9%
Cut injury	45	5.0%
Miscellaneous	32	3.6%
Total	900	100%

Fig 4: Cause wise distribution of medicolegal cases (n=900)

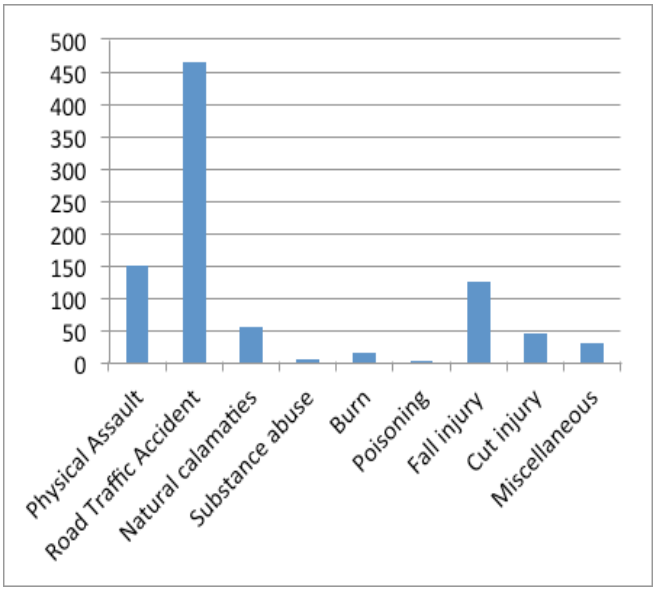
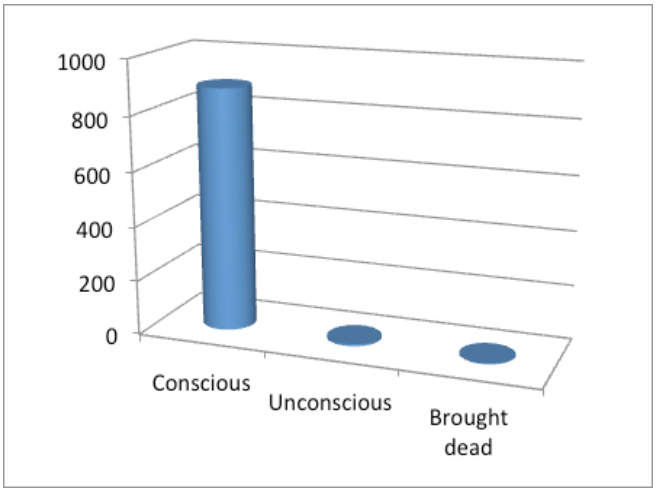


Fig 5: State of victim wise distribution of medicolegal cases (n=900)



DISCUSSION

In the present study maximum number of cases were males (65.3%) which was consistent with studies done by Timsinha *et al*[2], Yadav A *et al*[3], Dileep Kumar *et al*[4], Mahes M *et al*[5], and Saxena A *et al*[6]. The clear cut male preponderance may be due to the fact that they are nature wise more aggressive compared to female counterparts and also due to the fact they are more involved in outdoor activities which make them susceptible to various forms of injuries.

Most cases were in the age group 21 - 30 years (n=269 cases; 29.9%) followed by 10 - 20 years age group (n=208 cases; 23.1%). Similar findings were reported by Timsinha *et al*[2], and Yadav A *et al*[3]. This could be due to the fact that these age group individuals are more enthusiastic and are more involved in outdoor activities. Road traffic accidents stood as the leading cause of medicolegal cases (n=466 cases; 51.8%), followed by physical assault (n=152 cases; 16.9%), fall injuries (n=125 cases; 13.9%), natural calamities (n=57 cases; 6.3%). This finding is consistent with the findings of Timsinha *et al*[2], Dileep Kumar *et al*[4], and Mahes M *et al*[5]. Road traffic accidents being number one cause of medicolegal case could be due to increased number of vehicles especially two wheelers, poor road infrastructure and maintenance, poor city lighting, driving under the influence of alcohol or other agents hampering consciousness of the driver, inefficient drivers etc. There were accountable number of medicolegal cases due to natural calamity which were due to the devastating earthquake on 12th Baisakh, 2072 (25th April, 2015) and multiple aftershocks in the same year. Maximum cases were registered during the 16 - 22 hour interval (376 cases; 41.8%) followed by 10 - 16 hour interval (337 cases; 37.4%). This finding was similar to the study by Saxena A *et al*[6], and Mahes M *et al*[5]. Maximum cases were registered during the 10 - 22 hours interval because people are usually active and awake in this period of time. There were only three brought dead cases (0.3%), eight cases (0.9%) with patients in unconscious state whereas remaining 889 cases (98.8%) were in conscious state. This finding could be due to that major accidents or mishaps causing death of person have not happened in the locality nearby this hospital.

CONCLUSIONS

Emergency Department plays a vital role in treating emergency cases including the medicolegal ones. Each medicolegal case has to be dealt cautiously and diligently with proper observation, documentation and reporting,

following standard protocols and guidelines of the hospital and the country. Majority of medicolegal cases were due to road traffic accidents, followed by physical assault and fall injury. These unwanted events can be prevented by proper education, awareness, and law enforcement required in these sectors. Training of junior doctors, before starting his/her medical practice and in between trainings of old ones handling medicolegal cases is mandatory for the formation a proper judiciary system in a developing country like Nepal.

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Knowledge and Practice Regarding Rabies among People Attending Rabies OPD, Kathmandu

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Keywords
Antirabies vaccine, Knowledge, Practice, Rabies, Zoonotic disease.

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ABSTRACT

Background: Rabies, an invariably fatal viral disease, is transmitted to humans through animal bites, most commonly dogs. Public awareness regarding epidemiology of the disease and merits of prompt and appropriate post exposure treatment is important in preventing the disease

Hypothesis: H_1: There is no association between selected demographic variable with level of knowledge of rabies. H_2: There is no association between people's level of knowledge of rabies and practice after dog bite.

Methods: The study population consisted of 171 people attending rabies OPD of Teku Hospital. Non-probability purposive sampling method was used and data was collected using semistructured questionnaire through face to face interview. Statistical tests used were linear to linear association test, chi square test and Kruskal Wallis test.

Results: The findings unveiled that the mean age of the dog bite victims was 30.26 years and majority were males and had category II wound. Most of the respondents (52%) had moderate level of knowledge. The linear association test showed that there is significant association between the level of knowledge and the type of practice adopted after dog bite.

Conclusions: This study concludes that good knowledge on rabies leads to good practice in prevention of rabies that draws more attention towards community awareness regarding rabies so that the mortality can be prevented.

INTRODUCTION

Rabies, an invariably fatal viral disease, is transmitted to humans through animal bites, most commonly dogs. The disease is preventable through timely pre-and post-exposure vaccination. However, once the disease occurs, death is inevitable[1].

Rabies is a zoonotic disease that is almost always fatal. Globally 55,000 people die from rabies each year. Rabies is present in all continents with the exception of Antarctica, but more than 95% of human deaths occur in Asia and Africa[2].

Rabies is a fatal condition with no cure, but there are preventive interventions to reduce its burden, although they are not well adopted in India. As a result, India has the largest contribution to worldwide rabies mortality[3].

Rabies has been endemic in Nepal since time immemorial. It is a priority zoonotic disease of public health importance in Nepal. Animal rabies is also seen as a major problem in hill and Terai districts of Nepal. Dog is primary source of rabies transmission especially in urban areas whereas wild carnivores are also playing an important role in rabies transmission around national

parks, wildlife reserves and forest areas[4]. It is widely recognized that rabies is grossly under-reported even though it is a notifiable disease and a lack of accurate figures has rendered rabies a low public health and veterinary priority[5].

Knowledge, attitude and practice (KAP) study suggests that there is a need to create awareness amongst the masses regarding epidemiology of the disease and merits of prompt and appropriate post exposure treatment through enhanced information education and communication activities[6].

Poor public awareness towards rabies is considered as one of the bottle necks for the prevention and control of the disease in canine rabies endemic country like Nepal. Understanding communities' awareness of cause, mode of transmission, symptoms, local treatment and possible intervention measures of rabies is an important step towards developing strategies aimed at controlling the disease and determining the level of implementation of planned activities in the future.

METHODS

Descriptive, cross sectional research design was used to find out the knowledge and practice of people regarding rabies. The study was conducted in rabies Out Patient Department (OPD) of Sukraraj Tropical and Infectious Disease Hospital, Teku. This study was carried among people who arrived at the rabies OPD of the hospital for consultation after dog bite. Sample size was calculated using formula n = (z^2*p*(1-p)/t^2) where knowledge prevalence (p) was taken as 0.7%[7]. Corresponding z value was 1.96 and significance level was 95%. Non probability, purposive sampling was used and 171 samples were interviewed using semistructured questionnaire. Only those dog bite victims who came for first visit to the rabies OPD were included in the sample. Data collection was done for four weeks within the period of 1st Baisakh to 2nd Jestha, 2072 (14th April 2014 to 20th May, 2014) after taking written permission from the hospital and respondents.

Knowledge score up to first quartile was considered as inadequate knowledge; within inter quartile range as moderate knowledge and above third quartile as adequate knowledge.

Inadequate knowledge - first quartile- ≤6

Moderate knowledge- inter quartile range- >6 to 14

Adequate knowledge- third quartile- >14

Table 1: Respondents' socio demographic information

Variables	Number	Percentage
Age group in years (n=171)		
(15 - 29)	69	40%
(30 - 44)	75	43.8%
(45 and above)	27	15.7%
Mean ±SD 33.85 ±11.53 (years)		
Sex (n=171)		
Males	106	62%
Females	65	38%
Residence (n=171)		
Rural	87	50.9%
Urban	84	49.1%
Literacy Status (n=171)		
Literate	150	87.7%
Illiterate	21	12.3%
Education Level (n=150)		
Primary	35	23.3%
Secondary	46	30.6%
Higher Secondary and above	69	40.4%
Occupational Status (n=171)		
Service	73	42.7%
Self employed	54	31.6%
Homemaker	22	12.9%
Student	22	12.9%

Table 1 unveils that the nearly half (43.8%) of them belonged to the 30 - 44 years age group. The mean age was 33.85 years and standard deviation 11.53. Gender wise distribution revealed that majority (62%) of respondents were males. Respondents who resided in urban and rural area were nearly equal. Among the literate, majority of the respondents (40.4%) were educated up to higher secondary level. Most of the respondents (42.7%) were service holders, while 31.6% were self-employed which included business and agriculture, minority (12.9%) were homemakers and students respectively.

Table 2: Respondents' knowledge on wound cleaning, antirabies vaccine and dose of antirabies vaccine (n=171)

Variables	Number	Percentage
Knowledge of Wound Cleaning		
Yes	55	32.2%
Knowledge of antirabies vaccine		
Yes	152	88.9%
Knowledge of Dose of Vaccine		
Right dose	63	36.8%

Table 2 shows that 67.8% had no knowledge of wound cleaning and 32.2 % were aware about wound cleaning. Regarding knowledge of antirabies vaccine, majority of respondents (88.9%) were aware about antirabies vaccine although only 36.8% were aware about the correct dose.

Table 3: Respondents' local treatment practices of the wound (n=171)

Local treatment practice	Number	Percentage
Appropriate practice		
Wash the wound	108	63.2%
Inappropriate Practice		
Do nothing	51	29.8%
Dressing	6	3.5%
Apply indigenous material	6	3.5%

Table 3 displays that among 171 dog bite cases, majority of cases (63.2%) adopted practice of washing the wound immediately after dog bite, 3.5% adopted practice of applying dressing to the wound, 29.8% applied nothing to the wound and 3.5% adopted the practice of applying indigenous materials (petrol, turmeric and herbs) to the wound.

Table 4: Respondents' level of knowledge regarding rabies (n=171)

Level of knowledge	Frequency	Percentage
Inadequate	51	29.8%
Moderate	89	52%
Adequate	31	18.1%
Total	171	100%

Table 4 shows respondents' level of knowledge that out of 171 respondents, 51 respondents (29.8%) had inadequate knowledge, more than half (52%) had moderate knowledge and 31 respondents (18.1%) had adequate knowledge.

Table 5: Association between level of knowledge and practice

Level of knowledge	Inappropriate practice (%)	Appropriate practice (%)	*p* value
Inadequate	29 (46.03%)	22 (20.3%)	
Moderate	33 (52.3%)	56 (51.8%)	0.00*
Adequate	1 (1.5%)	30 (27.7%)	
Total	63	108	

*$p \leq 0.05$= statistically significant values

Table 5 displays the association between level of knowledge and type of practice. Linear to linear association test shows that there is significant association between level of knowledge and type of practice of the respondents (p=0.00) at 95% confidence level.

DISCUSSION

Regarding epidemiological characteristics of dog bite cases, the mean age of the victims was 33.85 years. This study revealed that only 34.5% respondents recognized that rabies is not curable and is fatal. Similarly a study reported that 29.9% recognized that rabies is not curable[8].

Regarding the knowledge of antirabies vaccine, majority of the respondents (89%) were aware about antirabies vaccine which is consistent with the finding which states that 86.6% people are aware of antirabies vaccine[9]. In relation to knowledge about wound cleaning as a local treatment practice, only 32.2% had knowledge of wound cleaning which is consistent with the results of a study that 31.9% felt that washing the wound with soap and water was the best option[3]. In relation to local treatment practices after dog bite, 63.2% washed their wound with either plain water or soap and water, 3.5% applied medical dressing, 29.28% did nothing and 3.5% applied indigenous material. This result is supported by a study, which mentioned that 61% washed wound with soap and water or only water, 38% did nothing to their wound[7].

Regarding association between socio-demographic variables and level of knowledge, the significant association was found between residence (p=0.008), occupation (p=0.002), literacy status (p=0.000) and education level (p=0.000) of respondents. These findings are consistent with the findings of a study that level of knowledge is statistically significant with socio demographic variables like educational level and occupation and sex[10]. Regarding association between the level of knowledge and the type of practice there was significant association (p=0.000). A study by Ali A *et al* in Ethiopia, reported statistically significant relationship between the level of knowledge and practice[10].

CONCLUSIONS

This study has provided understanding of the people awareness about rabies and practice after dog bite. Most of the respondents had moderate level of knowledge that draws more attentions to be given for increasing the knowledge of the community about rabies. Significant

association was found between the level of knowledge and residence, literacy status, educational level and occupation of the respondents. The linear association test showed that there is significant association between the level of knowledge and type of practice. This suggests that good knowledge on rabies lead to good practice in prevention of rabies. Knowledge affects the individual's behavior and literature on KAP studies revealed that healthy behaviors are enhanced by a person's increased level of knowledge.

Therefore, information sources like radio, television programs and newspapers should play a significant role in enhancing the level of knowledge of the community about the deadly nature of rabies and the availability of preventive measures like vaccinations both for human and dogs.

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Knowledge and Practice of Breast Cancer among Female School Teachers

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Keywords
Breast cancer, Knowledge, Practice.

Abbreviations

BSE	Breast self examination
CBE	Clinical breast examination

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ABSTRACT

Objectives: To investigate the knowledge and practice of breast cancer among female teachers of private schools.

Methods: A cross-sectional study was conducted in Pokhara valley using self-administered questionnaire. Out of 101 private schools of Kaski District registered under PABSON (Private and Boarding Schools of Nepal), 15 schools were selected by using simple random sampling. A total of 117 female school teachers were participated in the study.

Results: Almost 82% of the respondents were belonged to the age group of 20 years and above, 80.3% were Hindus; 62% belonged to Brahmin and Chhetri, 56.4% were married, 96.5% did not have the family history of breast cancer. All the respondents had heard about breast cancer; internet (27.5%) was the main source of information. Most of the respondents (70.2%) believed that positive family history was the common risk factor and 42.8% mentioned lump in the breast as common sign and symptoms. Approximately 15% had knowledge about breast self examination, whereas, none had knowledge about clinical breast examination, and mammogram. There was no any practice of breast self examination as well as clinical breast examination.

Conclusions: This study concludes low knowledge on breast cancer, risk factors and screening practice among female school teachers. Thus it is important to educate women about importance of early detection of breast cancer and need to incorporate the information about breast cancer in the curriculum of different levels of education for mass awareness.

INTRODUCTION

Breast cancer is the most common cancer of women and a major public health problem in developed and developing countries[1]. Worldwide more than 20 million people are living with cancer and its number is expected to be more than 30 million by 2020 AD[2]. In the United States, breast cancer is the most common cause of cancer death among women age range from 40 – 59 years. According to the National Cancer Institute (NCI) every two minutes one woman is diagnosed with breast cancer and every 13 minutes a woman dies of breast cancer in United States[3].

In developed countries, the incidence of breast cancer is more than 1000 per million where as in developing countries it is less than 200 per million women. However, cancer mortality is higher in developing countries than in the developed countries[4]. The higher mortality rates in developing countries are attributed to the disease presentation at advanced stages and limited resources for the diagnosis and treatment[5]. The main reasons for diagnosis at late stage are low levels of public awareness of breast health and lack of screening facilities[6].

According to World Health Organization (2008), breast

cancer accounts for 6% of all cancers in Nepal. The commonest age group of women with breast cancer in Nepal is 40 – 50 years. This is a remarkable difference in higher incidence of younger than 50 years age[7]. Data published by WHO in May 2014 also showed that breast cancer in Nepal reached 865 (0.55%) of total deaths. The age adjusted death rate is 8.13 per 100000 of population, Nepal ranks 159 in the world[8].

Early recognition followed by timely treatment has a key role for best prognosis and long term survival[9,10]. Breast cancer screening is of paramount importance in reducing breast cancer mortality through early detection[11,12]. American Cancer Society (ACS) suggests women to follow the screening guideline of yearly mammograms (MM) starting at the age 40 and continuing for as long as a woman is in good health, clinical breast examination (CBE) about every three years for women in their 20s and 30s and every year for women of 40 years age and over. For women aged 20 and above, monthly breast self-examination (BSE) is recommended as an optional, however women should remain aware of how their breasts normally look and feel and report any breast changes promptly to their health care provider[13].

Several studies showed that knowledge and attitude of women directly influence their attendance and acceptance of screening and treatment. A study conducted in Nepal among women demonstrated poor awareness of breast cancer including knowledge of warning signs and BSE[14]. Another study done among women of age range from 20 to 60 years revealed that low knowledge on breast cancer, risk factors and screening practice[15].

METHODS

A descriptive cross sectional study design was used to investigate the knowledge and practice of breast cancer among female teachers of private schools. Under the registration of PABSON (Private and Boarding Schools of Nepal), there are altogether 101 private schools in Kaski District. Among them, 15 schools were selected by using simple random sampling. All the female teachers working in those schools were selected for the study. A total of 117 female teachers were participated in the study. Self administered questionnaire was used to gather information. The data collection was done during the period of four weeks from 1st to 30th August 2015.

Questionnaire included the demography information, knowledge on breast cancer, sign and symptoms of breast cancer and screening practices. The instrument was developed through review of literature. Then it was reviewed with concerned subject experts for the validity. Informed consent was taken from each respondent. Pretesting of the instrument was done on 10% of population of similar setting of non study area to test reliability and clarity of the instrument and necessary modifications in tools were updated after pre-test.

Questionnaire was checked thoroughly after completion to minimize the error of missing data as well as for the completeness and accuracy. Coding and organizing was done before data entry. Data analysis was done using Statistical package for social science (SPSS) 20 versions. The descriptive statistics such as frequency, percentage, were calculated.

RESULTS

In the study, 82.1% of the respondents belonged to the age group 20 years and above, most of them were Hindus (80.3%). Sixty two percent of the respondents belonged to Bhramin and Chhetri. More than half of the respondents were married (56.4%). Almost 58% of the female teachers had bachelor degree. Regarding the work experience, majority (63.2%) of them had experience of 1 - 5 years. Most of the respondents (96.5%) did not have the family history of breast cancer; however, 3.41% of them reported positive family history out of which 75% of them had with their grandmother. Very few (1.7%) of them had a problem of breast pain.

All the respondents (100%) had heard about breast cancer. Main source of information about breast cancer was internet (27.5%), radio/TV (25.6%), newspaper (13.5%), health personnel (12.5%) respectively. Most common risk factor associated with breast cancer reported by the respondents was positive family history (70.2%). Most of the respondents (42.8%) answered lump in the breast is the most common sign and symptom of breast cancer. Near about 82% of the respondents did not believe that breast cancer is the common cancer among women in Nepal. Likewise, 19.1% of the respondents responded that breast cancer is associated with high incidence of cancer related death in women. More than 90% of the respondents reported that cancer is not a curable disease. Similarly, less than 10% of them expressed that early detection of breast cancer can improve the chances of survival. Approximately 15% of the respondents had knowledge about BSE as the recommended screening test for early detection of breast cancer, whereas, none had knowledge about CBE and mammogram. Eighty three percent of the female teachers were not sure of age to begin BSE.

Table 1: Knowledge of breast cancer

Variables	Frequency	Percentage
Heard about Breast cancer		
Yes	117	100.0%
No	0	0.0%
*Sources of information		
Family members	13	6.3%
Friends	17	8.2%
Health personnel	25	12.1%
Television/Radio	53	25.6%
Internet	57	27.5%
Newspaper	28	13.5%
Others	14	6.8%
*Risk factors associated with breast cancer		
Positive family history	87	70.2%
No breast feeding	20	16.1%
Use of contraceptives	16	12.9%
Obesity	1	0.8%
*Sign and symptoms of breast cancer		
Lump in the breast	83	42.8%
Lump under armpit	49	25.3%
Dimpling of the breast	27	13.9%
Discharge from the breast	35	18.0%

*multiple responses

The study revealed that there was no practice of BSE as well CBE among the respondents. Most of the respondents (46.1%) did not perform BSE as there were no symptoms of breast cancer, and 44.7% of them thought BSE was not important.

Table 2: Practices regarding prevention of breast cancer

Variables	Frequency	Percentage
Practice of BSE		
Yes	0	0.0%
No	100	00.0%
Doctor visit for CBE		
Yes	0	0.0%
No	100	00.0%
Reason for not doing BSE		
Never thought it was important	63	44.7%
No symptoms of breast cancer	65	46.1%
Too busy	5	3.5%
Others	8	5.7%

DISCUSSION

In this study, respondents were from different ethnic groups, such as Chhetri, Bhramin, Newar, Gurung, Magar and others. Among them the highest number of participants were from Bhramin and Chhetri (62%). Similar finding was revealed in the study conducted by Shrestha[15]. The studies conducted in Turkey by Muhyittin[16] showed that majority of the respondents were married which was similar to this study where married women comprised of 56.4%. This study revealed that majority (63.2%) had work experience of 1 - 5 years. Most of the respondents (96.5%) did not have the family history of breast cancer; however, 3.41% of them reported positive family history out of which 75% of them had with their grandmother. Few of them (1.7%) had complained of breast pain, contrary to the findings in a study by Muhyittin[16] which was 13.7%.

In the knowledge question 30% have heard of breast cancer and 70% have not heard[15], whereas this study depicted 100% have heard about breast cancer as participants were the school teachers. Thirty three percent of women reported Radio/TV as main source of information about breast cancer[15]. In contrary, this study showed the main source of information as internet (27.5%). Nepalese women demonstrated poor awareness of warning signs like a breast lump, lump under the armpit, bleeding or discharge from the nipple, pulling of the nipple, changes in the position of the nipple, nipple rash, redness of the breast skin, changes in the size of the breast or nipple, changes in the shape of the breast or nipple, pain in the breast or armpit, and dimpling of the breast skin[14], whereas in our study, most common risk factor associated with breast cancer reported by the respondents was positive family history (70.2%). Most of the respondents (42.8%) expressed lump in the breast was the most common sign and symptom of breast cancer. Eighty two percent of the respondents did not believe that breast cancer is the common cancer among women in Nepal. Among 110 women only 26% women knew about the breast cancer screening and women who were doing breast self examination were 19, mammogram 3, and ultrasound were 4 in number. Out of 26 respondents only 31% women had knowledge of mammogram[15]. This study showed that only 15% of the respondents had knowledge about BSE as the recommended screening test for early detection of breast cancer, whereas, none had knowledge about CBE and mammogram.

In the study conducted by Muhyittin[16], 53.7% have had never practiced BSE likewise in this study, there was no practice of BSE as well CBE among the respondents.

Reason for not doing BSE, 46.1% answered as there was no any symptom of breast cancer, 44.7% of them thought BSE was not important and 3.5% of them did not perform BSE because of their busy schedule.

CONCLUSIONS

From the study, it can be concluded that though having heard about breast cancer through different media, Nepalese women lack knowledge regarding screening tests of breast cancer. Though few of them had knowledge about BSE, they have never practiced it. Almost all female teachers have never gone for CBE and have no idea regarding mammogram. Breast health awareness could be the means of early diagnosis in countries with limited resources like Nepal. Hence, there is very urgent need for formulation of effective breast cancer education and prevention programs throughout the country with proper media. It also seems to be important to incorporate the information about breast cancer in the curriculum of different levels of education.

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Correlation Seminars in Basic Sciences at Gandaki Medical College, Lekhnath, Kaski, Nepal

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Keywords
Basic science subjects,
Correlation seminar,
Learning objectives, Medical college.

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ABSTRACT

Gandaki Medical College is located in Kaski District of Nepal with the affiliation of Tribhuvan University-Institute of Medicine (IOM), is imparting high quality medical education to medical and paramedical students.

In MBBS, the basic science subjects of anatomy, physiology, biochemistry, pathology, microbiology, and pharmacology are taught in horizontal integrated organ system-based manner during first two years of the course. Correlation seminars are conducted in each organ system during the first and second years, by selecting a commonly prevalent disease or problem at the end of covering the organ system.

The college holds a meeting of Professors/Heads from each of the basic science departments, and community medicine under the chairmanship of Principal for selecting the topics and finalization of learning objectives. Topics for seminars were selected based on the importance of disease condition, its public health relevance, and its ability to integrate learning objectives from the maximum number of subjects. The learning objectives were framed by concerned departments.

Correlation seminars help students revise the organ systems covered and understand its clinical importance, promote team work and organization, and supports active integrated learning, and can be used as mode of teaching-learning process in medical colleges.

There is a famous saying that, 'Knowledge that is learnt in isolation is rapidly forgotten'. Integration is defined as the organization of teaching matter to interrelate or unify the subjects which are frequently taught in separate academic subject courses or departments[1,2]. The dictionary meaning of integration is "to make entire".

Medical education is changing rapidly, with many medical colleges being engaged in reforms in curriculum. Many of these reforms or modifications in curriculum focus on implementing horizontal or vertical curricular integration[3,4]. Horizontal integration blends either the related basic science disciplines in order to enhance the students' understanding of the body organ systems, or the related clinical science disciplines through interdisciplinary clerkships[5-7].

Gandaki Medical College Teaching Hospital and Research Center Pvt. Ltd. (GMC), Pokhara is a health educational institution located at Lekhnath, Kaski District of Nepal, was established in 2007 AD with the aim of imparting high quality medical education to the students from different parts of the world. The emphasis is on developing attitude, skills and habits of life-long learning and to produce world leaders in medicine.

Presently, GMC is conducting MBBS, B.Sc. Nursing, B.Sc. MIT, B.Sc. MLT and BPH Programes with the affiliation of Tribhuvan University-Institute of Medicine (IOM). The college has been successfully running in its aim of providing quality medical education and health care services to the people. Gandaki Medical College proposes a 750 bedded teaching hospital with all activity of clinical

and medical facilities, to provide excellent health care facilities.

The MBBS (Bachelor of Medicine and Bachelor of Surgery) course is of four and half years duration followed by one year compulsory rotating internship. The college follows the curriculum prescribed by Tribhuvan University Institute of Medicine (IOM), which stresses community-based learning and early clinical exposure[8].

The basic science subjects of anatomy, physiology, biochemistry, pathology, microbiology, and pharmacology are taught in horizontal integrated organ system-based manner during first two years of the course. The topics covered in the first year are basic concepts and the musculoskeletal and neurosensory organ systems. The organ systems covered during the second year are the respiratory, cardiovascular, gastrointestinal, renal and electrolyte, endocrine and reproductive systems.

Students will have community field visit for one month in first year for an early exposure to community based learning[8]. Students visit the hospital for two weeks in second year[8] for early clinical exposure, enabling vertical integrated learning also. The emphasis is on history-taking, communication skills, and physical examination.

The predominant teaching-learning methodology is didactic lectures, but problem-based small group learning sessions are also conducted[8]. There are regular assessments at the end of each organ system and three term examinations (Internal assessments) at the end of each term, and students are counseled to improve their performance.

The correlation seminars in basic sciences are an approach that brings together educational/learning objectives from different basic science subjects and community medicine using a commonly prevalent disease condition within a particular organ system. As a result students develop an integrated view of the subject, and learn to work in a team.

Correlation seminars were conducted at the end of covering each organ system during the first and second year. For correlation seminar, a common disease or problem involving the organ system just covered was selected (Table 1). The college holds a meeting of Professors/Heads from each of the basic science departments, community medicine under the chairmanship of Principal for selecting the topics for correlation seminars. Topics were selected based on the importance of the disease condition, its public health relevance, and its ability to integrate learning objectives from the maximum number of subjects. The concerned departments were asked to generate two to six objectives for each seminar topic. Some departments were not able to generate learning objectives for certain topics. After two or three days, there was another meeting, where the objectives were discussed and modified as required. The objectives were framed in such a way that they were as objective and unambiguous as possible (Table 2).

Table 1: Topics selected from different organ systems during 2010 to 2016 for correlation seminars

	Organ system	Topics for seminar
1st year MBBS	General concepts	Immunity, immune system, and immune response Hypersensitivity Immunodeficiency diseases Malnutrition Genetic disorders (Each department framed their individual objectives)
	Musculoskeletal system	Osteomyelitis Arthritis Gas gangrene Tetanus Muscular dystrophy Cancer Leprosy Osteosarcoma Rhabdomyosarcoma
	Neurosensory system	Meningitis Rabies Poliomyelitis
2nd year MBBS	Respiratory system	Tuberculosis Pneumonia COPD Influenza (Swine flu) Emphysema
	Cardiovascular system	Anemia Endocarditis Malaria Coronary heart disease Hypertension Rheumatic heart disease
	Gastrointestinal and hepatobiliary system	Diarrhea Peptic ulcer Enteric fever Hepatitis Jaundice Cirrhosis of liver Colorectal carcinoma Intestinal parasitic infections
	Renal and electrolyte system	Urinary tract infections Nephritis
	Reproductive and endocrine system	Diabetes mellitus Pituitary gland hormones Syphilis Gonorrhea Carcinoma of cervix Thyroid hormones

Table 2: Learning objectives developed for the seminar topic pulmonary tuberculosis

S No	Objectives	Department
1	Describe the structure of lung	Anatomy
2	Describe the bronchopulmonary segments of lung and correlate with pulmonary tuberculosis	Anatomy
3	Describe the ventilation and perfusion in different zones of lungs	Physiology
4	Describe how lung compliance and airway resistance influences ventilation	Physiology
5	Describe the respiratory membrane	Physiology
6	Enumerate biochemical findings in tuberculosis patient	Biochemistry
7	Describe the morphology and cultural characteristics of *Mycobacterium tuberculosis*	Microbiology
8	Describe non-tuberculous mycobacteria causing pulmonary disease in humans	Microbiology
9	Discuss the pathogenesis of pulmonary tuberculosis including portal of entry up to formation of primary complex	Pathology
10	Describe the morphologic picture of fibrocaseous tuberculosis of the lung	Pathology
11	Describe the pathogenesis and morphological aspects of miliary tuberculosis	Pathology
12	Describe the laboratory diagnosis of pulmonary tuberculosis	Microbiology
13	Describe the prophylaxis of pulmonary tuberculosis	Microbiology
14	Basic principles of antimicrobial therapy of tuberculosis and pharmaco-therapeutic drugs used for tuberculosis	Pharmacology
15	Pharmacotherapy of smear +ve or seriously ill smear –ve pulmonary tuberculosis	Pharmacology
16	Pharmacotherapy of smear -ve pulmonary or extra-pulmonary tuberculosis	Pharmacology
17	Rationality for the use of first line antitubercular drugs	Pharmacology
18	Adverse effects of first line antitubercular drugs and their management	Pharmacology
19	Rationality of antitubercular drugs in MDR tuberculosis	Pharmacology
20	Discuss epidemiological determinants of tuberculosis	Community Medicine
21	Discuss about the vision, goal, objectives and strategies of National Tuberculosis Control Programme of Nepal	Community Medicine
22	Present diagnosis and treatment provision of tuberculosis in Nepal	Community Medicine

After learning objectives have been framed, they were distributed to all students (Table 2). The college admits 90 students to the MBBS course each year. Therefore 90 learning objectives were framed for each correlation seminar and a particular learning objective was assigned to each student. The students prepared a five minute power point presentation of the objective assigned, using the assigned text books, reference books available in the college library, notes from faculty lectures, and help from the faculty members of the relevant departments. Students also used articles and images obtained through Google search. Students were advised to cite the source of information on their slides to make them aware plagiarism and intellectual property rights.

The evaluation of correlation seminar was done by one faculty member (usually Professor/Head) from each basic science department and one from community medicine department. Each Professor assessed each student presenter. A Senior Professor was entrusted the responsibility of being the team leader and coordinated the proceedings of correlation seminar. The team leader provided a brief description of the correlation seminar and its evaluation at the beginning of the seminar. The assessment of the student presenters included (Table 3) preparation, introduction, lesson planning (Content organization, use of example), use of audio-visual aids, presentation of seminar (Voice clarity, word pronounciation, body language), audience participation, conclusion, adhering to the allotted time, summarizing the presentation, answering questions. For each of these categories the evaluator was required to choose one of five values: 1, 0.75. 0.50, 0.25, or 0 mark (1 mark representing the best performance and 0 the worst). The mean grading of different evaluators was calculated and was made available to the student presenters for feedback and further improvement. The marks were added to the assessment of students. The team leader also provided a brief report (concluding remarks) on the seminar (Table 3).

All students presented seminars using Microsoft power point slides. None used white board or overhead projector. Students were required to get their power point slides checked and approved by faculty members before the final presentation. In some cases this checking process was not followed strictly by both students and faculty. Many objectives allotted for seminars were not covered in detail during theory classes. One of the problems noted has been the use of power point slides with diverse backgrounds, some of which were overcrowded with text and not easily readable. To ensure uniformity in presentations, we have developed certain guidelines.

Informal feedback obtained from students suggests that correlation seminars have been effective in promoting self-learning and active learning among students, similar to the findings of Kalpana Kumari *et al*[9] in a study on students' perception about integrated teaching, where the

students suggested that integrated correlation seminars should be conducted more often, by including more topics. Students also seem to obtain a holistic view of the disease and understand its clinical implications[10].

The correlation seminars promote integrated active learning among students and highlight the importance of basic sciences in clinical medicine. Correlation seminars help students review the organ systems covered in lectures and understand its clinical importance, promote team work and organization, and supports active integrated learning, and can be used as mode of teaching-learning process in medical colleges.

Table 3: Evaluation sheet for evaluation of correlation seminars

Gandaki Medical College
Lekhnath-2, Kaski
Evaluation sheet for evaluation of correlation seminar

Date: Name of the evaluator: Topic:

Roll No	Preparation (1*)	Introduction (1)	Lesson planning (2)		Use of Audio visual aids (1)	Presentation (3)			Audience participation (1)	Conclusion (1)	Total (10 marks)	Remarks
			Content organization (1)	Use of example (1)		Voice clarity (1)	Word pronunciation (1)	Body language (1)				
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

*1 mark = best, 0.75 mark = good, 0.50 mark = average, 0.25 mark = poor, 0 mark = worst performance

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Sonographic Manifestation of Kimura Disease

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ABSTRACT

Kimura disease is a rare benign chronic inflammatory disorder. It is mostly presented with painless subcutaneous masses in the head and neck region along with lymphadenopathy of an unknown etiology. The disease is commonly seen in Asian population with a male predominance. Here we describe the ultrasonic appearance of this rare disease presented in, author's previous Institution (West China Hospital, Sichuan University, where he studied his PhD) over a period of ten years.

INTRODUCTION

Kimura disease (KD) is a rare chronic inflammatory disorder mimicking a malignant lesion clinically and on images[1]. This rare entity was firstly reported in 1937 from China by Kim and Szeto[2]. It received its first name in 1948 when Kimura *et al*[3] reported similar cases occurring in Japan and referring it as an unusual granulation combined with hyper-plastic changes in lymphoid tissue. This disease occurs mainly in young Asian male population, commonly in patients who are in the second and third decades of life[4]. Clinically they are characterized by a triad of painless unilateral cervical adenopathy or subcutaneous masses mainly in the head or neck region, blood and tissue eosinophilia, and markedly elevated serum immunoglobulin E (IgE) levels[5]. However, the involvements of other less common sites are the axilla, popliteal region, groin, and the forearm according to the reports in scientific literature [6,7]. Although imaging features of KD has been reported in scientific literature, but reports and information on sonographic image based features are still not enough. In this report we discussed the sonographic image based manifestations of Kimura disease on grey scale as well as color doppler sonograms. Prevalence of KD in Western countries is very rare compared to Asian population. Radiologists or sonographers in Western countries should be aware of the sonographic manifestations of KD.

Case Descriptions

Case 1

A 43 year old Chinese mainland male patient was admitted with complaints of right sub-mandibular mass that had begun to enlarge seven years before being admitted. On physical examination the right mandibular region was firm, non-tender, lobulated and mobile. No reddening of skin was seen. Before one month of his hospital admission, he complained that the mass was enlarging and painful. Multiple mobile non tender lymph nodes were palpated

in both the cervical regions and submandibular areas. Laboratory examination revealed a WBC differential eosinophillic count of 36.6% (normal range, 0.5% - 5.0%). Neutrophill differential count was 34.7% (normal range, 50 - 70%). Results for serum electrolytes, liver function tests, blood urea nitrogen (BUN), albumin and creatinine were normal.

Ultrasonic examination was performed by high frequency linear transducer (5 - 12 MHz, Philips IU22). Examination revealed enlarged right sub-mandibular gland with a hypoechoic mass of size 3.0 x 1.5 cm (Fig 1A). The mass showed heterogeneous internal echogenecity with an irregular shape and lobulated boundary. Color doppler examination revealed paucity of blood vessels within the mass. Similarly, ultrasound examination revealed bilateral enlarged lymph nodes on both cervical and submandibular areas. The maximum size of large node seen on right side was 21 x 11 mm and on left side it was 13 x 7 mm. All the nodes showed homogenous internal echoes with preserved cortico-medullary differentiation. On Doppler sonograms, all the nodes showed profuse hilar vascularity (Fig 1B). Fine needle aspiration biopsy of the node on the right side revealed follicular hyperplasia of the node, necrosis of germinal layers/ with reactive germinal layers, eosinophillic infiltrates involving the inter-follicular areas with enormous eosinophillic infiltration, eosinophillic abscess, suggesting of eosinophilic lymphgranuloma, diagnosing KD. It was further confirmed by excision biopsy of the right sub mandibular gland (Fig 2).

Fig 1A: Transverse sonogram of the right sub-mandibular gland. B-mode ultrasound image revealed an enlarged right sub-mandibular gland with a hypoechoic mass, heterogeneous internal echogenecity with irregular shape and lobulated boundary.

Fig 1B: Color Doppler examination on right sub mandibular region revealed enlarged lymph nodes with hilar vascularity and preserved cortico-medullary differentiation.

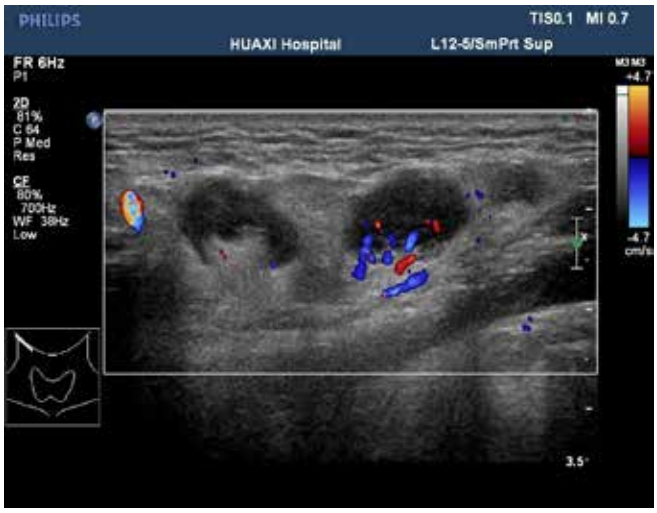
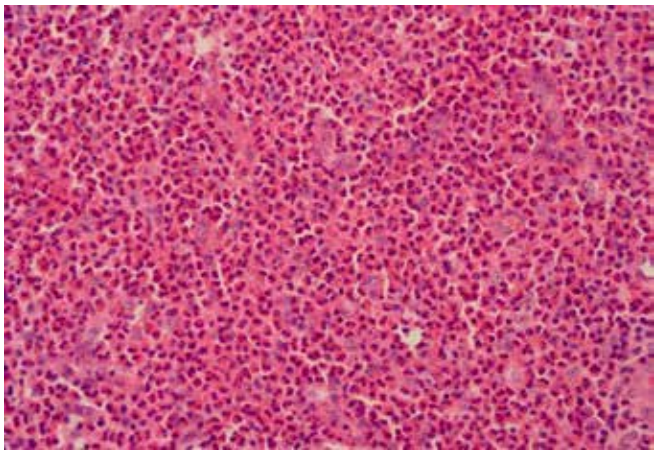


Fig 2: Hematoxylin and eosin stain image revealed marked infiltration of eosinopihills and lymphocytes with germinal layers. Proliferation of many blood vessels and thick fibrotic tissues are seen (Original magnification, x400).



Case 2

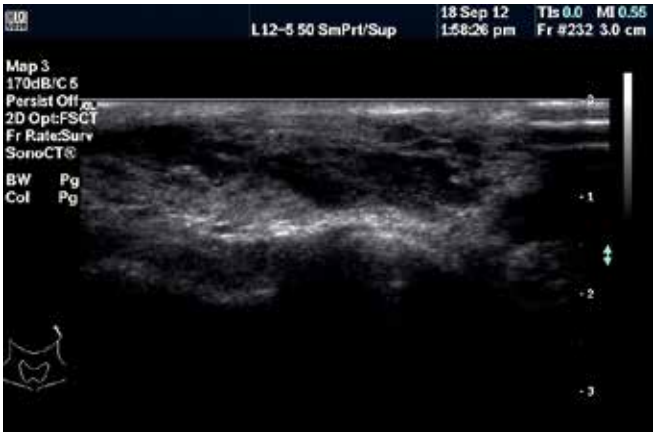
A 25 year old Chinese mainland resident male was admitted with a complaint of left pre-auricular mass history that was eight months old. On physical examination a painless palpable mass of size 4 x 3 cm was noted in the left pre-auricular region. The mass was non-tender mobile during examination. On laboratory examination, WBC count was 11.50 (3.5 - 9.5 normal), differential eosinophillic count of 37.6% (normal range, 0.5% - 5.0%). Neutrophill differential count was 36.4% (normal range, 50 - 70%). Results for serum electrolytes, alpha liver function test, blood urea nitrogen (BUN), albumin and creatinine were

normal. Carcinogenic marker like CEA was within the normal limit.

A high resolution ultrasonic examination (5 - 12 MHz, HDI 5000) showed a hypoechoic mass in left pre-auricular area. The shape of the mass was irregular with ill defined margin. The mass showed non-homogeneous internal echoes forming "trabecule pattern" (Fig 3). Doppler examination revealed paucity of blood vessels within the mass. Similarly multiple nodes were seen inside the left parotid gland. The maximum size of the node was 11 x 9 mm, with poor cortico-medullary differentiation. Color Doppler revealed paucity of blood vessels inside the lymph nodes. CT examination of the neck revealed localized soft tissue thickening in left pre-auricular area. Lymphadenopathy noted in both neck regions.

With the pre-operative diagnosis of vascular tumor and lymphadenopathy in left parotid gland, the patient had undergone surgery. Histopatholgical examination revealed follicular hyperplasia of the node, reactive germinal layer, eosinophillic infiltration, eosinophillic abscess, diagnosing Kimura Disease. Immunohistochemistry revealed epithelial CK (+); lymphoid tissue CD20 (+), CD3e (+), CD34 (-), S-100 (-); Ki67 was positive mainly for lymphoid follicles in germinal centers.

Fig 3: Transverse gray scale sonogram shows an ill defined, hypoechoic, heterogeneous mass with "trabecule pattern" in left pre-auricular area.



Case 3

A 46 year old Chinese male patient presented with a right parotid mass which began to increase in size two months before he was admitted to the hospital. Physical examination revealed mass on both parotid glands. On palpation masses were firm, non-tender and lobulated. Patient presented with fever 38°C (axillary) on examination. No reddening of skin was seen. Before two months of his hospital admission, he complained that the mass in right side was enlarging and painful. Multiple mobile non tender lymph nodes were revealed in both cervical regions and submandibular areas. Laboratory examination revealed a WBC differential eosinophillic count of 36.6% (normal range, 0.5% - 5.0%). Neutrophill differential count was 34.7% (normal range, 50 - 70%). Results for serum electrolytes, liver function tests, blood urea nitrogen (BUN), albumin and creatinine were normal.

Ultrasonic examination was performed by high frequency linear transducer (5-12 MHz, Philips IU22). Examination revealed heterogeneously enlarged bilateral parotid gland (Fig 4A and Fig 4B). Color Doppler examination revealed paucity of blood vessels within the affected areas. Bilaterally multiple enlarged lymph nodes revealed on cervical and submandibular region. These enlarged nodes showed heterogeneous internal echoes with poor cortico-medullary differentiation (Fig 4C and Fig 4D). Color Doppler revealed paucity of blood vessels inside the lymph nodes. Sonographically guided FNAC of the right parotid mass and the lymph node suggested a lympho-proliferative lesion. The diagnosis of Kimura disease was made after excision of the mass and the node (Fig 4E).

Fig 4A and 4B: Transverse sonogram of bilateral neck region. B-mode ultrasound image revealed heterogeneously enlarged parotid gland on both sides.

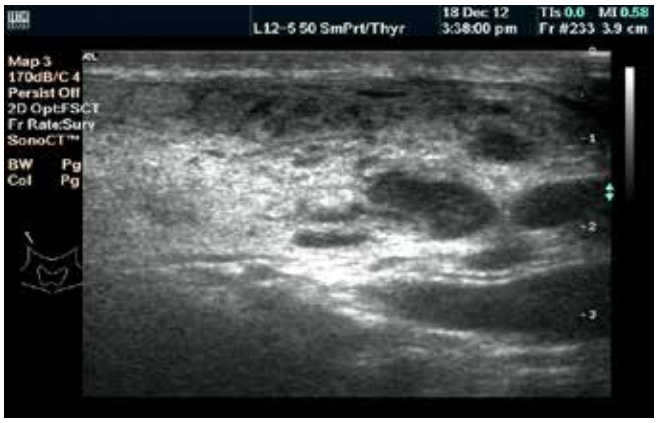
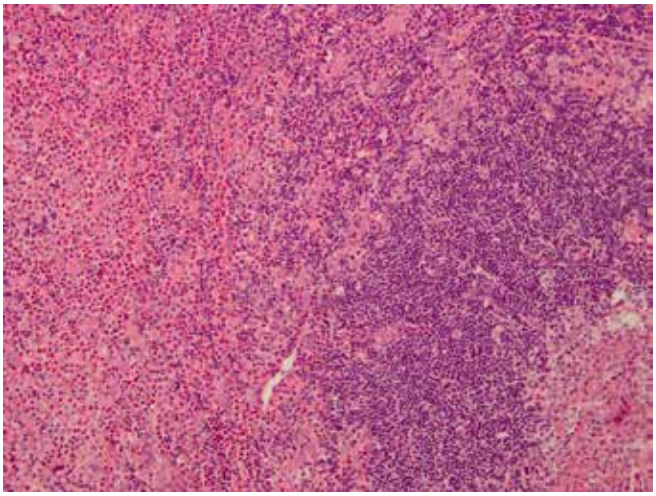


Fig 4C and 4D: Multiple enlarged lymph nodes on both sub-mandibular region. These nodes showed poor cortico-medullary differentiation

Fig 4E: FNAC of the lesion showed chronic inflammatory infiltrates with fibrotic stroma, (Hematoxylin and eosin stain, original magnification x200)



DISCUSSION

Kimura disease is a chronic angiolymphoid proliferative disorder, which is a rare entity in the West but endemic in Asia, especially in China and Japan[8]. Clinically they are manifestated by asymptomatic unilateral soft tissue swelling, and local lymphadenopathy, seen in salivary glands. Akio *et al*[7] reported a case of KD involving bilateral auricular mass, which is very rare. The cause of this disease remains unknown but is thought to be related to an allergic reaction because of patient eosinophilia and high serum immunoglobulin E level[7]. Histopathologically these entities usually presented with dense inflammatory infiltrate characterized by eosinophilic lymphoid tissue with germinal centers and micro abscesses[9]. Oftenly they can be presented with marked fibrosis within the typical lesions. KD is generally limited to the skin, lymph nodes, and salivary glands but patients with KD and nephrotic syndrome have been reported. The basis of this association is unclear[10]. Study conducted by Yang Yu Lin *et al*[11], showed that 93% of patients presented with multifocal lesions in the head and neck region with bilateral involvement 55% Vs unilateral involvement 45%. In her report, cervical lymph nodes were most commonly affected regions followed by salivary glands. According to her report, patients who underwent ultrasound examination revealed hypoechoic mass lesions on the salivary glands and subcutaneous tissue with heterogeneous echotexture, which we found in our above study also. Our study revealed that affected lymph nodes on Color Doppler examination showed profuse node hilar blood flow signal with poorly differentiated cortico-medullary junction as shown by the study conducted by Ahuja *et al*[12]. As KD is a rare disease, but still we need to rule out the possible differential diagnosis such as inflammatory disease of salivary glands, recurrent bacterial infections, warthin's tumor, lymphoma, vascular tumor, parasitic lymphadenitis, metastases, dermatopathic lymphadenopathy etc. Diagnosis is somehow difficult clinically; hence FNAC report and laboratory examination should be correlated to look for patient eosinophilia and high serum immunoglobulin E level.

CONCLUSIONS

In Conclusion, our study highlights the sonographic features of KD, a disease that is very rare and more common in Asian population. Due to enormous immigration of Asian population to Western world, KD should be kept in differential diagnosis when sonogram reveals an ill defined hypoechoic mass with heterogeneous echotexture

in salivary glands/ subcutaneous tissues in an Asian young male. Doppler examination would be helpful as affected lymph nodes shows profuse hilar vascularity mostly presented with poorly differentiated cortico-medullary junction. Surgical excision is the recommended treatment method although corticosteroid therapy may be the choice of treatment.

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An Overview of Community Health Diagnosis (CHD) Field Visit to Rupakot VDC

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Keywords
Community health diagnosis, Rupakot VDC, Survey.

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ABSTRACT

The Community Health Diagnosis (CHD) program began on 4th September, 2015 in Rupakot VDC, Kaski. During our stay there we conducted household surveys, focus group discussions, extracted out the real needs of the society and conducted micro health projects in the school as well as in their community. We put our steps towards development in the health status of the community hoping that in the upcoming days, a bright future beckons. We hope that, for all the things we have done and the programs we have conducted there, would lead to a healthier lifestyle of the people of Rupakot VDC ward no 2, 3, 4 and 9. CHD gave us the opportunity to build our team spirit and taught us the arts of problem solving. It taught us the importance of correct conduct and building a good rapport with the people who were unfamiliar to us.

From the very beginning of our session, we were being told about Community health diagnosis (CHD) field visit by our seniors, teachers and friends. That got us pretty excited for what was about to come. And finally, the day arrived when the date for the CHD was fixed and the groups divided.

"The secret of getting ahead is getting started". So, we started on our journey with great enthusiasm but also with a hint of anxiety and eagerness.

How would it go? Would the experience be great? How is the place? How would the people treat us? ..... Many questions came into our mind before we actually had gone for the Community diagnosis. But we had no idea that such scenic beauty and nature friendly environment of Rupakot was awaiting and many great things were about to be unfolded.

Filled with hospitable and helpful people, our program was very much seriously taken by them. And we are indeed indebted to them the way they believed in us as we were complete strangers to them and their environment. Their help and co-ordination made our stay there very much comfortable and memorable as well. In the end, it was pretty hard to say goodbye because of the bond we had made between ourselves and the people of Rupakot.

This visit was a minefield of knowledge for all of us. We have learned about group dynamics and have developed a sense of esteem and dignity for every one we have met. Also to interact with people with varying characters broadened our view towards mankind.

The Community Health Diagnosis (CHD) program began on 4th September, 2015 in Rupakot VDC, Kaski. Our activities were conducted in various steps as follows (Table 1).

1. Rapport building
2. Social mapping, secondary data collection, sampling
3. Data collection and analysis
4. First community presentation

5. Focus group discussion

6. Prioritization of needs and planning for MHP

7. Implementation and evaluation of MHP

8. Final community presentation

Table 1: Plan of action

Duration	Program	Program to be held at
30th Aug – 2nd Sept, 2015	Orientation for the CHD	College
3rd Sept, 2015	Pre-testing of questionnaire	Lekhnath
4th Sept, 2015	Departure from the hostel, rapport building, secondary data collection	
5th Sept, 2015	Social mapping, data collection	Community
6th - 8th Sept, 2015	Data collection and analysis	Community
9th Sept, 2015	Focus group discussions	Community
10th Sept, 2015	First Community presentation, preparation for MHP	Community
11th Sept, 2015	MHP (Micro health project)	Community
12th Sept, 2015	Preparation for final community presentation	Community
13th Sept, 2015	Final community presentation	Community
13th Sept, 2015	Departure from the community	
14th – 15th Sept, 2015	Preparation for college presentation and report writing	Hostels
16th Sept, 2015	College presentation	College

Rupakot VDC wards 2, 3, 4 and 9 have 183 houses and a total population of 832. The major ethnic groups were Chhetries and Gurung; majority follow Hinduism, speak Nepali language and agriculture was the main source of income for majority of the population.

With the use of census, we surveyed 183 households. The average household size is found to be five with predominantly nuclear family. Crude birth rate (CBR) and crude death rate (CDR) were 58.9 per thousand and 12 per thousand respectively. The population growth rate was 0.429 with the population doubling time of 163 years. Median age of the population was 31 years and the sex ratio was 94 males per 100 females. The dependency ratio was 0.41% and disability rate was 10%, the literacy rate was 73%.

Almost all the women go for antenatal checkups during pregnancy; 76% women were found to take the recommended course of iron tablets and tetanus toxoid (TT) vaccines. About 39% of the deliveries were at home. Another positive finding was that almost all children were fully immunized. Nearly half of the eligible couples surveyed by us adopted family planning methods. Nutritional status of the children was found to be satisfactory.

Majority of the population went to health centers during illness and knowledge, attitude, and practice (KAP) on diseases like TB, and AIDS was found to be poor but the knowledge about common diseases like diarrhea, worm infestation, etc was found satisfactory. The personal and environmental sanitation was also found to be satisfactory. All the households used local tap water and most of them do not have any purification practices.

At the beginning the new surroundings brought twists and turns and had it not been for the people residing there, we would not have such great efficiency in our work. The continuous help that they had offered us was very pleasing. Indeed, their attitude towards us was of first class.

During our stay there we conducted household surveys, focus group discussions, extracted out the real needs of the society and conducted micro health projects (MHP) in the school as well as in their community. We put our steps towards development in the health status of the community hoping that in the upcoming days, a bright future beckons.

We would consider ourselves lucky if our efforts would at least change their behavior towards goodness and health. At the end we would like to address that this visit would be cherished forever.

Our stay at the Rupakot VDC ward no 2, 3, 4 and 9 for ten days gave us the opportunity to realize the importance of our study. All the textbook knowledge was put to test during our stay. We got to experience the real veneer of the Nepali community.

CHD gave us the opportunity to build our team spirit and taught us the arts of problem solving. It taught us the importance of correct conduct and building a good rapport with the people who were unfamiliar to us. Not only did the CHD help us academically but also gave the booster for our personal and social life.

All in all, this visit to Rupakot VDC ward no 2, 3, 4 and 9 gave us the opportunity to explore and extract the things that will help us to build a foreseeable future.

We hope that, for all the things we have done and the

programs we have conducted there, would lead to a healthier lifestyle of the people of Rupakot VDC ward no 2, 3, 4 and 9.

"A hard beginning makes a good ending."- John Heywood

With a heavy heart and tearful eyes, we bid goodbye to the people of Rupakot VDC for all their love, support, respect and encouragement that they had given us since our first footsteps on their soil.

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My right is to my work

Journal of Gandaki Medical College-Nepal (J-GMC-N)

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

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

The text of the article should be divided into sections with the headings, and should commence on a new page in the following sequence: title page, abstract, key words, introduction, materials and methods, results, discussion, conclusions, acknowledgement, references, tables and figures. Abbreviations used in standard text books can be used, provided the full form has been given when it first appears in the text.

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The abstract should contain the essence of the whole paper. Be clear and concise and avoid unnecessary detail. Abstract must not exceed 250 words and should be presented in prescribed structured format: Background, Aims & objectives (hypothesis), Methods, Results, and Conclusions. Provide three to six key words below the abstract arranged alphabetically. The abstract need not be structured for a review article or case report.

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Introduction should be short and tell the reader why you undertook the study. Divide the introduction into three paragraphs. The first paragraph should be a very short summary of the existing knowledge of your research area. This should lead directly into the second paragraph that summarizes what other people have done in this field, what limitations have been encountered, what questions still need to be answered? This in turn, will lead to the last paragraph, which should clearly state what you did and why.

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9. Protocols followed, if any
10. Statistical analysis and computer software used

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The main outcome of the study and data obtained should be summarized in the Results section, in logical sequence in the text, tables and graphs. Remember that data and results are not the same thing.

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Discuss major findings. Describe the new and important aspects of the study. Do not repeat the data or other information given in the introduction or results section. Compare and contrast the results with other relevant studies. State the limitations of the study.

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