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Current Perspectives on Leishmaniasis

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Sir William Boog **Leishman** first demonstrated *Leishmania donovani* parasite in spleen smear of English soldier from London, who died of **Dum Dum fever** or **kala azar** contracted at Dum-Dum in Kolkata, India, in 1903. In the same year, **Sir Donovan** also reported the same parasite in spleen smear of a patient from Madras (Chennai), India. The name *Leishmania donovani* was therefore given to this parasite.

Their simultaneous discovery of *Leishmania donovani* first alerted the scientific community to the life threatening disease of visceral leishmaniasis. Now a century later, millions are still afflicted by *Leishmania*. It is a disease known for its complexity and diversity. It is endemic in regions ranging from the rainforests of South America to the deserts of Asia, and afflicts both rural and urban communities. A host of about 21 different species of *Leishmania* are classified under its primary syndromes; cutaneous, mucocutaneos and visceral, which result from parasite multiplication in macrophages in the skin, nasal-oral mucosa and internal organs, respectively. These protozoan species are transmitted by over 30 species of **phlebotomine sand flies.** Charles Nicolle, a 1928 Nobel laureate, at the Pasteur Institute of Tunis, characterized the new World visceral leishmaniasis and cultivated the etiologic agent.

While most modes of transmission are vector borne, some are congenital and parenteral (i.e. by blood transfusion, needle sharing, and laboratory accident). Also increases in travel and international migration have brought this disease to the attention of developed nations. Available treatments for leishmaniasis are expensive or have serious associated toxicities and may lead to the development of drug-resistant parasites. Prevention and control regimens focusing on vector reservoir control had not changed in decades. However international attention has now shifted towards the development of effective and cost-efficient treatment. Exciting recent advances in diagnosis, treatment, prevention makes most interesting to learn about Leishmaniasis.

Genus *Leishmania* is a **protozoan parasite** belongs to Phylum *Sarcomastigophora*, subphylum *Mastigophora*, family *Trypanosomatidae*, class *Kinetoplastidea*, and order *Trypanosomatida*. Genus *Leishmania* has two subgenera ***L. Leishmania*** and ***L. Viannia***. The main difference between the two subgenera is that promastigotes of the subgenus *Viannia* develop in the midgut and hindgut of sandfly where as that of subgenus *Leishmania* develop in the anterior portion of the alimentary tract of sandfly. Both the subgenera comprise of nearly 20 species that are nearly identical in morphology. Differentiation is, therefore, based on a number of biochemical and epidemiological criteria, use of monoclonal antibodies to detect specific antigens, promastigote growth patterns *in vitro* in the presence of antisera, vectors and reservoir hosts.

***Leishmania* parasite** exists in two stages: 1. **Amastigote** or aflagellar stage or **LD bodies** or leishmanial form is an obligate intracellular parasite of reticuloendothelial system (macrophages, monocytes, neutrophils, endothelial cells) predominantly of liver, spleen, bone marrow, lymph nodes etc of humans, and other vertebrate hosts (dogs, hamsters and other rodents), and 2. **Promastigote** or flagellar stage or **leptomonad** form is an extracellular form, lives in the digestive tract of insect vector, sand fly (genus *Phlebotomus* and *Lutzomyia*) and in cultures in the laboratory, which is an infective stage to the humans.

Fig 1: a) A macrophage filed with intracellular amastigotes of *Leishmania donovani* (Source: cdc. gov) b) Promastigotes (Leptomonad forms) (Source: pinterest.com)

Leishmaniasis is a disease caused by obligate intracellular protozoan parasites of the genus *Leishmania*, primarily affecting the reticuloendotheial system transmitted by the bite infected female phlebotomine sandflies. *Leishmania* species produce widely varying group of clinical syndromes ranging from self-healing cutaneous ulcers to fatal visceral disease, each with its own clinical manifestations and epidemiology. The parasite is transmitted by bite of the **female sandfly vector**.

The dog has been found to be naturally infected with *Leishmania donovani* in the Mediterranean region. A small rodent of North China, called a **hamster** (*Cricetulus griseus*) has been found to be very susceptible to *Leishmania donovani* infection. **Leishmaniasis** is mainly a **zoonotic** disease affecting dogs, foxes, jackals, and rodents. Animal reservoir hosts play major role in transmission of the disease. In Mediterranean region, China, and Brazil the dog is considered to be reservoir of infection. But in Indian subcontinent it is **anthroponotic** and non-zoonotic affecting only in humans and canine leishmaniasis does not exist. In Sudan and East Africa, rodents are reservoir hosts, and in Russia, the jackals are the reservoirs of infection. The hamster is the laboratory animal of choice for the isolation of *Leishmania* spp.

Fig 2: Phlebotomine sandfly

Leishmaniasis occurs in 98 countries; most of them developing countries of tropical and temperate regions. More than 350 million people are at risk, with an overall prevalence of 12 million. Two million cases occur annually, of which 1 – 1.5 million are cutaneous leishmaniasis and its variations and 500,000 cases are visceral leishmaniasis. **Four largest foci of visceral leishmaniasis (90%) are India, Nepal, Bangladesh, Sudan, Brazil.** In Indian subcontinent, visceral leishmaniasis is anthroponotic, while zoonotic visceral leishmaniasis is reported from Middle East, Pakistan, and other countries from Western Asia to China.

India is the worst affected country. Bihar is affected the most followed by Jharkhand, West Bengal and Uttar Pradesh. Forty eight districts with more than 165 millions of people are at risk. In 2012, more than 20,000 cases are reported from India with 23 deaths. Sporadic cases have been reported from Tamil Nadu, Pondicherry, Assam, Orissa, and Gujarat. Visceral leishmaniasis is an important opportunistic infection in AIDS patients.

In **Nepal**, the disease affects Eastern Terai region which lies adjacent to the Bihar state of India. Data collected from eight zonal hospitals in the Terai region suggests that the first confirmed case of visceral leishmaniasis was recorded in 1980. By 2003, the disease has spread to 14 districts of Central and Eastern regions of Nepal, and nearly six million people residing in these districts were at the risk of acquiring the disease. A total of 25,890 cases with 599 deaths were reported during the year 1980-2006 (up to July). District-wise analysis showed that, during 2003, highest incidence (per 100,000) was in Mahottari district (184), followed by Sarlahi (100) and Sunsari (96). The highest case fatality rate was in Dhanusha (2.9%) followed by Bara (2.4%) and Saptari (2.0%). The incidence of visceral leishmaniasis in Nepal seems to be increasing at a faster rate.

Leishmaniasis can be categorized **by geographic occurrence** into old world leishmaniasis and new world leishmaniasis. The term '**New world**' refers to the Americas and the '**Old world**' is used for the rest of the World.

i) **Old world leishmaniasis** caused by *Leishmania* species found in Africa, Asia, the Middle East, the Mediterranean, and India, which produces cutaneous or visceral leishmaniasis. The parasites of the old world leishmaniasis (*Leishmania Leishmania donovani, L.L infantum, L.L. tropica, L.L. major, L.L. aethiopica*) are transmitted to humans by the bite of female sandflies of the genus *Phlebotomus*.

ii) **New world leishmaniasis** caused by *Leishmania* species found in Central and South America, which produces cutaneous, mucocutaneous or visceral leishmaniasis. The parasites of the new world leishmaniasis (*L. Viannia peruviana, L.L. chagasi, L.L. mexicana complex,* and *L.Viannia braziliensis complex)* are carried by sandflies of the genera *Lutzomyia* and *Psychodopygus*.

Table 1: Clinical syndromes of leishmaniasis

- Visceral leishmaniasis/ Kala azar (VL)
- Post-kala azar dermal leishmaniasis (PKDL)
- Cutaneous leishmaniasis (CL)
- Diffuse cutaneous leishmaniasis (DCL)
- Leishmaniasis recidivans (LR)
- Mucocutaneous leishmaniasis (MCL)/ Espundia

OLD WORLD LEISHMANIASIS

I) VISCERAL LEISHMANIASIS

Visceral leishmaniasis, also known as **kala azar** (A Hindi term meaning **black fever**), **Dumdum fever** is fatal if left untreated in over 95% of cases. It is caused by *Leishmania donovani* complex that consists mainly of *L. infantum, L. donovani, and L. chagasi.*

Visceral leishmaniasis is a systemic disease characterized by a triad of fever, hepatosplenomegaly, and pancytopenia.

- Pyrexia is often an early symptom with irregular bouts of fever and rigor and chills, typically described as classical double rise of fever in 24 hours. Waves of pyrexia may be followed by apyrexial period
- Weight loss (Cachexia)
- Splenic enlargement is one of the most striking features and the organ progressively enlarges. With the progress of the disease, it extends several inches below the costal margin, often filling up the entire abdomen and palpable below the umbilicus.
- Hepatomegaly, usually moderate soon follows splenomegaly
- Lymphadenopathy is rare in Indian subcontinent but common in Africa and China.
- The skin over the entire body is dry, rough and harsh and is often pigmented (Darkened skin). The hair tends to be brittle and falls out.
- Pedal edema and ascites occur due to hypoalbuminemia in advanced stages of illness.
- In African kala azar watery eruption on the skin and mucosal lesions in mouth and nasopharynx are commonly seen, rare in India.
- Anemia (Normocytic and normochromic) appears early and may become severe enough to cause congestive heart failure
- Leucopenia
- Thrombocytopenia can lead to epistaxis, retinal hemorrhages, and gastrointestinal bleeding
- Hypergammaglobulinemia due to polyclonal B cell activation
- Nodular skin lesions (Leishmanioma) seen in African cases only
- If left untreated, 75 – 95% of the patients die within a period of two years. Death in kala azar is always due to some secondary complications, such as bacillary or amoebic dysentery, gastroenteritis, pneumonia, pulmonary tuberculosis, measles, and other septic infections. Cancrum oris seen in cases of severe neutropenia. It is to be noted that a profound immunosuppressive effect has been observed in kala azar and this may lead to bacterial invasion, which the patient will not be able to resist.

Table 2: Various forms of visceral leishmaniasis

	Old World visceral leishmaniasis			New World visceral leishmaniasis
	Indian visceral leishmaniasis (Kala azar)	**Infantile visceral leishmaniasis**	**African visceral leishmaniasis**	**Mediterranean visceral leishmaniasis**
Causative agent	*Leishmania donovani*	*Leishmania infantum*	*Leishmania donovani*	*Leishmania chagasi*
Vector	*Phlebotomus argentipes*	*Phlebotomus perniciosus*	*Phlebotomus orientalis, P. martini*	*Lutzomyia longipalpis*
Epidemiology	Indian subcontinent, East Africa	Middle East, Central Asia, China and Mediterranean basin	Sudan, Ethiopia, Kenya, Uganda	Central and South America
Age group affected	Young adults	Infants and children <5 years of age	Adults	Children
Reservoir	Anthroponotic (Human)	Zoonotic (Canine)	Anthroponotic, rarely zoonotic (Rodents)	Zoonotic (Canine)
PKDL	Common	Less common	Common	Less common
Lymph node involvement	Less common	More common, aggravated by poor response	Less common	Less common

Fig 3: Splenomegaly seen in visceral leishamniasis (Sources: web.stan and slideshare.net)

II) POST-KALA AZAR DERMAL LEISHMANIASIS (PKDL)

It develops months to years after the patient's recovery from visceral leishmaniasis (A sequel of visceral leishmaniasis), with cutaneous lesions ranging from hypopigmented macules to erythematous papules and from nodules to plaques usually on face, upper arms, trunks and other parts of the body. The lesions may be numerous and persist for decades. It occurs mainly in East Africa and on the Indian subcontinent, where 5-10% of

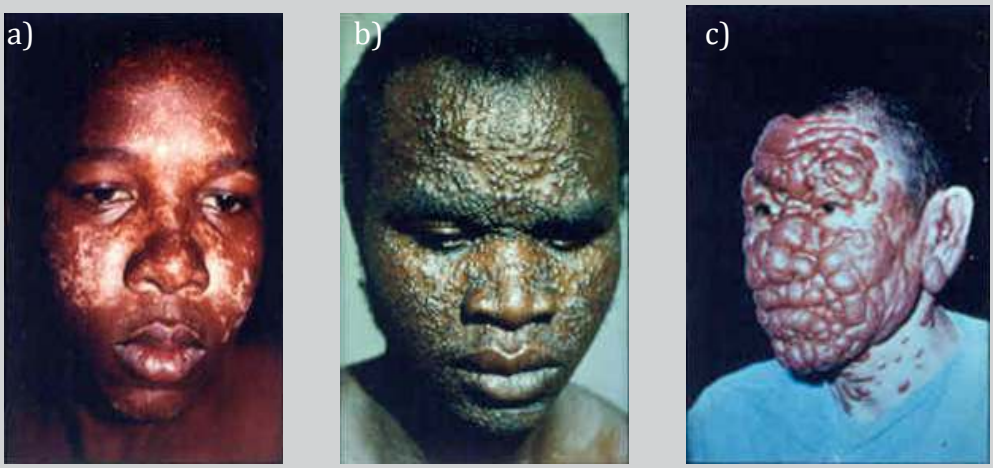
patients with kala-azar develop the condition. It usually appears six months to one or more years after kala azar has apparently been cured, but can occur earlier. People with PKDL are considered to be a potential source of kala azar infection.

PKDL develops as hypopigmented macule (Most common feature) near mouth which later on spreads to face and then to arms and trunks and finally becomes nodules resembling leprosy. Erythematous patches may occur as early lesions which appear on the nose, cheeks and chin, often having butterfly distribution (butterfly erythema). They are very photosensitive, becoming prominent towards the middle of the day. The nodules are soft, painless granulomatous growths of varying sizes generally found on the skin (Usually on face but can occur in any part of the body) and rarely on the mucus membrane of the tongue and eyes. Ocular lesions like conjunctivitis and uveitis are associated in some patients. Sometimes, PKDL occurs in patients with subclinical infection without a history of visceral leishamniasis.

The diagnosis is based on detection of amastigote in the skin in more than 80% cases in the Sudan. Amastigote is more easily detected from nodular lesions than other lesions. Direct agglutination test to demonstrate antibodies to rK39 antigen are positive in most of the cases.

The treatment of PKDL is by giving extended course of antimonial for a period of two to four months. PKDL cases often serve as reservoir of infection.

Fig 4: Post kala azar dermal leishmanoid (PKDL) a) Hypopigmented skin in early PKDL; b, c) Extensive facial nodular lesions in late PKDL (Source: El Hassan "Manual on visceral leishmaniasis control" WHO)



***Leishmania*-HIV coinfection**

HIV and *Leishmania* co-infection has become a significant concern for developing nations with high numbers of HIV immunocompromised individuals. *Leishmania*-HIV coinfected people have high chance of developing full blown clinical disease, and high relapse and mortality rates.

Both HIV and *Leishmania* affect each other's pathogenesis. *Leishmania* appears to cause activation of latent HIV by expressing high level of chemokine receptors (CCR5) on macrophages. HIV causes activation of TH_2 (T helper cells) cell response leading to disease progression and more relapses. *Leishmania* uptake is enhanced by the uptake HIV infected macrophages.

HIV co-infected patients do not show the classic signs of kala azar like hepatosplenomegaly but present with atypical features due to loss of immunity with presence of more gastrointestinal and pulmonary symptoms. The CD4 T cell count, often fall below 50/μL (Almost always <200/μL). There is a consideration to include leishmaniasis in Center for Disease Control and Prevention (CDC) clinical category C for the definition of AIDS as an opportunistic pathogen. Serodiagnostic tests for leishamniasis are usually negative. Amastigotes are demonstrated in unusual sites such as bronchoalveolar lavage fluid and buffy coat region of blood.

Liposomal amphotericin B is the drug choice for HIV-visceral leishmaniasis co-infection, but response is poor with frequent relapses. Antiretroviral treatment reduces the development of the disease, delays relapses and increases the survival of the co-infected patients.

Co-infection of HIV with visceral leishmaniasis has been reported from more than 35 countries. Mainly it is reported from Southern Europe (France, Italy, Spain and Portugal) where 5 - 75% of adult cases of visceral leishmaniasis are HIV positive and 7 – 17% of HIV infected people with fever have amastigotes. Also, reported from other places like sub-Saharan African and Indian subcontinent. In India, it is reported from Bihar, sub-Himalayan region and other North Indian States. Various studies reported the co-infection prevalence around 2 – 6%. High *Leishmania*-HIV co-infection rates are reported from Brazil, Ethiopia and the state of Bihar in India.

III) CUTANEOUS LEISHMANIASIS

It is also known as **Oriental sore, Tropical sore, Delhi boil, Aleppo boil, Baghdad button** is the most common form of leishmaniasis and causes skin lesions, mainly ulcers, on exposed parts of the body, leaving life-long scars and serious disability. It is caused by *Leishmania* tropica complex.

Leishmania tropica complex includes three species- *L. tropica, L. aethiopica*, and L. *major.* They cause old World cutaneous leishmaniasis. *L. tropica* is reported from Western India (mainly Rajasthan), Middle East and Mediterranean coast. It mainly affects urban area hence known as agent of urban anthroponotic cutaneous leishmaniasis. *L. aethiopica* infections are common in Ethiopia, Uganda, and Kenya. *L. major* is reported from Middle East, India, China, Africa, and Central Western Asia. It mainly affects rural area hence known as agent of rural zoonotic cutaneous leishmaniasis.

It is to be noted that *Leishmania tropica* exists in many countries where *L.donovani* is prevalent; the two parasites are not found in the same locality, and kala azar is very rare from places where oriental sore is endemic. In India, kala azar is confined to moist Eastern parts, whereas oriental sore is limited to dry Western parts. In Central Asia and Eastern Mediterranean region, they may be found side by side in a single family.

Table 3: *Leishmania* tropica complex of cutaneous leishmaniasis

Species	Geographical distribution	Clinical syndrome	Vector (Sandfly)	Reservoir	Transmission
Leishmania Leishmania tropica	Western India, North Africa, Middle East	Cutaneous leishmaniasis, Leishmaniasis recidivans	*Phlebotomus sergenti*	Humans	Anthroponotic

L.L. aethiopica	Ethiopia, Uganda, Kenya	Cutaneous leishmaniasis, Diffuse cutaneous leishmaniasis	*Phlebotomus longipes*	Hyraxes	Zoonotic
L.L. major	Middle East, India, China, Africa, Central and Western Asia	Cutaneous leishmaniasis	*Phlebotomus papatasi*	Rodents	Zoonotic

The oriental sore usually occurs on face and hands. It begins as papule, becomes nodular and finally it ulcerates. The margins of the ulcers are raised, painless and indurated. Lesions may be single or multiple and vary in size from 0.5 cm to more than 3 cm. Mostly it heals spontaneously leaving behind a scar. There may be satellite lesions, especially in L. major and L. tropica infections.

Fig 4: Cutaneous leishmaniasis (Source: dermatologyoasis.net)

Fig 5: Multilesional cutaneous leishmaniasis (Source: cmaj.ca)

IV) LEISHMANIASIS RECIDIVANS

It is a granulomatous response or relapse or recurrence of lesions at the site of apparently healed cutaneous leishmaniasis disease years after the original infection, typically on the face and often involving the cheek. It is characterized by new lesions formed on the face, usually scaly, erythematous papules and nodules develop in the center or periphery of a previously healed sore. The relentless expansion at the periphery may cause significant facial destruction similar to the lupus vulgaris variant of cutaneous tuberculosis, may persist for many years with a chronic and relapsing course. Cell mediated immunity (CMI) is intact and skin test (Leishmanin test or Montenegro test) is positive. Very few parasites can be demonstrated in the smears from the lesions.

Fig 6: Leishmaniasis recidivans (Source: slideplayer.com)

V) DIFFUSE (DISSEMINATED) CUTANEOUS LEISHMANIASIS

It is a rare form of leishmaniasis, caused by *L. amazonensis* and *L. mexicana* in South and Central America (New World) and by *L. aethiopica* in Ethiopia and Kenya (Old world). It is characterized by the absence of a Cell mediated immune response (CMI) to the parasite. Low CMI leads to widespread cutaneous disease, symmetric or asymmetric distribution of various lesions like papules, nodules, plaques, and areas of diffuse infiltration, non-ulcerative lesions (Analogous to lepromatous leprosy lesions) with heavy load of parasites. The delayed type hypersensitivity (DTH) response is negative therefore skin test (Montenegro test) is negative.

Fig 7: Diffuse cutaneous leishmaniasis (Sources: f1000Research and scholarship.org)

TREATMENT OF OLD WORLD LEISHMANIASIS

Supportive therapy: Correction of pancytopenia by blood transfusion, prompt management of other associated conditions.

Specific antileishmanial drugs: Pentavalent antimonial compound is the drug of choice in most endemic regions of the world, except in Bihar, India (due to emergence of drug resistance). Two pentavalent antimonial (SbV) preparations are available, **sodium stibogluconate** (100 mg of SbV/mL) and **meglumine antimoniate** (85 mg of SbV/mL).

WHO recommendations, 1995: For visceral leishmaniasis, the daily dose is 20 mg/kg by rapid intravenous infusion or intramuscular injection, and therapy continues for 28 – 30 days till smear microscopy is negative. For cutaneous leishmaniasis, 1 – 3 mL of antimonial preparation should be infiltrated at the base of the lesions for two to three times at interval of 1 – 2 days.

Resistance to antimonials: Increased resistance has been reported to *L. tropica, L. major,* and *L. mexicana* in comparision to *L. donovani*. Resistance to *L. donovani* is only reported from North Bihar, India. Mishandling of antileishmanial drugs is the single most important contributor to the development of drug resistance. The mechanism of emergence of this drug resistance is due to failure of reduction of SbV (prodrug) to its active form SbIII inside the resistant *L. donovani* amastigotes.

Amphotericin B is currently used as a first-line drug in Bihar, India for the treatment of visceral leishmaniasis. In other parts of the world, it is used when initial antimonial treatment fails. It is also the drug of choice for the new World mucocutaneous leishmaniasis. Conventional amphotericin B deoxycholate is administered in doses of 0.75 - 1.0 mg/kg on alternate days for a total of 15 infusions. Alternatively, the lipid formulations of amphotericin B are used which have lower side effects.

Paromomycin: It is an aminoglycoside antibiotic with antileishmanial activity. It is given intramuscularly at a dose of 11 mg of base/kg daily for 21 days.

Miltefosine: It is the first oral compound approved for the treatment of leishmaniasis. It is given as daily dose of 50 mg once or twice for 28 days.

PREVENTION OF OLD WORLD LEISHMANIASIS

Control measures to eradicate vector sandfly and personal prophylaxis by using insect repellents or bed nets. *Phlebotomus* doesn't fly high above the ground level and it is nocturnal in habitat. So, sleeping at top floors also can prevent transmission. Control of canine or rodent reservoir hosts is another preventive measure. Early treatment of all cases (Mainly anthroponotic visceral leishmaniasis and PKDL cases).

Currently no vaccine is available for the prevention of leishmaniasis. However, several trials are going on. Both killed and live-attenuated vaccine trials are ongoing targeting antigens derived from killed promastigotes. Trials for recombinant and synthetic vaccines are also ongoing using gp-63 antigen.

NEW WORLD LEISHMANIASIS

It is mainly caused by *Leishmania Viannia (L.V.) braziliensis complex, Leishmania Leishmania (L.L.) mexicana complex, L. L. chagasi (new World variant of L.L. infantum).*

The main difference between the two subgenera is promastigotes of the subgenus *Viannia* develop in the midgut and hindgut of sand fly where as that of subgenus *Leishmania* develop in the anterior portion of the alimentary tract of sand fly.

The morphology and life cycle of new world *Leishmania* species are identical to that of *L. donovani* except: Geographical distribution restricted to central and South America, vector *Lutzomyia* species, reservoir hosts include dogs and foxes (Zoonotic), and the amastigote forms in humans reside in reticuloendothelial cells of skin and mucus membranes, and do not invade viscera.

Leishmania Leishmania mexicana complex infected people develop cutaneous leishmaniasis similar to those seen with old World cutaneous disease. *L. mexicana* causes a specific form of cutaneous leishmaniasis called as chiclero ulcer or bay sore characterized by persistent ulcerations in pinna seen in Central America among workers living in forests harvesting chicle plants to collect chewing gum latex. Thirty percent of people are infected during the first year of exposure. *L. mexicana* and *L.amazonensis* produce diffuse cutaneous leishmaniasis similar to that of caused by *L. aethiopica.*

Fig 8: Chiclero ulcer (Source: dermatologyadvisor.com)

Table 6: *Leishmania Leishmania mexicana* complex

Species	Clinical syndrome	Geographical distribution	Vector	Reservoir	Transmission
Leishmania Leishmania mexicana	Chiclero ulcer, diffuse cutaneous leishmaniasis, mucocutaneous leishmaniasis	Central America and Northern parts of South America	Lutzomyia spp	Forest rodents, Marsupial and humans	Zoonotic
L.L. amazonensis	Cutaneous leishmaniasis, diffuse cutaneous leishmaniasis, mucocutaneous leishmaniasis				
L.L. venezuelensis	Cutaneous leishmaniasis				
L.L. pifanoi	Cutaneous leishmaniasis, diffuse cutaneous leishmaniasis				
L.L. garnhami	Cutaneous leishmaniasis				

***Leishmania Viannia braziliensis* complex** cause mucocutaneous leishmaniasis and also cutaneous leishmaniasis similar to oriental sore but they are more severe. **Mucocutaneous leishmaniasis** or **espundia** leads to partial or total destruction of mucus membranes of the nose, mouth, oral cavity, throat, and pharynx or larynx months to years after the cutaneous leishmaniasis. It is seen in 1 – 3% of patients infected with *L. braziliensis*, more commonly in males of age 10 - 30 years. The initial symptoms are often nasal stuffiness, erythema and mucopurulent discharge. It may eventually involve the upper lip, buccal, pharyngeal, or laryngeal mucosa. Ulcerative lesions are formed with erosion of the soft tissue and the cartilages leading to loss of lips, soft part of nose and soft palate. Gradually, the nasal septum may be destroyed, resulting in nasal collapse with hypertrophy of upper lip and nose leading to development of **tapir nose**.

Fig 9: Mucocutaneous leishmaniasis or espundia (Sources: openi.nlm.nih.gov and ResearchGate)

The cutaneous lesions of *L.V. guyanensis* and *L.V. peruviana* are known as **forest yaws** (pain bois) and **uta** respectively.

Leishmania Leishmania chagasi is the new World variant of *L.L. infantum*. It causes Mediterranean visceral leishmaniasis and cutaneous leishmaniasis, occurs in Central and South America. It is zoonatic with a canine reservoir host . Childrens are affected more commonly , the vector is Lutzomyia spp.

Table 7: *Leishmania Viannia braziliensis* complex

Species	Clinical syndrome	Geographical distribution	Vector	Reservoir	Transmission
Leishmania Viannia braziliensis	Cutaneous leishmaniasis, mucocutaneous leishmaniasis (Espundia)	Brazil			
L.V. panamensis	Cutaneous leishmaniasis, mucocutaneous leishmaniasis (Espundia)	Panama and Colombia			
L.V. guyanensis	Cutaneous leishmaniasis (Forest yaws), mucocutaneous leishmaniasis (Espundia)	Guyana	*Lutzomyia* spp	Dogs, foxes, forest rodents and humans	Zoonotic
L.V. peruviana	Cutaneous leishmaniasis (Uta), diffuse cutaneous leishmaniasis	Western Peru			
L.L. garnhami	Cutaneous leishmaniasis				

TREATMENT OF NEW WORLD LEISHMANIASIS

In contrast to old world cutaneous leishmaniasis, systemic therapy is recommended for new world cutaneous leishmaniasis as the lesions are more chronic, multiple and shows tendency for mucosal involvement.

Pentavalent antimonial is the drug of choice, administered as a dose of 20 mg/kg for 30 days. In case of relapse, **liposomal amphotericin** B (2 – 3 mg/kg for 20 days) or **miltefosine** (2.5 mg/kg for 28 days) are given.

Pregnancy Outcome in Women Having Oligohydramnios in Gandaki Medical College Teaching Hospital, Pokhara, Nepal

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Keywords
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ABSTRACT

Background: Amniotic fluid index is one of the most commonly used methods of amniotic fluid volume assessment and is a predictor of adverse maternal and perinatal outcome.

Objectives: To compare the maternal and perinatal outcome in women with singleton term pregnancies having amniotic fluid index (AFI) ≤5 cm to those having AFI ≥5 to 20 cm.

Methods: This is a prospective, case-control study which was conducted at Gandaki Medical College Teaching Hospital over a period of one year from July 2017 to July 2018. It included 60 pregnant women at term pregnancy with amniotic fluid index ≤5 cm. The control group included 60 pregnant women at term pregnancy with amniotic fluid index ≥5 cm. The two groups were compared. Statistical analysis was done using the Chi-square test to calculate the P- value.

Results: There was a significantly higher incidence of overall cesarean rates due to fetal distress, low birth weight babies and adverse neonatal outcome like 5 minute Apgar score ≤7, neonatal intensive care unit (NICU) admission rates, and meconium aspiration syndrome in the group with oligohydramnios as compared to the group with normal liquor volume.

Conclusion: Oligohydramnios adversely affects the perinatal outcome. However a favorable outcome can be expected by good antenatal and intrapartum surveillance and neonatal care.

INTRODUCTION

Amniotic fluid surrounds the fetus everywhere except at its attachment with the body stalk in the mother's womb. Amniotic fluid index (AFI) as described by Phelan and co-workers, in 1987, remains one of the most commonly used methods of amniotic fluid volume assessment. The AFI is the sum of the single deepest pocket from each quadrant. The normal range for AFI that is most commonly used is 5 to 24 cm, with values above and below this indicating hydramnios and oligohydramnios respectively[1].

Oligohydramnios is defined as amniotic fluid volume more than two standard deviation below the mean for specific gestational age or volume reduced below the fifth percentile for particular gestational age[2]. Late onset oligohydramnios has increased incidence of meconium stained liquor, abnormal fetal heart rate (FHR) tracing, low Apgar score, low birth weight, admission to NICU, birth asphyxia and cesarean section for fetal distress[3]. Clinical estimation of amniotic fluid volume is an important part of fetal assessment as variation in its amount has been related to a variety of pregnancy complications[4,5].

Oligohydramnios in pregnancy is related to increased maternal and fetal morbidity and mortality. Hence, this study was carried out to find the association of oligohydramnios with mode of delivery and perinatal outcome at term pregnancy in Western part of Nepal.

MATERIALS AND METHODS

This prospective study was conducted in Gandaki Medical College Teaching Hospital (GMCTH), Pokhara, Nepal over a period of one year from July 2017 to July 2018. A pregnancy outcome in 60 women with ultrasound diagnosis of oligohydramnios after 37 completed weeks of gestation was compared with 60 women with no oligohydramnios mother with same age and parity. All the pregnant women were admitted in maternity ward and those who fulfilled the study criteria were taken for the study purpose.

This study includes an analysis of mode of delivery, meconium passage, birth weight, Apgar score, neonatal intensive care unit admissions and neonatal deaths. Cases with AFI ≤5, Single live intrauterine gestation with cephalic presentation, 37 completed weeks of gestation and intact membrane were included in the study. Cases AFI ≥5, gestational age <37 completed weeks, post-term, Associated fetal malformations, ruptured membranes, malpresentation and multiple gestation and high-risk pregnancy having placental insufficiency, diabetes, chronic renal disease, connective tissue disorders abruption, prostaglandin syntheses inhibitors therapy, angiotensinogen converting enzyme inhibitors therapy, uterine scar due to previous lower segment cesarean section (LSCS), myomectomy, hysterotomy were excluded from the study.

Ethical approval was granted by the institutional review committee of the GMCTH to conduct the study. Informed verbal consent was taken from the patient. A detailed history was taken and examination was done in patients with ultrasonography (USG). The ultrasound transducer was held perpendicular to the floor and parallel to the long axis of the pregnant women. The uterus was divided into four equal quadrants, the right and left upper and lower quadrants, respectively; sum of four quadrants is amniotic fluid Index. The oligohydramnios group (AFI <5 cm) was compared with no-oligohydramnios group (AFI 5 - 20 cm). Variables like age and parity, mode of delivery, intrapartum complication, and fetal outcomes were noted. At birth, Apgar score, birth weight, and sex of the baby were recorded. Neonates who were admitted in the ward and Neonatal Intensive Care Unit (NICU) were followed till discharge.

Data was collected and compiled in MS-Excel 2010 and analysed using Chi-square test to compare the categorical variables. The p-value <0.05 was considered significant. All the analysis was carried out on SPSS software in 21.0 version.

RESULTS

During one year duration, 60 patients who completed 37 weeks of gestation with AFI <5 cm and met inclusion criteria were included in the oligohydramnios group. These patients were compared with 60 patients in no-oligohydramnios group (AFI 5 to 20 cm) after matching age group and parity. Both groups were followed to document the mode of delivery and neonatal outcome (Table 1).

Table 1: Maternal age and parity

Maternal age	Study group		Control group		p- value
	No.	%	No.	%	
Teenage	12	20	12	20	1
20 to 30 years	48	80	48	80	
Parity					
Primigravida	9	15	9	15	1
Multigravida	51	85	51	85	

From Table 1, it was observed that 20% of women with oligohydramnios were in the teenage group and 80% were in age group between 20 – 30 years. By parity 15% were primigravida followed by 85% multigravidas.

Table 2: Colour of liquor

Color of liquor	Study group		Control group		p-value
	No.	%	No.	%	
Liquor clear	30	50	52	86.7	<0.001
Thin meconium Stain liquor	22	36.7	6	10	0.001
Moderate meconium stain liquor	5	8.3	1	1.7	0.209
Thick meconium stain liquor	3	5	1	1.7	0.611

In presence of oligohydramnios, the occurrence of moderate and thick meconium stained were more, but statistically the difference between study and control group was non-significant (Table 2).

Table 3: Mode of delivery

Mode of delivery	Study group		Control group		P value
	No.	%	No.	%	
Normal delivery	11	18.3	54	90	<0.001
Vacuum delivery	6	10	2	3.3	0.272
Cesarean section	43	71.7	4	6.7	<0.001

As regards to mode of delivery, it was observed that 71.7% had cesarean and 18.3% had normal delivery in oligohydramnios group. There was statistically significant difference (p<0.001) between study and control group (Table 3).

Table 4: Neonatal outcome

		Study group		Control group		p-value
		No.	%	No.	%	
Apgar score in 5 minute	>7	49	81.7	58	96.7	0.008
	≤7	11	18.3	2	3.3	
Neonate weight	>2.5 gram	50	83.3	57	95	0.040
	≤2.5 gram	10	16.7	3	5	
Neonate admission	NICU	12	20	3	5	0.013
	Pediatric ward	3	5	0	-	0.244
	Baby with mother	45	75	57	95	0.002
	Perinatal death	0		0		

Oligohydramnios was significantly associated with poor Apgar score, decreased neonate weight and increased neonate admission (Table 4).

DISCUSSION

The objective of the present study was to compare the maternal and perinatal outcome in women with singleton term pregnancies having amniotic fluid index (AFI) ≤5 cm to those having AFI ≥5 to 20 cm. Assessment of amniotic fluid volume during the antenatal period is an important marker of fetal well being and considered a helpful tool in determining who is at risk for adverse neonatal outcome[6].

The present study assessed oligohydramnios with mode of delivery, color of liquor and neonatal outcome. In our study, there was no significant difference in age with oligohydramnios (p-value=1) which is similar to previous study[7]. Conversely, the incidence of oligohydramnios was 85% in multigravida, which was in contrast to Jandial *et al* and Petrozella *et al* who noticed that the incidence of oligohydramnios was 60.0% in primipara[8,9,10]. However, difference was statistically non-significant.

Regarding the color of liquor, our result is similar to that of Alchalabi *et al* where meconium staining of the amniotic fluid was significantly higher in the group with AFI <5 cm[11].

In this study, the rate of normal delivery was 18.30% in oligohydromnios group and 90% in no-oligohydramnios group. Various studies show different rates of cesarean deliveries in oligohydromnios patients while comparing with no-oligohydramnios group. In our study, the rate of cesarean section was higher in oligohydramnios (71.7% vs. 6.7%) and difference was statistically significant. These results correlate with the results of the study carried out by Nazlima and Fatima who found that 71% of women underwent cesarean in oligohydramnios group[6].

Concerning the neonatal outcome, our study showed statistically significant low Apgar score in oligohydramnios (18.3% vs. 3.3%) compared to no-oligohydramnios group. Similar results were observed by several studies[12,13,14,15,16]. On the contrary, Rainford *et al* noticed no significant differences in APGAR scores between the two groups[17]. The present study showed no significant differences in birth weight of babies (P=0.014 (>2.5 gm) and 0.013 (<2.5 gm). Results of this strongly correlate with studies done by Alchalabi *et al* and Gupta *et al*[11,18].

In the present study, there was no neonatal death in both study and control group. NICU admission was found to be significantly higher in oligohydramnios (P = 0.013) group compared to no-oligohydramnios group. Our result was similar to previous studies[13,19,20], but was in contrast other studies[11,17,21].

CONCLUSION

There are several adverse effects of oligohydramnios at term pregnancy on the perinatal outcome. An AFI ≤5 detected at term is an indicator for poor pregnancy outcome. However, Antepartum fetal assessment tests, intensive intrapartum monitoring coupled with timely intervention, a competent neonatologist and neonatal intensive care unit facility can reduce maternal and fetal morbidity and mortality.

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Dry Eye among Medical Students of Gandaki Medical College, Pokhara, Nepal

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ABSTRACT

Introduction: Dry eye disease results from decreased tear production, increased evaporation of tears and inflammation. Medical students often have dry eyes due to use of projectors, computers for study and also due to use of mobiles.

Objective: The present study was undertaken to find out dry eye by Schirmer 1 test with local anesthesia and measurement of wetting of Schirmer test strip.

Methods: Schirmer 1 test with anesthesia was performed on 200 medical students from June 1, 2017 to June 1, 2018 after obtaining informed consent and after applying some exclusion criteria. The test was performed by first applying 4% topical lignocaine and then using Whatman filter paper no 41 and wetting of the filter paper measured after five minutes and time noted.

Results: 146 (73%) Among 200 Students, were males and 54 (27%) were females. Mean age of patients was 21.73 ±1.42 years. Mild dry eye was seen in 19.5%, moderate in 13% and severe dry eye in 13.5% of medical students

Conclusion: Dry eye is one of common ocular disease among medical students.

INTRODUCTION

Dry eye is a common disease affecting worldwide. Dry eye is defined as a multifactorial disease of tears and ocular surface that results in discomfort, visual disturbance and tear film instability with potential damage to the ocular surface and is accompanied by increased osmolarity of tear film and inflammation of ocular surface according to International Dry Eye Workshop (2007)[1].

It is a very common condition affecting a significant percentage of the population. Different surveys have estimated the prevalence of dry eye varying between 5% and >30% in various age groups across different countries and worldwide. The estimated number of people affected by dry eye, range from 25 to 30 million all over the world[2]. Similarly other studies have also shown that dry eye affects 3-34% of the global adult population[3,4].

Dry eye disease results from decreased tear production, increased evaporation of tears and inflammation.

Symptoms of dry eye include dryness, discomfort, irritation, itching, fatigue, foreign body sensations, sensitivity to light in eyes, pain, and burning, mucous discharge and tear film alterations caused by tear deficiency and/or increased tear. More severe cases may present as eyes swelling, redness, corneal epithelium damage, and even vision disturbance.

Various methods used to diagnose dry eye disease include Schirmer test, phenol red thread test, tear film break up time (TBUT), tear meniscus height, epithelial staining

with rose Bengal and lissamine green, tear osmolarity, impression cytology.

Different tests have been shown to have different specificity and sensitivity. Tear osmolarity determination is the most reliable test to diagnose dry eye but is expensive to perform and time consuming. Schirmer test is one such test which is simple to perform and does not require slit lamp or other equipment and can be performed easily in OPD.

Schirmer introduced the test in 1903 and since then it has been modified by many investigators. Schirmer 1 test is the most popular of the variants and is carried out with and without anesthesia. When performed with anesthesia, it measures basic tear secretion and when performed without anesthesia it measures both reflex and basal tear secretions[5,6].

Gandaki Medical College Teaching Hospital is a tertiary centre at Pokhara with medical students enrolled in different subjects for graduation and post graduation. The MBBS program was started in 2010. Medical students often have dry eyes due to use of projectors, computers for study and also due to use of mobiles. Numbers of students come to Ophthalmology OPD with the problem. So this study is done to screen dry eye among medical students.

MATERIALS AND METHODS

After obtaining informed consent, 200 medical students from June 1, 2017 to June 1, 2018 were screened for dry eye by Schirmer 1 test after obtaining informed consent. Schirmer 1 test was done by commercially available schirmer strip that is Whatman filter paper no 41. Topical 4% xylocaine was applied to both the eyes five minutes before the test. Five millimetre of the Schirmer strip was folded and kept at the junction of lateral one third and medial two third of the lower eye lids with the eyes open. After five minutes the strip was removed and wetting of the strip was measured. According to wetting of the Schirmer strip, dry eye was graded as normal when the reading is more than 15 mm, mild dry eye 11 - 15 mm, moderate dry eye 5 - 10 mm, and severe less than 5 mm.

RESULTS

Among 200 students who were screened for dry eyes, 146 were males and 54 were females. The mean age of the students was 21.73 ±1.42 years. Table 1 shows age and sex distribution of the patients.

Table 1: Age and sex distribution of patients

Age	Males	Females
18	2	1
19	6	3
20	20	4
21	34	19
22	33	13
23	39	12
24	7	0
25	5	2
Total	146 (73%)	54 (27%)

Schirmer test showed that 108 students were normal that is there are no dry eyes, and 39 students had mild dry eyes, 26 students had moderate dry eyes and 27 had severe dry eyes.

Table 2: The results of Schirmer test

	No. of patients	Percentage (%)
Normal	108	54%
Mild dry eye	39	19.5%
Moderate dry eye	26	13%
Severe dry eye	27	13.5%

DISCUSSION

Dry eye is seen in all age groups but more commonly occurs in adult population. Dry eye is especially more common in those who work in computers, visual display terminals. No such studies among medical students have been done. Medical students are prone to dry eye due to prolonged use of projectors and computers for their academic activity. Also use of mobiles is common in this age group.

Dry eye is more common in females compared to males in studies done world wide[7,8,9,10]. Also study by Suchi Shah and Harsha Jani showed that 52% females had dry eyes compared to males[11].

Likewise a retrospective study conducted at Miami and Broward Veterans Affairs Eye Clinics estimated a prevalence of 22% DED in females compared to 12% in males[12]. In our study, it is more common among males than females. This can be explained from the fact that majority of the students were males. Also dry eyes in common among elderly women in studies world-wide but in our studies the subjects were

in twenties.

Our studies showed that 46% of the students had dry eyes, and 13.5% had severe dry eyes. Various hospital based studies showed prevalence of dry eyes as 18.4% and 40.8%[13,14,15]. Similarly the prevalence of dry eye is 25% in Canada[16] and 33% in Japan[17].

Dry eye has been seen among computer users. A study by Sandip D. Patil *et al*[18] among computers showed that dry eye is seen among 25% computers users. Study of medical students is generally based on computers and lap tops, so the dry eye seen among our students is consistent with other studies.

CONCLUSION

Dry eye is one of common ocular disease among medical students. Knowledge of dry eye helps in early diagnosis and treatment of dry eyes.

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Patterns of Cancer Occurrence In Nepal

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ABSTRACT

Background: Cancer is a public health problem throughout the world and Nepal is not an exception. Actual information on pattern of cancer morbidity and mortality is possible only from population-based registry, which unfortunately is lacking in Nepal.

Objectives: The objective of this study is to determine the pattern of cancer occurrence in Nepal with respect to different pertinent variables.

Methods: A descriptive cross sectional study was done among 198 admitted patients from Bhaktapur Cancer Hospital using semi-structured interview schedule. Data entry and analysis was done on IBM SPSS V20. Descriptive statistical measures were employed.

Results: This study showed that cancer was seen in advanced age group with no sex wise variations. Majority was married, literate, from rural area, of upper caste and upper lower socioeconomic status. Cancer of lung, rectum and bile duct were more frequent in males in contrary to that of breast, ovary and cervix in females. Malignant neoplasm of digestive organs in males and that of female genital organs in females were the commonest to occur according to ICD-10 classification.

Conclusions: Cancer is rapidly emerging non-communicable disease throughout the world. Despite lack of population based disease registry, patterns of disease from this hospital study emphasize prioritizing the health promotive activities against cancer in the general population.

INTRODUCTION

Cancer is a public health problem throughout the world and Nepal is not an exception. In 2012, there were 14.1 million new cancer cases, 8.2 million cancer deaths and 32.6 million people living with cancer (Within five years of diagnosis) globally. In the same year, an estimated 19 thousands new cancer cases and 14 thousands cancer deaths occurred in Nepal[1].

Actual information on pattern of cancer morbidity and mortality is possible only from population-based registry, which unfortunately is lacking in Nepal. Hospital based studies have shown that cancers of lung, oral cavity, larynx and stomach in males, and cancers of uterine cervix, breast, lung and ovary in females are the most frequent cancers reported in Nepal. Leukemia is common in case of children. Shifts in the main cancers are noted with different ages, with leukemias and lymphomas in young individuals replaced by lung, oral and stomach cancers in middle aged and lung, stomach and larynx cancers in the older category of males. In females the shift is to breast cancer in young women, then cervical cancer in middle age followed by lung cancer in the very aged. There results can vary between hospitals and regions within the country[2].

A significant proportion (23%) of total cancer patients in Nepal seeking cancer care inside the country are found to approach Bhaktapur Cancer hospital[2]. A large body of literature exists on the epidemiology of cancer in the Western world and some Asian countries. But, little has been done in Nepal in this regard. So the present study in the same hospital has been carried out to comprehensively delineate the cancer patterns in context of Nepal taking account of inadequate previous studies.

METHODS

A descriptive cross sectional study was done among 198 admitted patients from Bhaktapur Cancer Hospital, a specialized cancer care center, managed by Nepal Cancer Relief Society and located in the Bhaktapur district, Nepal. Study subjects were adult cancer patients, aged 18 and above, admitted in that center during four months of study period and willing to participate in this study. All invasive cancers in categories (C00-C99), precancerous lesions and in-situ carcinomas in categories (D00-D48) from International Classification of Diseases 10th Revision[3] (ICD-10), diagnosed by histopathology or radiology or other methods, were included in the study. Convenience sampling, a type of non-probability sampling method was used. Those who were seriously ill or in terminal stage or were unable to answer the questions were excluded.

Paper and pencil based interview was done with semi structured interview schedule. Data entry and analysis was done on IBM SPSS V20. Descriptive statistical measures were employed. Written consent was taken from patients, approval from Bhaktapur Cancer Hospital and ethical clearance from Institutional Research Committee. Patients had the right to refuse participation in the study and also the freedom to withdraw from it at anytime. The identity of the respondents and their response were kept confidential and the data were used for research purpose only.

RESULTS

Out of total 198 patients, 51% (101) were males and 49% (97) were females. The sex ratio was 1.04. Youngest and oldest ages were 19 and 81 years respectively. Age distribution of the cancer patients was left skewed with median age of 54 years and interquartile range (IQR) = [62 (third quartile Q3) – 45 (first quartile Q1)] = 17 years.

Since the study was carried out in adult patients above 18 years, 162 (81.8%) were married, 17 (8.6%) single and 19 (9.6%) widowed. Majority of the patients, 136 (69%), were from rural area and the rest 62 (31%) were from urban area as per their permanent residence status. Out of total patients, 77 (39%) were of upper caste. Disadvantaged non-dalit terai caste were 3 (1.5%), dalit 10 (5%), relatively disadvantaged janajatis 50 (25%), relatively advantaged janajatis 54 (27%) and religious minorities 4 (2%).

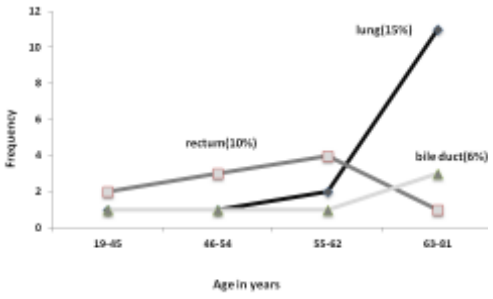
Regarding literacy status, 119 (60%) of the patients were literate and the rest 79 (40%) illiterate. Among the literates, majority had completed secondary education, followed by primary and higher secondary. When their socioeconomic status was assessed, none of them were from the upper socio economic class. Majority 105 (53%) was from the upper lower class, followed by lower middle class 78 (39%), lower class 11 (5%) and upper middle class 4 (2%) respectively.

In males, out of total 101 cases, 36 cases were malignant neoplasms of digestive organs (35.6%). This was followed by malignant neoplasms of respiratory and intrathoracic organs with 17 cases (16.8%). Third common cancer with 14 cases (13.9%) was of malignant neoplasms of lymphoid, haematopoietic and related tissue (Table 1).

Table 1: ICD classification of cancer and their respective occurrence in males

Types of Cancer	ICD Codes	Frequency	Percent
Malignant neoplasms of lip, oral cavity and pharynx	C00-C14	7	6.9%
Malignant neoplasms of digestive organs	C15-C26	36	35.6%
Malignant neoplasms of respiratory and intrathoracic organs	C30-C39	17	16.8%
Malignant neoplasms of bone and articular cartilage	C40-C41	10	9.9%
Malignant neoplasms of male genital organs	C43-C44	1	1%
Malignant neoplasms of thyroid and other endocrine glands	C73-C75	1	1%
Melanoma and other malignant neoplasms of skin	C43-C44	1	1%
Malignant neoplasms of mesothelial and soft tissue	C45-C49	7	6.9%
Malignant neoplasms of urinary tract	C64-C68	6	5.9%
Malignant neoplasms of eye, brain and other parts of central nervous system	C69-C72	1	1%
Malignant neoplasms of lymphoid, haematopoietic and related tissue	C81-C96	14	13.9%
Total		101	100

Fig 1: Age distribution of major cancers in males



When cancers from individual sites were considered, lung cancer was the most common cancer in males 15 (15%), followed by cancer of rectum 10 (10%) and cancer of bile duct 6 (6%). Age classification is done according to the quartile values, Q1= 45 years, Median = 54 years, Q3 = 62 years. The lowest and highest age of cancer patients in this study are 19 and 81 years respectively (Fig 1).

In case of females, malignant neoplasm of female genital organs were the most frequent type of cancers followed by malignant neoplasm of digestive organs and malignant neoplasm of breast (Table 1). Among individual cancers, breast cancer was the most common cancer in females 22 (23%), followed by cancer of ovary 13 (13%) and cancer of cervix 12 (12%) (Fig 2).

Table 2: ICD classification of cancer and their respective occurrence in females

Types of Cancer	ICD Codes	Frequency	Percent
Malignant neoplasm of lip, oral cavity and pharynx	C00-C14	3	3.1%
Malignant neoplasm of digestive organs	C15-C26	23	23.7%
Malignant neoplasm of respiratory and intra-thoracic organs	C30-C39	7	7.2%
Malignant neoplasm of mesothelial and soft tissue	C45-C49	1	1%
Malignant neoplasm of breast	C50	22	22.7%
Malignant neoplasm of female genital organs	C51-C58	30	30.9%
Malignant neoplasm of urinary tract	C64-C68	2	2.1%
Malignant neoplasm of eye, brain and other parts of central nervous system	C69-C72	2	2.1%
Malignant neoplasm of lymphoid, hematopoietic and related tissue	C81-C96	7	7.2%
Total		97	100

Fig 2: Age distribution of major cancers in females

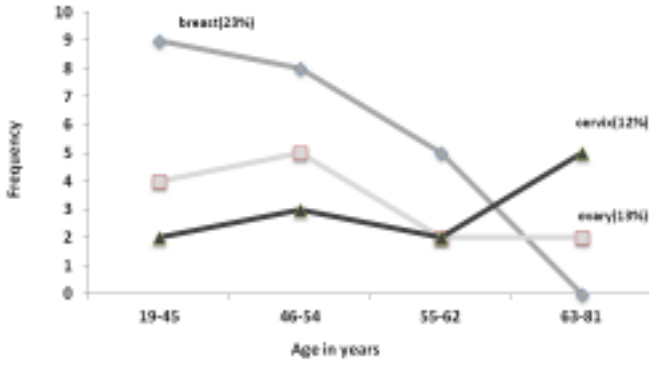
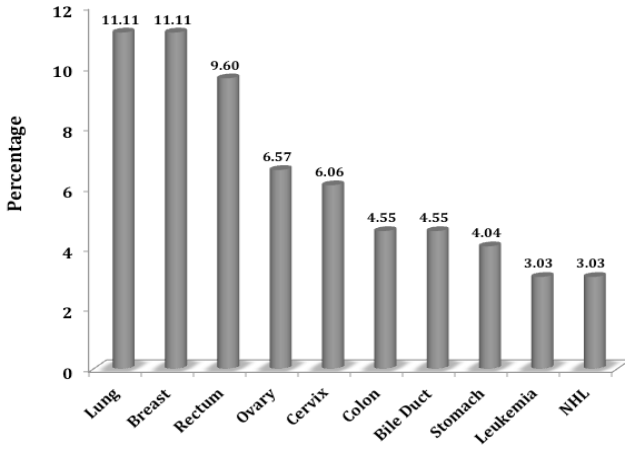


Fig 3: Top 10 cancers in both sexes



When 198 cancer patients of both sexes were considered, cancers of lung, breast, rectum, ovary and cervix were the most frequent cancers respectively (Fig 3).

DISCUSSION

Demographic characteristics of the study subjects include sex ratio of 1.04, age range of 62 years (81 - 19) and median age of 55 years. So cancer was more commonly seen in advanced age group though the types of cancer varied with age and sex. Binu VS *et al* in a study from Manipal College of Medical sciences, Nepal reported that out of total 957 cancer cases, 51.8% were males and 48.2% females with male to female ratio 1.1 : 1. The median age of males and females were 63 and 60 years respectively[4]. On contrary, El Helal TA *et al* reported in a study from Jordan that male to female ratio was 1.5 : 1; the median age for males was 43 years and for females it was 45 years[5].

According to ICD classification, this study found 36 (35.6%) cases were malignant neoplasm of digestive organs, followed by malignant neoplasm of respiratory and intra-thoracic organs with 17 cases (16.8%) among males. Third common cancer with 14 cases (13.9%) was of malignant neoplasm of lymphoid, hematopoietic and related tissue. In case of female, malignant neoplasm of female genital organs (30.9%) were the most frequent type of cancers followed by malignant neoplasm of digestive organs (23.7%) and malignant neoplasm of breast (22.7%).

A study from Western Nepal found that among males, 33.1% of all cancers were in the respiratory system,

followed by digestive organ cancers (23.2%). Among females, 28.4% cancers were related to the reproductive system, 22.8% to the respiratory system and 14.1% to digestive organs[4]. This study found that cancer of lung, rectum and bile duct were more frequent in males in contrary to that of breast, ovary and cervix in females. In males, cancers of lung and bile duct were seen less in younger and middle age group but more in older age group. In case of rectal cancer, patients from younger and middle age were more affected while it was seen less in older patients. Breast cancer was found more in younger age group and less in older patients. Cervical cancer was just the opposite with older people more affected. Number of ovarian cancer increased from younger age to adult and again decreased in older age group. Pradhananga KK *et al* found that the most common site in males was the lung, followed by the oral cavity and stomach; while the first three in females were cervix uteri, breast and lung. Shifts in the main cancers were noted with different ages, with leukemias and lymphomas in young individuals replaced by lung, oral and stomach in middle age and lung, stomach and larynx in the oldest category of males. In females the shift was to breast in young women, then cervix in middle age followed by lung in the very aged. There was also variation between hospitals, but this appeared largely due to the differences in the therapeutic modalities available in different institutions[2]. In similar studies, lung cancer in males and breast cancer in females are the most common cancers[6,7,8].

CONCLUSION

Cancer is a global disease. It is an important emerging non-communicable disease in developed as well as developing countries. This study showed cancer is equally common in both sexes, more in advanced age group and people from lower and middle socio-economic classes are more affected. Cancer of lung, rectum and bile duct in males, while cancers of breast, ovary and cervix in females are the more frequent types; further varying with different age. This emphasizes prioritizing the health promotive activities against cancer in the general population.

Conflict of Interest

None

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Etiological Profile and Management of Epistaxis in Tertiary Care Hospital

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ABSTRACT

Introduction: Epistaxis is a common otolaryngological emergency condition. It occurs due to local and systemic cause. Local cause lies within the nose bleeding either anterior or posterior. Commonest site of bleeding anterior epistaxis is kiesselbach's plexus. In posterior epistaxis, it is difficult to locate bleeding site. Epistaxis is controlled by simply pinching of nose, decongested nasal drop and abgel packing. Some cases become more challenging required nasal packing and arterial ligation.

Objectives: To study the epidemiological pattern and management of epistaxis.

Methods: This was a retrospective study on pattern of epistaxis managed at Gandaki Medical College Teaching Hospital over a period from April 2015 to April 2016. Information regarding demographic profile, presentation and management of epistaxis was obtained from the Hospital records, ENT Outpatient clinic, Emergency Department, ENT ward and operation theatre.

Results: A total of 78 cases were managed during study period. There was a significant male preponderance with male to female ratio 1.78:1. Patients' age varied from eight to 80 years with mean age 40.7 years. The peak age of incidence was 21 - 30 years group. Idiopathic nasal bleeding 27 (34.6%) was commonest followed by nasal trauma 23 (29.5%) cases and hypertension 16 (20.5%) cases. Seventeen (21.8%) cases managed in day care basis with decongested nasal drop, chemical cautery and abgel packing. Remaining cases required nasal packing and bipolar cautery and other specific form of treatment. Five (6.4%) cases required sphenopalatine artery ligation with no recurrence of bleeding.

Conclusions: Epistaxis is common ENT emergency. Most common causes are idiopathic followed by nasal trauma and hypertension. Prompt management is instituted according to cases. Most of the cases are managed by non-surgical method.

Keywords
Endscopy, Epistaxis, Nasal packing.

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INTRODCUTION

Epistaxis remains one of the common ENT emergency in medical practice. Prevalence of epistaxis is aournd 7 - 14% in general population[1,2]. It may be minor to major

troublesome bleeding which is life-threatening. Epistaxis is classified either primary or secondary according to causal relation. Anatomically, it can be classified anterior and posterior. Posterior epistaxis is more life threatening than anterior[2].

Different modaliities are available for treatment of epistaxis. In severe bleeding it starts with initial resuscitation. Assessment was done by taking history and by clinical examination. Different treatment modalities include pinching of nose, chemical cautery, anterior nasal packing, posterior nasal packing etc. Surgical ligation of bleeding vessel may require some cases. Earlier times, either maxillary or external carotid artery ligations were done to control refractory epistaxis. Nowadays after Hopkins rod telescope endoscopic sphenopalatine artery ligation is done which has high success rate[3].

The objective of this study is to find out causes, site of nose and modality of treatments in our setup.

METHODS

This is a retrospective study done in patients who presented with nasal bleeding in Department of ENT, Gandaki Medical College Teaching Hospital, Pokhara, Nepal during a period of from April 2015 to April 2016. A total of 78 cases of epistaxis were identified. These patients were received from Emergency Department, Otorhinology OPD, and referral cases from other Departments. Post operative nasal bleeding cases were excluded from study. The information regarding demographics of patients, site of bleeding, management were recorded. Data were collected and calculated SPSS version 21.0.

RESULTS

This study comprised of 78 cases of epistaxis, who attended the Ear, Nose and Throat, Department of Gandaki Medical College Teaching Hospital, Pokhara, Nepal, between April 2015 and April 2016. Patients varied from eight to 80 years of age with mean age 40.7 ±19.77 years. Males were affected more frequently than females. In this study, 50 cases (64.1%) were males and 28 (35.9%) were females. The male to female ratio was 1.78 : 1.

Table 1: Sex distribution of patients

Sex	No of cases	Percentage (%)
Males	50	64.1%
females	28	35.9%
Total	78	100%

Table 2: Age distribution

Age group (years)	No of cases	Percentage (%)
0 - 10	2	2.6%
11 - 20	9	11.5%
21 - 30	21	26.9%
31 - 40	10	12.9%
41 - 50	8	10.3%
51 - 60	12	15.3%
61 - 70	11	14.1%
71 - 80	5	6.4%
Total	84	100.0%

Age group 21 - 30 was most commonly affected (26.9%) followed by the age group 51 - 60 years (15.3%). Idiopathic nasal bleeding 27 (34.6%) was commonest followed by nasal trauma 23 (29.5%) cases and hypertension 16 (16.5%) cases. Most of cases bleed from unilateral side either left or right in 76% of cases. Bilateral nasal bleeding most commonly found in most of traumatic cases.

Fig 1: Site of epistaxis

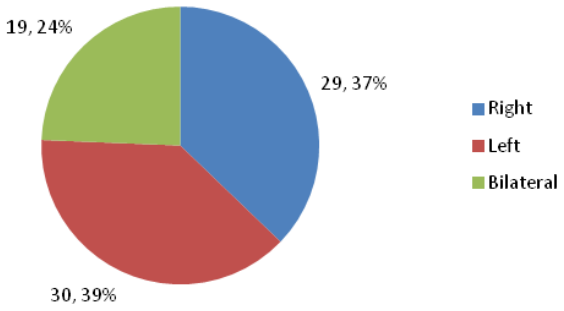

Table 3: Causal factor for epistaxis

	No of cases	Percentage (%)
Idiopathic	27	34.6%
Trauma	23	29.4%
Hypertension	16	20.5%
DNS with spur	6	7.8%
Neoplastic (Benign & malingnant)	3	3.8%
Inflammatory polyp	2	2.6%
Blood dyscrasia	1	1.3%
	78	100%

Table 4: Main modalities of treatment

	No of cases	Percentage (%)
Oxymethazoline nasal drop	4	5.2%
Chemical cautery	5	6.4%
Abgel	8	10.2%
Merocele packing	9	11.5%
bipolar cautery	20	25.6%
Sphenopalatine artery ligation	5	6.4%
Nasal bone reduction	18	23.1%
Excsion of tumor	3	3.8%
Septoplasty	2	2.6%
Fess	2	2.6%
Blood transfusion	2	2.6%
	78	100%

DISCUSSION

Epistaxis is a common otorhinolaryngological emergency. It ranges from little spot bleeding to a life threatening condition. It occurs in any age group from Pedatrics to adult. In our study, it occur from eight years of age to 80 years old patients. Etiology is different for different age groups. Epistaxis is common in all age groups.

Common local cause include trauma, tumor of nasal cavity, nose pricking, foreign body etc. systemic disease also present with epistaxis in hypertension, liver disease, bleeding disorder, liver disease, renal failure. Mean age of epistaxis found in our study was 40.7 years, similar finding found in a study by Akinpelu *et al*[4]. Epistaxis was found more common in males, with a male to female ratio of 1.78 : 1[5,6,7]. The higher incidence in males may be due to as increased exposure to trauma, physical assault and other injures. Women have less bleeding may be due to effect of estrogen[8].

In our study commonest etiological factor was idiopathic (34.5%), followed by the trauma (29.4%) and hypertension (20.5%), which is similar finding Iseh KR *et al*[9], Varsney *et al*[10]. Bhaumik N *et al*[8] and Hanif M *et al*[11] found that hypertension followed by trauma are the common causes of epistaxis. Unilateral bleeding occur in 76% of cases, either left or right. It signifies probability of local causes in idiopathic epistaxis.

Trauma was second most common cause of epistaxis in our study but Shresta I *et al*[12] showed trauma is most common cause. Trauma is more common in younger age group. Young people are the most active in the population so are more vulnerable to trauma from nose picking, fights, road traffic accidents, fall injury and physical assault. Out of 23 nasal trauma cases, 16 (69.9%) cases require reduction of nasal bone. Two (8.6%) cases with open reduction and remaining five (21.7%) cases treated with conservative treatment.

Hypertension is common above 40 years of age. Hypertension being the third commonest cause of epistaxis in our study but first common cause in study by Henif M *et al*[11]. Most of the large studies have failed to show a causal relationship between hypertension and epistaxis[2]. It signifies the poor blood pressure control. Strict regular blood pressure checkup and control must be emphasized.

Treatment of epistaxis range from observation to medical or surgical treatment. In our study 21.8 % of cases epistaxsis controlled by decongested (Oxymethazoline) nasal drop, chemical cautery and abgel. We feel treatment of epistaxis depends on amount and site of bleeding. It is better to observe overnight such patient in hospital. Most of case, we first do anterior nasal packing either ribbon gauze or merocele. After arresting active bleed, with in next 48 hour, we do endoscopy of nose by hopkin telescope 0 or 30 degree. If bleeding site seen, we do bipolar cautery to stop bleeding. It is effective method of treatment[13,14,16]. Cauterization of bleeding vesel done in 25.5% cases. In cases, where bleeding point uncertain, but bleeding present, those cases were managed with sphenopalatine artery ligation. In five (6.4%) cases, sphenopalatine artery ligation was done in our study. Ninety percent of the nasal mucosa received its blood supply via the sphenopalatine artery[17]. It is very effective method of surgical treatment with high success rate. It overall reduces hospital admission and cost of treatment[18]. No rebleeding occur in our study after artery ligation

In bleeding mass, we should think of nasal benign and malignant lesion. Endoscopic sinus surgery was done in 6.4% of cases, of them two hemangioma, one inverted papilloma and two nasal polyposis. The need for resuscitation in cases of severe epistaxis should be emphasized to prevent hypovolemic shock and fatal outcome. Prompt evaluation of quantity of blood loss and timely intervention is crucial in the management of epistaxis. There may be the need for blood transfusion. Two cases needed blood transfusion.

CONCLUSIONS

Epistaxis is common otolaryngological emergencies. Most common causes are idiopathic followed by nasal trauma and hypertension. Careful history and nose examination is essential to make diagnosis. Prompt management is instituted according to cases. Treatment depends on amount and site of bleeding. Most of the cases are managed by non-surgical method.

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Conflict of Interest
None

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Measurement of Length of Styloid Process by Orthopantomography

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ABSTRACT

Background: Styloid process (SP) is an anatomical structure whose elongation is not well understood. Proper clinical and radiological assessment is needed to detect an elongated SP. Anatomical variation is also common. SP is said to be elongated if longer than 30 mm. Orthopantomogram (OPG) is also an imaging modality by which we can view SP.

Objective: The objective of this study was to assess the SP on OPG and identify eagle syndrome.

Materials and Methods: The study was conducted on archived OPG radiographs available in the Department of Oral Radiology, Gandaki Medical College Teaching hospital and Research Centre. These radiographs were from patients who were subjected to radiographic examination for other dental problems. The length of SP was measured on both sides using the measurement tool bars on the accompanying analysis software.

Results: Average length of SP on males was 26.5 mm ±14.4 mm in right and 25.5 mm ±6.19 mm in left; and on females was 23.78 mm ±5.93 mm on right and 24.7 mm ±10.44 mm in left. Elongated SP was more on males compared to females. Elongated styloid process (ESP) was more prevalent in 21 - 30 years of age group, similarly unilateral and bilateral elongation was also predominant on males compared to females.

Conclusion: OPG is also useful for detection of an ESP in patients with or without symptoms and helps to avoid misdiagnosis of tonsillar pain or pain of dental, pharyngeal or muscular origin as well as Eagle syndrome (ES).

Keywords
Eagle syndrome, Elongated styloid process, Orthopantomogram, Styloid ligament, Styloid process.

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INTRODUCTION

Styloid process (SP) is a cylindrical bone that arises from the temporal bone in front of the styloid mastoid foramen, which is derived from the Reichert's cartilage of the second brachial arch[1]. It normally measures about 2 to 3 cm in length, although it varies in length from person to person and even from side to side in same individual[2,3].

The SP is a long, slender and pointed bony process projecting downwards, forwards and slightly medially from the temporal bone. It is interposed between the parotid gland laterally and internal jugular vein medially. External carotid artery crosses tip of SP superficially. Facial nerve crosses the base of styloid process laterally after it emerge from stylomastoid foramen.

It descends between the external and internal carotid arteries to reach the side of the pharynx. When symptoms are associated with elongation of the SP, the condition is termed as Eagle syndrome[3].

The ESP, when it causes pain on rotating head, dysphagia and referred otalgia is known as Eagle's syndrome. Eagle

syndrome was first described by Otorhinolaryngologist, named Eagle WW in 1937 on a case report of elongated SP, since then it is called Eagle's syndrome[3]. Eagle considered tonsillectomy is responsible for the formation of scar tissue around the styloid apex, with consequent compression or stretching of the vascular and nervous structure contained in the retro styloid compartment.

Eagle's syndrome is associated with disorders causing heterotopic calcification such as abnormal calcium-phosphorus metabolism and chronic renal failure. The syndrome is divided into two main sub types based on cranial nerve impingement and carotid arterial impingement. In cranial nerve impingement patient develops symptoms related to compression and irritation of cranial nerves V, VII, IX and X such as facial pain while turning the head, dysphagia, foreign body sensation, pain on extending tongue, change in voice, sensation of hyper salivation and tinnitus or otalgia. Compression of carotid artery produces vascular and ischemic symptoms, eye pain, visual symptoms, parietal pain and syncope.

MATERIALS AND METHODS

With this background we had proceeded to perform a retrospective study on archived OPGs to ascertain the length of the SP. Though there have been few studies done in the past this study was repeated for the fact that were no studies based on Nepalese population.

The study was conducted on archived OPG radiographs available in the Department of Oral Radiology, Gandaki Medical College Teaching hospital and Research Centre from August 2017 to April 2018. These radiographs were from patients who were subjected to radiographic examination for other dental problems.

A total of 1062 digital OPG, of patients aged between eight to 78 years were taken. From this group about 62 were excluded due to poor diagnostic quality. Out of radiographs 518 obtained from males and 482 from females. Only those radiographs were included in which both sides of SP were visible.

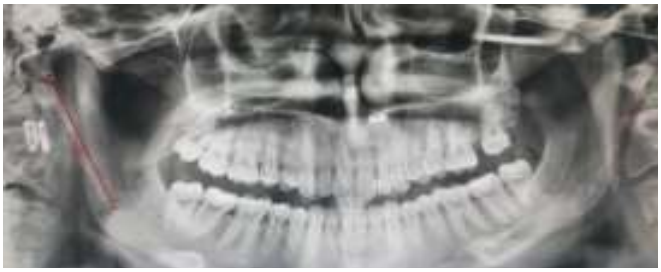
The radiographs were exposed with Vatechpa X-I (PCh-2500) machine, Korea. The exposures were taken at 70-73 kvp with 10-12 mA depending on the built of the patient.

SP measuring more than 30 mm were considered elongated[5] if the styloid or stylomandibular ligaments were ossified, they were measured along with SP, as a part of ESP. Figures shows normal SP and ESP (Fig 1, 2].

The collected data was entered in a spreadsheet (Excel 2013, Microsoft, and Richmond, USA) and was analyzed using statistical analysis software (SPSS version 17, Chicago, USA). The chi-square test, unpaired t test, and one-way ANOVA were used for analysis.

Fig 1: Orthopantomogram with SP

Fig 2: Orthopantomogram with ESP



Statistics

The data obtained was tabulated using Microsoft Excel, Redmond, USA. The results were analyzed with Statistical Package for Social Sciences, (SPSS) ver 25.0. The expected statistical analysis was to compare the mean lengths of the right and left sides, and between genders. When the comparison was done between the right and left side in the same the gender paired t test was used and between genders comparison for the right and left side was done with unpaired t test. The level of significance was fixed at $p<0.05$.

RESULTS

The study evaluated 1061 orthopantomographs. Out of these 61 were discarded for poor diagnostic quality, patient with artificial denture, and old age. A final set

of 1000 OPGs were taken for evaluation. Among the 1000 OPGs, 481 (48%) were males and 519 (52%) were females. The SP length was measured on both sides. The results obtained in the study are tabulated below (Table 1).

Table 1: The mean length of styloid process in males and females

	Numbers	Right	Left
Males	481	26.5 mm ±14.4	25.5 mm ±6.19
Females	519	23.78 mm ±5.93	24.7 mm ±10.44

The mean length of the SP on the right side for males was 26.5 ±14.4 mm and on left side was 25.5 ±6.19. The null hypothesis assumed was there is difference in length between the males and females. For the given scenario the statistical analysis performed was paired sample t test. The results were statistically insignificant (p>0.05) with the difference between the right and left being different (Table 2).

Table 2: Comparison of the mean length of the styloid process in the right and left side for males

	Mean	SD	p-value
Right	26.55	14.41	0.35
Left	25.89	6.19	

The mean length of SP infor the right side was 26.5 mm ±14.4 and for left side was 25.8 mm ±6.19. The paired sample t test analysis was performed which had yielded statistically insignificant (p >0.05) between the right and left sides (Table 3).

Table 3: Comparison of the mean length of the styloid process in the right and left sides for females

	Mean	SD	p-value
Right	23.78	5.93	0.079
Left	24.71	10.44	

Since the above tests showed that there is significant difference in the lengths between the right and left sides, we proceeded for the next analysis to compare the mean length of each side between genders.

The mean length of males, right SP 26.5 mm ±14.4 in 481 males and the mean length of females, right styloid process was 23.78 mm ±5.93 in 519 females. For the given scenario the unpaired sample t test was used. The test yielded statistically significant (p>0.05) accepting the null hypothesis that there is difference between right side of males and right side of females (Table 4).

Table 4: Comparison of the mean length of the styloid process in the right side length between males and females

	Mean	SD	p-value
Males	26.55	5.93	p <0.05
Females	23.78	14.41	

The mean length of males right SP was 26.55 ±5.93 mm and the mean length in females are 23.78 ±14.41 mm. The results showed statistically significant difference (p<0.05) between males and females based on unpaired sample t test (Table 5).

Table 5: Comparison of the mean length of the styloid process in the left side between males and females

	Mean	SD	p-value
Males	25.89	6.19	p<0.05
Females	24.71	10.44	

The mean length of males left SP was 25.8 mm ±6.19 and mean length in females was 24.7 mm ±10.44. The result showed statistically significant difference (P <0.05) between males and females based on unpaired sample t test.

Out of 1000 OPGs, approximately 2000 SP were evaluated. The percentage of SP elongation was 57.56% in males and 42.43% in females.

ESP were seen in all age groups as shown in Table 1, and more prevalent in the age group of 21 - 30 years. Unilateral elongated in 116 patients out of which males were 49 and females were 69 and bilateral elongated SP in 122 out of which males were 68 and females were 54.

Table 6: Mean and number of enlarged SP according to age group

Age group (Years)	No.	Right	Left
≤20	14	33.1 ±5.07	32.0 ±5.48
21 - 30	68	32.8 ±5.24	32.1 ±5.46
31 - 40	56	34.2 ±5.60	33.4 ±6.11
41 - 50	36	32.5 ±5.75	33.3 ±5.99
51 - 60	36	32.4 ±5.45	32.0 ±5.23
60 - 70	16	34.5 ±7.29	32.1 ±7.17
≥70	12	32.6 ±8.51	32.5 ±8.26

DISCUSSION

"SP" is derived from the Greek word 'Stylos' meaning a pillar. The styloid process is a long, slender cylindrical bone arising from the temporal bone infront of the stylomastoid foramen. Embryologically, the styloid

process and its ligaments are derived from the first and second branchial arches which also give rise to Reichert's cartilage. ESP was first reported by Eagle concerning findings indentomaxillofacial and ear-nose-throat patient[3].

There are several imaging modalities used for diagnosis of the Eagle syndrome, panoramic radiography, lateral skull radiography, Towne's view radiograph, anterioposterior skull radiograph, and CT scan are some of them. The complete details of length, angulation and relation to adjacent structures can be obtained from a CT scan by formulating a 3D-CT[5,6].

Radiological normal length of SP measures between 2.5 to 3 cms as reported by Eagle[7] but kaufman *et al* has reported 30 mm as upper limit of normal SP[4].

The exact cause for SP elongation is poorly understood and several theories had been proposed for the elongation of SP. It could be due to growth of osseous tissue at the insertion of stylohyoid ligament or it could be due to calcification of stylohyoid ligament due to unknown process or due to persistence of cartilaginous analog of stylohyal[7,8].

Various investigators have reported the incidence of elongated styloid as 1.4, 4, 7 and 18.2%, respectively[4,9-11].

The mean length of males, right and left styloid process was 26.55 mm ±14.41and 25.89 mm ±6.19 respectively. The mean length of female right and left styloid process was 23.78 mm ±5.93 and 24.71 mm ±10.44 respectively, concluding that males have longer styloids as compared to females.

In several studies conducted by various authors reveals that the styloid processes were elongated more in males when compared to females and more on the left side when compared to the right side[12-14]. However, this finding differed from those of some other researchers, who found an increased incidence in females[15].

The percentage of SP elongation was 57.56% in males and 42.43% in females. Unilateral elongation in left side (23.1%), right side (25.63%) and bilateral elongation was 28.5% in males and 22.26% in females. Bozkir *et al* had noted unilateral elongation in 25% and bilateral elongation in 75% of the panoramic radiographs[17]. In our study the length was greater on the right side than the left side.

In Balcioglu HA *et al* study, the length of the SP of males is statistically greater than the females in all age groups and on both sides[13].

In another anthropological study of 110 skulls, only five skulls had elongation of styloid process of which three had bilateral elongation and only two had unilateral elongation[18].

CONCLUSION

Our study yielded the average length of the SP which was consistent with the studies earlier reported in the literature. Panoramic radiography (OPG) is useful for detection of ESP in patient with or without symptoms. It can also help us to avoid misinterpretation of the symptoms as tonsillar pain or pain of dental, pharyngeal or muscular origin.

Conflict of Interest

Conflict of interest declared none

Financial support and sponsorship

Nil

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Profile of Hypertensive Retinopathy in a Tertiary Centre in Western Nepal

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Keywords
Fundus, Hypertensive retinopathy, Tertiary centre.

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ABSTRACT

Objective: The present study was done to find out prevalence of hypertensive retinopathy among patients attending in OPD in GMC.

Methods: A hospital based cross-sectional study was performed among 200 hypertensive patients visiting eye OPD from Dec 2016 to Dec 2017. Detailed eye examination including fundus evaluation under mydriasis was done on all subjects and hypertensive retinopathy was graded according to Keith, Wagner and Barker classification by ophthalmologist using 90 dioptre lens. Patient having diabetes and other retinal diseases were excluded from the study. Data analysis was done using spss software.

Results: The mean age of the patients was 60.58 ±12.26 standard deviation. In our study 56.5% patients had hypertensive retinopathy. Of which 31% had grade I, 19% had grade II, 6% had grade III and 0.5% had grade IV hypertensive retinopathy. The ratio of hypertensive retinopathy among male and female was 1.7:1.

Conclusion: Hypertensive retinopathy is common among hypertensives and males are more prone to retinopathy than females.

INTRODUCTION

Hypertension affects nearly 26% of the adult population worldwide. Kearney and colleagues estimated that the prevalence of hypertension in 2000 was 26% of the adult population globally and that in 2025 the prevalence would increase by 24% in developed countries and 80% in developing countries[1].

Hypertension is a risk factor for a number of vision-threatening eye conditions including retinal vascular occlusion, retinal macroaneurysm and non arteritic anterior ischaemic optic neuropathy.

Eyes are proven hypertensive target organs[2]. Hypertension may exacerbate the vision-threatening effects of diabetic retinopathy and has been implicated in the pathogenesis of age-related macular degeneration. Ocular involvement in the setting of hypertension was described by Liehroich in 1859. Fundamentally, the effects of ocular changes arise from the impact of the ocular vasculature.

Hypertensive retinopathy ocular changes occur in the rational circulation in the acute stage of hypertension, primarily involving the terminal arteries rather than the main retinal arteries. The main retinal arteries changes are seen in the respond to chronic hypertension. Retinal microvascular changes are signs of hypertensive retinopathy and can be useful to classify risk factors and treatment decisions for hypertension[3].

In general, the degree and duration of the hypertension are primarily determined on hypertensive retinopathy fundus changes. These retinopathy fundus changes may be seen in the other diseases with vascular risk factors such as diabetes. The retinopathy fundus changes may also be more severe and more progressive when diabetes and hypertensive are associated. Other factors such as hyperlipidemia may make the retinopathy worst as well. The subject of hypertensive retinopathy fundus changes

is still the focus of many controversies. The optic disc edema and retinal pigment epithelial tissue represent manifestation of hypertensive optic neuropathy.

Earlier detection of hypertensive patients who are in risk to develop retinopathy is very important. So, this study performed to estimate the prevalence of hypertensive retinopathy.

METHODS

A hospital based cross-sectional study was performed among 200 hypertensive patients visiting eye OPD from Dec 2016 to Dec 2017. Patients having blood pressure higher than normal (>140/90 mm of Hg) were included in the study. Most of them were already diagnosed case of hypertension on medication but not well controlled and some were newly diagnosed.

All hypertensive patients were enquired about the duration of hypertension and treatment. Most patients had uncontrolled blood pressure. A detailed examination of the eye was carried out including fundus examination under mydriasis with direct ophthalmoscope, +90 D lens and Goldman 3 mirror lens where necessary.

RESULTS

The mean age of the patients in our study was 60.58 ±12.26 years. Table 1 shows the age distribution of patients in different age groups.

Table 1: Age distribution of patients

Age group (Years)	No. of patients	Percentage
30 - 40	24	12%
41 - 50	36	18%
51 - 60	53	26.5%
61 - 70	45	22.5%
71 - 80	32	16%
>80	10	5%
Total	200	100%

In our study 87 patients i.e 43.5% were hypertensive without retinopathy changes and 113 patients i.e. 56.5% were hypertensives with retinopathy fundus changes. Table 2 shows grading of hypertensive retinopathy according to Keith-Wagner Barker grading in different sexes.

Table 2: Grading of hypertensive retinopathy

Keith Wagener	Males	Females	Total	Percentage
Grade I	38	24	62	31%
Grade I	26	12	38	19%
Grade III	6	6	12	6%
Grade IV	1	0	1	0.5%
Total	71	42	113	56.5%

In our study 71 patients were males and 42 were females. So the male: female ratio was 1.7.

DISCUSSION

Systemic hypertension is a chronic multi-factorial disease involving brain, heart, eyes, and kidneys. Systemic hypertension affects arteries, veins, choroid and optic nerve in eyes.

In our study more males were affected than females. Similar results were seen in a study by Mondal RN in Bangladesh[4] while studies showed more females than males[5].

The mean age of the patients in our study was 60.58 ±12.26 years. Similar age group was seen in studies by Bastola P *et al*[6]. Other studies Mondal RN[4] showed hypertension retinopathy at fifties.

In our study, 56.5% of the hypertensive patients had retinopathy changes and 43.5% patients without retinopathy fundus changes. Similar finding was seen in a study by Erden S, Bicakci E which showed hypertensive retinopathy in 66.3%[7]. But studies by Kabedi *et al*[8] stated hypertensive retinopathy incidence of 83.6% .Some studies[4] showed a lower rate too (29.9%). Likewise study by Klein R *et al*[9] showed lower rate of hypertensive retinopathy as in 7.8%. The higher prevalence of hypertensive retinopathy in our study may be due to late presentation of the patients to the hospital, uncontrolled hypertension, patients not taking medicines regularly due to lack of awareness.

In our study, prevalence of grade I and II hypertensive retinopathy was 38% and 26% respectively. Only 6% had grade III hypertension retinopathy. As per the study conducted by Del Brutto *et al*[10], hypertensive retinopathy grade 1 was recorded in 37%, and grade 2 hypertensive retinopathy was noted in 17% of hypertensive patients. Similar results showing more cases of grade I then II and few cases of grade III and IV were seen in other studies too[4,11,12].

CONCLUSION

In our study 55.6% of hypertensive patients had retinopathy. In a country like Nepal where education and economy is poor, such studies help the population to be aware of the diseases and possible complications.

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Histopathological Analysis of Endometrial Biopsy in Gandaki Medical College Teaching Hospital, Pokhara, Nepal

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ABSTRACT

Objective: To study the spectrum of histopathological diagnosis of endometrial lesions and their distribution according to age.

Methods: All the endometrium samples obtained by the procedure of dilatation and curettage and hysterectomy sent for histopathological examination at Pathology Department of Gandaki Medical College Teaching Hospital, Pokhara, Nepal. The study duration was total 12 months ranging from July 2016 to June 2017. All the endometrial samples were processed, sectioned at 4 - 6 µm and stained with routine H & E stain. Patient's data including age, sex, procedure of the biopsy taken and histopathological diagnosis were noted. A pathologist, using Olympus microscope, reported the slides. Cases were reviewed by a second pathologist whenever necessary.

Results: A total of 128 cases were studied. The most common histopathological diagnosis was proliferative endometrium (28.9%) followed by disorder proliferative endometrium (15.65%). Most of the patients were in age group 36 - 45 years comprising 32.03%. Hydatidiform mole comprised of 7.03% and among Hydatidiform mole, partial mole was more common. Dilatation and curettage (82.8%) was the common procedure in compare to hysterectomy for the evaluation of endometrial lesions.

Conclusions: In this study, we observed a variety of endometrial lesions. Most of them are benign; among benign, proliferative endometrium was the common histopathological diagnosis followed by disorder proliferative endometrium. Most common presenting age group was found to be at 36 - 45 years. In evaluation of hydatidiform mole, partial mole was more frequent in compare to complete mole. Conventional dilatation and curettage is the preferred method in developing countries with limited resource to screen endometrial lesion and therefore biopsy should be sent for histopathological examination. Thus histopathological examination of routinely stained hematoxylin and eosin is readily available and widely accepted standard technique for evaluation of the endometrial lesions.

Keywords
Endometrial biopsy,
Histopathological diagnosis,
Disorder Proliferative Enudometrium.

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INTRODUCTION

Endometrial biopsy is routinely done test to rule out various endometrial pathology. It is easily available, safe and cheap diagnostic test. Endometrial biopsy is performed

in cases of infertility, abnormal uterine bleeding, to rule out malignancies along with to know the phase of endometrium. However the histopathological diagnosis is highly affected by various factors like clinical history, menstrual history, age and status of use of exogenous hormones like tamoxifen.

Endometrial biopsy is done by dilatation of the cervix and curetting the endometrial cavity. If properly performed, this method can sample almost all the cavity except the cornu. However in practice, difficulties may occur during the procedure as being a blind technique done without any visual guidance and poor patient compliance. On the other side, various problems are also encountered during histopathological reporting like assessing the adequacy in scant tissue and in interpreting the artefactual changes.

Data collected from various parts of the Nepal showed the predominant histopathological diagnosis of endometrial lesion was cycling endometrium. The commonest pathology irrespective of the age group was disordered proliferative pattern and other were complications of pregnancy, benign endometrial polyp, endometrial hyperplasia, carcinoma and chronic endometritis.

This study was done to evaluate spectrum of histomorphology of the endometrial biopsy sent at Gandaki Medical College Teaching Hospital, Pokhara, Nepal.

METHODS

Source of data

All the endometrium samples received in the Department of Pathology from the patients who underwent minor and major surgery (i.e. dilatation and curettage and hysterectomy) in Gandaki Medical College Teaching Hospital, Pokhara, Nepal.

A cross sectional study was conducted in Gandaki Medical College Teaching Hospital, Pokhara, Nepal. The study duration was 12 months, from 2016, July - 2017, June. A total of 128 patients were enrolled in the study.

The endometrial biopsy specimens were received in 10% formalin. The tissues were processed and sectioned at 4 – 6 µm of thickness using semi-automated rotary microtome. These sections were adhered to a 76 x 25 mm glass slide using egg albumin and stained with routine H& E stain. A pathologist of the Gandaki Medical College Teaching Hospital, Pokhara, Nepal, using Olympus CX23/CX41 microscope, reported the slides. Cases were reviewed by a second pathologist whenever necessary. All the data obtained was entered in the Microsoft excel and study variables were statistically analyzed by "Statistical Package for the Social Sciences" (SPSS) 16.0. The data were expressed in terms of frequency and results were expressed in bar diagram, pie chart and tables.

Inclusion criteria

1. All the endometrial sample received in Pathology Department of Gandaki Medical College Teaching Hospital, Pokhara, Nepal.

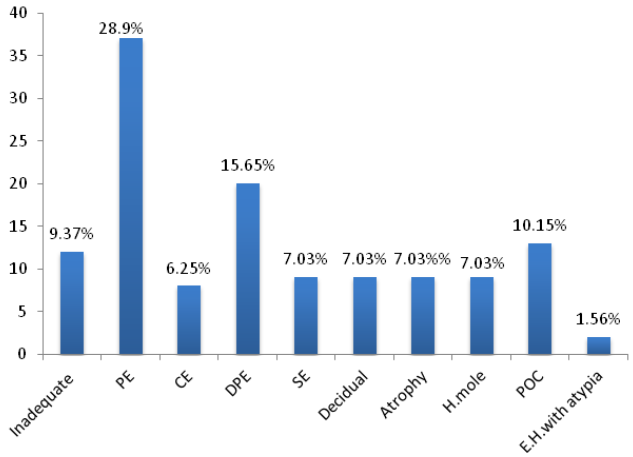
Exclusion criteria

1. Non-compliance of the patient
2. Autolysed specimen
3. Tiny inadequate specimen difficult to process
4. Specimen not well labeled

RESULTS

A total of 128 patients whose endometrial biopsies were received in the Department of Pathology during the time interval of July 2016 to June 2017 were enrolled in this study.

Fig 1: Frequency of histopathological diagnosis (N=128)



PE: Proliferative endometrium, CE: Chronic endometritis, DPE: Disorder proliferative endometrium, SE: Secretory endometrium, H. mole: Hydatidiform mole, POC: Product of conception, E.H. with atypia: Endometrial hyperplasia with atypia

In the present study, the most common histopathological diagnosis was proliferative endometrium 37 (28.9%) followed by disorder proliferative endometrium 20

(15.65%) and Product of conception 13 (10.15%), (Fig 1).

Table 1: Age wise distribution of diagnosis (N=128)

Diagnosis	Age group in years						Total
	15 - 25	26 - 35	36 - 45	46 - 55	56 - 65	66 - 75	
Inade-quate	1 (0.78%)	4 (3.12%)	4 (3.12%)	1 (0.78%)	1 (0.78%)	1 (0.78%)	12
P. E.	0	6 (4.68%)	16 (12.5%)	13 (10.15%)	1 (0.78%)	1 (0.78%)	37
C.E	0	1 (0.78%)	4 (3.12%)	2 (1.56%)	1 (0.78%)	0	8 (6.25%)
D.P.E.	1 (0.78%)	2 (1.56%)	8 (6.25%)	9 (7.03%)	0	0	20
S.E.	0	2 (1.56%)	2 (1.56%)	5 (3.9%)	0	0	9 (7.03%)
Decidual	3 (2.34%)	2 (1.56%)	3 (2.34%)	1 (0.78%)	0	0	9 (7.03%)
Atrophic	0	0	0	1 (0.78%)	4 (3.12%)	4 (3.12%)	9 (7.03%)
P. mole	2 (1.56%)	5 (3.9%)	1 (0.78%)	0	0	0	8 (6.25%)
C. Mole	0	0	1 (0.78%)	0	0	0	1 (0.78%)
E.H. with atypia	0	0	1 (0.78%)	1 (0.78%)	0	0	2 (1.56%)
POC	3 (2.34%)	9 (7.03%)	1 (0.78%)	0	0	0	13 (10.15%)
Total	10 (7.81%)	31 (24.21%)	41 (32.03%)	33 (25.78%)	7 (5.46%)	6 (4.68%)	128

PE: Proliferative endometrium, CE: Chronic endometritis, DPE: Disorder proliferative endometrium, SE: Secretory endometrium, P. mole: partial hydatidiformmole, C. mole: Complete hydatidiform mole, POC: Product of conception, E.H. with atypia: Endometrial hyperplasia with atypia.

In this study, the common histopathological finding was proliferative endometrium and the common age group was 36 – 45 years (Table 1).

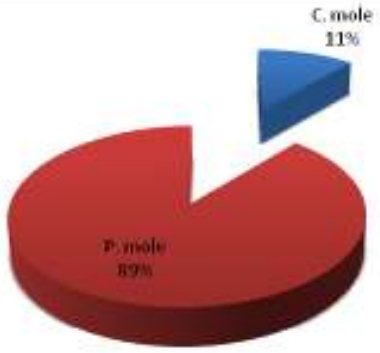
Table 2: Distribution of histological diagnosis according to the procedure of biopsy (N=128)

Diagnosis	Procedure			Total
	DC	VH	TAH	
Inadequate	12 (9.37%)	0	0	12 (9.37%)
Proliferative endometrium	24 (18.75%)	0	13 (10.15%)	37 (28.9%)
Chronic endo-metritis	7 (5.46%)	0	1 (0.78%)	8 (6.25%)
DPE	18 (14.06%)	0	2 (1.56%)	20 (15.65%)
Secretory phase	9 (7.03%)	0	0	9 (7.03%)
Decidual	9 (7.03%)	0	0	9 (7.03%)
Atrophic	3 (2.34%)	2 (1.56%)	4 (3.12%)	9 (7.03%)
P mole	8 (6.25%)	0	0	8 (6.25%)
E.H.with atypia	2 (1.56%)	0	0	2 (1.56%)
POC	13 (10.15%)	0	0	13 (10.15%)
C. Mole	1 (0.78%)	0	0	1 (0.78%)
Total	106 (82.8%%)	2 (1.56%)	20 (15.62%)	128 (100%)

DPE: Disorder proliferative endometrium, SE: Secretory endometrium, P. mole: partial hydatidiformmole, C. mole: Complete hydatidiform mole, POC: Product of conception, E.H. with atypia: Endometrial hyperplasia with atypia

Current study showed, the most common procedure for endometrial sampling was dilatation and curettage 106 (82.8%) followed by total abdominal hysterectomy 20 (15.62%) and vaginal hysterectomy 2 (1.56%) (Table 2).

Fig 2: Distribution of hydatidiform mole (n=9)



C. Mole: Complete hydatidiform mole, P. Mole: Partial hydatidiform mole

In this study, total nine hydatidiform mole were diagnosed histopathologically. Among them eight were reported as partial mole and only one was complete mole (Figure 2).

Fig 3: Chronic endometritis (H & E, 400X)

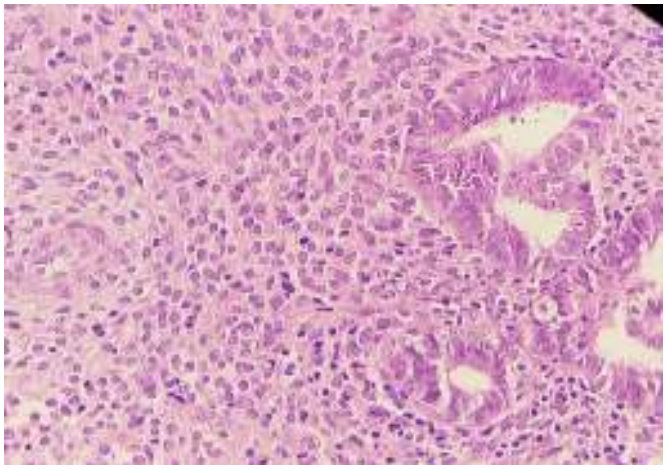


Fig 4: Partial hydatidiform mole (H & E, 40X)

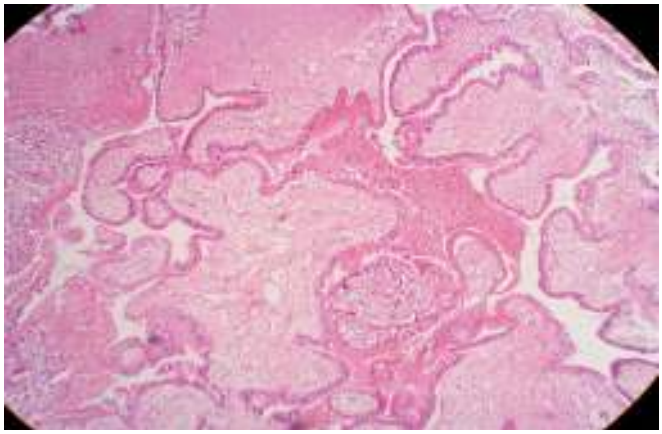
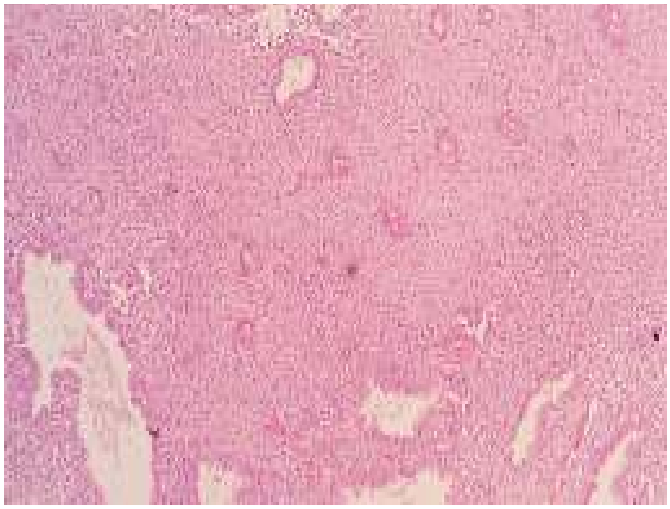


Fig 5: Spiral arterioles surrounded by predecudualized stroma (H & E, 100x)



DISCUSSION

A large number of studies have suggested that endometrial biopsy is an essential step in diagnosing various endometrial pathologies. The present study was an analysis of total 128 endometrial biopsies. A spectrum of endometrial pathology was studied in relation to age and procedure of the biopsy done.

In this study, the most common age group involved was 36 – 45 years with frequency of 41 (32.03%) followed by 26 - 35 years with frequency of 31 (24.21%). A close finding was seen in the study done by Muzaffer *et al*[1].

Like study by Nepal *et al*[2], this study also showed proliferative endometrium 37 (28.9%) as the most common histopathological diagnosis followed by disorder proliferative endometrium 20 (15.6%).

Disorder proliferative endometrium was the second most common histopathological diagnosis observed in 20 (15.6%) of cases and was frequent at the age group of 46 - 55 years of age which was similar to the study of Doraiswami *et al*[3] and Jetley *et al*[4]. Several studies explained that in perimenopausal age, an anovulatory cycle are more frequent and is associated with an irregular and unpredictable pattern of bleeding. In the absence of ovulation and the production of progesterone, the endometrium responds to estrogen. Which lead to extensive proliferating endemetrium outgrows its blood supply and finally causes rupture of the glands and abnormal bleeding.

In our study, in the age group of 25 - 35 years, product of conception was the common diagnosis comprising nine (7.03%) of cases. This can be explained by the fact that most of the women conceive at this age as being the most fertile period for reproduction. Hence, patient's presenting in this age group with abnormal uterine bleeding should be investigated for pregnancy related changes.

Atrophic endometrium was observed in nine (7.03%) cases and all the patients were above the age of 45 years. Similar finding was seen in the study of Doraiswami *et al*[3]. However in their study, a single case of atrophic endometrium was observed in the age group of 21 - 30 years. Novak and Woodruff[6] believed that in atrophy bleeding occurs as a result of blockage of venules by overdistended glands rather than rupture of the endometrial cysts. According to Choo *et al*[7], in perimenopusal age low levels of endogenous estrogen is sufficient to stimulate the endometrium to cause bleeding but do not lead to endometrial proliferation. In the study of Brunette *et al*[8], they suggested that the patients who are diagnosed as atrophic endometrium in histopathological diagnosis and are under the age of 50 years should undergo further investigations before ruling out the endometrial malignancy.

Out of total 128 cases, nine (7.03%) were diagnosed as hydatidiform mole in the current study. But the incidence of hydatidiform mole varies greatly around the world and this is due to the lack of a clear and precise definition of the disease and over-reporting of pregnancies with gestational trophoblastic disease[9].

Among hydatidiform mole, partial mole was more common than complete mole comprising eight (89%) and one (11%) respectively. In contrast, a study of Fukunga *et al*[10], showed the high incidence of complete mole in compare to partial mole. The reason for low frequency of complete mole in our study may be due to the geographical variation and histological pitfalls that early complete mole is often misdiagnosed as hydropicabortus or a normal pregnancy[11]. In our study, five (3.9%) patients were in the second and third decade of life, which was similar to the study done by Abdulaziz *et al*[9]. Although increased maternal age is one of the major risk factor for hydatidiform mole, only two (1.56%) of patients were in the age group of 36 - 45 years. The youngest age group observed in this study was 15 - 25 years with frequency of two (1.56%). The low socio-economic status, early marriage and early pregnancy in our country can be considered for this rising trend in young females.

Endometrial hyperplasia with atypia was found in three

(1.56%) of the cases in the age group of 36 - 55 years. Jetley et al[4] also found similar result in their study. In our study, we didn't found the case of endometrial hyperplasia without atypia, however in the study of Jetley *et al*[3] and Baral *et al*[12] the incidence of endometrial hyperplasia without atypia was common than the endometrial hyperplasia with atypia. This may be due to small number of sample in our study and lack of health awareness among female population in our society.

A total of 12 cases (9.37%) were reported as inadequate for opinion, among them four (3.12%) cases were found in the each age group of 26 - 35 years and 35 - 45 years, which was unlike to the study done by Nepal *et al*[2]. In their study, postmenopausal age was the frequent age for inadequate sampling, in which he has explained the inadequacy possibly due to the atrophic endometrium at that age. However, in this study, factor considered for inadequacy is due to the diagnostic challenges compounded by the fact that endometrial biopsies are done blindly with limited resources and randomly sampling the endometrial cavity.

The current study showed, the common procedure performed to diagnose endometrial lesion is dilatation and curettage followed by total abdominal hysterectomy and vaginal hysterectomy with frequency of 106 (82.8%), (15.6.2%) and two (1.56%) respectively.

CONCLUSIONS

The present study was an attempt to know the spectrum of histopathological diagnosis of endometrial lesions and their distribution according to age. In this study, we observed a variety of endometrial lesions. Most common lesion in this study was proliferative endometrium followed by disorder proliferative endometrium, both occurring frequently in the age group of 35 - 45 years.

In total of 128 cases, only nine cases were found to be of hydatidiform mole. Among them 89% were diagnosed as partial mole and 11% as complete mole. Among neoplastic lesions, we observed a case of endometrial hyperplasia with atypia in 1.53% of the patients. However, this frequency should be validated with large scale study as the sample size is small in our study.

Among the procedure, dilatation and curettage was the preferred procedure for the histopathological examination. Hence, we conclude that histopathological examination of routinely stained hematoxylin and eosin section is widely accepted and readily available standard technique to evaluate endometrial lesions and guidance for management.

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An Overview of Fingerprint Patterns among Students of Gandaki Medical College, Pokhara, Nepal

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ABSTRACT

Introduction: Fingerprint system of positive identification is based on the principle that the arrangement and distribution of fingerprint remains constant and persists throughout life and that the patterns of no two hands resemble each other.

Methods: A cross sectional study was carried out among 250 students (125 male and 125 female students), aged 17 - 40 years of age, of Gandaki Medical College, Pokhara, Nepal from 15 March to 13 April, 2017 A.D. The fingertip patterns of both hands were collected and identified with the aid of a magnifying glass and documented as: Loops, Whorls, Arches and Composite type. The data were enrolled in SPSS version 16 and analyzed accordingly.

Results: There was a preponderance of loop pattern (52.6%) followed by whorls (39.4%), arches (7.3%) and composite (0.6%). Whorls (41.7%) were more common in males compared to females (37.1%) and females had more arches (9.6%) compared to that of the male counterparts (5.04%). There was no significant difference in fingerprint patterns among male and female students.

Conclusion: The predominance of loops amongst other fingerprint patterns along with no significant gender differences in fingerprint patterns can be considered as a valuable research finding in the field of forensic science.

Keywords
Fingerprint, Gender, Identification, Nepal.

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INTRODUCTION

Fingerprint system of identification can be used as the most convenient, reliable and cheapest methods of positive identification. This method can be useful in identification in civil and criminal cases, especially in cases of decomposed, burnt, mutilated, dismembered body parts, mummified bodies etc[1]. Fingerprint system of identification is based on the principle that the skin of the balls of the fingers and thumbs is covered with characteristic ridges, the arrangement and distribution of which remains constant and persists throughout life and that the patterns of no two hands resemble each other. Even the fingerprints of the twins are not similar. It has been estimated that the chances of two persons having identical fingerprints is about one in 64 billion[2]. By the application of comparison method of finger-prints at the scene of a crime with the finger-print record of suspected persons, investigators can establish absolute proof of the presence or identity of a person. This study of ridge pattern can also be applied to the skins of the palms and soles[3]. Sir Henry Galton (1892), depending on the arrangement of papillary ridges classified the finger-prints into four major types: Loop (65%), Whorl (25%), Arch (07%) and Composite (02-03%).

This study can be helpful to the forensic doctors, investigating police officers and other concerned authority engaged in the identification of cases in mass disaster, decomposed bodies, mutilated bodies etc. where preliminary gender identification can efficiently reduce their workload just by taking account of fingerprint pattern. The main objectives of our study were to find out the distribution of different fingerprint patterns among students of Gandaki Medical College, Pokhara, Nepal and to find out the differences in fingerprint patterns among male and female students of the same institute.

METHODS

This is a prospective cross sectional study which was carried out among 250 students, aged 17 - 40 years of age, of medical and paramedical fraternities of Gandaki Medical College, Lekhnath, Nepal over a period of one month from 15 March to 13 April, 2017 A.D (1st Chaitra to 30th Chaitra 2074). Firstly ethical clearance was obtained from the Institutional Ethics Review Committee Board (IERCB), Gandaki Medical College. Students with deformities and scars due to injuries, congenital abnormalities or diseases on their fingers or thumbs were excluded from the study. Materials used in this study were ink pad and magnifying glass. Before starting the procedure, informed expressed consent was taken after explanation of the whole procedure to each subject. Each participant was asked to wash his/her hands thoroughly. After drying of the hands, the subject was asked to press each finger on the stamp pad and then to transfer the ink-imprinted fingerprint by rolling the fingers over the respective fingerprint blocks made on A4 size paper format where other informations, e.g.; the name, sex and age of the participants had also been collected. The participants were made cautious not to double roll the fingers to prevent smudging of the print. The distribution of dermatoglyphic fingertip patterns of both hands were identified with the aid of a magnifying glass and documented as: Loops, Whorls, Arches and Composite type. The data were enrolled in SPSS version 16 and analyzed accordingly.

RESULTS

Fingerprint pattern analysis of 2500 fingers showed that the loops (52.6%) were the most common fingerprint pattern followed by whorls (39.4%), arches (7.3%) and composite (0.6%). Males had a higher incidence of whorls (41.7%) compared to females (37.1%) and females had more arches (9.6%) compared to that of the male counterparts (5.04%). Loops were found almost equivalent in both the population. Loops were mostly seen on little fingers (75.2%) followed by middle fingers (64%) and thumb (45.2%). Whorls were more predominant on ring fingers (58.2%) followed by thumb (47.2%). Arches were more prevalent on index fingers (15.6%) followed by middle finger (8.6%).

There were significant differences in right thumb and right ring finger among male and female students ($p<0.05$). Except these two fingers, there was no significant difference in overall distribution of fingerprint pattern in both hands of male and female students ($p>0.05$).

Table 1: Distribution of fingerprint patterns among male and female students of Gandaki Medical College

S. No	Fingerprint Pattern	Males (%)	Females (%)	Total (%)
1.	Loops	657 (52.6)	659 (52.7)	1316 (52.6)
2.	Whorls	521 (41.7)	464 ((37.1)	985 (39.4)
3.	Arches	63 (5.04)	120 (9.6)	183 (7.3)
4	Composite	9 (0.7)	7 (0.6)	16 (0.6)
	Total	1250 (50)	1250 (50)	2500 (100%)

Table 2: Distribution of fingerprint patterns in ten fingers of right and left hands among male and female students of Gandaki Medical College

Fingers	Males, N (%)				Females, N (%)				P-Value
	Loop	Whorl	Arch	Composite	Loop	Whorl	Arch	Composite	
Right thumb	57 (45.6%)	66 (52.8%)	2 (1.6%)	00 (0%)	54 (43.2%)	59 (47.2%)	9 (7.2%)	3 (2.4%)	0.048
Right index	52 (41.6%)	56 (44.8%)	16 (12.8%)	1 (0.8%)	52 (41.6%)	52 (41.6%)	21 (16.8%)	00 (0%)	0.610
Right middle	85 (68%)	34 (27.2%)	6 (4.8%)	00 (0%)	86 (68.8%)	25 (20%)	14 (11.2%)	00 (0%)	0.101
Right ring	38 (30.4%)	84 (67.2%)	1 (0.8%)	2 (1.6%)	52 (41.6%)	67 (53.6%)	6 (4.8%)	00 (0%)	0.022
Right little	87 (69.6%)	37 (29.6%)	1 (0.8%)	00 (0%)	92 (73.6%)	28 (22.4%)	5 (4%)	00 (0%)	0.132
Left thumb	57 (45.6%)	59 (47.2%)	6 (4.8%)	3 (2.4%)	58 (46.4%)	52 (41.6%)	13 (10.4%)	2 (1.6%)	0.358
Left index	54 (43.2%)	54 (43.2%)	17 (13.6%)	00 (0%)	48 (38.4%)	52 (41.6%)	24 (19.2%)	1 (0.8%)	0.46
Left middle	76 (60.8%)	39 (31.2%)	7 (5.6%)	3 (2.4%)	73 (58.4%)	35 (28%)	16 (12.8%)	1 (0.8%)	0.187

Left ring	53 (42.4%)	67 (53.6%)	5 (4%)	00 (0%)	45 (36%)	73 (58.4%)	7 (5.6%)	00 (0 %)	0.537
Left little	98 (78.4%)	25 (20%)	2 (1.6%)	00 (0%)	99 (79.2%)	21 (16.8%)	5 (4%)	00 (0 %)	0.441

DISCUSSION

This study found that the predominance of loops with 52.6% (1316 out of 2500 responses) followed by whorl with 39.4% (985 out of 2500 responses, arch with 7.3% (183 out of 2500 responses) and composite with 0.6% (16 out of 2500 responses) in our study is in accordance with other studies involving medical students[4-10]. Percentage of loops found, were lower simultaneously with increased percentage of whorls while comparing with worldwide distribution percentage[5-10]. Our findings of loops (52.6% in males and 52.7% in females) is dissimilar when compared with the varied results given by Katwal *et al* and Kumar KR *et al* where there is male preponderance and Karki *et al,* Rastogi *et al*, Mehta *et al* where loop is predominant in female students. Our finding of whorl more predominant in male population is similar to the ones given by Karki *et al* and Mehta *et al*. Arches more prevalent in female students (9.6%) compared to 5.04% of male students is similar to that of findings given by Karki *et al*, Rastogi *et al,* Barsika *et al* and Kumar KR *et al*. Loops were found commonly in little fingers (75.2%) which was a similar figure to that given by Katwal *et al* (75.5%) and Kumar KR *et al* (76%). Loop occurrence in our study was followed by middle finger (64%) and thumb (45.2%) which was similar to findings given by researchers in their study[9,10]. Whorls were common in ring finger (58.2%) followed by thumb (47.2%) and index finger (42.8%) in our study with similar findings in studies done by these researchers[4,8-10]. Arches in our study were common in index finger (15.6%) and middle finger (8.6%) which were similar to 12.5% and 7.75% found in index finger and middle finger by Katwal *et al* in her study and 12.2% occurrence of arches in middle finger in study done by Kumar KR *et al*. Beside the right thumb and the right ring fingers, there was not any significant difference in overall distribution of fingerprint pattern in both hands among males and females which was similar conclusion as given by Kanchan *et al*[4], Rastogi *et al*[7], Mehta *et al*[8], Katwal *et al*[9] and Kumar KR *et al*[10].

CONCLUSIONS

The predominance of loops amongst other fingerprint patterns along with no significant gender differences in fingerprint patterns can be considered as a valuable research finding in the field of forensic science.

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Fetal Outcome in Pregnancies Complicated with Polyhydraminos: Study Done in Pokhara, Nepal

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Keywords
Cesarean section, Fetal outcome, Polyhydraminos.

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ABSTRACT

Introduction: Amniotic fluid plays an important role in the development of fetus. Any abnormality in the production amniotic fluid may have adverse effect on the fetus and the mother. Polyhydraminos is one of the common complications occurring during pregnancy and complicates around 0.2 - 2% of pregnancies.

Methods: It is a prospective study conducted in Manipal Teaching Hospital, Pokhara, Nepal from January 2013 to December 2015. All the pregnant ladies irrespective of gestational age with amniotic fluid index (AFI) 25 cm or more were enrolled for the study. According to the AFI, polyhydraminos was classified as mild (25 – 30 cm), moderate (30.1 - 35 cm) and severe (>35 cm). Fetal outcome, mode of delivery, presence of congenital anomalies, NICU admission and maternal glucose intolerance were recorded.

Results: Out of 8232 deliveries, 24 were diagnosed and admitted with the diagnosis of polyhydraminos. Mild polyhydraminos, 50% (n=12) occurred after 37 weeks of gestation and 12.5% (n=3) had severe polyhydraminos. All pregnant ladies 50% (n=12), beyond 37 weeks gestation had cesarean section, whereas 25% (n=6) had vaginal deliveries. 33.3% (n=8) had preterm labor, 12.5% (n=3) had premature rupture of membrane, 25% (n=6) had congenital anomalies, one IUFD, one case of Rh isoimmunisation and one case of twin pregnancy. NICU admission needed in 20.5% (n=5). Pregnant ladies with impaired glucose intolerance were 8.3% (n=2).

Conclusions: Polyhydraminos is associated with increased incidence of cesarean section, preterm labor, fetal malformation and NICU admission.

INTRODUCTION

Amniotic fluid (AF) plays an important role for the growth and development of fetus. It also helps in providing nutrients to the fetus, has excretory functions, helps in development of fetal lungs, prevents ascending infections and acts as a shock absorber[1]. Amniotic fluid volume (AFV) is determined by various sources like fetal urination, fetal swallowing reflex, secretions from fetal oral and nasal cavities, fetal lung fluid secretion, movement of water and metabolites between the placenta and the fetal blood and transudation of water and electrolytes across the amnion and chorion. Any disturbance in this mechanism can lead to abnormal production of amniotic fluid[2]. Polyhydraminos, one of the common condition in pregnancy is the excessive accumulation of AF. It complicates 0.2 - 2% of pregnancies[3,4,5,6]. It is associated with fetal, placental and maternal causes which may result in adverse fetal and maternal outcome.

The objective of this study was to assess the fetal outcome in pregnancies complicated with polyhydraminos.

MATERIALS AND METHODS

This is a prospective study which was carried out in the Department of Obstetrics & Gynecology, Manipal College of Medical sciences & Teaching Hospital, Pokhara, Nepal. All pregnant women irrespective of gestational age diagnosed with polyhydraminos and were admitted in the hospital were included in the study. The study period was from January 2013 to December 2015. However, women who were diagnosed with medical problems like heart disease, acute and chronic medical illness were not included in the study. Polyhydraminos was diagnosed by assessing amniotic fluid index (AFI). Various methods have been described to measure the AF. The two most used methods to describe AF are 1) Vertical measurement of the single deepest pocket of amniotic fluid and values more than 8 cm is considered as polyhydraminos. 2) AFI- dividing the uterus in two halves by an imaginary line and taking the sum of vertical measurement of each of the four quadrants of the amniotic fluid. AFI more than 25 was taken as Polyhydraminos[6]. In this study AFI was taken to assess the polyhydraminos. The degree of polyhydraminos was categorized as mild (AFI 25 – 30 cm), moderate (AFI 30.1 -35 cm) and severe (AFI >35.1 cm)[7]. During the study period, there were 8232 deliveries and twenty four pregnant ladies without any chronic illness and admitted in the hospital were included in the study. A maternal variable such as age, parity, gestational age and mode of delivery was collected. Neonatal variables like Apgar score, birth weight, gross anomalies detected and NICU admission were collected.

RESULTS

During the study period from January 2013 to December 2015, there were total 8232 deliveries. Out of them, 24 pregnant ladies were diagnosed as polyhydraminos and admitted in the hospital.

Table 1: Age distribution in relation to AFI

Age	AFI (n=24)		
	25 - 30	31.5 - 35	>35
<20 yrs	1	-	-
20 - 30 yrs	12	-	2
>30 yrs	7	1	1

In this study, majority of the clients belong to the age group between 20 to 30 years, 58.3% (n=14) while only one client was under the age group 20 years. Three clients (12.5%) had AFI more than 35.

Table 2: Parity distribution in relation to AFI

Parity	AFI (n=24)		
	25 - 30	30.1 - 35	>35
P1	5	-	-
P2	6	-	1
P3	5	1	-
P4 and more	4	-	2

The number of clients in this study was 29.1% (n=7) belong to Para 2, 25% (n=6) in both Para 3 and Para 4 and more and only 20.8% (n=5) were Para 1.

Table 3: AFI in relation to gestational age

Gestational age	AFI 25 - 30	31.5 - 35	>35
<20 weeks	1	-	-
20 - 28 weeks	2	-	-
29 - 37 weeks	4	2	3
>37 weeks	12	-	-

This study that the majority of the women were more than 37 weeks of gestation, 50% (n=12) as compared to those who were between 29 - 37 weeks, 37.5% (n=9), 0.8% (n=2) were between 20 - 28 weeks and only one (0.41%) was less than 20 weeks of gestation. Majority, 79.2 % (n=19) had AFI between 25 - 30cm and 12.55 (n=3) had AFI >35cm

Table 4: Mode of delivery in relation to AFI

AFI	Vaginal delivery	Elective cesarean section	Emergency cesarean section
25 - 30	3	6	10
31.5 - 35	2	-	-
>35	1	2	-

This study showed that 75% (n=18) women with polyhydraminos had cesarean section as compared to only 25% (n=6) who had vaginal deliveries.

Table 5: Mode of delivery in relation to gestational age

Gestational Age	Vaginal delivery	Elective cesarean section	Emergency cesarean section
<20 weeks	1	-	-
20 - 34 weeks	4	1	-
34 - 37 weeks	1	2	3
>37 weeks	-	4	8

This study showed that all the women with gestational age more than 37 weeks of gestation (n=12) had cesarean section as compared to women between 34 - 37 weeks gestation, five out of six had cesarean section. Women with gestational age less than 34 weeks (n=6) had vaginal delivery whereas only one had cesarean section.

Table 6: Outcome of fetus

Birth weight	<2 kg	2 - 2.5 kg	2.6 - 3 kg	>3 kg
	9	3	3	9
NICU admission	Yes	No	IUFD	NND
	5	15	1	6
Congenital anomalies	Yes	No		
	6	18		

This study showed that the number of newborns more than three kg and less than two kg were equal (37.5%, n=9 each) and similarly equal number of newborns were between the birth weight 2 - 2.5 kg and 2.6 - 3 kg (12.5%, n=3 each). Out of 24 newborns, 20.8% (n=5) needed NICU admission, 25% (n=6) had congenital anomalies, 25% (n=6) had neonatal death and one was IUFD.

Table 7: Factors related to polyhydraminos

	AFI- 25-30	30.1 - 35	>35
PIH	2	-	-
PROM	2	1	-
Preterm labor	5	1	2
Twin pregnancy	-	-	1
Rh incompatibility	-	-	1
Diabetes mellitus	2	-	-
Congenital anomalies	3	-	3
IUFD	-	1	-
Cord prolapse	-	-	-
PPH	-	-	-

DISCUSSION

Polyhydraminos is one of the conditions complicating pregnancy and is associated with adverse fetal and maternal outcome. It is also a challenge in obstetric management. Polyhydraminos may result from fetal causes such as decrease swallowing reflex of the fetus as in anencephaly, oesophageal atresia, choanal atresia, tracheoesophageal fistula, intestinal atresia. Other conditions are like increased urinary production, severe anemia, infections (Cytomegalovirus, toxoplasmosis, syphilis, parvovirus) and maternal diabetes[2].

This study was done to assess the fetal outcome in relation to polyhydraminos, factors associated and the mode of deliveries.

In this study, the majority of the women who were diagnosed with polyhydraminos were in between the age group 21 - 30 years, 58.3% (n=14), 37.5% (n=9) were more than 30 years and only one was less than 20 years of age. Majority of the patients were parity 2, 29.1% (n=7), followed by parity 3 and 4 (n=6) respectively and the least in parity (20.8%, n=5). Kaur Tajinder and Sood Ruchika[8] have also showed in their study that the majority of patients (57.1%) were in the age group between 27 - 35 years but however the incidence was more in nulliparous women which in contrast to this study which showed the incidence more among multipara, 79.1% (n=19). However in the study conducted by Tashfeen *et al*[9] showed that the incidence of polyhydraminos was more in multiparous 81.1%.

In this study, mild polyhydraminos was more common after 37 weeks of gestation (50%, n=12) and severe polyhydraminos was 12.5% (n=3) which was found in between 29 - 37 weeks of gestation. Only one pregnant lady had mild polyhydraminos in less than 20 weeks of gestation. The result resembles the study done by Rutwa J. Chavda *et al*[10] which showed that the incidence of polyhydraminos was more (86%) in the third trimester. Another study conducted by C Touboul *et al*[11] had observed higher frequency of polyhydraminos at the median gestational age of 39.1 weeks of gestation. Similarly, K Tajunder *et al*[8] had also observed a higher frequency of polyhydraminos (57.1%) between 29 - 36 weeks of gestation. In this study the incidence of mild polyhydraminos was more, 79.2% (n=19) as compared to moderate 8.3% (n=2) and severe polyhydraminos (12.5, n=3). This is similar to the study conducted by Rutwa J Chavda *et al*[11] which showed that 55% had moderately elevated AFI and 6.8% had markedly elevated AFI. Similarly, the study conducted by Guin G *et al*[12] also showed that 55% had mild polyhydraminos and only 6.8% had severe polyhydraminos.

This study showed that 75% (n=18) pregnant ladies had cesarean section and only 25% (n=6) had vaginal deliveries. All the pregnant ladies (n=12) with gestational age more than 37 weeks had cesarean section. However study done by Guin G *et al*[12] and K Tajunder *et al*[8] had only 22.2% and 28.6% cesarean section respectively. This study showed 25% (n=6) vaginal delivery which contradicts

the study conducted by Rutwa J Chavda *et al*[11], where the vaginal delivery was 82%. Similarly various studies have also shown higher percentage of vaginal deliveries.

Various studies have shown increased incidence of perinatal morbidity and mortality in pregnancies complicated with polyhydraminos[13,14,15]. Studies conducted by Dashe *et al* and Damato *et al*[17] had 79% and 63% of congenital anomalies identified respectively. However, this study showed only 25% (n=6) pregnant ladies of congenital anomalies. This may be due to the less number of pregnant ladies included in this study. Similarly, studies done by Rutwa J Chavda[10] also had 31% of congenital malformation. Kouame N *et al*[18] and Guin G *et al*[12] had showed only 1.6 % and 8% fetal malformation in their studies. This study showed 20.8% (n=5) NICU admission and one IUFD. Maymon *et al*[19] have observed increased risk of perinatal death and congenital anomalies. Similarly, several studies have shown increased incidence of fetal malformation, increase rate of NICU admission and neonatal death[20,21].

This study showed that 33.3% (n=8) had preterm deliveries. Several studies have shown associations of preterm delivery with polyhydraminos. Salih Askin *et al*[22] in their study showed 16.5% preterm deliveries. Similarly, Pri-Paz *et al*[23] and Dorlejin *et al*[24] reported higher incidence of preterm deliveries up to 20.5%. Ariel M *et al* had observed preterm deliveries as high as up to 40%. Similarly, Kaur Tajinnder *et al*[8] has observed higher incidence of preterm deliveries, 40%. In contrast, Kaukab Tashfeen *et al*[9] had observed low incidence of preterm deliveries, 2.5%.

This study showed that 12.5% (n=3) had premature rupture of membrane. While Rutwa J Chavda *et al*[10] have shown higher incidence of PROM, up to 44.5%. Studies have shown that the risk increases due to over distension of the uterus[25]. Only one pregnant lady in this study had twin pregnancy and one with Rh incompatibility. Rutwa J. Chavda *et al*[10] had also observed 6.6% of twin pregnancy and 4.4% Rh incompatibility in their study. Vasoconstriction leading to uteroplacental insufficiency is associated with oligohydraminos. Pregnancy induced hypertension (PIH) is rarely associated with polyhydraminos. In this study, only 8.3% (n=2) had PIH which is consisted with the findings done by Kuang Chao *et al* (3.9%). However, Rutwa J Chavda[10] had observed 17.7% PIH with polyhydraminos.

This study showed that 8.3% (n=2) had associated impaired glucose tolerance. This is consistent with the study conducted by, Rutwa J Chavda *et al*[10] which showed the incidence being 9%. Studies have shown association between polyhydraminos and maternal pregestational and gestational diabetes[26]. Literature have shown the prevalence of polyhydraminos in gestational diabetes ranging from 8 - 20%[27]. Study done by Idris *et al*[28] had shown polyhydraminos among 18.8% pregnant ladies of gestational diabetes. Similarly, Guin G *et al*[12] have also reported 20% of gestational diabetes associated with polyhydraminos.

CONCLUSION

In this study, it was observed that polyhydraminos was associated with increased rate of cesarean deliveries. It was also associated with increased risk of preterm labor, congenital anomalies and NICU admission.

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Mapping and Size Estimation of Key Populations on HIV Surveillance in Nepal

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ABSTRACT

Introduction: The HIV epidemic in Nepal is mainly concentrated among key populations, including people who inject drugs, gay men and other men who have sex with men, transgender people, female sex workers, and male labor migrants and their spouses. In countries with this type of concentrated HIV epidemic, the size of the key population estimation is important to address the national epidemic.

Objectives: The study has been designed to estimate the district and national level size of key populations at risk of HIV infection and providing a foundation for policy and programing and to guide the national response to address HIV epidemic.

Methods: This is a prospective mapping exercise study done in 44 districts of Nepal. Semi-structured interview were carried out among key populations members as well as non-key population key informants who were familiar with the local situation in and around the high prevalence areas. The study was conducted from August until November 2016. The collected data has been complied on Census and Survey Processing System and analyzed using Statistical Package for the Social Science software package 16 version.

Results: The national estimates of key populations were FSW around 54,207, MSM/MSW/TG around 112,150 of which men having sex with men were 67,292. The PWID individuals range around 34,487.

Conclusion: To fast track the response to achieve global 90-90-90 targets for the continuum of prevention to care, the country is updating its understanding of key population sizes and risk behaviors in different geographical area.

Keywords
Female sex workers, Gay men, HIV, Male labor migrants, Transgender,

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INTRODUCTION

The HIV epidemic remains concentrated among people who inject drugs (PWID), gay men and other men who have sex with men (MSM), transgender people (TG), female sex workers (FSW), clients of sex workers, such as male labor migrants (MLM) who travel to high HIV prevalence areas of India, and the sexual partners of all these groups. In countries with this type of concentrated HIV epidemic, the size of the key population is critical information to help guide the national response, and provide a foundation for the development of policies and programs[1].

Countries with concentrated HIV epidemics conduct studies to estimate the number of key population members with specific risk behaviors such as buying and selling sex, having unprotected sex with multiple partners and clients, and sharing needles and injecting equipment. There are several methods for estimating sizes of key populations including census, nomination enumeration through mapping, and survey-based methods, including multiplier, capture-recapture and network scale-up[2,3].

This is the first study done throughout the country among key populations. The main objective of our study on the Mapping and Population Size Estimates (PSE) exercise was to produce district and national level size estimates of key populations (FSW, MSM, TG, MSW and PWID) at the risk of HIV infection. To help better understanding of key population sizes and risk behaviors in different geographical area of Nepal and providing a foundation for policy and programming and to guide the national response to achieve the Global 90-90-90 targets for the continuum of prevention to care for our key populations.

METHODS

Our study uses the mapping exercise and size estimation methods to obtain direct estimates of key populations. The mapping field work study was done in multiple stages: Pre-mapping, level 1- mapping, level 2- mapping and district level validation of the data obtained. The study was carried out in 44 districts which were categorized into six epidemic zones (Eastern Hills, Far-West Hills, Highway, Kathmandu Valley, Remaining Hills, and West and Mid-West Hills. The districts were selected on the basis of behavior surveillance survey showing epidemiologically increased numbers of key populations residing within these districts. Each district was chosen as the unit of the present study (Fig 1).

With the help of key populations networks and local community mobilizes within each districts list hotspot areas where indentified. For Data collection in the field, nine field research teams were mobilized. Each team was composed of a quality controller, a supervisor, four to six field researchers, and one local motivator from each key population group. At the hotspot level, one researcher and one key population member were mobilized to conduct in-interviews after taking verbal consent from the participants. The study was carried out from 23 August 2016 till 28 November 2016.

The database was designed using Census and Survey Processing System (CSPro) with built-in checks for data entry errors and enabling of skip patterns as designed in the data collection forms. The study was approved by IRB of Nepal Health Research Council meeting of 2016. The method of extrapolation was used to calculate the proportion of adult males (in case of MSM and PWID) and the proportion of adult females (in case of FSWs) in the mapped district, and then multiplied that proportion by the number of adult males and adult females (respectively for MSM, PWIDs and FSW) in the unmapped districts.

RESULTS

The distribution of 44 mapped districts included in our study is in shown in Table 1. The maximum number of key populations: FSW, MSM/TG/MSW and PWID and their hotspots were highest in Kathmandu valley. Our study showed the top four districts with sex solicitation spots numbers were Kathmandu valley-613, followed by Rupendehi-145, Dhanusha-110 and Sunsari-101. The lowest number of FSW spots among mapped districts was found in Syangja-4 (Fig.2, Fig.3 and Fig.4). The national estimates of FSW are 54,207 which represent 0.58% of the adult female population (Table 2). The national estimates MSM/MSW/TG around 112,150 which is 1.34% of total adult male population (Table 3). The PWID individuals range around 34,487 which is 0.19% of the adult population (Table 4).

Fig 1: Mapping Districts of Nepal

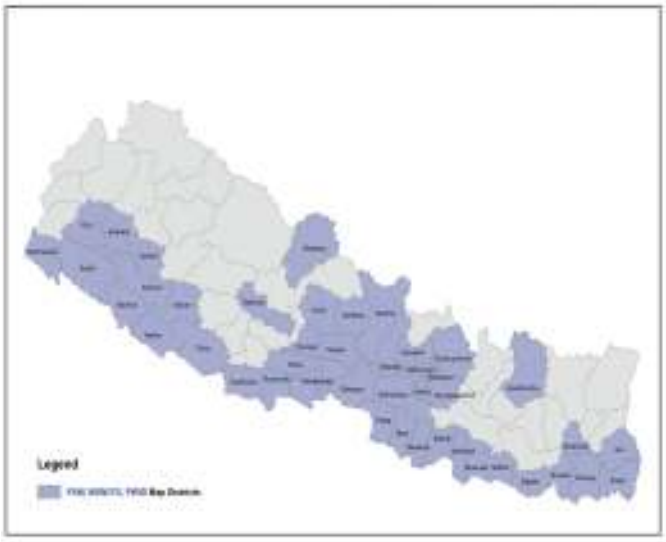

Table 1: Number of mapped, unmapped and extrapolated districts for FSWs, MSM/MSW/TG, and PWIDS

Districts	Mapping Status		Mapping Result		Extrapolation Required	
	Mapped	Unmapped	Zero	Non-Zero	No	Yes
FSW						
Program districts	29	-	-	29	29	-
Non-program Districts	15	31	11	4*	4	42
TOTAL	44	31	11	33	33	42
MSM/TG						
Program districts	31	-	-	31	31	0

Non-program districts	13	31	8	5*	5	39
TOTAL	44	31	0	36	36	39
PWIDS						
Program districts	34		2	32	32	2
Non-program districts	10	31	7	3*	3	38
TOTAL	44	31	9	35	35	40

* FSW Non-zero/Non-Program Districts: Baglung, Gorkha, Syangja, and Nuwakot ** MSM Non-zero/Non-Program Districts: Doti, Gorkha, Palpa, Salyan, Nuwakot ** PWID Non-zero/Non-Program Districts: Gorkha, Lamjung, Nywakot

Table 2: National size estimates of FSW

Districts	FSW	
	MIN	MAX
Mapped	43,254	53,499
Unmapped	575	708
Total	43,829	54,207

* These estimates include all adjustment factors

Table 3: National size estimates of MSM/MSW/TG

Districts	TG		MSW		MSM		Total	
	Min	Max	Min	Max	Min	Max	Min	Max
Mapped	18,193	23,519	15,714	20,340	51,603	65,046	85,510	10,8905
Unmapped	511	697	218	302	1,770	2,246	2,499	3,245
Total	18,704	24,216	15,932	20,642	53,373	67,292	88,009	112,150
Percentage*	0.22%	0.29%	0.19%	0.25%	0.64%	0.80%	1.05%	1.34%

* Percentage with respect to 2016 projected adult male population

Table 4: National size estimates of PWIDs

Districts	Male		Female		Total	
	Min	Max	Min	Max	Min	Max
Mapped	23,275	28,765	2,628	3,855	25,903	32,620
Unmapped	1,297	1796	48	71	1,345	1,867
Total	24,572	30,561	2,676	3,926	27,248	34,487
Percentage*	0.30%	0.36%	0.03%	0.04%	0.15%	0.19%
Percentage with respect to adult female population					0.47%	0.58%

*Percentage with respect to adult population

DISCUSSION

This paper is first study done extensively throughout the country including 44 districts for mapping and size estimation of key populations across Nepal. This study produced maps of all hotspots and estimated numbers of key populations in the majority of districts where intervention programs are being implemented. The study provided detailed local level estimates based on mapping data for high burden districts but relied mainly on extrapolated estimates from lower burden districts. This information is useful for quantifying the number of key populations who are visible and reachable by the program. Since the estimate was adjusted for double-counting, it can be used to help set targets, plan activities such as outreach, and measure coverage for venue-based key populations.

The adjustments factors were also applied to account for key populations who visited hotspots less frequently, or who did not visit hotspots at all. Therefore, the results can be used more broadly to help understand the magnitude of key populations who need to be reached with alternative (non-venue-based) service delivery models.

The study showed number of mapped hotspots of HIV key populations for FSW, MSM/MSW/TG and PWID were highest in Kathmandu valley within the country. This would be explained as due to increased population and the capital city of Nepal[4].

The national estimate of FSW is maximum 54,207 and minimum 43,829 which represent 0.58% and 0.47% of the adult female population[5]. The maximum numbers of FSW were in Kathmandu Valley followed by Terai highway districts-Kailali, Sunsari and Rupandehi. As Terai highways districts have increased numbers of regular people mobility, explains increased numbers of FSW living within the highways districts[6].

The national estimates MSM/MSW/TG is maximum 112,150 and minimum 88,009 which is between 1.34% and 1.05% of total adult male population[7]. The breakdown by subtype is 18,704 to 24,216 for TGs, 15,932 to 20,642 for MSWs, and 53,373 to 67,292 for MSM[8]. These estimates include both mapped and extrapolated districts and all adjustment factors. The maximum number of MSM/MSW/TG were in Kathmandu Valley followed by Terai Highway districts- Kailali, Rupandehi and Kaski[9,10].

The national estimate of PWIDs is minimum 27,248 and maximum 34,487, which is between 0.15% and 0.19% of the adult population. The breakdown by gender is 24,573 to 30,561 males and 2,676 to 3,926 females. These estimates include both mapped and extrapolated districts. The maximum numbers of PWID were in Kathmandu

Valley followed by Terai Highway districts- Kaski, Bara and Banke[11].

CONCLUSION

The present mapping study done at national level size estimation for key populations presents the overall status of key population with our country. The results for mapping exercises are expected to be useful in planning a new program to target key populations, formulation of policies and development of strategies that contribute to acquiring outcomes shaped through targeted interventions. The study will also help to fast track the response to achieve global 90-90-90 targets for the continuum of prevention to care. The country is updating its understanding of key population sizes and risk behaviors in different geographical area.

Limitations of the study

Mapping studies are subject to the inherent limitation of being cross-sectional, meaning that while they may count the majority of key populations who visit venues (hotspots) on a very regular basis, they count only a subset (perhaps a minority) of key populations who visit venues less frequently. This issue is compounded by the increasing use of mobile phones and social media sites for communication and hook-ups related to high-risk behavior. So as the time passes, it is possible that mapping studies may miss substantial subsets of key population members.

Conflict of Interest

None

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Association of the Level of Knowledge Regarding Effects of Alcoholism with Selected Demographic Variables of Rural Adults

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Keywords
Alcohol dependence, Effectiveness, Knowledge.

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ABSTRACT

Background: Alcoholism is the most severe form of alcohol abuse and involves the inability to manage drinking habits. It is also commonly referred to as alcohol use disorder. Alcohol use disorder is organized into three categories: mild, moderate and severe. Each category has various symptoms and can cause harmful side effects. If left untreated, any type of alcohol abuse can spiral out of control.

Objectives: To assess the demographic variables of rural adults, to associate the level of knowledge regarding effects of alcoholism with selected demographic variables of rural adults.

Methods: A Quasi experimental one group pre-test post-test research design was used. The structured interview schedule was developed to collect data. The study was conducted at Challaghatta Village, Bangalore, Karnataka, India and the data collected was analyzed and interpreted based on descriptive and inferential statistics.

Results: The associated pre-test level of knowledge regarding the effects of alcoholism among rural adults with their demographic variables in the study is non significant with the demographic variables at $p > 0.05$ level.

Conclusion: The present study found that there is no significant association between the demographic variables and level of knowledge among rural adults regarding effects of alcoholism.

INTRODUCTION

Alcoholism, also known as alcohol use disorder (AUD), is a broad term for any drinking of alcohol that results in mental or physical health problems[2]. The disorder was previously divided into two types: Alcohol abuse and alcohol dependence[3]. In a medical context, alcoholism is said to exist when two or more of the following conditions are present: A person drinks large amounts over a long time period, has difficulty cutting down, acquiring and drinking alcohol takes up a great deal of time, alcohol is strongly desired, usage results in not fulfilling responsibilities, usage results in social problems, usage results in health problems, usage results in risky situations, withdrawal occurs when stopping, and alcohol tolerance has occurred with use[1].

Alcohol use disorders refer to excessive drinking behaviors that can create dangerous conditions for an individual and others. Alcohol abuse is a pattern of drinking that result in adverse outcomes such as:

- Failure to fulfill work or personal obligations
- Recurrent use of alcohol in potentially dangeros situations
- Problems with the law
- Continued use in spite of harm being done to social or personal relationships

Alcohol dependence (AD) is the medical term for alcoholism. AD is characterized by:

- Increased amounts of alcohol are needed to produce an effect (tolerance)
- Withdrawal symptom (nausea, sweating, irritability, tremors, hallucinations, and seizures) develop when drinking is stopped or reduced
- Constant craving for alcohol and inability to limit drinking
- Continuing to drink in spite of the knowledge of its physical or psychological harm to oneself or others[4].

METHODS

Quantitative research approach was selected as the methodology for the study. The setting of the study was in Sullikere, a rural area in Bangalore District of Karnataka State, India. Probability random sampling method was used for sample selection[5]. A sample size of 20 adults was taken for the study based on inclusive criteria. The tool used for the study was partner interview questioner which includes questionnaire in alcoholism, such as meaning, clinical manifestation, causes, effects, complication, management, rehabilitation. To assess the level of knowledge, 25 multiple choice questions were formed each one given the score of 0, 1 respectively according to their response. Three structured interview among the subjects was conducted on a one to one basis in their homes.

Variables

1. **Study variables:** The level of knowledge regarding effects of alcoholism among rural adults.
2. **Demographic variables:** Demographic variables of adults aged between 20 - 50 years, sex, religion, educational status, occupation and monthly Income.

Plan for data analysis

Data collected was analyzed by using descriptive and inferential statistics.

Descriptive statistics

Frequency distribution was used to describe the demographic variables

Inferential statistics

Chi-square test was used to associate the level of knowledge regarding the effects of alcoholism among adults (20 – 50 years) with their demographic variables.

RESULTS

Organization and Presentation of data

Section 1: Assess the demographic variables of rural adults.

Section 2: Associate between pretest knowledge on effects of alcoholism among adults with their selected demographic variables.

Presentation of Data

Section 1: Frequency and percentage distribution of the demographic variables of rural adults.

Table 1: Assessment of demographic variables in frequency and percentage (n=20)

Sl. No	Demographic Value	No	Percentage (%)
1.	**Age in years**		
	a. 20 - 30	10	50
	b. 31 - 40	9	45
	c. 41 - 50	1	5
	d. 20 - 50	0	0
2.	**Sex**		
	a. Males	20	100
	b. Females	0	0
3.	**Marital status**		
	a. Married	12	60
	b. Unmarried	8	40
4.	**Education status**		
	a. No Formal Education	1	5
	b. Primary	5	25
	c. High School	9	45
	d. Bachelors	5	25
5.	**Occupation**		
	a. Working	8	40
	b. Not working	12	60
6.	**Monthly income in Rs. (INR) / Month**		
	a. Income	0	0
	b. Below 3000	1	5
	c. 3000 - 5000	5	25
	d. Above 5000	14	70
7.	**Type of family**		
	a. Nuclear family	3	15
	b. Joint family	17	85
8.	**Habits of drinking alcohol**		
	a. Yes	7	35
	b. No	13	65

Section 2: Association between pre-test knowledge regarding effects of alcoholism with their selected demographic variables.

Table 2: Association of the pre-test knowledge with their selected demographic variables n=20

S.N	Demographic Value	No	Inadequate		Moderate		Adequate		Chi square value
			F	%	F	%	F	%	
1	**Age (In years)**								
	a. 20 - 30	10	7	35	3	15	0	0	
	b. 31 - 40	9	8	40	1	5	0	0	1.305
	c. 41 - 50	1	1	5	0	0	0	0	df 6
	d. 20 - 50	0	0	0	0	0	0	0	N.S
2	**Sex**								
	a. Males	17	16	80	4	20	0	0	0
	b. Females	3	0	0	0	0	0	0	df2 N.S
3	**Marital Status**								
	a. Married	12	9	45	3	15	0	0	0.4625
	b. Unmarried	8	7	35	1	5	0	0	df 2
4	**Educational Status**								N.S
	a. No formal education	1	1	5	0	0	0	0	
	b. Primary	5	2	10	1	5	0	0	1.456
	c. High school	9	8	40	1	5	0	0	df 6
	d. Bachelors	5	5	25	2	10	0	0	N.S
5	**Occupation**								
	a. Working	8	5	25	3	15	0	0	2.545
	b. Not working	12	11	55	1	5	0	0	df 2 N.S
6	**Monthly Income**								
	a. Income	0	0	0	0	0	0	0	
	b. Below 3000	1	1	5	0	0	0	0	1.777
	c. 3000-5000	5	3	15	2	10	0	0	df 6
	d. Above 5000	14	12	60	2	10	0	0	N.S
7	**Types of family**								
	a. Nuclear family	3	2	10	1	5	0	0	0.801
	b. Joint family	17	14	70	3	15	0	0	df 2 N.S
8	**Do you have habits of drinking**								
	a. Yes	8	6	30	2	10	0	0	0.631
	b. No	12	10	50	2	10	0	0	df 2 N.S
	N.S - Not significant at 0.05 %level								

The above Table 2 shows the associated pre-test level of knowledge regarding the effects of alcoholism among rural adults with their demographic variables in the study is non-significant with the demographic variables.

DISCUSSION

Present study aims to associate the level of knowledge regarding effects of alcoholism with selected demographic variables of rural adults. The discussion of the study is based on the statistical analysis of the study[6].

The demographic variables of the present study reveals that regarding age distribution of adults majority 10 (50%) of them belongs to 20 – 30 years. Regarding sex 20 (100%) of them are males and none of them belongs to females. Regarding the distribution of marital status majority 12 (60%) of them are married. Regarding the educational status majority 9 (45%) of them belongs to high school education. Regarding occupational status, majority 12 (60%) of them belongs to non working group. According to family income a large proportion of 14 (70%) of adults belong to the family income of above Rs 5000 (INR). Regarding the type of family, a majority 17 (85%) of them were from joint family. Regarding the habit of drinking alcohol majority 13 (65%) belongs to the drinking group.

A similar descriptive study was conducted on knowledge towards alcoholism among 200 P.U. (Pre-University) College students of age 12 - 16 years in Mangalore Taluk, Karnataka State, India selected by random sampling technique. The findings of the study revealed that majority of students 83 (41.5%) had favorable attitude toward alcoholism[7].

A similar study was conducted on substance abuse among 489 adolescents in urban slums of Sambalpur, Orissa by simple random sampling technique from 29 municipality ward. The study revealed that 14.7% of adolescents were using alcohol and the median age of substance abuse for males was 15.09 years old and 15.29 for females. The study recommended a very pragmatic approach to the problem by improving education and communication activities directed towards adolescents and their family members[8].

There is no significant association between the levels of knowledge regarding effects of alcoholism among demographic variables. The results show that there is no significant association between the level of knowledge regarding effects of alcoholism among demographic variables.

This study is also supported by a descriptive study which was conducted on approaches to alcohol addiction which examined the available scientific literature to provide an overview of different approaches that are being integrated increasingly to advance their knowledge of the genetic based alcoholism. Genetic factors account for more than 50% of the variance in alcoholism liability[9].

CONCLUSION

The study was conducted to associate the level of knowledge regarding effects of alcoholism with selected demographic variables of rural adults, the results have shown that there is no significant association between the level of knowledge regarding effects of alcoholism which also emphasizes that irrespective of any demographic status, adults should be given health teaching about ill effects of alcoholism.

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Anxiety and Stress among B.Sc. Nursing First Year Students in a Selected Nursing College at Lekhnath, Pokhara, Nepal

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ABSTRACT

Background: Nursing students are important human resources in the field of health. Detection of potential anxiety and stress among nursing students is crucial since anxiety and stress can lead to low productivity, low quality of life, and suicidal ideas. Identifying factors affecting anxiety and stress in initial period of college among nursing students can help nursing educators to find ways to decrease anxiety and stress.

Objectives: To assess the anxiety and stress among B.Sc. nursing first year students in their initial college life.

Methods: A cross-sectional descriptive research design was used for this study. Consecutive sampling technique was used to select the subjects. Total 13 students (100%) were taken as a sample and standardized Beck anxiety scale and modified scale for academic stress was used to collect data.

Results: The study shows that majority of the students, 8 (61.5%) were in the age of 18 years old, follows Hindu religion, 10 (76.9%) belonged to upper caste, 11 (84.6%) stayed in urban area, 7 (53.8%) had no difficulty in this college. Out of 13, 2 (15.4%) students had moderate anxiety and 11 (84.60%) had low level of anxiety with 1.15 ±0.37 whereas 6 (46%) students had mild stress and 7 (54%) had moderate level of stress with 1.53 ±0.51. There were no significant association of anxiety score and stress score with age, ethnicity, residence, feeling difficulties in the college with $p < 0.05$; 6 (46%). There was low positive correlation between anxiety and academic stress with $r_p = 0.395$. It was found that the cause of anxiety was due to college environment, seniors ragging, difficult subjects, delay session and can be reduced by stopping seniors ragging, providing transportation, starting session on time, counselling, providing lunch in canteen, friendly environment, free hours for library.

Conclusions: Students who are newly taking admission to nursing profession will have mild form of psychological variation. Students are mainly faced with practical and academic stressors and anxiety. Hence the study strongly suggests that, starting session on time, time management, avoid ragging, student counselling are the most important factors to reduce anxiety and academic stress to the newly admitted students.

Keywords
Academic stress, Anxiety, B.Sc. nursing, First year.

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INTRODUCTION

Everyone goes through anxiety and stress at one time or another. Stress and anxiety goes hand in hand as anxiety is a response to the stress in times of threat. Anxiety is a vague feeling of dread that is unwarranted by the situation or any event. It is an unpleasant affect characterized by psychological, physiological and behavioral changes in response to an intra psychic conflict[2].

Anxiety is a diffuse apprehension that is vague in nature and is associated with feelings of uncertainty and helplessness. Low levels of anxiety are adaptive and can provide the motivation required for survival, whereas it becomes problematic when the individual is unable to prevent the anxiety from escalating to a level that interferes with the ability to meet basic needs[3].

Standardized professional preparation of nursing students in the nursing institutions is largely determined by their initial adjustment in new environment and ability to cope and adjust with changes, necessary during her entire study period. In this period if they can take care of their self, then they will be able to study effectively and take care of the others or clients[1].

Nursing course is very stressful, most of the students experience increase stress prior to their class adjustment because of ragging from their seniors, clinical rotations or their written examinations, especially their finals. More paperwork and skill performance and evaluation system increase the tension round the year with very tight schedule. Academic sources of stress include long hours of study during examination assignments and grades, lack of free time, and lack of timely feedback[4].

When stress is perceived negatively or becomes excessive, students experience physical and psychological impairment. Methods to reduce stress by students often include effective time management, social support, positive reappraisal and engagement in leisure activities[5].

It has been estimated that 10% to 30% students experience academic related stress that affects their academic performance. Information load, high expectations, academic burden or pressure, unrealistic ambitions limited opportunities, high competitiveness are some of the sources of stress which create tension, fear and anxiety[6].

OBJECTIVES OF THE STUDY

1. Determine the level of anxiety among B.Sc. Nursing first year students
2. determine the level of stress among B.Sc. Nursing first year students.
3. find the association between anxiety score and selected baseline variables.
4. find the association between stress score and selected baseline variables.
5. examine the correlation between anxiety level and stress level

METHODS

Descriptive cross sectional research design was employed to explore the level of anxiety and academic stress among 13 B.Sc. nursing first year students of College of Nursing Sciences, Gandaki Medical College. Data was collected on their starting period of the college life. Non-probability consecutive sampling technique was used in this study. Data was collected using self-administered standardized tools for anxiety scale and modified scale for academic stress to assess the academic stress. The research instrument was divided into three sections.

Section I: Socio demographics characteristics of respondents

Section II: Beck anxiety scale

Section III: Modified scale for academic stress

B.Sc. nursing students started their class from october 19, 2017. The data was collected on september 18, 2017; verbal consent was taken voluntarily from the participant with assured confidentiality and anonymity. Self–administered standardized tool was administered to assess the level of anxiety and academic stress among B.Sc. Nursing first year students. Ethical clearance is obtained from institutional review board of Gandaki Medical College. SPSS Program version 16.0 was used for entering and tabulating data. Frequency and percentage was used to analyze socio-demographic characteristics. Descriptive statistics as mean, standard deviation and mean percentage was used to assess level of level of anxiety and stress. The association of level of anxiety and stress with their selected demographic variables were analyzed by using Chi-square test and Correlation between anxiety level and stress level by using the Karl Pearson's correlation coefficient formula.

RESULTS

Organization and presentation of related data

Section I: Description of demographic variables of students.
Section II: Level of anxiety among students.
Section III: level of stress among students.
Section IV: Association of the level of anxiety with selected demographic variables.
Section V: Association of the level of stress with selected demographic variables.
Section VI: co-relation between level of anxiety and level of stress.

Section I: Description of characteristics of respondents

Table 1: Frequency and percentage distribution of demographic characteristics (N = 13)

Demographic characteristics	Frequency	Percentage	
Age (in years)			**Mean age**
18	8	61.5%	18.54
19	3	23.1%	
20	2	15.4%	
Religion			
Hindu	13	100%	
Ethnicity			
Upper caste	10	76.9%	
Janjati	2	15.4%	
Dalit	1	7.7%	
Residence			
Rural	2	15.4%	
Urban	11	84.6%	
Did you feel difficulties in this college?			
Yes	6	46.2%	
No	7	53.8%	

Table 1 depicts that the mean age of the subjects was 18.54, ranging between 18 to 20 years. Among them eight (61.5%) participants were in the age group of 18 years, 3 (23.1%) were 19 years and 2 (15.4%) were 20 years. All respondents (100%) were belonged to Hindu religion. Ten (76.9%) subjects were belonged to upper cast (chhetri and Brahmin), two (15.4%) were janajati and only one (7.7%) was dalit; among them majority 11 (84.6%) were from urban area and two (15.4%) were from the rural area. Almost half (46.2%) of the respondents responded that they felt difficulties in this college.

Section II: Level of anxiety among students

Fig 1: Level of anxiety among students

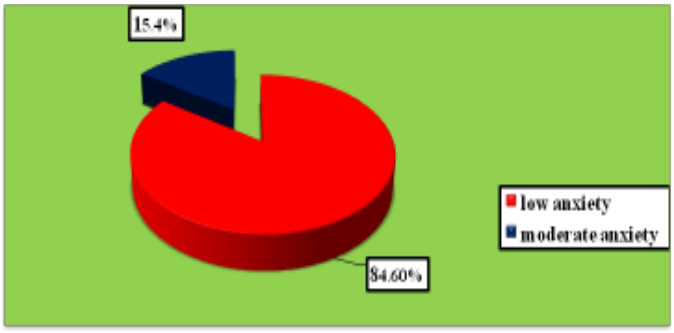

Fig 1 shows that out of 13 respondents, two (15.4%) respondents had moderate anxiety and 11 (84.60%) had low level of anxiety whereas mean and standard deviation were 1.15 ±0.37

Section III: Level of stress among students

Fig 2: Level of stress among students

Fig 2 shows that out of 13 respondents, 6 (46%) students had mild stress and 7 (54%) had moderate level of stress whereas mean and standard deviation were 1.53 ±0.51.

Section IV: Association of the level of anxiety with selected demographic variables

This section analyses the association between anxiety score with selected baseline variables such as age, religion, ethnicity, residence and feeling difficulties in the college. The association was observed by cross tabulation and calculating Pearson Chi-square test. Specific findings are as follows:

Table 2: The association between anxiety score with selected baseline variables (N = 13)

Baseline variables	Pearson Chi-square	df	P value
Age (in years)			
18			
19	1.477	2	0.478
20			

Ethnicity			
Dalit	2.245	2	0.325
Janjati			
Upper caste			
Residence			
Rural	0.430	1	0.512
Urban			
Feeling difficulties in this college			
Yes	.014	1	0.906
No			

The above Table 2 shows that there was no significant association between anxiety score with demographic variables like age, ethnicity, residence, feeling difficulties in the college with $p < 0.05$.

Section V: Association of the level of stress with selected demographic variables

This section analyses the association between stress score with selected baseline variables such as age, religion, ethnicity, residence and feeling difficulties in the college. The association was observed by cross tabulation and calculating Pearson Chi-square test. Specific findings are as follows:

Table 3: The association between stress score with selected baseline variables (N = 13)

Baseline variables	Pearson Chi-square	df	P value
Age (years)			
18			
19	0.258	2	0.879
20			
Ethnicity			
Dalit			
Janjati	1.331	2	0.514
Upper caste			
Residence			
Rural	0.14	1	0.731
Urban			
Feeling difficulties in this college			
Yes	3.899	1	0.078
No			

The above Table 3 shows that there was no significant association between stress score with demographic variables like age, ethnicity, residence, feeling difficulties in the college with $p < 0.05$.

Section VI: Co-relation between level of anxiety and level of stress

Table 4: Correlation between anxiety and stress level (N = 13)

		Academic stress		Total	Pearson's Correlation (r_p)
		Mild stress	Moderate stress		
Anxiety	Low anxiety	6	5	11	0.395
	Moderate anxiety	0	2	2	
Total		6	7	13	

The above table 4 shows that there was low positive correlation between anxiety and academic stress with $r_p = 0.395$.

Table 5: Causes of anxiety (N = 13)

Causes	Frequency	Percentage
College environment		
Yes	7	53.8%
No	6	46.2%
Seniors/ragging		
Yes	13	100%
faculty/basic		
Yes	3	23.1%
No	10	76.9%
New environment		
Yes	4	30.8%
No	9	69.2%
Difficult subjects		
Yes	9	69.2%
No	4	30.8%
Adjustment problem		
Yes	6	46.2%
No	7	53.8%
Class hour		
Yes	4	30.8%
No	9	69.2%
Lunch hour		
Yes	2	15.4%
No	11	84.6%
Vehicle / Transportation		
Yes	4	30.8%
No	9	69.2%
Expenditure		
Yes	4	30.8%
No	9	69.2%
Delay session		
Yes	9	69.2%
No	4	30.8%

Hostel problem		
Yes	1	7.7%
No	12	92.3%
Food adjustment		
Yes	5	38.5%
No	8	61.5%
Lack of time to sleep		
Yes	3	23.1%
No	10	10%
Tight class schedule		
Yes	4	30.8%
No	9	69.2%

The above table shows that the cause of anxiety was due to college environment (53.8%), seniors ragging (100%), difficulty in subjects (69.2%), delayed session (69.2%).

Table 6: Management of anxiety (N = 13)

Management	Frequency	Percentage
Stop seniors ragging		
Yes	13	100%
Decrease class hour		
Yes	3	23.1%
No	10	76.9%
Increase lunch hour		
Yes	2	15.4%
No	11	84.6%
Provide transportation		
Yes	9	69.2%
No	4	30.8%
Session start in time		
Yes	11	84.6%
No	2	15.4%
Compulsion of stay in hostel		
Yes	1	7.7%
No	12	92.3%
Counselling		
Yes	13	100%
Lunch/ tiffin in canteen		
Yes	9	69.2%
No	4	30.8%
Friendly environment		
Yes	12	92.3%
No	1	7.7%
Free hours for library		
Yes	11	84.6%
No	2	15.4%

The above table shows that anxiety can be reduced by stopping seniors ragging (100%), providing transportation (69.2%), starting session on time (84.6%), counselling (100%), providing lunch in canteen (69.2%), friendly environment (92.3%), and free hours for library (84.6%).

DISCUSSION

The study shows that majority of the students, 8 (61.5%) were in the age of 18 years old, follows Hindu religion, 10 (76.9%) belonged to upper caste, 11 (84.6%) stayed in urban area, 7 (53.8%) had no difficulty in this college.

Out of 13 respondents, two (15.4%) students had moderate anxiety and 11 (84.60%) had low level of anxiety whereas mean and standard deviation were 1.15 ±0.37.

Out of 13 respondents, six (46%) students had mild stress and seven (54%) had moderate level of stress whereas mean and standard deviation were 1.53 ±0.51

Another study supported the present study was conducted to in National Institute of Nursing Education, PGIMER, Chandigarh to assess the causes of stress in B.Sc. nursing first year students at 2009. The study findings showed 48.83% students had mild level of stress[7].

Current study is supported by another study conducted in Nellore, India to assess the level of stress in BSc nursing first year students. The study findings showed 36.7% students had mild level of stress[8].

Current study is supported by next similar types of study conducted in Manipal College of Nursing, Pokhara, Nepal to assess the level of stress/ stressors and coping mechanism in nursing students. The finding of the study showed that 60.4% students had moderate level of stress[9].

There was no significant association between anxiety score with age, ethnicity, residence, feeling difficulties in the college with $p < 0.05$.

In total 13 participants, 6 (46%) students had mild stress and 7 (54%) had moderate level of anxiety whereas mean and standard deviation were 1.53 ±0.51. There was low positive correlation between anxiety and academic stress with $r_p = 0.395$. It was found that the cause of anxiety was due to college environment, seniors ragging, difficult subjects, delay session and tight schedule.

These problems can be reduced by stopping seniors ragging, providing transportation, starting session on

time, and counselling, providing lunch in canteen, friendly environment, and free hours for library.

CONCLUSIONS

Students who are newly taking admission to nursing profession will have mild form of psychological variation. It's the institutional teachers who have to focus on their psychological needs.

Students are mainly faced with practical and academic stressors and anxiety. Hence the study strongly suggests that, starting session on time, time management, avoid ragging, student counselling are the most important factors to reduce anxiety and academic stress to the newly admitted students.

Nursing faculty should create caring and supportive learning environments that facilitate students coping and persistence, perceived self- efficacy, and success in nursing.

Acknowledgement

We would like to express our sincere gratitude whole heartedly to the authority of Gandaki Medical College for giving us the opportunity to undertake this study.

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Epidemiology and Clinical Outcome of Snakebite in Western Nepal: A Retrospective Study

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ABSTRACT

Introduction: Snakebite is an environmental hazard associated with significant morbidity and mortality. It is an important medical emergency and cause of significant numbers of hospital admissions in many parts of the Asian region. In this study, we assess the epidemiology and clinical outcome of snake bite.

Methods: This was a retrospective study of all patients with snake bites admitted to the Department of Internal Medicine, Manipal Teaching Hospital, Pokhara, kaski, Nepal. A total numbers of 265 snake bite cases in the period of 2013 to 2016 were enrolled in this study. Snake bite cases by person, place and time along with month of snake bite and time of bite, were analyzed. We also identified the types of snake and site of the bite. Sign and symptoms were clinically observed and the management of the snake bite cases was clinically done. Prothrombin time (PT) test along with INR value was performed by Medical Technologist at the Department of Laboratory, Manipal Teaching Hospital. Data was entered in to the Microsoft excel and analyzed by SPPS version 21.0. Percentages were applied to find the results.

Results: Total numbers of snake bite cases were 265. More than half, 60.4% of the snake bite cases were females. Regarding the age group, nearly half, 47.9% were in the age group of 20 - 40 years and 9.8% cases were in the age group of 60 years and above. In this study, 50.6% bite cases were held at the day time and most of the bites were reported/ observed in the limb, 53.6% in lower limb, and 43.4% in the upper limb. Very few bites were in the head, neck and trunk. Our result shows 49.1% were green snake and 30.9% snake were unidentified. When we observed the sign and symptoms, 153 (57.7%) cases showed local swelling, 83 (31.3%) showed fang mark. Hematological manifestation were 144 (54.3%) cases and complication observed in 145 (54.7%) cases. Snake bite cases were managed after PT/INR test, INR. Antibiotic were prescribed in 154 cases and in 135 (50.9%) cases blood was transfused. There were no fetal cases noticed among hospital admitted snake bite cases.

Conclusion: There is gross disparity in the management and outcomes of snake bite in different hospitals. Snake bite cases should manage in tertiary care hospital as early as possible.

Keywords
Case fatality rate, Poisoning, Snake bite.

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INDRODUCTION

Snakebite is an environmental hazard associated with significant morbidity and mortality. It is an important medical emergency and cause of significant numbers of hospital admissions in many parts of the Asian region[1]. Although high snakebite mortality is often reported to occur in India, the highest incidence of venomous yet snakebite has not been a prioritized public health issue in Nepal[2,3]. The Snake bite has been considered to be a devastating environmental occupational injury, affecting poor rural communities like farmers, plantation workers and fishermen around the world[4]. The incidence of bites is high in warm regions, where snakes are abundant and economic activities are mainly agricultural. Among 3,000 known species of snakes, only 200 are poisonous to humans. Snakebite is a widely distributed but neglected condition. Viper species are most often involved, the victims are primarily men, and the most common site of the bite is the upper limbs. The clinical presentation caused by snakebite varies with the species involved and most of the viper venoms exhibit both anticoagulant and coagulant effects[5]. In Asia alone, it has been estimated that 4 million snakebites occur each year, of which approximately 50% are envenomed, resulting in 100,000 annual deaths. The incidence is particularly high in rural areas of warm regions where snakes are abundant and human activities, mainly agriculture, increase the risks of snake encounters. Case fatality rates can be high where patients do not have rapid access to life-saving Anti-Snake Venom Serum (ASVS), a common situation in rural areas of developing countries[5]. World Health Organization reported venomous snakes caused 5.4 million bites every year around the world, of them 2.5 million suffered with envenoming and around 125,000 died[4]. The incidence is quite high in rural warm regions of Terai and even in the mountainous region of the Nepal. Envenomation is an occupant hazard for the farmers and farm labors, plantation workers, herders and hunters in tropical and subtropical countries. Although the exact incidence is unknown, about 20% of the bites result in no envenomation and 10% result in mortality; the actual incidence of snake bites may be much higher[6,7]. The snake venom contains many enzymes like digestive hydrolases, hyaluronidase, and activators or inactivators of physiological processes which include L-amino acid oxidase, phosphomono and diesterase, 5'-nucleotidase, DNAase, NAD-Nucleosidase, phospholipase A2, and peptidases[8]. Some snake venom, contains carbohydrates (glycoprotein) lipids and biogenic amines while other venom contain free amino acids[9,10].

MATERIALS AND METHODS

Manipal Teaching Hospital is situated in Pokhara, kaski district in western development region. It is the only medical institution providing tertiary care facilities for the people residing in western development region of Nepal which constitutes about 20% of total population of Nepal it gets its referral from regional hospital, medical colleges and other zonal hospital and district hospital of Western Development Region of Nepal[6].

This was a retrospective study of all patients with snake bites admitted to the Department of Internal Medicine, Manipal Teaching Hospital, Pokhara, kaski, Nepal. A total numbers of 265 snake bite cases in the period of 2013 to 2016 were enrolled in this study. Snake bite cases by person, place and time along with month of snake bite and time of bite, were analyzed. We also identified the types of snake and site of the bite. Sign and symptoms were clinically observed and the management of the snake bite cases was clinically done. The management of cases was done by PT and INR test. For PT and INR value, 3.0 ml of venous blood sample was collected with standard protocol and test was performed by Medical Technologist at the Department of Laboratory, Manipal Teaching Hospital. Data entry was performed using the Microsoft excel and percentages were applied to find the results.

RESULTS

Total numbers of snake bite cases were 265. More than half 60.4% of the snake bite cases were females. Regarding the age group, nearly half, 47.9% were in the age group of 20 - 40 years and 9.8% cases were in the age group of 60 years and above. Mean age of the snake bite cases was 38.7 (SD ±16.32) with the range of 14 to 82 years. More than half, 58.1% cases were admitted from Kaski District followed by Syangja district (15.5%) and Tanahun district (14.7%). In the study, cases of snake bites were included from 2013 to 2016. Out of total cases, 35.8% and 32.8% cases were collected in 2014 and 2016, respectively. Only, 14% cases were admitted in the year 2013. Out of the total cases nearly one third, 31.3% cases were admitted in August. No cases were observed in January, February and December. Cases began to appear from March and peaked in August and gradually decreased. After August, higher proportion of cases, 22.3% and 17.7% were occurred in July and September, respectively. Regarding the time of bite, more than half, 50.6% bites were reported at day time, from 5

AM to 7 PM.

Table 1: Distribution of snake bite cases by person, place and time (N=265)

Characteristics	Number	Percentage
Sex		
Males	105	39.6%
Females	160	60.4%
Age group		
Below 20	29	10.9%
20 - 40	127	47.9%
40 - 60	75	28.3%
>60	26	9.8%
Missing	8	3.0%
Mean age	257	38.7 (±16.32)
Place of residence		
Kaski	154	58.1%
Others	18	6.8%
Parbat	13	4.9%
Syangja	41	15.5%
Tanahun	39	14.7%
Year-wise distribution		
2013	37	14.0%
2014	95	35.8%
2015	46	17.4%
2016	87	32.8%
Seasonal Variation		
March-June	42	15.8%
July	59	22.3%
August	83	31.3%
September	47	17.7%
October to November	34	12.8%
Bite time		
Day time	134	50.6%
Night time	84	31.7%
Missing	47	17.7%

Most of the bites were reported/observed in the limb, 53.6% in lower limb and 43.4% in the upper limb. Very few bites were in the head, neck and trunk. Of the total, 49.1% participants reported that they were bitten by green snake and 30.9% could not mention the type of snake.

Table 2: Site of bite and snake identified

Variable	Frequency	Percentage
Site of the bite		
Lower Limb	142	53.6%
Upper Limb	115	43.4%
Others	8	3.0%
Type of snake identified		
Black Snake	13	4.9%
Green Snake	130	49.1%
Not Identified	23	8.7%
Others	17	6.4%
Not mentioned	82	30.9%

Out of the total cases included, 31.3% were presented with visible fang mark of snake. Of the total, 57.7% had developed local swelling and 4.2% had found with local bleeding. Of the total, 54.7% had developed some sort of complications. Of the total cases, 54.3% were found with hematological manifestation. Bruising was observed in 5.3% cases.

Table 3: Sign and symptoms of the snake bite

Signs observed (multiple response-question)	Frequency	Percentage
Fang mark visible	83	31.3%
Local swelling	153	57.7%
Local bleeding	11	4.2%
Local necrosis	2	0.8%
Complication	145	54.7%
Hematological manifestation	144	54.3%
Bruising	14	5.3%

Regarding the management, $MgSO_4$ dressing was done in 49.4%. Of the total, 58.1% cases were provided antibiotics. PT was not found clot in the 39.6% cases. INR was 9 or did not clot in 46.4% cases. Therefore, more than half, 50.9% cases required blood transfusion.

Table 4: Management of the cases

Variable	Frequency	Percentage
$MgSO_4$ dressing done	131	49.4%
Antibiotic prescribed	154	58.1%
PT		
Did not Clot	105	39.6%
Clot	160	60.4%
INR		
<4.5	126	47.5%
4.5 - 9	15	5.7%
>9 or did not clot	123	46.4%
Blood transfusion required		
No	130	49.1%
Yes	135	50.9%

DISCUSSION

This study showed that most of the snake bite occurred in age 20 - 40 years which are in same in the study conducted in Western Region of Nepal[1]. More than half 60.4% of the snake bite cases were females. Regarding the age group, nearly half, 47.9% were in the age group of 20 - 40 years and 9.8% cases were in the age group of 60 years and above. Mean age of the snake bite cases was 38.7 (SD ±16.32) with the range of 14 to 82 years. It has been reported that snakebite largely affects the adolescent and young adults (10-30 years)[12]. More than half, 58.1% cases were admitted from Kaski District followed by Syangja district (15.5%) and Tanahun district (14.7%), which may be due to assessable, snake bite case admitted in Manipal Teaching Hospital, located at Pokhara, Kaski District.

In the study, cases of snake bites were included from 2013 to 2016. Out of total cases, 35.8% and 32.8% cases were collected in 2014 and 2016, respectively. Only, 14% cases were admitted in the year 2013. Out of the total cases nearly one third, 31.3% cases were admitted in August. No cases were observed in January, February and December. Cases began to appear from March and peaked in August and gradually decreased. After August, higher proportion of cases, 22.3% and 17.7% were occurred in July and September, respectively. Regarding the time of bite, more than half, 50.6% bites were reported at day time, from 5 AM to 7 PM. Most of the bites were reported/observed in the limb, 53.6% in lower limb and 43.4% in the upper limb. Very few bites were in the head, neck and trunk. Of the total, 49.1% participants reported that they were bitten by green snake and 30.9% could not mention the type of snake. There is a huge difference on species of the snakes so as the venom. Similar to our results, a study conducted in Pokhara shows majority of the victims were from Kaski district 65.34% and higher proportion of victims were aged between 10 - 59 years (86.81%). And the maximum number of victims 49.45% belonged to farmers in occupation. Most of the snake bite cases were reported in the of month of May to October and the bite was mostly during day time 65.93%[6]. The major signs we noted in this study are local swellings (57.7%) and 144 (54.3%) cases manifested hematological complication, which are managed by blood transfusions. To remove the venom is by transfusing a blood. PT/INR test is the reliable test to indicate the complication of venom and we found 123 (46.4%) cases, PT/INR test did not clotted and blood transfusion was required.

CONCLUSION

Snake bite is still a major problem in developing countries like Nepal, causing significant morbidity and mortality. There is gross disparity in the management and outcomes of snake bite in different hospitals. Lack of transport facilities is common reason for causing delay in seeking treatment. Public health intervention should focus on improving victim's rapid transport mainly for people residing in far-off district to seek adequate treatment in a tertiary care hospital setting.

Recommendation

Further study is recommended in our part of the country to evaluate the protocol recommended by WHO for Southeast Asia region which considers the aggressive anti snake venom use within first few hours of innovation.

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Correlation of Ultrasound Parameters with Serum Creatinine in Renal Parenchymal Disease

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ABSTRACT

Introduction: Chronic kidney disease (CKD) is common cause of renal failure. It involves a progressive loss in the structure and function of the kidneys over the course of months, with or without decreased glomerular filtration rate (GFR). CKD can be diagnosed by its pathological abnormalities, changes in the levels of renal function markers in the blood or urine, or by imaging investigations (E.g. USG etc).

Objectives: The purpose of our study is 1) To correlate renal echogenicity with serum creatinine in order to determine the significance of renal echogenicity for identifying the progression of chronic kidney disease (CKD) and for the sonographic grading of CKD, 2) To study association of blood pressure, renal cortical cysts and renal size with grade of chronic renal disease.

Methods: This hospital based cross sectional study was carried out at National Kidney Centre, Banasthali Kathmandu. Two hundred patients above 20 years, diagnosed with CKD according to the guidelines of the National Kidney Foundation and referred for USG, were included in the study. Patients with kidney transplant, on dialysis, with liver disease and renal tumors were excluded. Ultrasound of kidneys was performed by senior consultant radiologist who was blind to the patients' serum creatinine levels. The relationship between grade of CKD with serum creatinine, kidney size, blood pressure and cortical cysts were assessed. Statistical analysis was performed by Kruskal wallis test using SPSS version 17. P values less than 0.05 were considered statistically significant.

Results: Mean serum creatinine was 1.7 mg/dl for Grade 1 (range: 1.1-4.7 mg/dl, STD 0.44), 2.38 mg/dl for Grade 2 (range: 1.8-3.9 mg/dl STD 0.40), 4.18 mg/dl for Grade 3 (range: 2.6-6.0 mg/dl, STD 0.88), and 5.65 mg/dl for Grade 4 (range: 3.1-12 mg/dl, STD 2.0.

Conclusion: Renal echogenicity and its grading correlates better with serum creatinine in CKD than other sonographic parameters. Hence, renal echogenicity is a better parameter than serum creatinine for estimating renal function in CKD, and has the added advantage of irreversibility.

Keywords
Hypertension, Chronic kidney disease, Renal cortical cysts, Renal echogenicity, Serum creatinine.

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INTRODUCTION

The grade of kidney disease is determined by cortical echogenicity with Grade 1 mild form, Grade 2 moderate form, Grade 3 severe form and Grade 4 as end-stage renal disease[1].

Chronic renal disease (CKD) is defined as:

1. Kidney damage ≥3 months, as defined by structural or functional abnormalities of the kidney with or without decreasing GFR, manifest by either pathological abnormalities or markers of kidney damage including abnormalities in the composition of blood or urine or abnormalities in the imaging tests.
2. GFR <60 ml/min/1.73 m^2 for ≥3 months with or without kidney damage[2].

Chronic Kidney disease is a worldwide public health problem, both for the number of patients and cost of treatment involved. Globally, CKD is the 12th commonest cause of death and the 17th commonest cause of disability, respectively[1]. The commonest cause of CKD is diabetic nephropathy[3].

Renal ultrasound is simple, inexpensive and can be done at the bedside to provide the clinician with important anatomical details of the kidneys with a low inter-observer variability[4]. The safety of the diagnostic procedure using ultrasound is well established[5]. In the clinical practice, Ultrasonography is used in the initial evaluation of CKD patients for three major reasons as follows:

1. To rule out potentially reversible causes (E.g. collecting system dilatation).
2. To make a decision about a possible renal biopsy in cases where US fails to define the CKD etiology.
3. To obtain renal measurements as a prognostic factor. Such measurements are important since in most cases CKD leads to a common final-stage condition characterized by small kidneys, cortical and parenchymal thinning (indicating atrophy) and hyperechogenicity indicating sclerosis and fibrosis (small, dense, echogenic kidneys); such findings indicate disease irreversibility and poor prognosis[6].

The measurement of serum creatinine has been the traditional approach to assessing CKD. The estimated GFR (Egfr) derived from formulas such as the Modification of Diet in Renal Disease (MDRD) equation is superior to serum creatinine alone in the diagnosis of CKD.[7]

Chronic kidney disease is one of the common causes of renal failure. It involves a progressive loss over the course of months in the structure and function of the kidneys, with or without a decreased glomerular filtration rate (GFR)[8]. CKD can be diagnosed by its pathological abnormalities, changes in the levels of kidney function markers in the blood or urine, or by imaging investigations[9]. Ultrasound is the ideal imaging modality in CKD because of its non-invasiveness, and because it provides easy accessibility and visualization of the kidneys. Ultrasonography is the first, and, in most cases, the only imaging investigation required in the work-up of chronic renal failure. Observation of a small kidney with a thin, echogenic cortex or parenchyma indicates irreversible damage[10,11]. The best screening modality to evaluate renal insufficiency in patients is sonography[12]. As ultrasonographic findings like echogenicity, longitudinal length, parenchymal, and cortical thickness represent irreversible changes, ultrasonography is a better imaging modality when it comes to ascertaining the progression of the disease[10,11]. The serum creatinine level is an endogenous serum marker that is commonly used to estimate GFR, and accordingly, the stage of CKD[13].

Renal parenchymal disease is a group of disease of renal parenchyma which is broadly divided into glomerular, vascular and tubulointerstitial disease. There is substantial overlap amongst these disease entities with the end result being functional impairment.

After six months of age, the cortex should not be more echogenic than the liver, and there is progressive decrease in echogenicity so that the cortex is less echogenic than the liver in 90% of cases by the age of seven years[14]. It was known long before that renal length decreases with progression of renal parenchymal disease[15]. The mean right renal length is 10.74 ±1.35 cm and the mean left renal length is 11.1 ±1.15 cm, measured as the longest diameter obtained on a posterior oblique image, with a lower limit of normality generally indicated as 9 cm[16]. According to Fiorini et al, renal length under 8 cm is definitely reduced and should be attributed to chronic renal failure, whereas a length between 8 and 9 cm should always be correlated to the patient's phenotype, particularly the height[17].

Study by Miletić et al[18] revealed that relative renal length (calculated using the kidney length to body height ratio) better represents kidney size than absolute renal length (Measurements of longitudinal renal diameter) because it eliminates sex and height differences. In an attempt

to improve differentiation of normal kidneys from those affected by chronic kidney disease, some authors have furthermore proposed the evaluation of renal volume using the ellipsoid formula (V = craniocaudal diameter anteroposterior diameter x transeverse diameter x 0.5233)[19] subsequently adjusted to patient's body mass index.

MATERIALS AND METHODS

This hospital based cross sectional study was conducted at National Kidney Centre, Banasthali, Kathmandu, after approval by the ethical committee. The duration of study was three years, from May 2015 to April 2018. Two hundred patients above 20 years of age who had been diagnosed with CKD according to the guidelines of the National Kidney Foundation were selected[9]. Patients on hemodialysis, peritoneal dialysis, renal transplantation, those with fatty liver and other liver diseases diagnosed on ultrasonography, patients with renal tumors and those unwilling to give consent were excluded. Detailed information from patients regarding age sex, duration of diabetes mellitus if diabetic, duration of hypertension if hypertensive, other causes of chronic renal failure, and treatment history were collected. Using a standard B mode grayscale ultrasound (Medison, sonoace R7), ultrasonography of the kidneys was performed using curved array transducers of 2.5-4 MHz. Low tissue harmonic imaging was applied to visualize the kidney echogenicity. The radiologist was blind to patients' serum creatinine values. Renal longitudinal size (both Right and Left), cortical echogenicity, corticomedullary differentiation and associated renal cortical cysts were evaluated. Renal cortical echogenicity was compared and graded with the echogenicity of the liver, where:

Grade 0: Normal echogenicity less than that of the liver, with maintained corticomedullary definition.

Grade 1: Echogenicity the same as that of the liver, with maintained corticomedullary definition.

Grade 2: Echogenicity greater than that of the liver, with maintained corticomedullary definition.

Grade 3: Echogenicity greater than that of the liver, with poorly maintained corticomedullary definition

Grade 4: Echogenicity greater than that of the liver with a loss of corticomedullary definition.

Latest serum creatinine levels were obtained from patient's record. Statistical analysis was calculated by Kruskal wallis test using SPSS 17 version. The relationship between grade of CKD with serum creatinine, kidney size, blood pressure and cortical cysts were assessed. P values less than 0.05 were considered statistically significant.

RESULTS

Out of 200 selected patients, 128 (64%) were males and 72 (36%) were females (Table1). Patient age was from 20 years to 86 years with mean age of 46.39 years. 31-40 year age group had the highest frequency of CKD (25%) followed by 41 - 50 year age group (20.5%). Least frequency was found in age group of >80 years (3%) (Table 2). Sixty five patients (32.2%) had sonological Grade 1 CKD, 63 (31.5%) had Grade 2 CKD, 40 (20%) had Grade 3 CKD, and 32 (16%) had Grade 4 CKD (Table 3). Mean serum creatinine was 1.7 mg/dl for Grade 1 (Range: 1.1 - 4.7 mg/dl, STD 0.44), 2.38mg/dl for Grade 2 (range: 1.8 - 3.9 mg/dl STD 0.40), 4.18 mg/dl for Grade 3 (range: 2.6 - 6.0 mg/dl, STD 0.88), and 5.65 mg/dl for Grade 4 (range: 3.1 - 12 mg/dl, STD 2.0 (Table 4). The mean longitudinal size of right kidney was 9.8 cm for Grade 1 (range: 8.9 - 12.6 cm, STD 0.8), 9.1 cm for Grade 2 (range: 9.1 - 10.9 cm, STD 0.6), 8.2 cm for Grade 3 (Range: 6.1 - 9.3 cm, std 0.9), and 7.1 cm for Grade 4 (range: 5.1 - 9.0 cm, STD=1.0) (Table 5). Mean longitudinal size for left kidney was 9.8 cm for grade 1 (Range 8.8 - 12.1 cm, STD 0.7), 9.1 cm for grade 2 (Range 6.9 - 11 cm, STD 0.67), 8.4 cm for grade 3 (Range 6.2-9.5 cm, STD 0.87) and 7.2 cm for grade 4 (Range 5.6 - 9.2 cm, STD 1.0) (Table 6).

Renal cortical cyst was present in 22(33.8%) in grade 1, 20(31.7%) in grade 2,18 (45%) in grade 3 and 12 (37.5%) in grade 4 patients (Table 7).

Table 1: Male to female ratio of study population

		Grade (MRD)				Total
		2	3	4		
Sex	**Male**	46	42	22	18	128
	Female	19	21	18	14	72
Total		65	63	40	32	200

Table 2: Age group of the study population

Age group (Years)	Number	Percentage (%)
20 - 30	35	17.5
31 - 40	50	25
41 - 50	41	20.5

Age group (Years)	Number	Percentage (%)
20 - 30	35	17.5
31 - 40	50	25
41 - 50	41	20.5
51 - 60	36	18
61 - 70	20	10
71 - 80	12	6
>80	6	3
Total	200	100

Table 3: Different grades of renal echogenicity in study population

Grade (MRD)	Mean	N	Std. Deviation	Minimum	Maximum	Std. error of Mean	Sum	Range
1	44.14	65	16.587	20	81	2.057	2869	61
2	47.43	63	16.343	20	86	2.059	2988	66
3	49.83	40	14.629	28	84	2.313	1993	56
4	44.59	32	16.000	22	84	2.828	1427	62
Total	46.39	200	16.075	20	86	1.137	9277	66

Fig 1: Grade 4 renal cortical echogenicity with small kidney size

Fig 2: Grade 2 echogenic kidney with maintained CMD

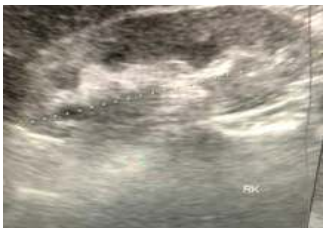

Table 4: Mean serum creatinine in each grade

Grade (MRD)	Mean	N	Std. Deviation	Minimum	Maximum	Std. error of Mean	Sum	Range
1	1.732	65	0.4416	1.1	4.7	0.0548	112.6	3.6
2	2.389	63	0.4017	1.8	3.9	0.0506	150.5	2.1
3	4.183	40	0.8892	2.6	6.0	0.1406	167.3	3.4
4	5.659	32	2.0111	3.1	12.0	0.3555	181.1	8.9
Total	3.058	200	1.7193	1.1	12.0	0.1216	611.5	10.9

Table 5: Mean right renal size

Grade (MRD)	Mean	N	Std Deviation	Minimum	Maximum	Std error of mean
1	9.802	65	0.8100	8.9	12.6	0.1005
2	9.113	63	0.6150	7.0	10.9	0.0775
3	8.248	40	0.9747	6.1	9.3	0.1541
4	7.131	32	1.0636	5.1	9.0	0.1880
Total	8.847	200	1.2477	5.1	12.6	0.0882

Table 6: Mean left renal size

Grade (MRD)	Mean	N	Std. Deviation	Minimum	Maximum	Std. error of Mean	Sum	Range
1	9.857	65	0.7697	8.8	12.1	0.0955	640.7	3.3
2	9.171	63	0.6709	6.9	11.0	0.0845	577.8	4.1
3	8.478	40	0.8743	6.2	9.5	0.1382	339.1	3.3
4	7.238	32	1.0441	5.6	9.2	0.1846	231.6	3.6
Total	8.946	200	1.2046	5.6	12.1	0.0852	1789.2	6.5

Table 7: Association of cortical cysts in echogenic grade

		Grade (MRD)			Total
		2	3	4	
Cysts	Yes	22	20	18	12	72
	No	43	43	22	20	128
Total		65	63	40	32	200

DISCUSSION

In our study, mean age was 46.39 year (Range 20 - 86 years) suggesting all age group are prone to the chronic renal disease. The highest frequency was seen in age group 31 - 40 years (25%) followed by 41 - 50 years (20.5%). The least frequent cases were in age group >80 years (3%). Study by Singh A *et al*[1] showed the mean age of 54.32 year (range 19 - 85 years). In their study, the most frequent age group was 51 – 60 years (33%) followed by 41 - 50 years (31%) and least frequent was >80 years (1%). In our study, male to female ratio was 1.77:1 with male : female ratio of 2.4 : 1 for Grade 1, 2 : 1 for Grade 2, 1.2 : 1 for Grade 3 and 1.28 : 1 for Grade 4. Male to female ratio was 2.3 : 1 in study by Siddapa JK *et al*[8] and it was 1.38 : 1 in study by Singh A *et al*[1].

In our study, 65 patients (32.2%) had sonological Grade 1 CKD, 63 (31.5%) had Grade 2 CKD, 40 (20%) had Grade 3 CKD, and 32 (16%) had Grade 4 CKD (Table 2) which correlates well with study by Singh A *et al*[1], which showed that 35 cases had Grade 1 echogenicity (35%), 42 cases had Grade 2 echogenicity (42%), 16 cases had Grade 3 echogenicity (16%) and 7 cases had Grade 4 echogenicity

(7%). Study by Siddapa *et al*[8] showed 29 patients (48.3%) had sonological Grade 1 CKD, 21 (35%) had Grade 2 CKD, 7 (11.7%) had Grade 3 CKD, and 3 (5%) had Grade 4 CKD.

The lower number of people in Grade 3 and Grade 4 may be an underestimate, as patients with CKD are more likely to die of cardiovascular disease than to reach End-Stage Renal Disease (ESRD). Another reason may be due to the fact that, the institution is a tertiary referral center, most cases were treated with renal replacement therapies like hemodialysis, peritoneal dialysis, and renal transplantation due to complications associated with CKD, therefore excluded from the study.

Raised renal cortical echogenicity was reported in all the patients with CKD in our study which correlated with study by Singh A et al[1] and siddapa JK *et al*[8]. In our study, there was no difference in echogenicity between two kidneys suggesting that changes occur in CKD patients bilaterally and symmetrically, whereas study by Singh A *et al*[1], showed four cases (4%) had difference in the echogenicity of the two kidneys, Paivansalo M *et al*[21] also reported that an echogenic cortex was the most common abnormality detected.

In our study CMD (corticomedullary differentiation) was maintained in 128 patients ((64%), poorly maintained in 40 patients (20%) and lost in 32 patients (16%). It correlates well with study by Singh A *et al*[1], where cortico-medullary differentiation was maintained in 77% of the cases, poorly maintained in 16% of the cases and it was lost in 7% of the cases and study by Siddappa JK *et al*[8], who had 83.3% of cases with maintained cortico-medullary differentiation, 11.7% with poorly maintained cortico-medullary differentiation and in 5% of the cases the cortico-medullary differentiation was lost.

In our study, Mean serum creatinine was 1.7 mg/dl for Grade 1 (Range: 1.1 - 4.7 mg/dl, STD 0.44), 2.38 mg/dl for Grade 2 (Range: 1.8 - 3.9 mg/dl STD 0.40), 4.18 mg/dl for Grade 3 (Range: 2.6 - 6.0 mg/dl, STD 0.88), and 5.65 mg/dl for Grade 4 (range: 3.1 - 12 mg/dl, STD 2.0 (Table 4). This showed statistically significant correlation between grading of chronic kidney disease and serum creatinine (p value <0.001). In study by Singh A *et al*[1], The mean serum creatinine values were 2.87 mg/dL for Grade 1 echogenicity (Range 1.8 - 5.6 mg/dL; SD=0.81), 3.26 mg/dL for Grade 2 echogenicity (Range 1.6 - 6.1 mg/dL; SD=1.09), 4.3 mg/dL for Grade 3 echogenicity (Range 2.7 - 7.5 mg/dL; SD=1.58) and 5.81 mg/dL for Grade 4 echogenicity (Range 3.6 - 9.5 mg/dL; SD=5.81). In study by Siddapa JK *et al*[8], Mean serum creatinine was 2.80 mg/dl for Grade 1 (Range: 0.9 - 9.2 mg/dl), 3.69 mg/dl for Grade 2 (Range: 1.2 - 10.3 mg/dl), 3.86 mg/dl for Grade 3 (range: 1.1 - 6.5 mg/dl), and 7.90 mg/dl for Grade 4 (range: 3.1 - 11.4 mg/dl). Our study showed significant positive correlation between grade of cortical echogenicity and serum creatinine. Same results were shown in study by Singh A *et al*[1] and Siddapa JK *et al*[8]. Moghazi S *et al*[20] also supported this finding by stating that renal echogenicity had the strongest correlation with histological parameters (Glomerular sclerosis, tubular atrophy, interstitial fibrosis and interstitial inflammation). Paivansalo *et al*[21] also reported that an echogenic cortex was the most common abnormality detected ·Hricak *et al*[22] showed a statistically significant positive correlation between cortical echogenicity and the severity of global sclerosis, focal tubular atrophy, the number of hyaline casts per glomerulus and focal leucocytic infiltration.

Our results contradict those of Platt JF *et al*[23], who found that renal echogenicity equal to the echogenicity of the liver is not a good indicator of disease.

In our study, right kidney was small (<8 cm) in 42 (21%), normal in 157 (78.5%) and enlarged (>12 cm) in 1(0.5%) whereas left kidney was small in 35 (17.5%) normal in 164 (82%) and enlarged in one case (0.5%). In none of the cases, size discrepancy between two kidneys was found more than 2 cm (maximum size discrepancy of 1.9 cm was found in only one case) suggesting that both kidneys were symmetrically involved in chronic kidney disease. In a study by Arvinder *et al*[1], 35% had small size, 3% had enlarged size and 62% had normal sized kidneys. Size discrepancy of >2 cm was found between two kidneys in 4% cases. This study had close result to our study.

In our study, The mean longitudinal size of right kidney was 9.8 cm for Grade 1 (Range: 8.9 -12.6 cm, STD 0.8), 9.1 for Grade 2 (Range: 9.1 - 10.9, STD 0.6), 8.2 for Grade 3 (Range: 6.1 - 9.3, STD 0.9), and 7.1 mm for Grade 4 (Range: 5.1 - 9.0 cm, STD = 1.0) and Mean longitudinal size for left kidney was 9.8 cm for Grade 1 (Range 8.8 - 12.1, STD 0.7), 9.1 cm for Grade 2 (Range 6.9 - 11, STD 0.67), 8.4 cm for Grade 3 (Range 6.2 - 9.5 cm, STD 0.87) and 7.2 cm for Grade 4 (Range 5.6 - 9.2 cm, STD 1.0). This showed that with increasing grade of CKD, the mean kidney length of both kidneys decreased, showing significant correlation between these two parameters (P value<0.001). In study by Siddapa *et al*[8], The mean longitudinal size was 101.38 mm for Grade 1 (Range: 76 - 124 mm), 91.43 mm for Grade 2 (Range: 63 - 115 mm), 89.43 mm for Grade 3 (range: 60 - 111 mm), and 78 mm for Grade 4 (Range: 67 - 91 mm). In

a study by Singh A *et al*[1], the average kidney length measured was 8.69 cm (Range, 6.6 - 15.45 cm; SD = 1.35 cm). Both these study results correlate with our study.

In our study, renal cortical cysts were present in 72 patients (36%). Renal cortical cyst was present in 22 (33.8%) in Grade 1, 20 (31.7%) in Grade 2, 18 (45%) in Grade 3 and 12 (37.5%) in Grade 4 patients. But this relation was not statistically insignificant (P value 0.54). In a study by Arvinder *et al*[1], 9% of patients had associated renal cortical cysts.

In our study, 165 (82.5%) had increased BP whereas 35 (17.5%) had normal BP with 49.2% having increased BP for Grade 1, 96.8% having increased BP for Grade 2, 100% having increased BP for Grade 3 and 100% having increased BP for Grade 4 indicating that with increase in Grade of CKD, blood pressure was found to increase (Increase in BP may be both cause and effect of CKD).

CONCLUSION

Renal echogenicity and its grading correlates better with serum creatinine in CKD than other sonographic parameters. Hence, renal echogenicity is a better parameter than serum creatinine for estimating renal function in CKD, and has the added advantage of irreversibility. Chronic renal disease was also associated with increased blood pressure and decreased kidney size.

Conflict of Interest
None

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Teaching How to Teach: Microteaching (A Way to Build up Teaching Skills)

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Keywords
Microteaching, Pedagogi skills, Teacher training technique.

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ABSTRACT

Microteaching is one of the most recent innovations in teacher training program which is used as a professional developmental tool in pre-service or in-service teacher training programs. Microteaching helps teachers to better understand the processes of teaching and learning and provides the opportunity to learn teaching skills, to study their own teaching, and to study the teaching of others.

Microteaching is an organized, scaled-down teacher training program where a trainee teacher plans a short lesson, teaches it to a reduced group of students (Three to ten) in a 5 to 20 minute lesson, and then reflects on their teaching afterwards. The lesson is video recorded for either individual or peer review. The trainee teacher's micro-lesson is reviewed, discussed, analyzed, and evaluated to give a feedback. Based on this feedback, the trainee teacher re-teaches the micro-lesson, incorporating those points raised during the discussion and analysis.

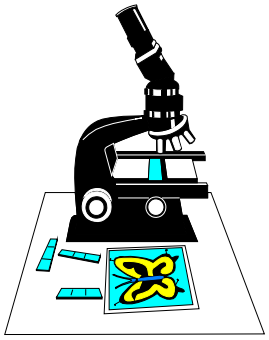
The main objective of this article is to address and emphasize that microteaching has the potential to improve the teachers' pedagogic skills, competencies, self-confidence, beliefs, and attitudes with minimum available facilities and to provide students with valuable teaching experiences and make them aware of the benefits and relationships between theory and practice.

INTRODUCTION

For the recruitment of medical teachers, no special prior training in pedagogic techniques is considered necessary. Therefore, the training of in-service medical teachers in specific teaching skills is a major challenge in medical education programs. The pedagogic skills required for medical teachers can be imparted through more structured faculty training programs[1].

Microteaching is a teacher training technique for learning teaching skills. It employs real teaching situation for developing pedagogic skills and helps to get deeper knowledge regarding the art of teaching[2,3]. Microteaching provides medical teachers an opportunity to build their confidence and improve both content and methods of teaching and develop specific teaching skills through a "teach, critique, re-teach" model[4]. It is a new innovative program for medical teachers, which enhances their classroom attitude and behavior.

Fig 1: Microteaching



ORIGIN AND DEVELOPMENT OF MICROTEACHING

Microteaching was first used in medicine at Stanford University in 1960s to promote the quality of students[9] and then it was applied for teacher training[10].

The idea of microteaching as teacher training technique originated for the first time at Stanford University (Teacher education program) in USA in 1963 by Dr Dwight W. Allen[5] and his colleagues. It was first applied to teaching science, but later it was introduced to language teaching. The theoretical basis for this microteaching was initially related to the psychological theory of behaviorism[6] (Bandura's social learning theory).

Microteaching has become an established teacher training education procedure to raise the level of the teachers' competencies in many colleges and Universities.

DEFINITIONS OF MICROTEACHING

Microteaching is a concentrated, focused form of peer feedback and discussion that can improve teaching strategies. Microteaching is a system of controlled practice that makes it possible to focus on specific teaching behaviors and to practice teaching under controlled conditions. Competence in one skill is developed before proceeding to another skill. Microteaching has been defined in a number of ways.

Allen DW (1966): Microteaching is a scaled-down teaching encounter in class size and time[7].

Allen DW and Eve AW (1968): Microteaching is defined as a system of controlled practice that makes it possible to concentrate on specified teaching behavior and to practices teaching under controlled conditions[5].

Bush RN (1968): Microteaching is a teacher education technique which allows teachers to apply clearly defined teaching skills to carefully prepared lessons in a planned series of five to 10 minutes encounter with a small group of real students, often with an opportunity to observe the result on video[8].

Singh LC (1977): Microteaching is a scaled down teaching encounter in which a teacher teaches a small unit to a group of five pupils for a small period of five to 20 minutes. Such a situation offers a helpful setting for an experienced or inexperienced teacher to acquire new teaching skills and to refine old ones[2].

Clift JC *et al* (1976): Microteaching is a teacher training program which reduces the teaching situation to a simpler and more controlled encounter achieved by limiting the practice teaching to a specific skill and reducing time and class size[9].

Encyclopedia of Education (Ed. Deighton, LC: 1971): Microteaching is a real, constructed, scaled down teaching encounter which is used for teacher training, curriculum development, and research[10].

OBJECTIVES OF MICROTEACHING

The main objectives of microteaching are[12]:

1. It enables trainee teachers to learn and assimilate new teaching skills under controlled conditions
2. It enables trainee teachers to master a number of teaching skills
3. The trainee teachers gains confidence in teaching, understand the concept and principles underlying microteaching.
4. Also the student can analyze the complex process of teaching into essential microteaching skills and comprehend the procedure of microteaching for developing teaching skills

CONCEPT OF MICROTEACHING

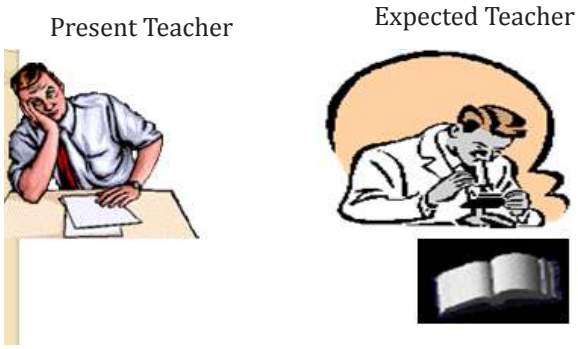
Microteaching is a relatively a new innovation in the field of teacher education; a highly individualized training device to prepare effective teachers. Microteaching is a real teaching but focuses on developing teaching skills[4].

Microteaching is so called since it gives trainee teachers an opportunity to safely put themselves "under the microscope" of a small group audience, so that all faults in teaching are observed to get a constructive feed-back and also to observe and comment on others performance.

In microteaching, the trainee teacher is engaged in a scaled-down teaching situation.

i) It is scaled down in terms of class size, since the trainee teacher is teaching a small group of five to 10 pupils.

Fig 2: Microteaching gives trainee teachers an opportunity to put themselves "under the microscope" of a small group audience



ii) The lesson is scaled down in length of class-time and is reduced to five to 10 minutes. Thus, microteaching lessens the complexities of normal class-room teaching. Class size, scope of content, and time are all reduced.

iii) It is also scaled down in terms of teaching tasks. Only one teaching skill or task is taken up at a time, and practiced through a scaled down encounter and then take others in a similar way. These tasks may include the practicing and mastering of a specific teaching skill such as lecturing or teaching explanation, questioning or leading a discussion; mastering of specific teaching strategies; flexibility, instructional decision making, alternative uses of specific curricula, instructional materials and class room management. Thus, microteaching focuses on training for the accomplishment of specific tasks.

Video recording of the teaching provides adequate feed-back for trainee teacher's performance. The trainee teacher immediately views his/her lesson, evaluates it, amends his approach, re-teaches the lesson to another group of pupils, reviews and evaluates. Thus microteaching provides skilled supervision with an opportunity to get a constructive feedback. The class room teaching is like learning to swim at the deeper end of the swimming pool, microteaching is an opportunity to practice at the shallower and less risky side[11].

Microteaching allows for the increased control of practice. In the practice setting of microteaching, the rituals of time, students, methods of feed-back and supervision, and many other factors can be manipulated. As a result, a high degree of control can be built into the training program. Microteaching greatly expands the normal knowledge of results or feedback dimensions in teaching.

CORE SKILLS APPLICABLE IN CLINICAL TEACHING

The teaching activity as a whole is divided into its individual component skills[4,11,13,14].

1. **Lesson planning** with clear-cut objectives and an appropriate planned sequence. The content should be concise, appropriate, relevant, and could cover the specified duration.

2. **Introduction skill (Set induction)** - The process of gaining pupil's attention at the beginning of the class by establishing rapport with pupils, promoting their attentions, exposing them to essential contents, and linking their previous knowledge with the topic.

3. **Presentation and explanation skills** – Teacher enthusiasm, explanation, narration, giving appropriate illustrations and examples, planned repetition, and encouraging group discussion wherever necessary. The trainee teacher should be able to rightly explain the concept by simple, relevant, and interesting examples to increase pupils' understanding.

4. **Skill of stimulus variation** – Securing and sustaining the attention of the pupil is imperative for a good teacher. The effective components of the skill are
   - Gestures (Hand, facial, body)
   - Change in the speech pattern
   - Voice variation and modulation (Pitch, volume,
   - speed)
   - Change in the interaction pattern
   - Focusing
   - Pausing movement
   - Emphasis on significant points

5. **Proper use of audio-visual aids** – The increased awareness of the audiovisual aids and other equipment is important for this skill. Neatness, readability, adequate spacing, distinct size, proper spacing between words and lines, and use of relevant words or phrases are the key components for this skill.

6. **Skill of black-board writing**

Table 1: The components of the skill of black-board writing

• Legibility (Easy to read)
• Size and alignment (In a straight line)
• Highlighting main points
• Utilization of the space
• Black-board summary
• Correctness
• Position of the teacher
• Contact with the pupils

7. **Reinforcement** - Recognizing pupil's difficulties, listening, encouraging pupil participation and response. The use of positive verbal and non-verbal cues would be the key components for this skill.

8. **Skill of probing questions** - Probing questions are those which help the pupils to think in depth about the various aspects of the problem enabling pupils to understand the subject deeply. It is important to allow and encourage the fellow trainee teachers to ask structured questions and clarify doubts. Redirection, refocusing, and increasing critical awareness are important components of this skill.

9. **Silence and nonverbal cues** (Body language)

10. **Classroom management** – Providing proper instructions, restricting inappropriate behavior, and calling the pupils by name are essentials of this skill.

11. **Skill of achieving closure** - Method of concluding a teaching session so as to bring out the relevance of what has been learnt, its connection with past learning and its application to future learning. Questions and statements by the teacher by consolidation of the major points covered during the lesson and ability for applying the knowledge gained by pupils during the lesson to new situations. Closure should be timely! Prepare to start and end in time.

PROCEDURE OF MICROTEACHING (MICROTEACHING CYCLE)

Microteaching is a system of controlled practice that makes it possible to focus on specific teaching behaviors and to practice teaching under controlled conditions. Competence in one skill is developed before proceeding to another skill[4,11, 13,15-17].

1. **Defining the skill:** A particular skill to be practiced is defined and explained to trainee teachers in terms of the purpose, teaching behaviors to provide the knowledge and awareness of the component teaching skills with examples.

2. **Demonstrating the skills:** The specific skill in microteaching is demonstrated by the experts/ supervisor in simulated conditions or through video to the trainee teacher.

3. **Planning the lesson:** The trainee teacher selects a topic and plans a short lesson (Micro-lesson) for five to 10 minutes with the help of his/her supervisor, on the basis of demonstrated skill for his/her practice. The lesson planning should be in a logical sequence where maximum application of the components of a skill is possible.

4. **Teaching the lesson:** The trainee teacher teaches the lesson to a micro-class (A small group of pupils, five to 10) and uses the components of skill as per the planning of the lesson. If the situation is different and not as visualized in the planning of the lesson, the trainee teacher should modify his/her behavior as per the demand of the situation in the class. The trainee teacher should have the courage and confidence to handle the situation arising in the class effectively.

5. The lesson is observed by the supervisor or peers or video recorded or televised at close circuit television (CCTV).

6. **Feedback:** This term refers to giving information to the trainee teacher about his performance (Points of strength as well as weakness) so that trainee teacher can improve his/her performance in the desired direction. The feedback should be constructive and based on observation. Commenting on observable behavior also leads to suggestions for improvement. Thus the teaching is followed by discussion to provide the feed-back to the trainee on the basis of observation of the lesson. The teaching is evaluated by students, peers and the supervisor. Colleagues and post-graduate students can act as peer evaluators. The supervisor reinforces the instances of effective use of the skill and draws attention of the teacher trainee to the points where he/she could not do well.

The trainee teacher can observe his/her teaching activities on video or CCTV[8]. The awareness of his/her own teaching performance provides the reinforcement of the trainee teacher.

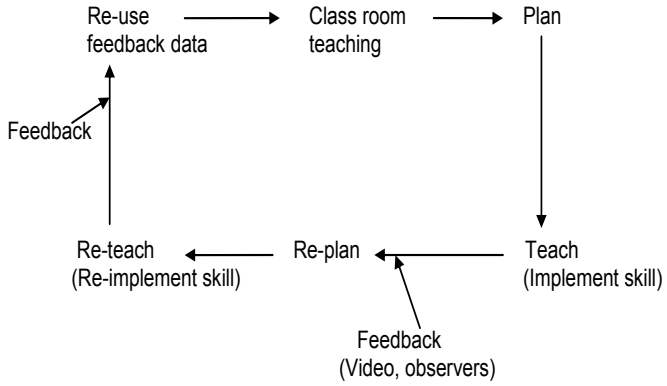
7. **Re-planning:** In the light of the discussion, suggestions and feedback given by the supervisor, the trainee teacher re-plans the lesson incorporating the points of strength in order to practice the small skill effectively in the second trial for improvement.

8.. **Re-teaching**: The revised lesson is re-taught to another small group of pupils of same class for the same class duration to practice the small skill. This involves teaching to the same group of pupils if the topic is changed or to a different group of pupils if the topic is the same. This is done to eliminate boredom or monotony of the pupil. The trainee teacher teaches the class with renewed courage and confidence to perform better than the previous attempt.

9. **Re-feedback**: The supervisor observes the re-teach lesson and gives re-feed back to the trainee teacher with convincing arguments and reasons. Thus the re-teaching is again followed by discussion, suggestions and encouraging the teaching performance by the re-feedback provided to the trainee teacher. This is the most important component of microteaching for modification of behavior of trainee teachers in the desired direction in each and every skill practice.

10. **Repeating the cycle**: The "teach-re-teach" cycle may be repeated several times till desired level of skill or adequate mastery is achieved. Such repeated cycles of teaching, feedback and re-teaching help the teacher to improve his teaching skills one at a time.

Fig 3: Microteaching cycle (The cycle continues up to the extend when a trainee will be able to master a specific skill)



TIME DURATION FOR THE MICROTEACHING

Planning of micro-lesson may take 2 hours	
1. Time duration	
Teach	5 – 6 minutes
Feedback session	5 – 6 minutes
Re-plan	10 – 12 minutes
Re-teach another group	5 – 6 minutes
Re-feedback	5 – 6 minutes
Total	30 – 36 minutes approximately
2. Number of trainee teachers in a group	10
3. Supervisor(s)	1 or 2
4. Feedback by supervisor(s)/ peers	

PHASES OF MICROTEACHING

Microteaching procedure has various phases of acquiring skills[4,11,13,17].

1. **Knowledge acquisition phase (Pre-active phase):** It is the preparatory pre-active phase in which the teacher gets trained on the skills and components of teaching through lectures, discussion illustration and demonstration of skills by experts. The trainee teacher gets theoretical as well as the practical knowledge of the skill.

2. **Skill acquisition phase (Inter-action phase):** In this inter-active skill acquisition phase the trainee teacher plans a micro-lesson for practicing the demonstrated skills and carries out the microteaching cycle and evaluation of the practiced skill (Feedback), then re-plan, re-teach and re-feedback till the desired level of

3. skill achieved.

4. **Transfer phase (Post-active phase)**: Here, the trainee teacher uses the mastered skill in the real class room teaching and tries to integrate all the different skills.

ADVANTAGES OF MICROTEACHING

A microteaching session is much more comfortable than real class room situations, because it eliminates pressure resulting from the length of the lecture, the scope and content of the matter to be conveyed, and the need to face large numbers of students, some of whom may be

inattentive or hostile. Another advantage of microteaching is that it provides skilled supervisors who can give support, lead the session in a proper direction[4,11,18].

- It helps to develop, sharpen and master specific teaching skills
- It employs real teaching situation for developing teaching skills
- It helps to accomplish specific teaching competencies
- It is more effective in understanding and modifying teacher behaviors important in class room teaching
- It increases the confidence of trainee teacher
- It is a vehicle of continuous training applicable at all stages not only to teachers at the beginning of their career but also for more senior teachers
- It enables projection of model instructional skills
- It provides expert supervision and a constructive feedback
- It provides for repeated practice without adverse consequences to the trainee teacher or his/her students
- It reduces the complexity of teaching process as it is a scaled down teaching
- It helps to get deeper knowledge regarding the art of teaching
- It caters for individual differences of prospective teachers in their training
- Duration of teaching as well as number of students are less
- Content is divided into smaller units
- There is facility of re-planning, re-teaching and re-evaluation
- It puts the teacher under the microscope, and all the faults of the teacher are observed
- The problem of discipline can also be controlled

Table 2: Changes in teacher role

	A shift from	A shift to
1	Knowledge transmitter, primary source of information, content expert, and source of all answers	Learning facilitator, Collaborator, Coach, Mentor, Knowledge navigator, and co-learner
2	Teacher controls and directs all aspects of learning	Teacher gives students more options and responsibilities for their own learning

Table 3: Changes in student role

	A shift from	A shift to
1	Passive recipient of information	Active participant in the learning process
2	Reproducing knowledge	Producing and sharing knowledge
3	Learning as a solitary activity	Learning collaboratively with others

LIMITATIONS OF MICROTEACHING

- It is skill oriented; content not emphasized
- A large number of trainee teachers cannot be given the opportunity for re-teaching and re-planning
- It is very time consuming technique
- It requires special class room setting
- It covers only a few specific skills
- It deviates from normal class room teaching
- It may raise administrative problem while arranging micro-lessons

MICROTEACHING Vs TRADITIONAL TEACHING

Table 4: Comparison between microteaching and traditional teaching

	Microteaching	Traditional teaching
1	Objectives are specified in behavioral terms	Objectives are general and not specified in behavioral terms
2	Class consists of small group of 5 – 10 students	Class consists 40 – 60 students
3	The teacher takes up one skill at a time	The teacher practices several skills at a time
4	Duration time for teaching is 5 – 10 minutes	Duration time for teaching is 40 – 50 minutes
5	There is immediate feedback	Immediate feedback is not available
6	Teaching is carried on under controlled situation	There is no control over situation
7	Teaching is relatively simple	Teaching become complex
8	The role of supervisor is specific and well defined to improve teaching	The role of the supervisor is vague
9	Patterns of class room interaction can be studied objectively	Patterns of class room interactions cannot be studied objectively
10	Provision for re-teaching	No
11	Trainee teachers gain confidence in teaching	Tense and scared

LINK PRACTICE (INTEGRATION OF TEACHING SKILLS)

Link practice involves the integration of skills. The main objectives of integration of teaching skills are to help in the transition from microteaching situation to real teaching situation where the trainee teacher is allowed to teach all the skills together learnt in microteaching sessions.

The link practice may be defined as a process of selection, organization and utilization of different teaching skills to form an effective pattern for realizing the specified instructional objectives in a given teaching learning situation[18].

CONCLUSIONS

Microteaching is a teacher training concept that can be applied at the pre-service and in-service stages in the professional development of the teachers. Medical teachers have no special prior or in-service training in teaching. Microteaching helps medical teachers to improve their self-confidence and teaching skills. Microteaching is a vehicle of continuous training applicable at all stages not only to teachers at the beginning of their career but also for more senior teachers. Microteaching is an excellent way to build up skills and confidence, to experience a range of lecturing/tutoring styles and to learn and practice giving constructive feedback. Microteaching is a system of controlled practice that makes it possible to focus on specific teaching behaviors and to practice teaching under controlled conditions. Competence in one skill is developed before proceeding to another skill. Many institutions are using the microteaching model to raise the level of the teachers' competencies to develop teaching skills.

Recommendations

The Department of Medical Education should organize more microteaching sessions because microteaching experiences have a positive impact on teaching competencies.

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Light Weight Complete Denture Prosthesis - A Case Report

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ABSTRACT

Retention, stability and support are the basic principles on which the success of a complete denture relies on. Extreme resorption of the maxillary denture-bearing area leads to a narrower, constricted residual ridge with decreased supporting tissues and a larger restorative space between the maxillary and mandibular residual ridge. Rehabilitation in such cases may result in increased weight and height of the prosthesis further compromising its retention, support and stability. So, to prevent further resorption of ridges, the weight of the prosthesis needs to be reduced which can be achieved by making hollow prosthesis. This case report describes a novel technique of fabricating maxillary hollow maxillary complete denture.

INTRODUCTION

No step in denture construction should be stopped short of perfection yet many dentures are worn, which have imperfections built into them, provided they have peripheral seal sufficient to hold them in place. Increased inter ridge distance would lead to the fabrication of heavy-weighted dentures which results in leverage forces affecting the principle of mechanics in the fabrication of complete dentures. Different weight reduction approaches have been achieved earlier using a solid three-dimensional spacer, including dental stone, cellophane-wrapped asbestos[1], silicone putty[2], or modelling clay[3] during laboratory processing to exclude denture base material from the planned hollow cavity of the prosthesis. This case report describes most convenient and easy method of fabrication of hollow denture using putty spacer and auto polymerizing acrylic resin.

CASE DESCRIPTION

A 65-year-old male patient reported to the Department of Prosthodontics and Crown-Bridge in B.P. Koirala Institute of Health Sciences, Dharan, Nepal with a chief complaint of difficulty in chewing food due to worn out dentures, which was in use till date since 11 years. Clinical examination revealed a flat maxillary alveolar ridge with severely resorbed mandibular ridge. His long lip length, adequate inter-ridge distance and unwillingness to any surgical procedures directed us to plan a hollow maxillary denture using a novel technique.

Steps for conventional complete denture fabrication were followed up till the try-in stage with the exception of using admix technique to obtain the final impression for the flat and resorbed mandibular edentulous ridge.

TECHNIQUE

1. V-shaped notches were made at three different sites on the land area of the maxillary cast and the waxed maxillary denture was sealed to the master cast. The maxillary trial denture was duplicated with irreversible hydrocolloid impression material (Zelgan, DENTSPLY ISO 13485) and poured in Type IV dental stone (Kalrock, Kalabhai Pvt., Ltd., Mumbai, India) to obtain a working cast.

2. A template of 1mm thick BIOPLAST (Scheu Dental GmbH, Iserlohn, Germany) transparent film was then fabricated on this working cast with the help of a BIOSTAR (Scheu Dental GmbH) heat and vacuum press to obtain the trial denture external contours [Fig 1a].

3. The maxillary trial denture was invested and de-waxed in the conventional manner.

4. Modelling wax (2mm thick) was adapted over the master cast to ensure uniform and adequate thickness of resin all around the planned hollow cavity in the completed dentureand subsequently eliminated during a second de-waxing cycle prior to packing.

5. For the purpose of achieving the hollow cavity, first a temporary putty spacer was fabricated, adjusted for suitability and used for all the steps of denture fabrication up till the trial closure. A glycerine soap replica of the putty spacer was hand carved using a Le Cron carver for use during the final closure and acrylization.

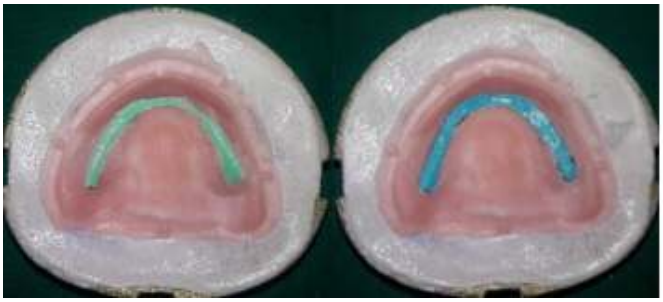
6. The accuracy of the 3D spacer from all aspects was assessed by placing between the master cast (with 2mm modelling wax adapted to it) and the BIOSTAR template (Fig 1b).

Fig 1 (a, b): Maxillary trial denture duplicated and adaptation of thermoplastic sheet on duplicated cast which is subsequently used for the verification of putty shim and uniform hollowness of denture

7. The 2mm base plate wax adapted over the maxillary cast was acrylised using interchangeable flasks to obtain permanent intaglio surface of final prosthesis.

8. After this, a trial closure was carried out using the temporary putty spacer. The flasks were opened and temporary putty spacer retrieved. The mold space was visually assessed for adequate resin thickness all around the hollow cavity. The hollow space left by the temporary putty spacer was now filled with the soap spacer and final closure of the flasks was achieved [Fig2]. The denture was acrylized in conventional manner.

Fig 2: Trial closure; putty replaced with soap shim



9. The denture was retrieved in the usual manner following processing. Using a micromotor handpiece, openings were cut into the denture base distal to the second molar. The denture was then immersed in a bowl of water to allow dissolution of soap. Also, a cleaning brush was pushed in and out through the openings to aid in mechanical removal of the soap. Water spray was used to flush traces of soap completely. The hollow cavity was air dried, and the openings were sealed using autopolymerizing acrylic resin.

10. The denture was immersed in water overnight and weighed before and after immersion to assess leakage into the cavity. A water test was performed to evaluate the hollow space as evident by the floating denture (Fig 3).

11. Upper/lower dentures were then finished, polished, and delivered to the patient [Fig 4]. The patient was reviewed after a week, and minor adjustments were made.

Fig 3: Hollow denture

Fig 4: Prosthesis *in situ*

DISCUSSION

Rehabilitation of a patient with increased inter ridge distance and long lip length is a challenge to the dentist. Conventional denture leads to an extensive volume of the denture base material. Fabrication of hollow denture has been tried to decrease the weight of the prosthesis which in turn increases the retention and stability[3,4]. The technique described here, uses a soap spacer, specifically hand carved out of a soap due to its easy retrievability[5]. The advantage of using soap spacer is that it can sustain curing temperature and does not interfere with polymerization of heat cure acrylic resin or leave ant residues inside the hollow cavity. Most authors have used a double flask technique for fabrication of hollow denture[5]. Double flask technique means this technique utilized a pair of split dental flasks with interchangeable counters where first set of flasks was used to obtain a permanent record base followed by using a second set of flasks to pack heat cure acrylic resin over the teeth.

CONCLUSION

This technique overcomes the disadvantages of the older technique. The soap spacer has advantages of easy retrievability, ease of carving and it doesn't adhere to acrylic resin. Hollow maxillary complete denture is boon to patients with increased inter ridge distance and severely resorbed ridges. It besides enhancing the retention considerably reduces the weight of the prosthesis and prevents transmission of detrimental forces to the underlying tissues.

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District Health Service Management

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Regional health directorate,
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ABSTRACT

District Health System Management is a comprehensive study of the health system of the district as a unit of national health system. The report of District Health System Management has been prepared as per the MBBS 4th year (Third phase) curriculum of Tribhuvan University (TU), Institute of Medicine (IOM), Nepal after the field placement of our group in Gorkha and Kaski districts.

We prepared regional health directorate profile, regional tuberculosis center profile, district profile, district health profile of Kaski, hospital profile of Western Regional Hospital, Kaski, and critical analysis on human resources of the Aampipal hospital. We prepared five year plan on ICU services of Gorkha District Hospital and conducted epidemiological study on COPD in WRH, Pokhara.

The techniques used in this study were observation, interviews, interactions, participation, secondary data retrieval, analysis and presentation using specific tools and guidelines devised for the same.

The field practice proved to be a milestone in enabling the students to develop aptitude in the fields of management, administration and communication in different health set-ups of the country. It is in fact once-in-a lifetime opportunity for the medical students to imbibe the practicality of management skills at various levels.

INTRODUCTION

District health service management is a comprehensive study of the health system of the district as a unit of national health system. As per the curriculum for Bachelor of Medicine and Bachelor of Surgery (MBBS) program of Institute of Medicine (IOM), the Department of Community Medicine, Gandaki Medical College has been conducting the District Health System Management study for the 4th year (Third phase) MBBS students. The field program aims to enable students to understand the type of work they are expected to perform in hospital of periphery as well as to acquire knowledge and skill in administration, management and supervision while working as a team member at district level.

The program includes theory classes on management and orientation classes at campus and placement of the students in three different districts along with on field supervisions in between. Since districts of Nepal are the most peripheral fully organized unit of local Government and administration, placement of students at the same places justifies the essence and objectives of the program. For the purpose, six different groups were placed at five different sites with the compulsion for each group to rotate at three sites within a period of six weeks. Among all groups, our group (F) spent two weeks each in the Western Regional Health Directorate, Western Regional hospital, Regional TB Center, DPHO, Kaski; Aampipal Community Hospital, Gorkha District Hospital and Gorkha District Public Health Office, Gorkha from 2 Poush 2074 to 12 Magh 2074.

GOAL

The goal of the study was to acquire knowledge and skills in health system management, administration and planning while working as a team in the allocated districts.

OBJECTIVES

General objective

To understand the health care delivery system in the district so as to attain knowledge and skills in different aspects of management

Specific objectives

1. To get acquainted with the existing health care delivery system in the district in terms of infrastructure, human resources, financial status, management, accessibility and availability
2. To acquire knowledge regarding management, activities and roles of various health institutions of a district.
3. To develop knowledge and skills to review and prepare district profile and district health profile
4. To understand all managerial aspects of a hospital and hence prepare a hospital profile
5. To develop knowledge and skills to prepare epidemiological study in selected health problem
6. To develop knowledge and skills to prepare five year plan on health management issue or health program
7. To develop knowledge and skills to critically analyze specific health management issue

Table 1: Study site

District	Placement
Kaski, Pokhara	Western Regional Health Directorate, Western Regional Hospital, Regional TB center, District Public Health Office (DPHO)
Aampipal, Gorkha	Aampipal Community Hospital
Haramtari, Gorkha	District Public Health Office

Study duration

A total of six weeks were allocated for the study. Two weeks were spent in each of the study districts to fulfill our objectives.

We prepared regional health directorate profile, regional tuberculosis center profile, district profile, district health profile of Kaski district, hospital profile of Western Regional Hospital, Kaski, critical analysis on human resources of the Aampipal hospital. We prepared five year plan on ICU services of Gorkha district hospital and conducted epidemiological study on COPD in Western regional hospital.

Study techniques and tools

The techniques used in this study were observation, interviews and interactions, participation, secondary data retrieval and analysis, document review and presentations. Observations regarding the infrastructure and management aspects were based on criteria such as adequacy, appropriateness, utilization, effectiveness, constraints and weaknesses.

We also participated in various events such as meetings, clinical rounds in the hospital, training programs and free health camp. Wherever relevant and necessary, secondary data were retrieved and analyzed from record/statistical sections or from the recording registers at different departments of the concerned institution. Prepared guidelines and semi-structured questionnaires were used during those interviews (for DPHOr, MS, administrative in-charge, accounts in-charge, hospital staff, HP and PHC in-charge). A presentation was made at all those three hospitals in front of all the concerned people by our group at the end of each posting.

Data Collection

Almost all of the data used in this study were secondary. The sources of data were annual report, records from different sections of DHO/DPHO and hospitals, relevant national and local publications as well as pertinent information from journals. The data collected were both qualitative and quantitative.

Ethical considerations

We submitted the official letters from campus to the institutions. Before approaching any personnel for interview or discussion, we explained the objectives of the study and took verbal consent. An informed verbal consent was taken with every patient or patient parties who were interviewed. However written consent was not

taken. Confidentiality was maintained as far as possible.

DISTRICT HEALTH PROFILE

Kaski district lies in Gandaki zone of Western Development Region. The district its district headquarters, covers an area of 2,01,700 hector and has a population of 4,92,098. It consists of three constituencies, one metropolitan city and four Gaupalika and provides health services through two hospitals, four PHCC, and 44 HPs. The district runs different preventive, promotive and curative health programs like expanded program on immunization, control of infectious diseases, national program, family health program and maternal and child health programs. Besides this, district health system has also been able to provide effective health education and the awareness among the public.

HOSPITAL PROFILE

Western Regional Hospital located at Ramghat of Kaski is the regional hospital of Western Development Region. It was established in 2012 B.S. and named as "Soldiers Board Hospital" strongly initiated by Major Bir Singh Gurung and his friends. It also provides health services to the poor, rural, Dalit and other marginalized people. It is a 500 bedded hospital. Being the Regional Hospital, whole Western Region is catchment area with patients mainly from the Kaski, Tanahun, Syangja, Parbat and Baglung districts visit here. It provides 24 hours emergency service, pharmacy with adequate medicine, X-ray service, USG service, lab service and other preventive and promotive services.

REGIONAL TUBERCULOSIS CENTRE PROFILE

We were posted to RTC for one day where we conducted a study about tuberculosis profile of Western Development Region and we found out that there are 93 microscopy centres, 26 urban DOTS, 4 DR treatment centre, 14 DR treatment sub-centres, four Gene Xpert centres and one culture service (RTC) in 16 districts. In fiscal year 2072/73 total all forms of TB cases notified was 5635, case notification rate was 109 per 1,00,000 population, 2572 new PBC cases, 992 newPCD cases, 1482 new EP cases. Total slides examined were 5300; total slide positivity rate was 8.06%, 73% casefinding rate, 90% sputum conversion rate, 88% cure rate, 90% treatment success rate, 4.5% death rate, 1.3% loss to follow up and 1.4% failure rate.

REGIONAL HEALTH DIRECTORATE

We were posted in RHD for four days. Western regional health directorate (WRHD) looks health system of all Western Development Region which was established in 2941 B.S. The functions of WRHD are to develop annual work plan, implement national policy, regional level programs, conduct monitoring and supervision of district level program, monitor online based monthly district report, maintain personal record of the staff within the region, provide incentive and penalize sixth and below level staff, monitor and control the financial transaction in the district level etc. Main health activities within the region are child health (immunization, nutrition, CBIMNCI), family health (safe motherhood, family planning, FCHV, PHCORC), disease control program (TB, leprosy, HIV-AIDS, epidemic outbreak and disaster management), training, health education, special health, curative services health promotion for non-communicable diseases.

CRITICAL ANALYSIS

We did critical analysis on human resources in Aamipipal Hospital. Then reason behind choosing this topic was that among 17 sanctioned posts from GO, only 11 were fulfilled and geographical location of this hospital was very challenging.

FIVE YEAR PLAN

In Gorkha District Hospital, there are large number of referral cases and large number of complications. To reduce the large number of referral cases and complications we made five year plan to establish and start ICU service. We planned different activities to achieve our target within budget five crore twenty six lakh seventy four thousands.

EPIDEMIOLOGICAL STUDY

Epidemiological study is done in COPD in Western Regional Hospital as it is one of the most common cause of hospital admission in Nepal. COPD is a respiratory disease. It is clinically characterized by cough, sputum production and exertional dyspnea. It is the number one cause mortality and number five cause of morbidity as per the Annual Report of Western Regional Hospital, 2073/74 B.S. reliable data was available and COPD being a non-communicable disease is adding misery along with communicable disease in our country.

CONCLUSIONS

The field practice proved to be a milestone in enabling the

students to develop aptitude in the fields of management, administration and communication in different health set-ups of the country. It is infact once-in-a life-time opportunity for the medical students to imbibe the practicality of management skills at various levels.

1. Learned about the organization and functioning of district health system
2. We came to know the role and importance of peripheral health institutions and peripheral health care providers in promoting national health
3. Learned to identify the problems, their prioritization and carrying out studies to suggest feasible solution
4. Gained skill to conduct critical analysis and formulating a five year plan for a pertinent problem in the district
5. Built skill and confidence on interacting with stakeholders, local authorities and general public
6. Learned that besides clinical expertise, doctors should have managerial and administrative skills as well as leadership.

Acknowledgement

It is our immense pleasure to acknowledge and express our sincere admiration and gratitude to all thse individuals and institutions for their invaluable prop up to bring about our all-inclusive district health system management study to make it productive and practical. We would like to reimburse appreciation to our Gandaki Medical College & Teaching Hospital for providing us an opportunity to renovate our conjectural knowledge into practical understanding and skills needed to become a competent and proficient health care provider. We convey our respect and gratitude to all those, who directly or indirectly helped us in this field process.

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Journal of GANDAKI MEDICAL COLLEGE-NEPAL (J-GMC-N)

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Innovating Tomorrow Inventing the Future

The human mind is an ocean of limitless ideas.

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We at Gandaki Medical College Teaching Hospital & Research Centre wish all medical fraternity a life filled with well-being and great health.

Editor-in-Chief

Journal of Gandaki Medical College-Nepal

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AIMS & SCOPE OF THE JOURNAL

Journal of Gandaki Medical College-Nepal (J-GMC-N) is an official, open access, peer reviewed, biannual, biomedical, scientific Journal published by Gandaki Medical College Teaching Hospital & Research Centre Pvt Ltd, Pokhara, Nepal.

The J-GMC-N publishes original scientific articles (not published or submitted for publication elsewhere) written in English from all over the world, related to research done in the field of biomedical sciences related to all the disciplines of the Medical Sciences, Public health, Medical education, Health care management, including ethical and social issues pertaining to health. The Journal will publish original articles, systematic reviews and meta-analyses, case reports, editorial articles, images, viewpoint, and letters to the editor.

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The editors review/screen all submitted manuscripts initially for format and style as per the guidelines and if not matched, paper will be returned for resubmission as per the guidelines. Manuscripts with insufficient originality, serious scientific and technical flaws, or lack of a significant message are rejected. If good articles are written poorly, then authors will be requested to revise and resubmit according to the J-GMC-N format.

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

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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.

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The title page should carry

1. Type of manuscript (e.g. Original article, Review article, Case report etc).
2. Title of the article: The simpler the title better; should be concise and informative, should reflect the content of the paper.
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4. Author(s) names with highest academic degree(s), designation, name of the department and institution affiliated (where the research was carried out), postal and email address, phone numbers.

Abstract

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

Introduction

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

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

Materials and Methods

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

1. Study type and study design e.g. randomized clinical trials, cross sectional study, retrospective study, experimental study, cohort study, survey etc. Investigators embarking on Randomized clinical trial reports should present information based on the CONSORT (Consolidated Standards of Reporting Trials) statement (http://www.consort-statement.org).
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4. Sample size and sampling method.
5. Inclusion and exclusion criteria.
6. Methods of data collection.
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8. Ethical approval and patient consent.
9. Protocols followed, if any.
10. Statistical analysis and computer software used.

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

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

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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. Results should be presented in a concise manner avoiding data that are already given in tables and figures. The tables and figures used in the manuscript should be precisely incorporated in sequential order in the result section. In this section, generally the minimum, maximum and mean values of the parameters should be mentioned. Likewise, statistical values should also be mentioned.

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

Conclusions

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

Acknowledgements

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

Source of Financial support

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

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

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References

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

Journal

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

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

Book

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

Chapter

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

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

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- Soundness of conclusions and interpretations
- Relevance of discussion
- Clarity of presentation and organization of the article
- Conducted according to the highest ethical standards
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- Does the title clearly represent the main theme and contents of the manuscript?
- Does it resemble with key words used in the manuscript?

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

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- Does it accurately describe what the author main objectives to achieve?
- Are you satisfied with the problems being investigated? Is the statement of the problems briefed satisfactorily?
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- Does the author mention satisfactorily how the data/ information was collected?
- Does the author apply universally known methods to address the problems? Are there citations?
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Results

- Does the author clearly give the range of main and sub-main parameters minimum, maximum and mean values?
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- Does the author give clear cut results what has been discovered?
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