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Journal of
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**Volume 6** **Issue 2** **July-Dec 2013**

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# Editorial

Prof. Dr. K. Rajeshwar Reddy

# CA–MRSA: Current Perceptions on Treatment

*Staphylococcus aureus* is a bacterium that constitutes normal flora of skin and nose. **Methicillin-Resistant *Staphylococcus aureus* (MRSA)** is a strain of *Staphylococcus aureus* that is resistant to methicillin, an antibiotic in the same class as penicillin, and is traditionally seen in people who have been recently hospitalized or who have been treated at a health care facility.

**Community-Associated MRSA (CA-MRSA)** infections are MRSA infections in healthy people who have not been hospitalized or had a medical procedure (such as dialysis or surgery) within the past year (CDC's definition).

Any one can get CA-MRSA, however outbreaks have been seen among athletes, prisoners, military recruits, daycare attendees, injection drug users and other groups of people who live in crowded settings and/or routinely share contaminated items. Poor hygiene practices, such as lack of hand washing, may spread the bacteria easily.

CA-MRSA infections typically begin as skin infections. They first appear as reddened areas on the skin, or can resemble pimples that develop into skin abscesses or boils causing fever, pus, swelling or pain.

CA-MRSA infections can be treated by draining any abscesses or boils and providing localized care. Antibiotics can be given if necessary. When left untreated, CA-MRSA infections can progress to serious complications. Careful hand washing is the single most effective way to control spread of CA-MRSA.

Methicillin-Resistant *Staphylococcus aureus* (MRSA) has emerged as a major public health threat. The challenge to the clinical microbiology laboratory and clinicians is how to respond to the MRSA problem, in particular to CA-MRSA.

Previously, infection with MRSA typically occurred in hospitalized patients, known as **Health-care Associated MRSA infection (HA-MRSA)**. But since the late 1990s, there has been a dramatic increase in the frequency of CA-MRSA infections, particularly in children without any established risk factors for acquiring MRSA infections.

Fortunately, CA-MRSA isolates are usually susceptible to more antibiotic agents whereas HA-MRSA isolates are usually resistant to multiple antibiotics.

Genotypes of CA-MRSA strains are distinct from HA-MRSA isolates. The mecA gene in staphylococci is responsible for resistance to beta-lactam antibiotics. The mecA gene is transported on a mobile genetic element known as a staphylococcal cassette chromosome (SCC). Five SCC-mec complex types have been found for *Staphylococcus aureus*.

Another important characteristic differentiating CA-MRSA strains from HA-MRSA strains is the production of unique toxins and virulence factors. Analyses have revealed differing genes and toxins isolated from CA-MRSA strains that have not been found in HA-MRSA isolates. A clinically significant virulence factor unique to CA-MRSA strains is the Panton Valentine Leucocidin (PVL) toxin. This cytotoxin damages human leukocytes and can produce severe tissue necrosis. Infection with a PVL-producing strain can result in serious clinical illness, such as osteomyelitis or hemorrhagic necrotizing pneumonia.

Due to the genotypic differences described above, CA-MRSA isolates are primarily resistant to beta-lactam antibiotics (penicillins, cephalosporins, carbapenems) and macrolides. Many clinicians jump to use vancomycin, the best for use in MRSA infections. Well reviewed studies indicate, oral antibiotic choices most likely to be used by pediatric clinicians include clindamycin, trimethoprim-sulfamethoxazole (TMP-SMX), doxycycline, minocycline, rifampin and linezolid.

Because TMP-SMX contains a sulphonamide antibiotic, it should not be used in children with a history of a documented true allergic reaction to previous sulphonamide use. As CA-MRSA infection may also occur in new-borns, caution should be used when prescribing TMP-SMX in these patients. As TMP-SMX may displace bilirubin from albumin binding sites, this antibiotic should not be used in new-borns with increased bilirubin.

Clindamycin, another antibiotic frequently recommended as an initial therapeutic option. Most CA-MRSA isolates are susceptible to clindamycin. However, it is important that inducible resistance be tested for when using clindamycin. Clindamycin should not be used if D-test is positive, which indicates inducible resistance. Clindamycin is a viable option for infants aged younger than 2 months with CA-MRSA infection.

Vancomycin is generally considered the drug of choice for severe CA-MRSA infections. Although MRSA is usually sensitive to vancomycin, strains with intermediate susceptibility or, more rarely, resistant strains have been reported.

Linezolid is a unique antibiotic, a member of the oxazolidinone class. Linezolid provides good *in vitro* activity toward MRSA, although resistance has been reported. Data on its use and effectiveness in treating CA-MRSA is limited.

An important theoretical but unproven beneficial effect of linezolid and clindamycin may be the ability of these agents to modify CA-MRSA toxin production. As linezolid and clindamycin both function by inhibiting protein synthesis in bacteria; may be valuable in modifying exotoxin production.

Doxycycline and minocycline have been reported in a small number of adult case reports to be effective therapy for MRSA infection, including skin and soft tissue infections caused by CA-MRSA.

Rifampin may possess good *in vitro* activity toward CA-MRSA. Case reports have been published describing the use of rifampin in combination with another antibiotic, such as TMP-SMX, clindamycin or doxycycline/minocycline.

To conclude, we are treating many cases of CA-MRSA without much rationalism. Moreover, in most laboratories, we do not have facilities to differentiate HA-MRSA from CA-MRSA by molecular methods. Unless we establish better facilities in our laboratories, microbiology reports may not serve the true purpose of optimal treatments in cases of HA-MRSA and CA-MRSA.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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2013
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# Uterine Fibroid: A Common Cause of Menorrhagia. A Retrospective Study at Gandaki Medical College Teaching Hospital

**Tripathi M[1], Pandit C[2], Sherchan A[3]**

*[1,2,3]Department of OBG, Gandaki Medical College Teaching Hospital, Pokhara, Nepal*

**Key words**:
Fibroid,
Menorrhagia,
Progesterone,
TAH.

## ABSTRACT

**Objectives:** To explore the common causes of menorrhagia and factors related to fibroid in menorrhagic patients.

**Methods:** A cross sectional retrospective study was done using the data from the record charts of the patients admitted or visited OPD during Bhadra 2067 BS to Shrawan 2068 BS (Aug/Sept 2010 to July/Aug 2011) at Gandaki Medical College Teaching Hospital, Pokhara. A total number of 110 menorrhagic patients were enrolled to find out causes of menorrhagia and its relation to fibroid uterus.

**Results:** Out of 110 patients with menorrhagia, 59 patients were diagnosed as cases of fibroid uterus, 32 as DUB, eight as PID, six as adenomyosis, three as IUCD and two as medical disorders. Menorrhagic patients with fibroid uterus were mostly between 20-40 years of age. Ultrasonography showed 34 patients with single and 25 with multiple fibroids. Out of 59 patients, 14 were treated medically and 45 underwent surgical intervention. Total Abdominal Hysterectomy (TAH) alone was done in 18 patients and TAH with Bilateral Salpingo-Oopherectomy (BSO) in 27 patients. Post-operative complications were seen in 26.7% of patients undergoing surgery. Fever was seen in 13.3%, UTI in 4%, wound infection in 2.2% and urinary retention in 2.2% cases.

**Conclusions:** Fibroid is a common cause of menorrhagia. The occurrence of fibroid is more common in middle-aged multiparous women. Surgical intervention is more common than medical management. TAH and TAH + BSO are usually done as a surgical management with very few post-operative complications like fever and UTI.

## INTRODUCTION

Menorrhagia is cyclical bleeding at regular interval which is excessive in amount or duration. It is generally caused by conditions affecting the uterus and its vascular apparatus rather than by any ovarian disturbance. It occurs if the bleeding surface is increased by uterine tumors such as uterine fibroid and adenomyosis or it can be a manifestation of a coagulation disorder.

Uterine fibroids are the most common benign uterine tumors. They may be subserosal, intramural or sub mucosal located within the uterus or cervix, broad ligament, or on a pedicle. Fibroids may occur singly but often are multiple. They may cause a range of symptoms from abnormal bleeding to pelvic pressure. The mechanism of their effect on menstrual blood loss is poorly understood but may involve abnormalities of local venous drainage, enlargement of the uterine cavity and abnormalities in prostaglandin production. Their cause remains unknown although it has long been assumed that they are

**Correspondence:**
*Dr. Malati Tripathi, (MD, DGO)*
*Dept. Obstetrics and Gynecology,*
*Gandaki Medical College, Pokhara.*
*E-mail: drmalatitripathi@hotmail.com*

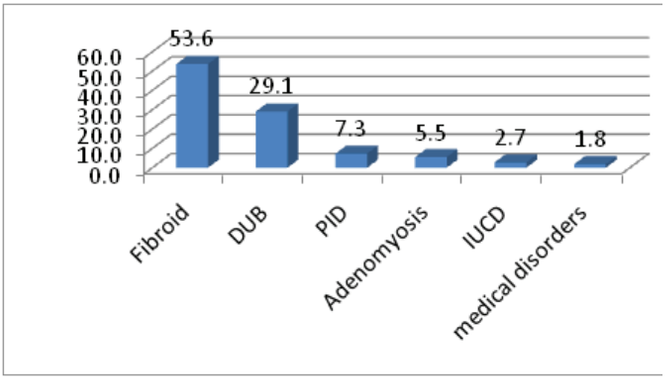
estrogen dependent. Fibroids have the potential to enlarge during pregnancy as well as to regress after menopause. The most common initial symptom associated with fibroids, and the one that most frequently leads to surgical intervention is menorrhagia. Majority of women with uterine fibroid associated with menorrhagia are treated by hysterectomy, although development in endoscopic surgery has enabled a more conservative approach in some circumstances.

## METHODS

It is a cross sectional retrospective study, which was carried out at the Department of Obstetrics and Gynecology, Gandaki Medical College Teaching Hospital, Pokhara. This study used the data from record of the patients visiting OPD or admitted in the ward between Bhadra 2067 BS to Shrawan 2068 BS (Aug/Sept 2010 to July/Aug 2011). The records of the patients attending Out-patient or Emergency department with menorrhagia in the above duration were enrolled in the study. 110 cases were selected for the study. Causes of menorrhagia, age distribution, duration of symptoms, parity, USG findings, treatment modalities, surgical procedures, histopathological findings, complications of these cases were analyzed and reported as percentages.

## RESULTS

Fig 1: Causative factors of menorrhagia (n=110)




Almost 54% patients were diagnosed as cases of fibroid uterus, 32 (29.1%) as DUB, 8 (7.3%) as PID, 6 (5.5%) as adenomyosis, 3 (2.7%) as IUCD and 2 (1.8%) as medical disorders.

Table 1: Characteristics of patients with fibroid (n=59)

| Factors | Number of cases | Percentage (%) |
|---|---|---|
| **Age in years** | | |
| 20 to 30 | 10 | 16.9 |
| 30 to 40 | 34 | 57.6 |
| 40 to 50 | 15 | 25.4 |
| **Parity** | | |
| Nulliparous | 10 | 16.9 |
| 1-3 | 23 | 38.9 |
| 3-5 | 20 | 33.8 |
| >5 | 6 | 10.2 |
| **Types of menorrhagia** | | |
| Increase in menstrual days | 20 | 33.8 |
| Increase in menstrual flow | 23 | 38.9 |
| Both | 16 | 27.1 |
| **Duration of symptoms** | | |
| <6 months | 10 | 16.9 |
| 6 months – 2 years | 30 | 50.8 |
| 2-5 years | 15 | 25.4 |
| >5 years | 4 | 6.8 |
| **Type of fibroid** | | |
| Single | 34 | 55.6 |
| Multiple | 25 | 42.4 |

Table 1 explains that menorrhagic patients with fibroid uterus were mostly between 20 and 40 years of age. Fibroid was commonly seen in multiparous (72.7%). Nearly 34% had increased number of menstrual days, 38.9% had increased menstrual flow and 27.1% cases had both increased number of menstrual days and amount of menstrual flow. Majority of patients had the duration of symptoms for 6 months to 2 years. Ultrasonography showed 34 (55.6%) single and 25 (42.4%) multiple fibroid cases. Histopathology report confirmed that 73.3% had leiomyoma only and 26.7% had leiomyoma with cystic glandular endometrial hyperplasia.

Table 2: Treatment modalities (n=59)

| Treatment modalities | No of cases | Percentage (%) |
|---|---|---|
| Medical treatment (n=14) | | |
| Progesterone | 9 | 64.3 |
| Anti-fibrinolytic agent | 2 | 14.3 |
| NSAIDs | 2 | 14.3 |
| Danazole | 1 | 07.1 |
| Surgical methods (n=45) | | |
| TAH | 18 | 40 |
| TAH + BSO | 27 | 60 |

Majority of patients 45 (76.3%) were treated with surgical methods and 14 (23.7%) received medical treatment. Nearly 65% of medically managed patients were treated with progesterone and others with anti-fibrinolytic agents, NSAIDs and danazole. Out of 45 patients who underwent surgical treatment, total abdominal hysterectomy (TAH) alone was done in 18 patients and TAH with Bilateral Salpingo-Oopherectomy (BSO) in 27 patients. No vaginal hysterectomy was done (Table 2).

Table 3: Post-operative complications (n=45)

| Complications | No. of cases | Percentage (%) |
|---|---|---|
| UTI | 4 | 8.8 |
| Wound infection | 1 | 2.2 |
| Fever | 6 | 13.4 |
| Urinary retention | 1 | 2.3 |
| No complications | 33 | 73.3 |

Post-operative complications were seen in 26.7% of patients undergoing surgery. Fever was seen in 13.4%, UTI in 8.8%, wound infection in 2.2% and urinary retention in 2.3% cases (Table 3).

## DISCUSSION

Menorrhagia being a common gynecological problem affects one out of 10 healthy women. The cause may differ in each individual ranging from uterine fibroids, adenomyosis, DUB, pelvic infection, endometrial polyp to presence of foreign body such as IUCD. Uterine fibroid is an important cause of menorrhagia[1].

In our study, 110 patients presenting with menorrhagia were treated in the above mentioned duration. Out of these, 59 patients were diagnosed as cases of fibroids giving the incidence of the disease to be 53.64% in menorrhagic patients. According to Rybo *et al* the incidence of fibroid in menorrhagic patients was 50%, which is comparable with incidence of fibroid in our study[2].

Most of these menorrhagic patients with fibroid (74.5%) were between 20 - 40 years of age, which is similar to the observation made by Ashraf T[3]. According to her 80% of the patients with uterine leiomyomas were in the age group of 31-50 years. In a study by Abraham, 50% of symptomatic patients were with fibroid present before the age of 35 years[4].

72.7% patients of our study group had parity between one and five and 16.9% were nulliparous showing that majority of my patients were multiparous. Same observation was made by Ashraf T[3]. She observed that 30 (26%) patients were para-one to four and 44 (38%) were para-five or above. So total of 64% patients had parity more than one. But our observation is opposite to that reported by Derek[5]. According to him leiomyomas are more common in nulliparous or infertile patients. The reason for this opposite observation is that our study included only menorrhagic patients with fibroid rather than asymptomatic infertile patients with fibroids.

Out of 59 cases of menorrhagia, 33.8% of patients had increased menstrual days, 38.9% had increased menstrual flow and 27.1% had increased menstrual flow along with increased menstrual days. The relationship between amount of menstrual blood loss and duration of menstruation is open to dispute. Haynes *et al*[6] studied 50 women with menstrual blood loss of 80 ml or more, including 12 women whose loss exceeded 200 mL and 5 women whose loss exceeded 450 mL and found no significant correlation between menstrual blood loss and duration of menstruation. In contrast, Rybo *et al* observed when duration of menstruation exceeded seven days then mean menstrual blood loss was greater than 50 mL[2]. It has generally been agreed that 90% of menstrual blood loss occurs in the first 48-72 hours in both normal menstruation and in menorrhagia.

Ultrasonography showed that 55.6% of the fibroid were single and 42.4% multiple. Out of 59 patients, 14 were treated medically and 45 underwent surgical intervention. 64.3% of medically managed patients were treated with progesterone and others with antifibrinolytic agent, NSAIDs and danazole. Fraser observed that when oral progestogen (Primolut-N) prescribed for 21 out of 28 days there was significant decrease in blood loss[7]. Danazole was very effective in reducing blood loss in menorrhagic patients with fibroid. In a placebo-controlled study administering 2.5 mg gestrinone (which is synthetic derivative of 19-nortestosterone) weekly for 12 weeks to 19 women with objectively diagnosed menorrhagia with fibroid, a marked reduction in menstrual blood loss was seen in 5 women, and 10 became amenorrhoeic[8].

Out of 45 patients who underwent surgical treatment for fibroid with associated menorrhagia, total abdominal hysterectomy (TAH) was done in 18 (40%) patients and TAH with Bilateral salpingo-oopherectomy (BSO) in 27 (60%) patients. No vaginal hysterectomy was done. In study by Ashraf T, total hysterectomy rate was 69.4%, out of which, abdominal hysterectomy was done in 66% of patients and 3.4% of patients underwent vaginal hysterectomy because uterine size was less than 12 weeks[3].

Postoperative complication was seen in 26.7% of patients undergoing surgery. Fever was seen in 13.4%, UTI in 8.8%, wound infection 2.2% and urinary retention in 2.3%. Abiodun also had similar complications like UTI, postoperative pyrexia, wound infection and anemia in a study on surgical management of uterine fibroids[9]. According to Dicker RC urinary retention after hysterectomy is uncommon occurrence[10]. In our study, urinary retention is only in 2.2% cases.

## CONCLUSIONS

Our study shows that menorrhagia is a common gynecological problem affecting large number of females of Pokhara and neighboring districts. Fibroid is the most common cause of menorrhagia in this region. The occurrence of fibroid is more common in middle aged females. Risk of fibroid is more common in multiparous than in nulliparous women. Due to various socio-economic factors menorrhagic patients seek medical help very late after the onset of their symptoms. Surgical intervention is more common than medical management in menorrhagia due to fibroid. TAH and TAH + BSO are usually done as surgical management. Progesterones are effective medical alternative for fibroid uterus. Post-operative complications are only few and not very significant.

## REFERENCES

1. West CP. Fibroids and meno. *Bail Clin Obstet Gynaecol*. 1989; 3(2): 357-74.3.
2. Rybo G, Leman J, Tibblin R. Epidemiology of menstrual blood loss. In: Baird DT, Michie EA (Eds). Mechanism of menstrual bleeding. Raven Press, New York 1985; 81-93.
3. Ashraf T. Management of uterine leiomyomas. *J Coll Phys Surg Pak*. 1997; 160-61.
4. Abraham R. Uterine fibroids. Manual of clinical problems in Obstet Gynaecol. 4th ed. 1994; 227-29.

5. Derek LJ. Benign enlargement of uterus. *Fundamentals of Gynaecol.* 1990; 2(5): 193.

6. Haynes PJ, Hodgson H, Anderson ABM *et al*. Measurement of menstrual blood loss in patients complaining of menorrhagia. *Br J Obstet Gynaecol.* 1977; 84: 763-68.

7. Fraser 1986. Medical treatment of menorrhagia. Progress in Obstetrics and Gynaecology Vol.9, Studd John; Ist 1991; 337.

8. Turnbull AC, Rees MCP. Gestrinone in the treatment of menorrhagia. *Br J Obstet Gynaecol.* 1990; 97: 713-15.

9. Abiodun Opmole-Ohonsi and Francis Belga. Surgical management of uterine fibroids at Aminu Kano Teaching Hospital. Obstetrics and Gynecology International Volume (2012) ID 702325.

10. Dicker RC. Greenspan JR. Strauss LT, *et al*. complication of abdominal and vaginal hysterectomy among women of reproductive age in the United States: the collaborative review of sterilization. *Am J Obstet Gynecol*. 1982: 144: 841-848.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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2013
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# Surgical Treatment of Late Presented Displaced Lateral Condylar Fracture of the Humerus in Children

**Kandel IS[1], Shrestha RP[2], Shrestha B[3], Tripathi RB[4]**

*[1]Assistant Professor, [2]Clinical Professor, [3]Associate Professor, [4]Professor*

*Department of Orthopedics and Trauma surgery, Gandaki Medical College Teaching Hospital, Pokhara, Nepal*

**Key words**:
Lateral condyle fracture,
Late presentation,
Surgical treatment.

## ABSTRACT

**Objectives:** Late presentation of displaced lateral condyle fracture of humerus is common in developing countries like ours. The current controversy regarding the management of fractures of the lateral condyle of the humerus presenting between 3 to 8 weeks excited us to evaluate our results of open reduction and internal fixation of such fractures.

**Methods:** Eighteen patients operated between June 2009 and May 2011 were included in this study. Eight patients presented between 3–4 weeks and ten between 5–8 weeks post injury. Three were Milch type I and fifteen were Milch type II. Six fractures were classified as stage II and twelve as stage III (Jacob *et al*. criteria). All patients underwent surgery (open reduction and internal fixation with K-wires without bone grafting).

**Results:** Excellent to good results were observed in majority of patients presenting till six weeks post injury. The fracture united in all cases; however, malunion was observed in two patients with cubitus varus deformity. Avascular necrosis of the lateral condyle in one patient, superficial pin tract infection in two patients, and gross restriction of elbow movements in one patient were the complication. Accurate reduction was difficult as a result of new bone formation and remodeling at the fracture surfaces.

**Conclusions:** Open reduction and internal fixation is recommended in all cases of displaced fractures of the lateral condyle of the humerus presenting at up to 8 weeks post injury and surgical treatment may even be possible after greater delay. To avoid complications it is important to carry out careful dissection of the soft tissue attachments and to mobilize the fragment without the use of force.

## INTRODUCTION

Fractures of the lateral condyle of the humerus constitute around 13%–18% of elbow injuries, with the peak occurring at the age of 6–7 years. The management of fresh displaced fractures of less than 3 weeks duration is not controversial as it is generally agreed that it should be treated by osteosynthetic procedures[1-3]. Although there could be some difference of opinion regarding the approach, fixation method (wire *vs* screw), or period of immobilization[4-6] etc., the consensus remains in favor of operative intervention. The problem arises when the patient presents late due to socioeconomic reasons, lack of awareness, missed diagnosis, or improper initial treatment. It has been observed that nonunion and growth arrest more commonly result from minimally displaced fractures than from markedly displaced and rotated fractures, probably because severe fractures are treated more adequately with surgery[7]. A late presentation leads to difficulty in management due to displacement of the fragment as a result of the pull of the common extensors, incongruous reduction of articular surfaces, injury/early closure of the epiphyseal growth plate, and possible damage to vascular supply because of stripping of soft tissue attachments. For these reasons, when the patient presents at 3–8 weeks, the controversy is with regard to whether to treat these fractures by nonoperative or operative methods. If

**Correspondence:**
*Dr. Ishwar Sharma Kandel*
*Assistant Professor*
*Department of Orthopedics and Trauma surgery*
*Gandaki Medical College Teaching Hospital, Pokhara, Nepal*
*Email: drisk79@gmail.com*

these fractures are treated nonoperatively, the various possible complications are nonunion, malunion, deformity at the site, instability of the elbow joint, stiffness, cubitus valgus/varus, and tardy ulnar nerve palsy. On the other hand, when these fractures are treated operatively, there could be peroperative problems of reduction. In addition, precarious blood supply to the fractured fragment due to excessive stripping of the soft tissues, may result in avascular necrosis of the fragment[3,8]. So the majority favor management of established nonunion by no treatment as the functional problems are not very severe[3,9]. It is easier to treat cubitus valgus/varus at a later date by corrective osteotomy or to treat tardy ulnar nerve palsy by ulnar nerve transposition rather than to attempt a difficult reduction. Despite the inherent risk associated with the surgery, there are reports in the literature of successful outcomes of open reduction and internal fixation of these established nonunion cases[10-12]. The current controversy regarding the management of fractures of the lateral condyle of the humerus presenting between 3 to 8 weeks excited us to evaluate our results of open reduction and internal fixation of such fractures.

## METHODS

This prospective study included 18 patients of fracture of the lateral condyle of the humerus presenting at 3–8 weeks post injury who were treated by open reduction and internal fixation from June 2009 and May 2011. Study was conducted in Department of Orthopedics and Trauma surgery, Gandaki Medical College Teaching Hospital, Pokhara, Nepal. All the patients presented with limitation of elbow movements and lateral prominence at the elbow. Pain was the next most common complaint (12/18). As almost all presented with some degree of fixed flexion deformity of the elbow, it was not possible to assess the cubitusvarus/valgus deformity correctly at the time of presentation. Ten patients had been treated elsewhere with above-elbow Plaster-of-Paris (POP) posterior slab, with or without manipulation, five had applied crepe bandage with local analgesic ointment and three of the patients had no history of treatment (other than oral medicines). Plain radiographs (anteroposterior and lateral) of involved elbow were obtained. The informed consent for surgery was obtained. The patients were operated upon by one of the authors.

### Operative procedure

A lateral approach was used[13]. A gentle dissection of the fracture fragment was done, with minimum stripping of the soft tissue attachments on it. Multiple incisions over the fascia of the common extensors were placed in an attempt to close the gap between the fragments[14]. We avoided the use of sharp instruments to force the reduction. The curettage of the sclerosed fracture end of the distal humerus was done. In those cases presenting with gross restriction of movements and of less than 6 weeks' duration, gentle force was applied with the aim of increasing the range of flexion/extension motion to some extent. Anatomical reduction was attempted in every case; however, it was not possible in fractures more than 6 weeks old, and in these cases we accepted the best possible reduction. In some of the older fractures, in order to get acceptable reduction, careful curettage of new bone/callus was required. We used plain K-wires (minimum two in number) for fracture fixation. Postoperatively, an above-elbow POP slab was applied for about 6-8 weeks, depending upon the status of the union. The wires and POP slab were removed between 6-8 weeks then mobilization exercises of the elbow were started. For the assessment of results, the patients were evaluated clinically at 12 weeks of post surgery for pain, range of motion, carrying angle, and any neurological deficit e.g., weakness, wasting or sensory loss. The radiological points noted during evaluation were reduction, status of the growth plate, evidence of avascular necrosis of the fractured fragment, congruity of the joint, status of union, and deformity.

A clinical score was awarded to each case according to a point system based on function and appearance given by Dhillon KS *et al*[15] (Table 1). For functional grading pain on activity, presence of any neurological deficit e.g., weakness, wasting or sensory loss and decrease in the range of movements were considered. In overall grading, any deformity due to alteration in carrying angle was also taken in to account.

Table 1: Dhillon's scoring system for the outcome of the lateral humeral condyle fracture in children

| Function<br>Pain or weakness<br>ROM(degree) | | Carrying angle (degree) | Score points, Each column |
|---|---|---|---|
| Nil | 0-140 | Valgus 7-10 | 3 |
| Occasional | >15-125 | Valgus <20<br>Varus <0 | 2 |
| After heavy work | >30-110 | Valgus 20-30<br>Varus 0-15 | 1 |
| With normal activity | <30-110 | Valgus >30<br>Varus >15 | 0 |

Functional grading (points): excellent 6, good 5, fair 4, poor <4.
Overall grading (points): excellent 9, good 7-8, fair 5-6, poor <5.

## RESULTS

The average age at the time of surgery was 5.7 years (range 3–10 years). Fifteen were Milch type II fractures and three were Milch type I. Eight patients presented between 3–4 weeks and ten between 5–8 weeks post injury (Table 2). The follow-up period ranged from 3 months to 6 months, with an average follow-up duration of 4 months. Three patients presented to us without having received any treatment elsewhere, five patients had local analgesic massage and crepe bandage application, whereas the other 10 patients had a long arm posterior slab applied elsewhere before they came to us. As per Jacob *et al* classification[3], six were classified as stage II and twelve as stage III.

Table 2: Outcome of fracture of lateral humeral condyle

| A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 8/F/R | I | II | 18 | N | 0-145* | 10 val | E | E |
| 2 | 7/M/L | II | III | 27 | N | 0-143 | 9 val | E | E |
| 3 | 7/F/L | II | III | 21 | O | 5-135 | 7 val | F | G |
| 4 | 6/M/R | I | II | 28 | N | 0-144 | 8 val | E | E |
| 5 | 3/F/L | II | III | 19 | N | 0-140 | 8 val | E | E |
| 6 | 6/M/L | II | III | 26 | N | 10-130 | 15 val | G | G |
| 7 | 3/F/L | II | III | 16 | N | 0-140 | 10 val | E | E |
| 8 | 5/M/L | II | II | 25 | O | 0-145 | 16 val | G | G |
| 9 | 4/M/R | II | III | 34 | N | 0-143 | 10 val | E | E |
| 10 | 7/F/L | II | III | 49 | N | 0-140 | 8 val | E | E |
| 11 | 6/M/L | II | III | 53 | O | 25-120 | 15 varus | P | P |
| 12 | 6/M/L | II | II | 42 | N | 0-140 | 10 val | E | E |
| 13 | 4/M/R | II | III | 50 | N | 5-130 | 15 val | G | G |
| 14 | 5/M/L | II | III | 44 | O | 10-125 | 10 varus | F | F |
| 15 | 10/M/R | I | II | 48 | O | 15-120 | 15 val | F | F |
| 16 | 6/M/L | II | III | 35 | N | 10-130 | 10 val | G | G |
| 17 | 4/M/L | II | III | 40 | O | 0-140 | 12 val | G | G |
| 18 | 6/M/R | II | II | 32 | N | 0-140 | 13 val | E | G |

A- case number, B- age/sex/side C- Milch type of fracture, D- Jakob's stage of fracture, E- days of injury, F- pain or weakness (N = nil, O=occasional), G- Range of movment, H- carrying angle, I-Functional Grading (E-excellent, G-good, F-fair, P-poor) J-Overall grading

On outcome rating as per Dhillon's *et al*. functional grading, nine patients had excellent result, five had good result, three had fair result, and one had poor result whereas in overall grading, eight patients had excellent result, seven had good result, two had fair result, and one had poor result. On clinical evaluation, none of our patients had any preoperative or postoperative signs of ulnar nerve involvement. Two other patients developed mild pin tract infection; the wires were removed at 5 weeks in both the cases. On radiology, the fracture had united in all the cases (Fig 1 a,b,c). Premature closure of the epiphysis was observed in two cases (Fig 2).

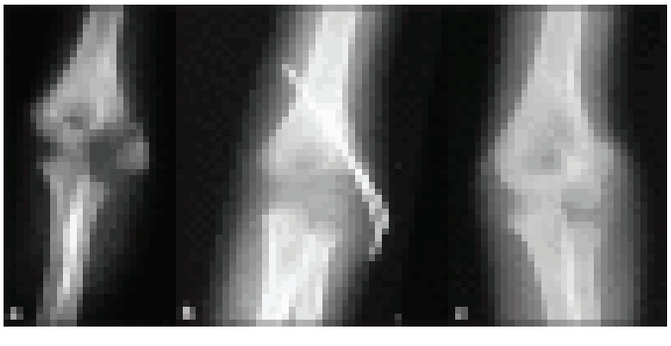

Fig 1: X-ray of the elbow joint (anteroposterior view) showing

a) eight-week-old fracture of the lateral condyle of the humerus
b) Immediate postoperative X-ray after fixation with two K-wires
c) same patient after union

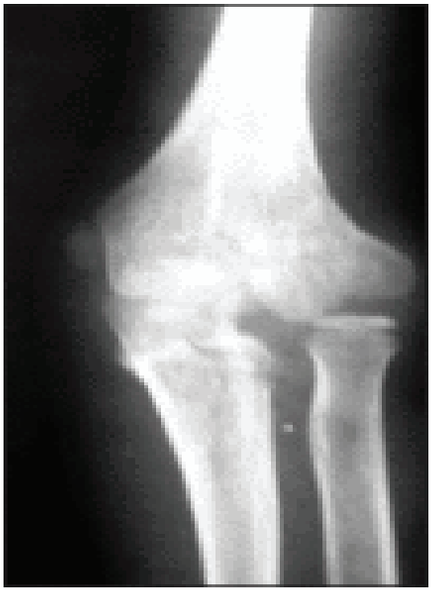

Fig 2: X-ray of the elbow joint (anteroposterior view) at 8 week follow up showing premature closure of the epiphysis and fishtail deformity

## DISCUSSION

In developing countries, patients with fractures of the lateral condyle of the humerus usually present late[16] (Fig 3). Sometimes the diagnosis is missed due to incorrect interpretation of the radiograph, as the fracture fragment is partially cartilaginous; the radiographs are also often of poor quality (Fig 4 a, b). A prospective cohort study showed that internal oblique radiographs are more sensitive than a plain anteroposterior (AP) view for diagnosing displaced or minimally displaced fractures[17]. Recently, a 20° tilt AP radiograph has been suggested to demonstrate fragment dislocation more precisely than a standard radiograph[18]. High-resolution ultrasonography[19] or MRI[20] can also demonstrate the cartilage hinge and the displacement; however, these facilities may not be available in the rural and suburban areas in most developing countries. The diagnosis of minimally displaced fractures is therefore often missed in the early stages, being made late or only after more displacement has occurred.

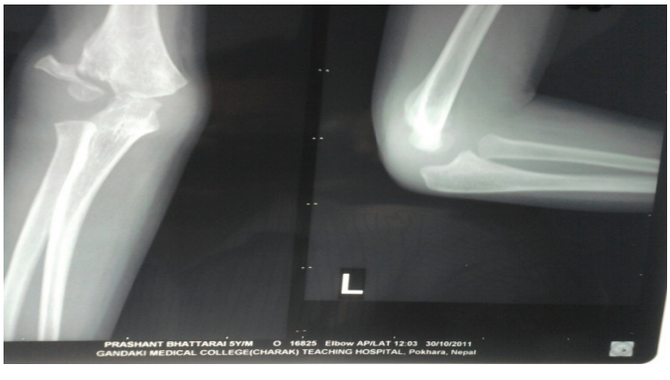


Fig 3: Six weeks old neglected lateral condyle fracture of humerus

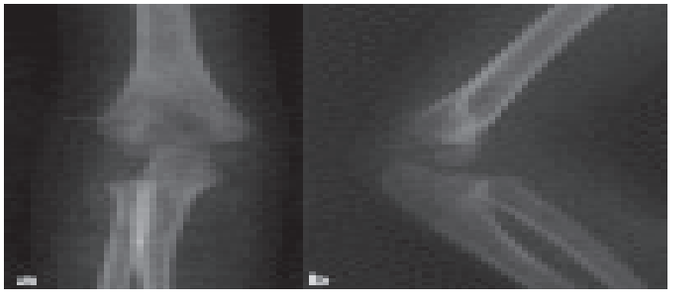

Fig 4: a) Fracture in anteroposterior view of the elbow can be missed
b) Lateral view of the elbow showing displacement of the fragment

The management of fractures of the lateral condyle of the humerus in patients presenting late remains controversial. When these fractures present 12 weeks post injury, the majority opinion is in favor of nonoperative management in order to avoid the problems of stiffness of the elbow, avascular necrosis of the fragment, and difficulty in reduction[3,8,21]. Achieving anatomical reduction is often not possible because of remodeling of the fragment, new bone formation, and sclerosis and smoothening of the fracture line. For these various reasons, in long-standing untreated nonunion, reduction of the fracture has been a concern. With higher grades of displacement, it sometimes becomes impossible to bring the fragment into normal position without stripping the soft tissue attachments on the displaced fragment. As extensive soft tissue dissection may lead to avascular necrosis of the fragment, many recommend that these fractures should be left alone[3,9]. Dhillon *et al*[15] do not recommend osteosynthetic procedures even after 6 weeks. Despite the disappointing results and the general disapproval of surgery, there are several reports in the recent literature in favor of surgery[22,23]. Mazurek and Skorupski[11] operated a 7 year old boy with nonunion of 1 year duration using an olecranon osteotomy approach, with open reduction, bone grafting, and K-wire fixation, and reported excellent results at 6 months. In the series by Shen *et al*[24] 13 patients with fracture of more than 4 weeks' duration (56 days on average) were treated by open reduction and internal fixation; all had improvement in range of movements and good cosmetic outcome. In the series by Shimada *et al*[10] there were 16 patients with an average interval of 5 years between injury and operation; excellent results could be obtained in eight and good result in seven patients after open reduction, bone grafting, and internal fixation with K-wires. Wattenbarger *et al*[25] studied the effect of late open reduction of >3 week old lateral condyle fractures in 11 children and did not find any case of avascular necrosis even though four of their cases had displacement of more than 10 mm.

The problems and the resulting complications may not be as bad when the patient presents within 12 weeks of the injury, as careful dissection and modifications in the surgical technique can provide a satisfactory reduction without compromising the blood supply. In those cases where we could not achieve the reduction without compromising blood supply with soft tissue dissection, we used the technique of making multiple incisions in the common extensor aponeurosis as described by Gaur *et al*[14]. This was helpful for achieving reduction. It is recommended that these fractures be fixed using non threaded K-wires so as not to disturb the growth plate.

The minimally displaced fractures with high potential for displacement should be fixed at the earliest when the surgery is technically less demanding and functional outcome is relatively more predictable. If left untreated, it can result in malunion or, more frequently, nonunion. The treatment of malunion is even more difficult and is fraught with complications. Launey *et al*[28] showed displacement in 5 of the 17 fractures treated by cast immobilization; four of them required surgery at a later date. In our opinion, another reason for fixing these fractures is to enable the physis to take part in the growth process of the distal humerus; otherwise, the physis will close prematurely, resulting in even more severe deformity. Duration since injury, in our opinion, is the most important factor that decides the outcome. The results were better (Table 2) in fractures that were less than 6 weeks old as compared with those of longer duration.

The cases presenting with gross restriction of movements – and of less than 6 weeks' duration – gentle force was applied under anesthesia with the aim of providing some increase in the range of motion. As far the depth of the trochlear groove and fish-tail deformity is concerned, our follow-up period was not sufficiently long to study this aspect; however, in those cases where reduction was not satisfactory, some deepening of the groove and a tendency to develop the fish-tail deformity was observed.

## CONCLUSIONS

We conclude that open reduction and internal fixation is recommended in all displaced fractures of the lateral condyle of the humerus presenting up to 8 weeks after injury; the results become poorer with increase in duration after the injury and grade of displacement.

## REFERENCES

1. Conner AN, Smith MG. Displaced fractures of the lateral humeral condyle in children. *J Bone Joint Surg Br.* 1970; 52: 460–4.
2. Hardacre JA, Nahigian SH, Froimson AI, Brown JE. Fractures of the lateral condyle of the humerus in children. *J Bone Joint Surg Am*. 1971; 53: 1083–95.
3. Jakob R, Fowles JV, Rang M, Kassab MT. Observations concerning fractures of the lateral humeral condyle in children. *J Bone Joint Surg Br*. 1975; 57: 430–6.
4. Hasler CC, von Laer L. Prevention of growth disturbances after fractures of the lateral humeral condyle in children. *J Pediatr Orthop B*. 2001; 10: 123–30.
5. Thomas DP, Howard AW, Cole WG, Hedden DM. Three weeks of Kirschner wire fixation for displaced lateral condylar fractures of the humerus in children. *J Pediatr Orthop*. 2001; 21: 565-9.

6. Song KS, Kang CH, Min BW, Bae KC, Cho CH, Lee JH. Closed reduction and internal fixation of displaced unstable lateral condylar fractures of the humerus in children. *J Bone Joint Surg Am.* 2008; 90: 2673–81.
7. Flynn JC, Richards JF, Jr, Saltzman RI. Prevention and treatment of non-union of slightly displaced fractures of the lateral humeral condyle in children. An end-result study. *J Bone Joint Surg Am.* 1975; 57: 1087–92.
8. Fontanetta P, Mackenzie DA, Rosman M. Missed, maluniting, and malunited fractures of the lateral humeral condyle in children. *J Trauma*. 1978; 18: 329–35.
9. Rohl L. On fractures through the radial condyle of the humerus in chidren. *Acta Chir Scand*. 1952; 104: 74–80.
10. Shimada K, Masada K, Tada K, Yamamoto T. Osteosynthesis for the treatment of non-union of the lateral humeral condyle in children. *J Bone Joint Surg Am*. 1997; 79: 234–40.
11. Mazurek T, Skorupski M. Nonunion of the lateral humeral condyle-operative treatment, case report. *Chir Narzadow Ruchu Ortop Pol*. 2006; 71: 227–9.
12. Roye DP, Jr, Bini SA, Infosino A. Late surgical treatment of lateral condylar fractures in children. *J Pediatr Orthop*. 1991; 11: 195–9.
13. Canale ST. 10th ed. St. Louis: Mosby; 2003. Fractures and dislocations in children. Campbell's Operative Orthopaedics; p. 1429.
14. Gaur SC, Varma AN, Swarup A. A new surgical technique for old ununited lateral condyle fractures of the humerus in children. *J Trauma.* 1993; 34: 68–9.
15. Dhillon KS, Sengupta S, Singh BJ. Delayed management of fracture of the lateral humeral condyle in children. *Acta Orthop Scand*. 1988; 59: 419–24.
16. Vrisha M. In Proceedings of the CME at 54th Annual conference of the Indian Orthopaedic Association 2009 Nov 24-27. Bhubaneswar, India: Neglected lateral condyle injuries; pp. 5–6.
17. Song KS, Kang CH, Min BW, Bae KC, Cho CH. Internal oblique radiographs for diagnosis of nondisplaced or minimally displaced lateral condylar fractures of the humerus in children. *J Bone Joint Surg Am.* 2007; 89: 58–63.
18. Imada H, Tanaka R, Itoh Y, Kishi K. Twenty-degree-tilt radiography for evaluation of lateral humeral condylar fracture in children. *Skeletal Radiol.* 2010; 39: 267–72.
19. Zhang JD, Chen H. Ultrasonography for non-displaced and mini-displaced humeral lateral condyle fractures in children. *Chin J Traumatol.* 2008; 11: 297–300.
20. Horn BD, Herman MJ, Crisci K, Pizzutillo PD, MacEwen GD. Fractures of the lateral humeral condyle: Role of cartilage hinge in fracture stability. *J Pediatr Orthop*. 2002; 22:8–11.
21. Masada K, Kawai H, Kawabata H, Masatomi T, Tsuyuguchi Y, Yamamoto K. Osteosynthesis for old, established non-union of the lateral condyle of the humerus. *J Bone Joint Surg Am*. 1990; 72: 32–40.
22. Ackerman G, Jupiter JB. Non-union of fractures of the distal end of the humerus. *J Bone Joint Surg Am.* 1988; 70: 75–83.
23. Yang WE, Shih CH, Lee ZL, Chang CH, Chen WJ. Anatomic reduction of old displaced lateral condylar fractures of the humerus in children via a posterior approach with olecranon osteotomy. *J Trauma*. 2008; 64: 1281–9.
24. Shen P, Zhang J, Chen T. Treatment of old united lateral condyle fractures of humerus in children. *ZhongguoXiu Fu Chong Jian WaiKeZaZhi*. 2007; 21: 266–8.
25. Wattenbarger JM, Gerardi J, Johnston CE. Late open reduction internal fixation of lateral condyle fractures. *J Pediatr Orthop*. 2002; 22: 394–8.
26. Sharma JC, Arora A, Mathur NC, Gupta SP, Biyani A, Mathur R. Lateral condylar fractures of the humerus in children: Fixation with partially threaded 4.0-mm AO cancellous screws. *J Trauma*. 1995; 39: 1129–33.
27. Baharuddin M, Sharaf I. Screw osteosynthesis in the treatment of fracture lateral humeral condyle in children. *Med J Malaysia*. 2001; 56: 45–7.
28. Launay F, Leet AI, Jacopin S, Jouve JL, Bollini G, Sponseller PD. Lateral humeral condyle fractures in children: A comparison of two approaches to treatment. *J Pediatr Orthop.* 2004; 24: 385–91.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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# Association Between Hypothyroidism and Young Diabetic Patients in People of Western Nepal

**Upadhyaya TL[1], Shakya S[2], Bhattarai A[3]**

[1]*Associate Professor & Consultant Endocrinologist, Gandaki Medical College, Pokhara, Nepal*

[2]*Consultant Endocrinologist, DTECC, Pokhara*

[3]*Staff Nurse, DTECC, Pokhara*

**Key words**:
Diabetes,
Hypothyroidism,
Autoimmunity.

## ABSTRACT

**Objectives:** This study was designed to know the prevalence of hypothyroidism in young diabetic patients or vice versa in western part of Nepal.

**Methods:** 500 patients with either diabetes or thyroid disorders from Gandaki Medical College Teaching Hospital and Diabetes Thyroid and Endocrinology Care Center in Pokhara, with age less than 40 years were enrolled in the study. Detailed history and physical examination was done. Thyroid Function tests (FT3, FT4 and TSH), fasting blood sugar, glycosylated hemoglobin A1c (HbA1c) were performed by immunoradiometric method.

**Results:** 78 (15.6%) patients out of total 500 had both diabetes as well as hypothyroidism.

**Conclusions:** Hypothyroidism has frequent association with diabetes especially in young patients as hypothyroidism and diabetes in young (especially Type 1) is associated with autoimmunity.

## INTRODUCTION

Diabetes in young, especially type 1 diabetes and hypothyroidism are both autoimmune diseases. The association is shown in many Asian countries including India[1,2]. No work has been done in Nepal to find such association. This study was designed to know the prevalence of hypothyroidism in diabetic patients or vice versa in western part of Nepal.

## METHODS

This is a cross sectional observational study. 500 patients with age less than 40 years, with either diabetes or thyroid disorders from Gandaki Medical College Teaching Hospital and Diabetes Thyroid and Endocrinology Care Center in Pokhara, were enrolled in the study from the year 2011 December to 2012 December. Detailed history and physical examination was done by expert endocrinologist. Thyroid Function tests (FT3, FT4 and TSH), fasting Blood sugar, glycosylated hemoglobin A1c (HbA1c) were performed by immunoradiometric method.

**Correspondence:**
*Dr. T. L. Upadhyaya*
*Associate Professor*
*Gandaki Medical College, Pokhara, Nepal*
*Email: tirtha77@hotmail.com*

## RESULTS

Out of a total of 500 cases 78 patients (15.6%), below 40 years of age had both diabetes and hypothyroidism, which is a large percentage showing that when there is diabetes there is high chances of getting hypothyroidism and vice versa.

## DISCUSSION

Hypothyoroidism and type 1 diabetes are both autoimmune diseases. Nepal, especially western region, a lot of the part falls under hilly region. Not only hypothyroidism due to iodine deficiency is common in Western Nepal but hypothyroidism due to autoimmunity is equally common here. Studies done by our team in our center found that around 42% of the hypothyroid cases are due to autoimmunity in western Nepal. Diabetes is also in the increasing trend in Nepal. No study was performed in Nepal between the association of hypothyroidism and type 1 diabetes due to the lack of resources and technical personnel.

But a lot of emerging endocrionologists are coming up now and more and more work will be done in the future. Because of the lack of resources, we did not perform insulin levels and c-peptide along with GAD 65 to confirm type 1 diabetes.

The rate of hypothyroidism documented in this study was higher than those reported by Unnikrishnan in Kochi but somewhat similar from New Delhi and Tirupati[3,4]. They are much higher than those seen in western population[5,6]. It is important to recognize and treat hypothyroidism especially in diabetic patients as this has impact on insulin requirement and glycemic control[7,8]. The poor control is evidenced by HbA1c level. In our study also people with hypothyroidism had a very poor HbA1c level which is a proof that hypothyroidism in diabetes should be treated promptly.

## CONCLUSIONS

Hypothyroidism has frequent association with diabetes especially in young patients. Because Hypothyroidism and diabetes in young (especially type 1) are both associated with autoimmunity. We recommend all young patients with either diabetes or hypothyroidism to have complete work up of either diabetes or thyroid dysfunction.

## REFERENCES:

1. Tsai WY, Lee JS. Thyroid disease in Chinese children with IDDM. *Diabetes care*.1993; 16: 1314-5.
2. Chikuba N, Akazawa S, *et al*. Type 1 Diabetes Mellitus with coexisting autoimmune thyroid disease in Japan. *Intern Med.* 1992; 31: 1076-80.
3. Goswami R, Marwaha RK, *et al*. Prevalance of thyroid autoimmunity in sporadic idiopathic hypoparathyroidism in comparision to type 1 diabetes in premature ovarian failure. *J Clin Endocrinol Metab.* 2006; 91: 4256-9.
4. Reddy PA, Suresh V, *et al.* Prevalance of thyroid autoimmunity in type 1 diabetes mellitus. *Thyroid Res Pract.* 2011; 8: 7-11.
5. Bottazo GF, Mann JI, *et al*. Autoimmunity in juvenile diabetes and their family. *Br Med J.* 1978; 2: 165-8.
6. Riley WJ, Maclaren NK, *et al.* Thyroid autoimmunity in insulin dependant diabetes mellitus the case for routine screening. *J paediatr.* 1981; 99: 350-4.
7. Franzese A, Buono P, *et al*. Thyroid autoimmunity starting during the course of type 1 diabetes mellitus denote a subgroup of children with more severe diabetes. *Diabetes Care.* 2000; 23: 1201-2.
8. Mohn A, Di Michelle S, *et al*. The effect of subclinical hypothyroidism on metabolic control in children and adolescents with type 1 diabetes mellitus. *Diabet Med.* 2002; 19: 70-3.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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# A Study of Ocular Morbidity of Patients Attending a Clinic in Waling, Nepal

**Tuladhar S[1], Dhakal S[2]**

[1]*Department of Ophthalmology, Gandaki Medical College, Pokhara, Nepal*

[2]*Department of Medicine, Western Regional Hospital, Pokhara, Nepal*

**Key words**:
Morbidity,
Ocular diseases,
Cataract,
Refractive error.

## ABSTRACT

**Objectives:** The study is performed to identify the causes of ocular morbidity in Waling.

**Methods:** A prospective study of all patients attending the eye clinic at Waling from August 2010 to August 2011 was done.

**Results:** The study included 915 patients, 617 (67.5%) females, and 298 (32.5 %) males. Refractive error was the most common ocular morbidity accounting 26.8% followed by conjunctivitis 20.6%, cataract 11.8%, pterygium 6%, chalazion/stye 4%, ectropion/entropion 3.9%, keratitis 3.8%, dry eyes 2.8%, and corneal opacities 2.3%.

**Conclusions:** The study gives a picture of pattern of ocular disease in Waling which is helpful in planning and management.

## INTRODUCTION

Nepal is a developing country where health services are not accessible to majority of the population. Ophthalmology is one of the important specialties in medical services. The number of ophthalmologists and the number of eye care services are not accessible to the entire population. So blindness and ocular disease is a major problem in Nepal.

This study was performed to detect the pattern of ocular disease in a clinic in Waling municipality of Syanja district, which is a fully equipped with a refraction unit, slit lamp, direct and indirect ophthalmoscope and minor operating theatre. The clinic is running since last fourteen years and providing considerable eye care services to the community of Syanja district.

Waling is one of three municipality of Syanja district. Putali bazaar and Waling are the two municipalities of Syanja district.

A prospective study was done from August 2010 to August 2011. A total number of 915 patients were seen. Findings pertaining to the pattern of ocular diseases in the community will be compared with that of the hospital based studies.

This study would also help to generate baseline information, which will be beneficial for program formulation and planning of community based activities.

**Correspondence:**
*Dr. Sarita Tuladhar*
*Assistant Professor, Department of Ophthalmology*
*Gandaki Medical College &Teaching Hospital, Pokhara, Nepal*
*Email: drtuladharsarita@yahoo.com*

## METHODS

All patients who attended the eye clinic at Waling from August 2010 to August 2011 were enlisted for this study. The patient data was collected from the OPD register at the clinic and analyzed retrospectively. A total of 915 patients attended the eye clinic, which constituted the sample size of the study.

Visual acuity was evaluated using the Snellen's chart for the literates and illiterate E chart for the illiterates and refraction was done if required. Patients were examined with slit lamp, direct and indirect ophthalmoscope for funduscopy, Schiotz tonometer for measuring intra ocular pressure. Cyclorefraction, Schirmer test and syringing were done if required. Torch light was used to examine young children.

Minor surgical procedures like removal of foreign bodies, surgeries for chalazion, abscess, entropion, lid laceration were done under local anaesthesia.

Patients requiring further investigations like glaucoma, retinal detachment, diabetes retinopathy and those requiring surgeries were referred to higher centers.

All patients' data were entered and analyzed using SPSS software 11.7 version.

## RESULTS

A total of 915 patients were examined, out of which 617 (67.5%) were females and 298 (32.5%) were males. Patients examined were from all age groups, out of which maximum numbers of patients were females and maximum numbers of patients were in age group 11 to 20 years (Table 1).

Table 2 shows pattern of ocular diseases. Refractive error was the most common ocular morbidity accounting 26.8% followed by conjunctivitis 20.6%, cataract 11.8%. Trauma related conditions were foreign bodies 1.3%, subconjunctival hemorrhage 0.8%, and eye lid injury 0.3%.

It was observed that refractive errors and conjunctivitis were seen more in the younger age groups, whereas cataract and posterior segment diseases were seen in the older age groups.

Table 1: Age and sex distribution of patients

| Age in years | Male | | Female | |
|---|---|---|---|---|
| | No | (%) | No | (%) |
| ≤10 | 46 | 5 | 43 | 4.7 |
| 11-20 | 84 | 9.2 | 187 | 20.4 |
| 21-30 | 39 | 4.3 | 123 | 13.5 |
| 31-40 | 36 | 3.9 | 85 | 9.3 |
| 41-50 | 24 | 2.6 | 68 | 7.5 |
| 51-60 | 25 | 2.7 | 36 | 3.9 |
| ≥60 | 44 | 4.8 | 75 | 8.2 |
| Total | 298 | 32.5 | 617 | 67.5 |

Table 2: Pattern of ocular disease

| Diseases | | No of patients | Percentage (%) |
|---|---|---|---|
| Refractive errors | | 245 | 26.8 |
| Strabismus | | 8 | 0.9 |
| Lid related: Entropion/Ectropion | | 36 | 3.9 |
| Stye/Chalazion | | 37 | 4 |
| Conjunctivitis | | 184 | 20.6 |
| Pterygium/pinguecula | | 55 | 6 |
| Episcleritis | | 16 | 1.7 |
| Dry eyes | | 26 | 2.8 |
| Dacryocystitis | | 12 | 1.3 |
| Keratitis | | 35 | 3.8 |
| Corneal opacities | | 21 | 2.3 |
| Cataract | | 108 | 11.8 |
| Pseudophakia | | 19 | 2.1 |
| Glaucoma and glaucoma suspect | | 15 | 1.6 |
| Retina related | Diabetic retinopathy | 2 | 0.2 |
| | Age related macular degeneration | 10 | 1.1 |
| Trauma related | Foreign body | 12 | 1.3 |
| | Subconjunctival haemorrhage | 7 | 0.8 |
| | Lid injury | 3 | 0.3 |
| NAD | | 21 | 2.3 |
| Miscellaneous | | 43 | 4.4 |

## DISCUSSION

The study shows that females (67.5%) were more commonly affected than males (32.5%). This is because of easy access of the clinic which enables them to seek medical help without being dependent on their spouses or family members. Similar results showing a female preponderance was seen in the National Blindness Survey[1], where the survey took place at the rural areas thereby enabling the females for easy access to eye care services. Female preponderance was also seen in a study performed by Sapkota YD *et al* in Gandaki zone[2]. Similar results were obtained in a study performed by Sherchan A *et al* in Lumbini Zone and Chitwan district of Nepal where women constituted 52% and 53% of the total enumerated and examined population, respectively[3]. This is different from most hospital based studies where there is a male preponderance[4,5,6].

Refractive error was the most common ocular morbidity accounting 26.8% followed by conjunctivitis 20.6%, cataract 11.8%. Similar results were seen in a study performed in Bhaktapur[7] where refractive error was the primary ocular morbidity accounting for 22.5%, followed by cataract 17.4% and extra ocular diseases, like conjunctivitis 14.9%, conjunctival degenerations (pterygium and pinguecula) 10.8%.

Similar results were seen in a hospital based study done at Shree Birendra Hospital[4], where in all age groups, except above 60 years, the most common ocular disease was conjunctival and scleral disorders (23.7%) followed by refractive error (18.8%) while in age group above 60 years lens disorder (66%) was the most common disease followed by conjunctiva and scleral problem (10.4%) and refractive error (5.4%).

In contrary to our study, in a study performed by Sapkota YD *et al*[2], cataract was the principal cause of blindness (60.5%) followed by refractive error (11.7%), macular degeneration (8.7%), and corneal opacities (8%). This can be explained from the fact that in the latter study the age group included were people aged above 45 years while in our study there was no specific age groups and maximum number of patients in our study were in age group of 11 to 20.

In a study performed in a tertiary hospital in Bangladesh[8], conjunctivitis was seen in 21.94%, cataract in 9.2%, refractory error in 15.2%, headache in 11.09%, dacryocystitis in 6.51% and blepharitis in 3.2% cases.

A clinic based survey of several rural eye clinics in Cambodia showed that cataract, refractive error, anterior segment diseases, glaucoma were the common diseases seen in the community[9].

In a study done in Ethiopia[10], trachoma was found to be the leading cause of ocular morbidity (33.7%), followed by refractive error (6.3%) and non-trachomatous conjunctivitis (5.9%).

In a study done in Nigeria, conjunctivitis was the most common ocular disease seen in (32.9%), followed by cataract (14.7%), ocular injuries (12.8%) and refractive errors (9.9%)[11].

## CONCLUSIONS

In our study, there was female preponderance and the patterns of ocular disease were refractive error, cataract, pterygium, chalazion/stye, ectropion/entropion, keratitis, dry eyes, and corneal opacities. The patient requiring surgery like cataract, uncontrolled glaucoma and those requiring further investigations and specific treatment like severe diabetic retinopathy, retinal detachment were referred to higher centers.

This type of study is helpful to have idea about the epidemiology of any type of diseases in area which is helpful in planning and management. Early detection of diseases such as cataract and glaucoma in this population will reduce the burden of blindness.

## REFERENCES

1. Brilliant LB, Pokhrel RP, Grasset NC, *et al*. Blindness in Nepal. *Bulletin of WHO*.1985: 63: 375-862.
2. Sapkota YD, Pokhrel GP, *et al*. Prevalence of blindness & cataract surgery in Gandaki Zone, Nepal. *BJO*. 2006; 90:411-416.
3. Sherchan A, Kandel RP, *et al*. Blindness prevalence and cataract surgical coverage in Lumbini Zone and Chitwan District of Nepal. *Br J Ophthalmol.* 2010; 94: 161-166.
4. Rajkarnikar S, Gurung A, *et al* .Pattern of ophthalmological diseases in the patients of Shree Birendra Hospital. *Medical Journal of Shree Birendra Hospital*. 2010; 9: 30-37.
5. Badhu BP. Shrestha SP. Pattern of incurable blindness at BPKIHS. *J Nepal Med Assoc.* 1997; 37: 370-72.
6. KC RM, Ale JB, Singh SK. Pattern of blindness in Mechi - a hospital based study in Mechi eye care centre. *J Nepal Med Assoc.* 1998; 37: 422-6.
7. A Rizyal, Shakya S, *et al.* A study of ocular morbidity of patients attending a satellite clinic in Bhaktapur, Nepal. *Nepal Med Coll J.* 2010; 12(2): 87-89.
8. Murad MAU, Alam MS, *et al*. Pattern of eye diseases in a tertiary hospital in a suburban area: A retrospective study, *The ORION Medical Journal.* 2007; Sep; 28: 492-494.
9. Thomson I. A clinic based survey of blindness and eye diseases in Cambodia. *Brit J Ophthal.* 1997; 81: 578-80.
10. Shaffi M, Bejiga A. Common eye diseases in children of rural community in Goro district, Central Ethiopia. *Ethiop J Health Dev.* 2005; 19(2): 148-152.
11. Scott SC, Ajaiyeoba AL. Eye diseases in general out-patient clinic in Ibadan. *Niger J Med.* 2003; 12: 76-80.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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Journal of
GMC-NEPAL
2013
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# Single Oral Dose Toxicity Study of *Cnidium monnieri* Fruits Extract in ICR Mice

**Malla B[1], Chang BY[1], Han EB[1], Lee MK[2], Kim SK[1]**

[1]*Institute of Pharmaceutical Research and Development, College of Pharmacy, Wonkwang University, Shinyoung-dong 344-2, Iksan, Jeollabuk-do, Republic of Korea*

[2]*College of Pharmacy, Chungbuk National University, Cheongju 361-763, Korea*

**Key words**:
*Cnidium monnieri* fruits extract, Acute oral toxicity, LD50.

## ABSTRACT

**Objectives:** The present study was undertaken to evaluate the primary safety and 50% lethal dose of *Cnidium monnieri* fruits extract.

**Methods:** *C. monnieri* fruits extract was once orally administered to male and female ICR mice at dose levels of 2000, 300, 50, 5 and 0 mg/Kg body weights according to OECD guidelines 2001. The mortality, change in body weight and abnormal clinical signs were monitored from 0 to 14 days after dosing. After 14 days of observation period the mice were sacrificed and their relative vital organ weights were calculated.

**Results:** No death or abnormal clinical signs were shown during the observation period. There were no differences in net body weight gain, organ weight and gross pathological findings at the terminal sacrifice. The results suggested that acute oral toxicity of the *C. monnieri* fruits extract is very low at the conditions employed in this study.

**Conclusions:** The $LD_{50}$ in male and female ICR mice after single oral dose of *C. monnieri* fruits extract was estimated over 2000 mg/Kg. Hence, *C. monnieri* fruits extract was considered to be non toxic at the test conditions.

## INTRODUCTION

Traditional medicines are used by about 80% of the world's population which is largely of plant origin, for their primary health care needs[1]. As increase of the concern in the functional food and well being in life, the demands and consumption of functional food originated from the natural sources have been increased[2]. The major contributory factors to this increasing interest include: rising costs of orthodox medicines, low therapeutic index of synthetic compounds and the growing incidence of drug resistance among the pathogens especially in developing countries with very weak economic indices[1]. Despite the widespread use of traditional medicines and functional foods from long time, few scientific studies has been undertaken to assure their safety and efficacy. In addition, the compounds of the plants or their extracts used for any therapeutic or cosmetic purposes must be practically non toxic and efficacious[3]. Therefore, detail toxicological studies should be conducted to control the potential toxicities of the traditional medicines and functional foods.

Acute toxicity tests can provide preliminary information on the toxic nature of a material for which no other toxicological information is available[4]. The most common test of acute toxicity is the $LD_{50}$ test. $LD_{50}$ means, if we administer any dose of drug to animal group for experimental purpose for the estimation of therapeutic effectiveness of that drug, and if 50% of animal get died then it means that particular dose of drug is lethal dose 50 ($LD_{50}$). The larger the $LD_{50}$ value, the lower the toxicity. However, LD50 is not tested on humans[5].

An aqueous extract elucidated from one of the important traditional Chinese medicines, *Cnidium monnieri* fruits was

**Correspondence:**
*SungYeon Kim (Ph.D.)*
*College of Pharmacy, Wonkwang University*
*460 Ikandae-ro, Iksan, Jeonbuk 570-749, Republic of Korea*
*E-mail : sungykim@wonkwang.ac.kr*

examined. The dried fruit of *C. monnieri* is a well-known traditional herbal medicine as well as a fragrance. It has been used for the treatment of impotence, frigidity, pain in female genitalia, asthma, cough, fungal infection and dermatitis from the ancient time[6,7]. It is a novel immunostimulant which significantly increases the nitric oxide (NO), tumor necrosis factor- α (TNF-α) level and phagocytosis activity of macrophage RAW264.7 cells *in vitro* as well as enhances the innate immune system *in vivo*.

The purpose of the present study was to investigate the primary safety information about *C. monnieri* fruits extract to assure its safety for clinical use. For this, acute toxicity was evaluated in male and female ICR mice and 50% lethal dose ($LD_{50}$) of the *C. monnieri* fruits extract was estimated.

## METHODS

### Plant materials

*C. monnieri* fruits extract used in this study were supplied by the college of Pharmacy, Chungbuk National University, South Korea.

### Animal Models and Husbandry

Fifty specific pathogen free (SPF) male and female ICR mice (6 weeks of age) were purchased from Hanil laboratory animal (Iksan, Korea) and were used after acclimatization for 7 days. Mice were allocated five per plastic cage and kept in animal facility room at 23 ± 2 $^0$C and 55 ± 5 % relative humidity with a 12 h/12 h light/dark cycle (6 AM to 6 PM). The mice were free accessed to standard commercial diet (Picolab Rodent Diet 20) and distilled water. After 1 week of acclimatization in laboratory setting mice were transferred to new cages for the investigation. All animals were fasted for 3 hour before dosing and terminal necropsy but they were provided with distilled water. Mice experiments were approved by the Wonkwang University Animal Care and Use Committee. The experiment was performed as per the OECD Guidelines[8].

### Test groups and *C. monnieri* fruits extract dosing

Male and female mice were allocated into ten groups with five mice per groups. The current oral toxicological data of the *C. monnieri* fruits extract was not available therefore; the doses were selected as per OECD Guideline 2001. The highest dose was 2000 mg/Kg and other was 300 mg/Kg, 50 mg/Kg, 5 mg/Kg and 0 mg/kg. The male and female vehicle control groups were also observed. The test article or distilled water was once orally gavaged to test or control groups respectively by using a gastric feeding tube attached to a 1 mL syringe.

### Observation of clinical signs

Clinical signs (tremors, convulsions, salivation, diarrhea, lethargy, sleep and coma) were carefully observed till six hour of drug administration. After that the mice were carefully observed once a day for 14 days.

### Body weight changes

Body weight was measured immediately before the drug treatment (day 0). The change in body weight was recorded daily for fourteen days. At the fourteen day of observation, all the mice were euthanized by ether anesthesia. The target organs were grossly observed including the liver spleen heart, brain, kidney and gonad (testis/ ovaries).

### Organ weight (OW)

The target organs were aseptically excised, blotted dry and weighted. The absolute organ weight was measured and the relative organ weight (% body weight) was calculated for each of the vital organs: liver, spleen, heart, brain, kidneys (left and right), testis/ ovaries (left and right). The relative organ weights were calculated by formula: organ weight (g)/ body weight (g) X 100. The body weight of the mice just before the euthanized was used[9].

## STATISTICAL ANALYSIS

Experimental results were expressed as mean ± SD. Statistical significance was calculated by two tailed student's *t*-test. *P*-values of less than 0.05 were considered to be statistically significant.

## RESULTS

### Mortalities

No *C. monnieri* fruits extract treatment related unscheduled mortalities were observed in the study. All the animals (5/5; 100 %) in *C. monnieri* fruits extract treatment groups and vehicle control groups were survived for 14 days (Table 1).

Table 1: Mortality of male and female mice orally treated with *C. monnieri* fruits extract

| Sex | Dose (mg/kg) | No of animals | Hours after treatment | | | | | | Days after treatment | | | | | | | | | | | | | | Final mortality |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| Male | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |
| | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |
| | 50 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |
| | 300 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |
| | 2000 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |
| Female | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |
| | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |
| | 50 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |
| | 300 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |
| | 2000 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/5 (0%) |

### Clinical signs

In this study, *C. monnieri* fruits extract treatment related any abnormal clinical signs were not detected for 14 days regardless of male and female mice.

### Changes on body weight

No significant changes on body weight were detected in all *C. monnieri* fruits extract treatment groups as compared to the vehicle control groups (Fig A and B).

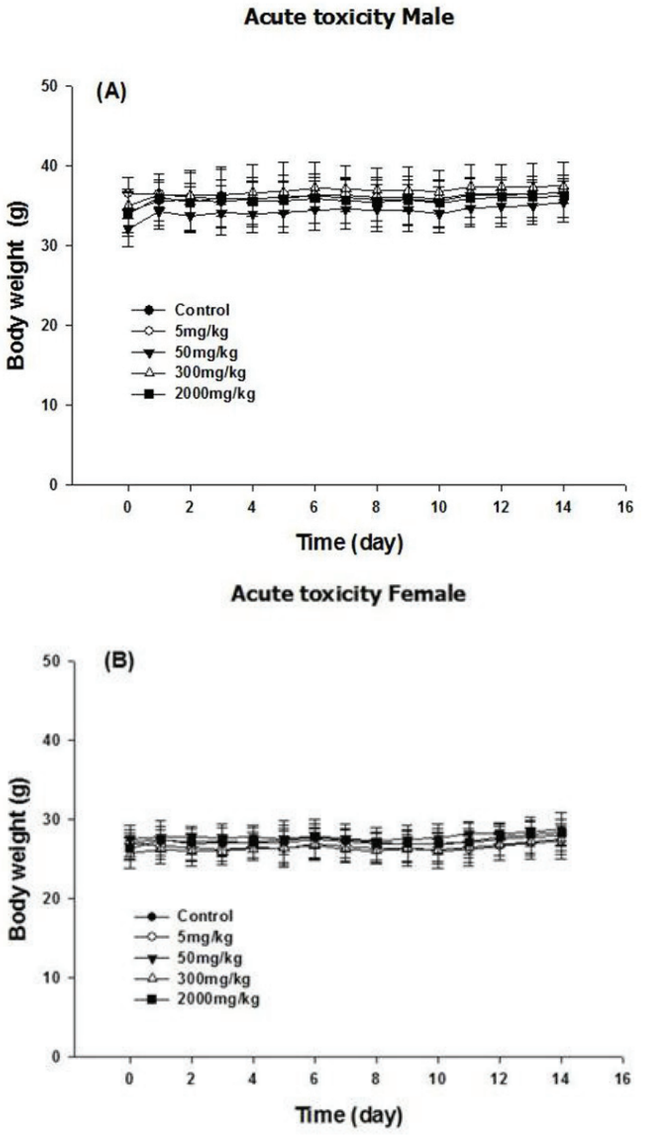


Fig 1**:** Body weight changes in male (A) and female (B) mice after once oral administration of *C. monnieri* fruits extract. No significant changes were detected in all *C. monnieri* fruits extract treated groups as compared with vehicle control group.

**Changes on the organ weight**

No significant changes on the relative organ weight of the vital organs were observed in the all *C. monnieri* fruits extract treated groups as compared to the vehicle control group (Table 2 and 3).

Table 2: Changes on the final relative organ weights of male ICR mice after oral treatment of *C. monnieri* fruits extract

(Values are presented as mean ± standard deviation (SD) of five mice, % body weight at sacrifice).

| Parameters | /Sex | Male | | | | |
|---|---|---|---|---|---|---|
| | /Dose (mg/kg) | 0 | 5 | 50 | 300 | 2000 |
| Liver (%) | | 5.54±0.84 | 5.89±0.42 | 6.01±0.29 | 5.56±0.66 | 5.30±0.41 |
| Spleen (%) | | 0.26±0.08 | 0.33±0.04 | 0.30±0.02 | 0.31±0.03 | 0.31±0.05 |
| Heart (%) | | 0.55±0.12 | 0.50±0.06 | 0.48±0.05 | 0.53±0.09 | 0.44±0.05 |
| Brain (%) | | 1.33±0.16 | 1.26±0.12 | 1.31±0.09 | 1.29±0.07 | 1.26±0.09 |
| Testis (%) | Right | 0.36±0.07 | 0.39±0.05 | 0.41±0.05 | 0.37±0.05 | 0.36±0.07 |
| | Left | 0.36±0.06 | 0.39±0.05 | 0.37±0.05 | 0.36±0.05 | 0.34±0.05 |
| Kidney (%) | Right | 0.77±0.12 | 0.81±0.03 | 0.79±0.07 | 0.76±0.11 | 0.75±0.09 |
| | Left | 0.78±0.14 | 0.79±0.05 | 0.78±0.07 | 0.79±0.08 | 0.74±0.10 |

Table 3: Changes on the final relative organ weights of female ICR mice after oral treatment of *C. monnieri* fruits extract (Values are presented as mean ± standard deviation (SD) of five mice, % body weight at sacrifice).

| Parameters | /Sex | Female | | | | |
|---|---|---|---|---|---|---|
| | /Dose (mg/kg) | 0 | 5 | 50 | 300 | 2000 |
| Liver (%) | | 5.47±0.78 | 5.55±0.50 | 5.52±0.51 | 5.36±0.77 | 5.57±0.67 |
| Spleen (%) | | 0.39±0.05 | 0.38±0.04 | 0.43±0.10 | 0.37±0.07 | 0.40±0.08 |
| Heart (%) | | 0.52±0.09 | 0.53±0.08 | 0.46±0.08 | 0.47±0.04 | 0.59±0.09 |
| Brain (%) | | 1.67±0.19 | 1.73±0.11 | 1.59±0.22 | 1.67±0.19 | 1.64±0.12 |
| Ovary (%) | Right | 0.06±0.01 | 0.08±0.04 | 0.09±0.05 | 0.07±0.01 | 0.06±0.01 |
| | Left | 0.11±0.10 | 0.20±0.29 | 0.06±0.03 | 0.07±0.01 | 0.06±0.02 |
| Kidney (%) | Right | 0.69±0.12 | 0.74±0.12 | 0.68±0.09 | 0.71±0.07 | 0.59±0.08 |
| | Left | 0.69±0.06 | 0.74±0.05 | 0.67±0.06 | 0.68±0.08 | 0.66±0.07 |

## DISCUSSION

To determine the safety of drugs and plant products for human use, toxicological evaluation is carried out in various experimental animals to predict toxicity and to provide guidelines for selecting a 'safe' dose in humans. The highest overall concordance of toxicity in animals with humans is with hematological, gastrointestinal, neurological, phototoxicity and cardiovascular adverse effects while certain adverse effects in humans, especially hypersensitivity, idiosyncratic reactions, liver function are poorly correlated with toxicity observed in animals. Furthermore, it is quite difficult to assure certain adverse effects in animals such as headache, abdominal pain, dizziness and visual disturbances. Indeed, interspecies differences in the pharmacokinetic parameters and apparent design deficiencies make it difficult to translate some adverse effects from animals to humans[10,11]. Nevertheless, the acute toxicity studies with a range of doses have to be conducted first to select proper dose(s) for chronic and sub-chronic studies; the doses selected for chronic and sub-chronic toxicity studies should be at and above the suggested human dose[11].

In the present study, we have investigated the single oral dose toxicity of *C. monnieri* fruits extract on the ICR mice as a part of the safety test. In order to estimate $LD_{50}$ the test article was once orally gavaged to mice at a dose level of 0, 5, 50, 300 and 2000 mg/Kg.

According to the guidelines of OECD (2001), the

recommended highest dose of test materials were 2000 mg/Kg and the recommended oral dose volume in mice was10 ml/Kg. Therefore, the highest oral dose and volume was selected as 2000 mg/Kg/10 mL in the experiment.

As the results, we could not find any abnormal clinical signs; *C. monnieri* fruits extract treatment related death, changes in body weights and relative organ weights in the test groups as compared to the vehicle control groups. These results revealed that *C. monnieri* fruits extract, at the tested doses, was not toxic to the male and female ICR mice. Moreover, increase in the body weight of the test groups was well corresponded with the increase in the body weight of the age matched vehicle control group, suggesting that even at the highest dose (2000 mg/Kg/10 mL) *C. monnieri* fruits extract did not induce any harmful effects on the body weights. Our results were in agreement with Choi *et al*, Park *et al* and Roh and Ku[12,13,14] where the test articles were not toxic at the highest dose.

## CONCLUSIONS

The results obtained in this study suggest that *C. monnieri* fruits extract is not toxic in mice and is therefore likely to be safe for clinical use. The $LD_{50}$ in male and female ICR mice after single oral dose of *C. monnieri* fruits extract was estimated over 2000 mg/Kg because no mortalities were detected upto 2000 mg/Kg that was the highest dose recommended by OECD.

## REFRENCES


1. Bulus T, Atawodi SE, Mamman M. Acute toxicity effect of the aqueous extract of *Terminalia avicennioides* on white albino rats. *Science World Journal*. 2011; 6: 1-4.
2. Kim KH, Gam CO, Choi SH, Ku SK. Mouse single oral dose toxicity test of *Bupleuri Radix* aqueous extracts. *Toxicol Res*. 2012; 28: 11-18.
3. Lalitha P, Sripathi SK, Jayanthi P. Acute toxicity study of extracts of *Eichhornia Crassipes* (Mart.) Solms. *Asian J Pharm Clin Res*. 2012; 5: 59-61.
4. Draft. Chapter IV. *Guidelines for Toxicity Tests*. IV C 2.
5. Deora PS, Mishra CK, Mavani P, Asha R, Shrivastava B, Nema RK. Effective alternative methods of $LD_{50}$ help to save number of experimental animals. *J Chem Pharm Res*. 2010; 2: 450-53.
6. Kim SB, Chang BY, Han SB, Hwang BY, Kim SK, Lee MK. A new phenolic glycoside from *Cnidium monnieri* fruits. *Nat Prod Res*. 2013; 27: 1945-48.
7. Matsuda H,Tomohiro N, Ido Y, Kubo M. Anti-allergic effects of cnidii monnieri fructus (dried fruits of *Cnidium monnieri*) and its major component, osthol. *Biol Pharm Bull*. 2002; 25: 809-12.
8. Organization of economic co- operation and development (OECD). OECD guideline for testing of chemicals revised draft guideline 420. 2001.
9. Bagri P, Kumar V, Sikka AK and Punia JS. Preliminary acute toxicity study on imidacloprid in Swiss albino mice. *Vet World*. 2013; 6: 955-59.
10. Olson H, Betton G, Robinson D, Thomas K, Monro A, Kolaja G, Lilly P, Sanders J, Sipes G, Bracken W, Dorato M, Deun KV, Smith P, Berger B and Heller A. Concordance of toxicity of pharmaceuticals in humans and in animals. *Regul Toxicol Pharmacol*. 2000; 32: 56-67.
11. Tahraoui A, Israili ZH, Lyoussi B. Acute and sub-chronic toxicity of a lyophilized aqueous extract of *Centaurium erythraea* in rodents. *J Ethnopharmacol*. 2010; 132: 48-55.
12. Choi JS, Kim JW, Kim KY, Ku SK, Sohn JH. Single – dose oral toxicity of fermented rice extracts (FREs): a 14- day observation. *J Pharm Sci*. 2014; 27: 129-37.
13. Park K, Kim DJ and Byun JS. Single oral dose toxicity study of aqueous extracts of *Binso-san* in ICR mice. *Korean J Orient Physiol & Pathol*. 2010; 24: 134-42.
14. Roh SS, Ku SK. Mouse single oral dose toxicity study of DHU001, a polyherbal formula. *Toxicol Res*. 2010; 26: 53-59.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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# Practice of Condom Use Among Spouses of Migrant Workers and Non-migrants in Bardiya District of Nepal

**Sharma B[1], Poudyal AK[2], Shrestha B[3]**

[1]*Bimala Sharma, Assistant Professor, Dept of Community Medicine, Gandaki Medical College, Kaski, Nepal*

[2]*Amod K Poudyal, Associate Professor, Department of Community Medicine & Family Health, Institute of Medicine, Tribhuvan University*

[3]*Binjwalam Shrestha, Assistant Professor, Department of Community Medicine & Family Health, Institute of Medicine, Tribhuvan University*

**Key words**:
Condom use,
HIV/AIDS,
Migrant workers,
Spouses.

## ABSTRACT

**Background:** Migration has been significant risk factor for Human Immunodeficiency Virus (HIV) transmission in Nepal. Consistent use of condom helps to prevent sexual transmission of HIV from the bridge population to low risk population.

**Objectives:** This study aimed to assess practices of condom use among spouses of male migrant workers and non-migrants.

**Methods:** A cross sectional comparative household survey was designed and 294 women were interviewed face-to-face. Respondents were selected from three Village Development Committees of the district by proportionate simple random sampling. Control group was selected by matching for age and geographical location.

**Results**: About half (51%) spouses of migrants and three–fifth (61%) of non-migrants never used condom with husbands in their marital life, and those who used; majority (91%) used it as contraceptive. Condom use on last sex was significantly higher among spouses of migrants than non-migrants (46% and 27%, OR=2.3, CI=1.1-4.9). Sixty one percent respondents never asked for condom and of those who asked, only 31% indented it to prevent of sexually transmitted infections. Spouses of migrants were more likely to ask for condom use (50% and 27%, OR= 2.7, CI=1.7-4.4).

**Conclusions**: Condom use was relatively higher among spouses of migrants than non-migrants but still low. Condom use for prevention of sexually transmitted infections is least practiced in both groups.

## INTRODUCTION

Nepal is categorized as a country with concentrated epidemic of HIV[1]. However proportion of housewives among new cases of HIV is increasing[1-4]. Now, spouses or female partners of migrant workers and clients of sex workers accounts for 28% of all adult infection[4]. Most common cause behind this is both internal and international temporary migrations are common in Nepal. Migrant people are vulnerable for HIV infection[4- 6]. More migrants than non-migrants have reported involvement in risky sexual behavior when they are away from home[5]. Since the migrant returnees tend to have unsafe sex with their wives and other sex partners, infection among women are likely to rise[5]. A hospital based study of HIV patients carried at Seti Zonal Hospital stated that more than 50% of cases were housewives, 38.8% were migrant workers and 10% were dependent children[6]. A study conducted by Family Health International found that high-risk behavior among labor

**Correspondence:**
*Bimala Sharma*
*Assistant Professor Dept of Community Medicine,*
*Gandaki Medical College, Kaski, Nepal*
*Email: bimalasharma@gmail.com*

migrants was responsible for 50% of HIV burden in Nepal[7].

The spread of HIV from male migrants to their wives and sex partners seems to be an immediate challenge in the area where migration is high[8]. Most studies have focused on male migrants and little is known about HIV infection and related behaviors among wives and women. As bordering district, seasonal migration to India is common in Bardiya. The study aimed to assess practices of condom use and associated factors among spouses of migrants and non-migrants. The findings might prove valuable to plan appropriate interventions to promote condom use and prevent spousal transmission of HIV.

## METHODS

It is a cross sectional comparative study. The field work was carried out during August to September, 2009. Three VDCs were selected purposively. Sampling frame was prepared by listing the households of migrants on each VDC and proportionate simple random sampling technique was applied to select households of migrants from each VDC. The VDCs were Taratal, Kalika and Mohammadpur; and samples of 71, 47 and 29 households of migrants were taken respectively. A married woman of 15-40 years whose husband had been working outside the country or outside the residing district of the country at least three months in the same year prior the survey was selected as sampling unit for spouse of migrant worker. Samples of non-migrants were selected by matching age with spouses of migrants at the nearby houses.

Face to face interview was conducted for household survey with 294 women (147 from each group) using semi-structured questionnaire. Five respondents were excluded in analysis of condom use due to incomplete information. The data was edited and analyzed in Statistical Package on Social Sciences (SPSS) version 13.0 for windows. Frequencies of variables across migrants and non-migrants were computed and bivariate analysis (Crosstab and Chi-square test, Bivariate logistics) was applied to find out significance of condom use with independent variables with five percent level of significance.

An ethical approval was taken from research committee of Department of Community Medicine and Family Health, Institute of Medicine before conduction of study. The research objective was shared with District Health Officer of the district and permission was taken. Consent was taken from each respondent prior interview. The people who were migrants before one year from the date of survey were not considered migrant people for the study.

## RESULTS

### Condom Using Practices of Spouses(wives) with Husbands

Of the total, 55.5 % respondents (51% spouses of migrants and 61% of non-migrants) never used condom with husbands. Only 14% respondents in the migrant group and 3.6% in non-migrant group had used it to prevent STI. Of total users, only 37.5% respondents used it on their last sexual contact. More spouses of migrants had used it on their last sexual contact (45.8% and 26.8%, OR=2.3, CI= 1.1-4.9). Among those who did not use condom on last sex, 50% women did not use because of using other contraceptive, 32.5% did not use due to dislike.

Table 1: Condom using practices of spouses with husbands

| Characteristics | Non-migrants (n=143) | | Migrants (n=146) | | Total | |
|---|---|---|---|---|---|---|
| | No | % | No. | % | No. | % |
| **Had ever used condom with husbands** | | | | | | |
| Yes | 56 | 39.2 | 72 | 49.3 | 128 | 44.3 |
| No | 87 | 60.8 | 74 | 50.7 | 161 | 55.7 |
| Total | 143 | 100.0 | 146 | 100.0 | 289 | 100.0 |
| **Reasons for using condom** | | | | | | |
| Contraceptive | 54 | 96.4 | 62 | 86.1 | 116 | 90.6 |
| STI prevention | 2 | 3.6 | 10 | 13.9 | 12 | 9.4 |
| Total | 56 | 100.0 | 72 | 100.0 | 128 | 100.0 |
| **Use of condom on last sex with husbands** | | | | | | |
| Yes | 15 | 26.8 | 33 | 45.8 | 48 | 37.5 |
| No | 41 | 73.2 | 39 | 54.2 | 80 | 62.5 |
| Total | 56 | 100.0 | 72 | 100.0 | 128 | 100.0 |
| **Reasons for not using condom on last sex** | | | | | | |
| Dislike | 10 | 24.4 | 16 | 41.0 | 26 | 32.5 |
| Planned for children | 9 | 22.0 | 5 | 12.8 | 14 | 17.5 |
| Using other contraceptive | 22 | 53.7 | 18 | 46.2 | 40 | 50.0 |
| Total | 41 | 100.0 | 39 | 100.0 | 80 | 100.0 |

### Socio-demographic characteristics and condom use by spouses with husbands

Respondents who were 20 years or below were more likely to use condoms as compared to the respondents who were more than 30 years (OR=3.0 CI=1.2-8.0). Literates were more likely to use it (OR=1.9, CI=1.07-3.31). Hindus were more likely to use condoms (OR=2.7, CI=1.2-6.3). Condom use was 1.8 (CI=1.2-2.9) times higher among those whose husbands' age was less than thirty years. Respondents whose husband spent less than a month at home on their last visit were more likely to use it (OR=2.0, CI=1.0-3.9) than those spending more time.

Table 2: Socio-demographic characteristics and condom use by spouses with husbands

| Characteristics | Condom use | | | | p value | OR (CI) |
|---|---|---|---|---|---|---|
| | Yes | | No | | | |
| | No. | % | No. | % | | |
| **Age of the respondents** | | | | | | |
| ≤ 20 years | 17 | 68.0 | 8 | 32.0 | | 3.0 (1.2-8.0) |
| 21 to 30 years | 87 | 42.2 | 119 | 57.8 | | 1.0 (0.6-1.8) |
| > 30 years | 24 | 41.4 | 34 | 58.6 | | Reference |
| **Education of the respondents** | | | | | | |
| Illiterate | 23 | 32.9 | 47 | 67.1 | | Reference |
| Literate | 105 | 47.9 | 114 | 52.1 | | 1.9 (1.1-3.3) |
| **Religion of respondents** | | | | | | |
| Non-Hindu | 8 | 24.2 | 25 | 75.8 | | Reference |
| Hindu | 120 | 46.9 | 136 | 53.1 | | 2.7 (1.2-6.3) |
| **Age of husbands** | | | | | | |
| < 30 years | 65 | 52.0 | 60 | 48.0 | | 1.8 (1.2-2.9) |
| ≥30 years | 59 | 36.9 | 101 | 63.1 | | Reference |
| **Type of study population** | | | | | | |
| Non-migrants | 56 | 39.2 | 87 | 60.8 | 0.08 | |
| Migrants | 72 | 49.3 | 74 | 50.7 | | |
| **Duration spent by husbands at home on last arrival** | | | | | | |
| < one month | 41 | 58.6 | 29 | 41.4 | | 2.0 (1.0-3.9) |
| ≥ one month | 31 | 40.8 | 45 | 59.2 | | Reference |

**Socio-demographic characteristics and condom use among migrants and non-migrants**

Education was not statistically significant with condom use among spouses of non-migrants however, it was among spouses of migrants (OR=3.6, CI=1.6-8.0). Age of respondents and of their husbands was statistically significant with condom use among spouses of migrants. Migrants whose age was less than 30 years were more likely to use condoms (OR= 2.4, CI=1.2-4.7).

Table 3: Socio-demographic characteristics and condom use among migrants and non-migrants

| Characteristics | | Condom use | | OR (CI) |
|---|---|---|---|---|
| | | Yes | No | |
| **Education** | | | | |
| Non-migrants | Illiterate | 13 | 20 | Reference |
| | Literate | 43 | 67 | 0.9 (0.4-2.2) |
| Migrants | Illiterate | 10 | 27 | Reference |
| | Literate | 62 | 47 | 3.6 (1.6-8.0) |
| **Age of the respondents** | | | | |
| Non –migrants | 20≤ years | 6 | 6 | 1.4 (0.4-5.4) |
| | 21 to 30 years | 38 | 64 | 0.8 (0.4-1.9 |
| | > 30 years | 12 | 17 | Reference |
| Migrants | 20≤ years | 11 | 2* | 7.7 (1.4-41.7) |
| | 21 to 30 years | 49 | 55 | 1.2 (0.6-2.9) |
| | > 30 years | 12 | 17 | Reference |
| **Age of husbands** | | | | |
| Non-migrants | < 30 years | 27 | 36 | 1.4 (0.7-2.9 |
| | ≥30 years | 26 | 51 | Reference |
| Migrants | < 30 years | 38 | 24 | 2.4 (1.2-4.7) |
| | ≥30 years | 33 | 50 | Reference |

**Demand for condom by spouses with husbands**

Out of total, 61% never asked for condom with husbands to use with them. However, only 30.7% of them had asked for it to prevent of STI. Spouses of migrants were more likely to ask for condom (OR= 2.7, CI=1.7-4.4). Only one respondent from non-migrants asked for condom to prevent STI.

Table 4: Demand for condom by spouses with their husbands

| Characteristics | Non-migrants | Migrants | Total | OR (CI) |
|---|---|---|---|---|
| **Had ever demand for condom** | | | | |
| Yes | 40 (27.2) | 74 (50.3) | 114 (38.8) | 2.7 (1.7-4.4) |
| No | 107 (72.8) | 73 (49.7) | 180 (61.2) | Reference |
| **Reasons for demand** | | | | |
| As contraceptive | 39 (97.5) | 40 (54.1) | 79 (69.3) | |
| To prevent STI | 1 (2.5) | 34 (45.9) | 35 (30.7) | |

(Note: values in parenthesis indicate percentage)

## DISCUSSION

The study revealed that more than half of women had never used condom in their marital life and majority used it as contraceptive. This barrier method has its triple protection such as prevention from pregnancy, prevention from HIV transmission by sexual contact, and prevention from infertility in woman[9]. However, it is mostly understood as a contraceptive method. Half of the respondents did not use it on their last sexual act because they were using other contraceptives and one third did not use because of dislike which is similar with the study. The studies conducted in western and mid-far western of Nepal revealed that use of condoms by labor migrants during the last sex act with wives was low[10,11]. Most did not used it because of using other contraceptive[10]. The great majority of migrant workers in the Western region (77.4%) and in the mid to far western region (63.5%) had never used a condom with their wife and over half of the respondents reported not having used a condom because they didn't think it was necessary/didn't think of it[11]. For a long period, condom had been used primarily for contraception, not for disease prevention and condom use rates are generally low among the population[12].

Condom use on last sex act was significantly higher among migrants. This is consistent to the study conducted among Mexican migrants revealed that condom use was greater among male migrants than male non migrants[13]. However, a study in Viet Nam revealed that none of the male migrant respondents use condoms with their wives[12]. Education and younger age seems to be associated with higher rate of condom use among migrants. The age relation could be attributed to education, knowledge of the contraceptives, and incomplete family which necessitates preference of temporary contraceptive. Men who were younger than 35 years were significantly more likely to have ever used of condom[14]. Use of condom was 2 times higher among those migrants who spent less than a month at their home on their last visit than those living longer. It seems they used it for temporary contraceptive.

In the study, spouses of migrants were more likely to ask for condom. Similarly, Spouses of migrants thought that their husbands might establish extramarital sexual relationship with other women and commercial sex workers in the absence of wives while being in away from home[15]. However use of condom requires mutual consent. People were relatively receptive to condom use if it was in non-marital relationships but use of condom was entirely non-existent within marital relationship as a safe sex measure[16].

Consistent use of condom with husbands and demand for condom to prevent STI is low in both groups.

## CONCLUSIONS

Use of condoms on last sex significantly higher among spouses of migrants but still low. It is least practiced for the prevention of STI in both groups. Demand for condom to prevent STI is also low among spouses of migrants and almost non-existent among non-migrants. Awareness program on condom use should be planned for both groups. It should be promoted as a dual protective method between couples in the community.

## REFERENCES


1. Ministry of Health and Population. Annual Report, 2007/2008, Department of Health Service. Kathmandu: Ministry of Health and Population, Nepal, 2009.
2. National Centre for AIDS and STD Control. Cumulative HIV and AIDS situation of Nepal. Kathmandu: Ministry of Health and Population, Nepal, National Centre for AIDS and STD Control. April, 2009.
3. National Centre for AIDS and STD Control. Cumulative HIV and AIDS Situation of Nepal. Kathmandu: Ministry of Health and Population, Nepal, National Centre for AIDS and STD Control. August, 2010.
4. Ministry of Health and Population. Annual Report, 2009/2010. Department of Health Service. Kathmandu: Ministry of Health and Population, Nepal. 2011; 187-208.
5. Poudel KC, Jimba M, Okumura J, Joshi AB, Wakai S. Migrants' risky sexual behaviors in India and at home in far western Nepal. *Trop Med Int Health*. 2004; 9: 897-903.
6. Poudel BN, Sharma S, Singh GB, Dhungana GP, Poudel P. Socio-demographic profile of HIV Patients at Seti Zonal Hospital. *J Nepal Health Res Counc*. 2008 Oct; 6 (13): 107-10.
7. Stevens LL, Shrestha B, Pandey P. Influence of mobility patterns on Cross-border HIV treatment and care. *Family Health International*, Nepal. 2008.
8. Nepal B. Population mobility and spread of HIV across the Indo-Nepal border. *J Health Popul Nutr*. 2007 Sep; 25 (3): 267-277.
9. Brady M. Preventing sexually transmitted infections and unintended pregnancy and safeguarding fertility: triple protection needs of young women. *J Reproductive Health Matters*. 2003; 11(22): 134-141.
10. Family Health International. Integrated bio-behavioral survey among male labor migrants in 11 districts in western and mid-far western regions of Nepal. *Family Health International (FHI),* Nepal. 2006; 10-35.
11. Family Health International. Integrated bio-behavioral survey among male labor migrants in 11 districts in western and mid-far western regions of Nepal-II Round. *Family Health International (FHI),* Nepal. 2008; 9-43.
12. Anh DN. The HIV/AIDS vulnerability of labor out-migrants and its consequences on the left-behind at the household level. Institute of Sociology, Hanoi, Viet Nam. 2005; 10-15.
13. Rodrıguez CM, Lemp G, Hernandez MT, Sanchez MA, Estrada F. Going North: Mexican migrants and their vulnerability to HIV. *J Acquir Immune Defic Syndr*. 2009; 51: 21–25.
14. Lurie MN, Williams BG, Zuma K, Mkaya-Mwamburi D, Garnett G, Sturm AW, Sweat MD, Gittelsohn J, Abdool Karim SS. The impact of migration on HIV-1 transmission in South Africa. *Sex Transm Dis*. 2003 Feb; 30 (2): 149-56.
15. Cau B, Agadjanian V. Labor migration, spousal communication and HIV/STD risk perceptions and prevention. Centre for Population Dynamics, Arizona State University. Population Association of America Annual Meeting, New Orleans, LA, 2008; 17-19.
16. Jolly S, Ying W. Key Issues on Gender and HIV/AIDS in China, Report for DFID. 2003. Available from: *www.siyanda.org/docs_genie/jolly_aidschina.doc.*

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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Journal of
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2013
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# A Cross Sectional Study of Assessment of Relevance and Effectiveness of CHW Development System

**Talukder MHK[1], Nazneen R[2], Hossain MZ[3], Chowdhury IJ[4]**

[1]*Associate professor, Teaching Methodology, Centre for Medical Education (CME), Bangladesh*

[2]*Associate professor, OB/GYN department, HFRC Medical College and Hospital' Bangladesh*

[3]*Registrar, Sapporo Dental College, Dhaka, Bangladesh*

[4]*MO, Dhaka Shishu Hospital, Bangladesh*

**Key words**:
Community health workforce (CHW), Public health, Bangladesh.

## ABSTRACT

**Objectives:** To assess relevance and effectiveness of community health workforce (CHW) development system in Bangladesh.

**Methods**: This descriptive type of cross sectional study was conducted adopting purposive sampling technique. Study population was directors, administrators, principals, teachers of different institutes/organizations, community health workers working in different corners of Bangladesh. Study places were Dhaka, Sylhet, Jokigong, Sunamgong, Moulovibazar, Chittagong, Bogora, Rangpur, Sirajgonj, Mymensingh, Comilla, Noakhali, Jhenaidah, Pabna, Gazipur, Rajbari. Developed questionnaire and checklist were used for the collection of data. Data was also collected sending questionnaire and checklist and getting back those by courier service. The data was edited, processed and analysed by using SPSS soft ware and a few parts manually.

**Results**: Study revealed that all the respondents (100%) are in favor of production of CHW in Bangladesh (Part A: Table 1) through formal academic institutional or pre-service education (61.4%). Most of the respondents (56.8%) viewed that there are scopes of utilization of produced CHW in rural areas and most of the respondents (63.6%) also viewed that terminal/marginalized/ underprivileged people of hard to reach areas at least can be served by CHW. Regarding the competency of produced CHW few of the respondents (43.2%) viewed positively (Table 3). Most of the respondents (86.4%) viewed that both Government and non-government private sectors should produce CHW with a very good co-ordination and co-operation. Study revealed the institutional capacities or situations about physical facilities, ongoing course, audiovisual aids, library, man power and assessment procedure. Time constraint was a major factor due to PRL of previous DD (MA) or Programme manager to start and complete this activity.

**Conclusions:** Study revealed that there is strong and logical relevance for the production of CHW in Bangladesh. So the existing Human Resource for Health (HRH) policy is to be revised and revisited as a time felt need to develop more competent CHW for Bangladesh to serve the marginalized, terminal, people of remote, rural and hard to reach areas.

**Correspondence:**
*Dr. Md. Humayun Kabir Talukder*
*Associate professor, Teaching Methodology*
*Centre For Medical Education (CME), Bangladesh*
*Email: hktalukder@yahoo.com*

## INTRODUCTION

Community health workers (CHW) are lay members of communities who work either for pay or as volunteers in association with the local health care system in both urban and rural environments. They have been identified as community

health advisors, lay health advocates, promoters, outreach educators, peer health promoters, peer health educators and community health representatives. CHWs offer interpretation and translation services, provide culturally appropriate health education and information, assist people in receiving the care they need, give informal counseling and guidance on health behaviors, advocate for individual and community health needs, and provide some direct services such as first aid and blood pressure screening. They are community members who serve as frontline health care professionals. Generally they work with the underserved and are indigenous to the community and play a pivotal role in meeting the health care needs of frontier communities.

They help increase access to health services, improve quality of care, reduce health care costs, and contribute to broader social and community development[1].

As "in-between people", CHWs draw on their insider status and understanding to act as culture and language brokers between their own community and systems of care[2].

CHWs may be paid or unpaid/volunteer, and have varying levels of job-related education and/or training. According to the National Rural Health Association, the most significant commonalities of CHW programs are that:

- they are focused on reaching hard-to-reach populations
- the workers usually are indigenous to the target population
- their expertise is in knowing their communities rather than formal education[3].

Community Health Workforce development has a rich history in South East Asian Region (SEAR). In 1926 the first Community Health Unit was established in Kalutara, a small district in Sri Lanka. Since then many of the regional countries like, Thailand, Mayanmar, India etc., practiced different types of community based health workforce depending on the unique country requirements. In 1978 after the formal Alma Ata Declaration all most all the member countries are practicing many of the elements of the Primary health care (PHC). It has been 31 years, since the Alma Ata Declaration on Health for All through PHC. Community Health Workers were in the fore front workforce to bring about change through community health programmes to national levels.

Despite the importance of CHWs, the challenges of providing them with high-quality training opportunities can be problematic. In an issue paper on community health advisors, the National Rural Health Association (NRHA) states, "training of CHAs is variable in terms of quality and content" and considers it to be a major challenge to community health advisor programs[4].

## JUSTIFICATION

In Bangladesh there are different categories of health workforce serving in the health care delivery system named FWA, FWV, HA, SBA etc. But there are less formal academic institutes from where such types of different health workforces are produced. Within the last 3 years Government approved 14 institutes to produce CHW through one year certificate course who will mainly serve in the non Govt. sectors.

Most of the CHW get training after recruitment. The process of production of CHW is not effective, and as well as not need based and also not institutionalized. So it is very time felt need to assess the relevance and effectiveness of CHW development system in Bangladesh. In our context, effectiveness means "doing the right thing" and relevance refers to the pertinence, or applicablility of the activity of health workforce to the community.

## GENERAL OBJECTIVES

To assess the relevance and effectiveness of community health workforce development system in Bangladesh.

## SPECIFIC OBJECTIVES

To identify the present status and to assess the strengths, weaknesses, opportunities & threats of community health workforce development system in Bangladesh in terms of infrastructures, logistics, teaching facilities and manpower for production of community health workforce.

## METHODS

The study was a descriptive, cross sectional study that took place in different districts of Bangladesh. Participants were the directors, administrators, principals and teachers of different institutes/organizations and also Community Health Workers for the period of 6 months (1st November 2010 to 30th April 2011).

Available documents on CHW production and organization in Govt. and non Govt. sectors of Bangladesh were studied. Purposive sampling was done and questionnaire and checklist for data collection were developed after literature review followed by consultation with the concerned persons and subject specialists.

Pre-testing of the questionnaire and checklist were done outside the study area. According to the feed back of the pre testing, corrections were made in the tools. Questionnaire and checklist were used for the collection of information from the institutes/ organizations. Data was also collected sending questionnaire and checklist and getting back those by courier service after telephonic communication.

Data was then edited, processed and analyzed by using SPSS soft ware and also a few parts manually.

Regarding ethical issues, prior permission was taken from the concerned authority. Confidentiality and anonymity were assured and maintained.

# RESULTS

## Part –A (Through Questionnaire)

Table 1: Distribution of the respondent by their opinion whether they think production of Community Health Workforce (CHW) is essential for Bangladesh

| Opinion of the respondent about production of Community Health Workforce (CHW)HW is essential for Bangladesh | Frequency | |
|---|---|---|
| | Yes (%) | No (%) |
| | 44 (100) | 0 |

Study revealed that all the respondents (100%) are in favor of production of CHW in Bangladesh.

Table 2: Distribution of the respondent by their opinion regarding the time when they feel for training to produce CHW (n= 44)

| Opinion regarding the time when training to be imparted to produce CHW. | Frequency | Percent (%) |
|---|---|---|
| Pre service education (Before job through formal academic institutes) | 27 | 61.4 |
| In service training (Just after recruitment) | 11 | 25.0 |
| In service training (Within job/during service time) | 6 | 13.6 |

Table 2 shows the opinion regarding the time when the respondents feel for training to produce CHW through formal academic institutional or pre service education (61.4%).

- *Responses are more than 100% due to multiple response.*

Table 3: Distribution of the respondent by their opinion regarding different events for production of CHW in Bangladesh

| Opinion regarding different events for production of CHW in Bangladesh | Different levels of opinion | | | | | |
|---|---|---|---|---|---|---|
| | Strongly agree (SA) | Agree (A) | Undecided (U) | Disagree (D) | Strongly disagree (SD) | Total |
| After recruitment of certain group of people for job as CHW training for them on different issues as before is sufficient for production of CHW in Bangladesh. | 14 (31.8%) | 12 (27.3%) | 6 (13.6%) | 9 (20.5%) | 3 (6.8%) | 44 |
| The system/process of production of CHW through Institutes of CHW is all right. | 16 (36.4%) | 14 (31.8%) | 1 (2.3%) | 10 (22.7%) | 3 (6.8%) | 44 |
| Scope of organization of CHW in Bangladesh is enough specially in rural areas. | 25 (56.8%) | 7 (15.9%) | 7 (15.9%) | 2 (4.5%) | 3 (6.8%) | 44 |
| Terminal/marginalized/ underprivileged/ people of hard to reach areas at least can be served by CHW. | 28 (63.6%) | 16 (36.4%) | - | - | - | 44 |
| Produced Community Health Workforces (CHW) in this country competent enough to serve the targeted community. | 7 (15.9%) | 19 (43.2%) | 5 (11.4%) | 10 (22.7%) | 3 (6.8%) | 44 |

Table 3 shows that most of the respondents (56.8%) viewed that there are scopes of utilisation of produced CHW in rural areas and most of the respondents (63.6%) also viewed that terminal/ marginalized/underprivileged/peoples of hard to reach areas at least can be served by CHW. Few of the respondents (43.2%) viewed positively about the competency of produced CHW.

Table 4: Distribution of the respondent by their opinion regarding sector which can produce CHW

| Opinion regarding sector which can produce CHW. | Different levels of opinion | | | |
|---|---|---|---|---|
| | Govt. sector | Non govt. sector | Both govt. & non govt. sector | Total |
| | 5(11.4%) | 1(2.3%) | 38(86.4%) | 44 |

Table 4 shows that most of the respondents (86.4%) viewed that both Government and non-government sectors should produce CHW with a very good co-ordination and co-operation.

Table 5: SWOT Analysis in regards to the production of CHW in Bangladesh

| Strengths | Weaknesses | Opportunities | Threats |
|---|---|---|---|
| 1. Available personnel as trainees & trainers. | 1. Lack of manpower and instruments. | 1. There is a developed curriculum by SMF. | 1. Heterogeneous way of production of CHW. |
| 2. Enough Facilities are available in both sectors. | 2. Lack of co-ordination among institutes, DGHS & DGFP. | 2. The program can be coordinated easily by SMF, there are job opportunities, particularly in community clinics and urban slums. | 2. Ongoing different programs will deteriorate the quality of services of CHW. |
| 3. MATS can also run CHW programmes. | 3. Attitude of business rather than academic and/ or social welfare. | 3. Opportunities for self employment are there. | 3. If job opportunities are not ensured, future unrest may result. |
| 4. There are enough target population. | 4. No standard uniform course curriculum. | 4. Need more production CHW in Bangladesh. | 4. No standard uniform curriculum. |
| 5. Health infrastructures for CHW already exists at community clinics and in NGOs. | 5. Poor teaching-learning or training. | 5. Existing institutes and infrastructures present. | 5. Reduced quality of produced CHW. |
| 6. There are 20 govt. approved institutes and 12 applied for permission. | 6. Services for target population are not well defined. | 6. The CHW producing training is institution based following uniform course curriculum of 1 year. | 6. Conflict of interest will be raised between old staff & new staff by designation . |
| 7. One year course for CHW is running at different institutes under DGHS & SMF. | 7. Job descriptions for CHW is not nationally established and uniform. | 7. Literacy rate is increasing & a lot of educated both male & female are coming forward to join this CHW course. | 7. Problems of quality also in non-government sectors. |
| 8. Heath facilities are up to grass root level where CHW can work. | 8. Less number of institutions, no definite guidelines. | 8. Good GO-NGO collaboration. | 8. No structured guidelines, no job assurance, no future planning . |
| 9. Existing good GO-NGO collaboration. | 9. Lack of good planning of production & utilization of CHW. | 9. In many organizations man power can be utilized to train as CHW among rural population. | 9. Selection/ Recruitment variation of CHW. |
| 10. Commitment of Govt. to provide health care services will help government to increase & improve health indictors. | 10. Less institutes for production of CHW as per demand. | 10. Lots of scopes of primary health care, essential service packages & family planning services by CHW. | 10. Institutional capacity development is not properly done. |
| 11. At present about 905 personnel can be trained yearly by 20 training institute. | 11. No job guarantee for CHW. | 11. Having enough educated manpower for training. | 11. Non co-operation from concerned authority & lack of positive attitude for establishment of the centre. |
| 12. Having enough manpower to be trained and also to run the CHW course. | | | 12. If quality is not controlled & government organization not involved in admission procedure, the programme will fail and people will not get good services. |

Table 5 shows distribution of physical facilities as per institutes shows that in half of the cases, the building is owned by the institutes. Total space of the Institute ranges from, 2000 to 6000 sq. feet mostly. Most of the institutes had class rooms, tutorial rooms, conference room, auditorium, library, audiovisual section and patients' exposure facility.

In most of the institutes, the course curriculum offered is for community health worker (CHW), diploma in one institute and basic training for family welfare visitor (FWV) in one institute. Minimum requirement for admission was SSC passed, average number of students per year per institute was 50 -100 in all 16 institutes. Course duration is between 1-3 years, with permission and affiliation from DGHS/ MOH and FW.

Majority of the institutes had minimum teaching aids, such as computer, multimedia, over head projector, slide projector, film projector, black board/white boards etc.

Distribution of library as per Institutes space 300-1200 sq. ft. seats about 50, total No of books 2000-7000 with availability of Journals.

Majority of the Institutes had manpower of average 10-15 per institute. Only NIPORT, Dhaka had 34 doctors and 22 nurses. Institutes of Chittagong, Sylhet, Pabna, Rajbari, Gazipur and Dhaka had formal assessment system.

## DISCUSSION

'Public health' is the organized response by society to protect and promote health, and to prevent illness, injury and disability. The workforce involved in this enterprise ranges from those who identify as public health professionals to those who may undertake aspects of public health functions in the course of their health or other related work.

Public health functions occur at a number of levels. Commonwealth, State and Territory Governments are primarily concerned with the setting of public health policy, determining broad resource allocation and providing an appropriate regulatory framework. Governments need to be informed by population based research and surveillance systems. Current demand for public health skills reflects the diversity of related issues and the public health workforce, as well as the better understanding of the comprehensive range of competencies required to deliver appropriate and evidence-based services. There is a need for an improved focus for investment in public health resources which has the capacity to respond to public health priorities, recognizes a greater range of opportunities for effective education and training, having regard in particular for workforce, locus of employment, location and need for flexibility, and seeks out partnerships.

More specifically, there are workforce implications flowing from the Partnership Group's Work Program including research and development, information development, harmonisation of public health regulatory frameworks and stronger national monitoring and surveillance systems[6].

In United States, the Bureau of Labor Statistics projected that between 2000 and 2010, the work force they need is in shortage and accordingly the capacity building was planned.

Rural health care facilities include a wide variety of services along the continuum of care: nursing home, assisted living, home health, hospital, clinic, oral health, mental/behavior health, emergency, and pharmacy[1].

Recent trends make clear that the struggle to find employment is widespread and that people at the low-wage and less educated end of the employment spectrum face an increasingly uphill battle to find jobs that pay adequately. As the growth of the economy has slowed, job growth is concentrated in positions requiring skills that are hard to find among the unemployed[2].

Bangladesh has managed to develop nation wide network of medical colleges, nursing and paramedical institutes. As per DGHS Health Bulletin 2009, there are 59 medical colleges (41 of them are private), 13 nursing colleges (7 of them are private), 69 nursing institute (22 of them are private), 17 medical assistant training schools (10 of them are private), and 16 institutes of health technology (13 of them are private). In spite of this growth to health workforce production, Bangladesh is still having health workforce shortage and skill mix and geographical imbalances. The World Health Report 2006 identified Bangladesh among 57 countries with critical shortage of doctors, nurses and midwives (Compared to WHO identified threshold of 2.28 doctors, nurses and midwives per 1000 population, Bangladesh has 0.56 per 1000 population). The Nurses: Doctors' ratio is below 1:1, which is among the lowest group in the world.

Repeated assessments have shown that there are major quality gaps in the teaching learning process and environment in health workforce education institutes. The recent growth of the non-government health professionals' education sector has increased the need of having functioning health professionals' regulatory bodies, which can work closely with the related government agencies to ensure the quality of education and practice. There is no recognized body to ensure the quality of public health education and accredit the related courses[3].

Over 80% of Bangladeshi's turn to non-state providers as a first port of call when they fall ill. These health care providers include traditional healers, traditional birth attendants, village doctors, drug stores and NGO trained community health workers. Bangladesh Health Watch has discovered that there are only 5 physicians and 2 nurses per 10,000 of the population as opposed to 12 village doctors and 11 drug sellers. Community members often value informal providers as they only charge for the drugs, not the consultation. They also offer flexible payment schemes.

The report looks at the strengths and weaknesses of providers and offers suggestions for where improvements can be made. It is not uncritical of the quality of health service that is often supplied by informal providers but it argues that this is a reason that they should be trained and managed effectively. They conclude that the quality of care - across the board in the public and private sectors - needs improvement. Currently,

unqualified providers give drugs and advice but rarely rely on laboratory testing or refer appropriately to the formal sector. This leads to problems related to the inefficient and improper prescribing of drugs which can lead to continuing ill health and impoverishment[4].

Bangladesh is identified as one of the countries with severe health worker shortages. However, there is a lack of comprehensive data on human resources for health (HRH) in the formal and informal sectors in Bangladesh. This data is essential for developing an HRH policy and plan to meet the changing health needs of the population. This paper attempts to fill in this knowledge gap by using data from a nationally representative sample survey conducted in 2007[5]. The shortage of qualified health workers, especially in low-income countries, has drawn attention in recent times, as it seriously threatens the attainment of the millennium development goals (MDGs)[6].

## LIMITATIONS

Due to PRL, transfer of the previous DD (MA) /programme manager and also due to in absence of regular posting of the DD (MA) the work could not be done using the allocated time. So time constraint was important factor also to complete the work due to developed situation.

## REFERENCES


1. Report of regional consultation of strategic plan for health workforce. Bali, Indonesia, December 2006, 18-20. World Health Organization, Regional Office for South-East Asia, New Delhi, May 2007.
2. Training community health workers. Using technology and distance education. The health resources and services administration's office of rural health policy with the frontier education center under contract number HHSH250200436014C (April 2006).
3. Mary Beth Love, Community health workers: Who they are and what they do. 1997; 24(4): 510-522.
4. Dhaka declaration, Strengthening health workforce in countries of the South-East Asia region. Dhaka, 22 August, 2006.
5. Accreditation guideline for educational/training institutions and programmers in public health. Report of the regional consultation, Chennai, India, 30th January- 1 February 2002.
6. National public health partnership public health workforce development background paper. Jun 1998. Bangladesh.
7. National organization of state offices of rural health. Revised September 2006. Bangladesh.
8. Policy Statement 31: Workforce Development Systems. Bangladesh.
9. Strengthened health system. Human resources for health. World health organization. Country office for Bangladesh.
10. Institute of development studies. Health workforce in Bangladesh: Who constitutes the healthcare system? Bangladesh.
11. Ahmed SM, Hossain MA, Ahmed M, Chowdhury R, Bhuiya AU. The health workforce crisis in Bangladesh: shortage, inappropriate skill-mix and inequitable., February 2011; 9(3). Bangladesh.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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# Infant and Young Child Feeding Practices Among Mothers in Rural Areas of Mahottari District of Nepal

**Yadav DK[1,2], Gupta N[1], Shrestha N[3]**

[1]*Faculty of Health Sciences, Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, India*
[2]*School of Health and Allied Sciences, Pokhara University, Nepal*
[3]*Valley College of Technical Sciences, Mahrajgunj, Kathmandu*

**Key words**:
Breastfeeding,
Nutritional knowledge,
Child feeding practices,
Children.

## ABSTRACT

**Background:** Improvement of exclusive breast feeding practices, adequate and timely complementary feeding, along with continued breast feeding for up to two years or beyond, could save annually the lives of 1.5 million children under five years of age.

**Objectives:** The objective of this study was to assess infant and young child feeding practices of mothers having children 0 - 35 months of age.

**Methods:** An end-line data was analyzed and prepared this article from a study pre-post with controlled design that was conducted in Mahottari district of Nepal in 2012.

**Results:** Majority (83.3%) of children received colostrums and similarly 74.3% and 13.7% of children received breast milk within one hour of birth and within first day of life respectively. 25.7% mothers did not initiate breast feeding within 1 hour of birth and 19.9% mothers of children aged 6 months or more did not exclusively breastfeed their babies up to 6 months. Participants response that eight in ten (85.7%) and seven in ten (72.8%) reported that they had heard of iron and vitamin A respectively.

## INTRODUCTION

Malnutrition in all its forms, either directly or indirectly, is responsible for approximately half of all deaths worldwide. This applies to perinatal and infectious diseases as well as chronic diseases. Malnutrition accounts for 11% of the global burden of disease, leading to long-term poor health and disability and poor educational and developmental outcomes[1].

Maternal and child mortality have declined significantly in Nepal to the extent that Nepal is on track to meet the Millennium Development Goals for maternal and child mortality. Similar improvements have not been seen in general nutrition status of them[2].

Many children deaths are possibly associated with inappropriate feeding practices during early years of life. Only 35% of infants world-wide are exclusively breastfed during the 1st four months of life and complementary feeding begins either too early or too late with foods, which are often nutritionally inadequate and unsafe. Poor feeding practices in infancy and early childhood, resulting in malnutrition, contribute to impaired cognitive and social development, poor school performance and reduced productivity in later life[3].

Improvement of exclusive breastfeeding practices, adequate and timely complementary feeding, along with continued breast feeding for up to two years or beyond, could save annually the lives of 1.5 million children under five years of age[4].

The present study was undertaken in a rural area of Mahottari district of Nepal and objective of the study was to assess infant and young child feeding practices of mothers having children 0 - 35 months of age using the feeding indicators.

## METHODS

An end-line data was analyzed and prepared this article from the study that was conducted pre-post with controlled design

**Correspondence:**
*Dipendra Kumar Yadav*
*PhD Scholar, Faculty of Health Sciences*
*Sam Higginbottom Institute of Agriculture, Technology and Sciences, Allahabad, India*
*Email: dipendrayadavph@gmail.com*

conducted in Mahottari district of Nepal in 2012. Study population was children under three years of age and their mothers. Desired numbers of participants were selected by using formula given below and a total 615 sample size was selected for the study.

$$n = D [(Z1+ Z2)2 * (P1 (1 - P1) + P2 (1 - P2)) / (P2 - P1)2]$$

This study adopted stratified sampling. Unit of study was selected by applying following stages.

First Stage: Mahotarri district was selected purposively and the district (76 VDCs) was divided into three stratums according to geographical location (North, Middle and South Part) in terms of caste, food taboos and health behavior and practices.

Second Stage: Names of all VDCs were recorded alphabetically in separate stratum. Four VDCs from each stratum were selected randomly. Twelve VDCs were selected for study.

In the final stage: Each VDC consists of nine wards. Five wards were selected randomly from each VDC and at least ten respondents were selected from each ward by Expanded Programme on Immunization (EPI) method of household's selection sampling technique, excluding one municipality because this research was conducted in rural areas only. Only one child aged less than three years (0 to 35 months completed age) was recruited for the study from each selected household randomly if the household had more than one child. If in the selected house, there was no child, then the house was skipped and the next house was selected for the study. If for any reason, one selected house could not be surveyed (refusal of the house occupants) then the house was not substituted by another one.

Interview schedule focused on socio-demographic conditions, nutrition and feeding behaviors and child seeking practices were collected from mothers.

Ethical Approval was taken from Sam Higginbottom Institute of Agriculture, Technology & Sciences, Allahabad, India and Nepal Health Research Council, Kathmandu, Nepal.

## RESULTS

A total of 708 children of age less than 3 years and their mothers were selected for this study.

Table No. 1: Demographic and socio-economic characteristics of participants

| Characteristics | Number (n= 708) | Percentage |
|---|---|---|
| Age of mother | | |
| 16 to 19 years | 51 | 7.2 |
| 20 to 29 years | 525 | 74.2 |
| 30 to 39 years | 132 | 18.6 |
| Average age ± SD | 25.01± 4.39yrs | |
| Family Income Monthly | | |
| 1000 to 4999 Rupees | 120 | 16.9 |
| 5000 to 9999 Rupees | 477 | 67.4 |
| 10000 to 19000 Rupees | 111 | 15.7 |
| Average income ± SD | 7020.23± 3969.58 NRs | |
| Educational status of mother | | |
| Illiterate | 456 | 64.3 |
| Non- formal | 108 | 15.2 |
| Primary | 71 | 10.0 |
| Secondary | 51 | 7.2 |
| Intermediates | 14 | 2.2 |
| Bachelor & above | 8 | 1.1 |
| Religion | | |
| Hindu | 560 | 79.1 |
| Muslim | 148 | 20.9 |
| Age of children (in month) | | |
| <= 12 | | |
| 13-24 | 223 | 31.5 |
| 25-35 | 168 | 23.7 |
| Median age | 14.5 | |
| Sex of children | | |
| Female | 339 | 47.9 |
| Male | 369 | 52.1 |

In this study, 74.2% (525) of the mothers were aged between 20 and 29 years, while 7.2% (51) mothers were in their teens (16-19 year). Mean age of mother was 25.01± 4.39 years. Mean age of children 44.8% (317), 31.5% (223) and 23.7% (168) out of 708 children were 0-12 months, 13-24 months and 25-35 months of age respectively. Median age of children was 14.5 months. 64.3% of the mothers were illiterate and 7.2% passed the secondary level. Overall female literacy status was 35.7%.

Table 2: Knowledge on iron and vitamin A

| Characteristics | Number (n=708) | Percentage |
|---|---|---|
| **Ever heard about iron** | | |
| Yes | 607 | 83.7 |
| No | 101 | 14.3 |
| **Knowledge of Food sources of iron*** | | |
| Green leafy vegetables | 455 | 74.9 |
| Legumes | 242 | 39.9 |
| Millet | 176 | 29.0 |
| Milk/milk product | 133 | 21.9 |
| Meat/Liver | 206 | 33.9 |
| **Ever heard about vitamin A** | | |
| Yes | 516 | 72.8 |
| No | 192 | 27.2 |
| **Knowledge of Food sources of vitamin A*** | | |
| Green leafy vegetables | 479 | 92.8 |
| Yellow fruits | 283 | 54.8 |
| Meat/Fish | 165 | 31.9 |
| Milk | 211 | 40.9 |

(*Because of multiple answers, percentages add up to more than 100).

Participants were asked if they had heard of iron and vitamin

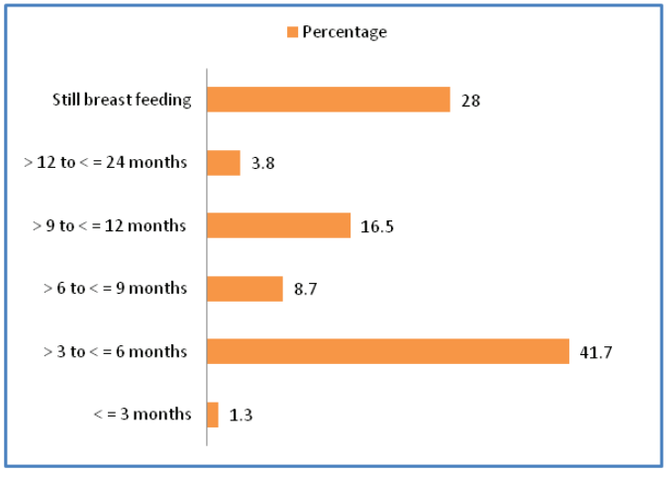
A. On response, around eight in ten (85.7%) and seven in ten (72.8%) reported that they had heard of iron and vitamin A respectively.

Table 3: Feeding practices to children

| Characteristics | Number (n=708) | Percentage |
|---|---|---|
| **Child given colostrums** | | |
| Yes | 590 | 83.3 |
| No | 118 | 16.7 |
| **Initiation of breastfed after birth** | | |
| Within 1 hour of birth | 526 | 74.3 |
| Within 1 day of birth | 97 | 13.7 |
| Next day after birth | 41 | 5.8 |
| Never breast feed | 16 | 2.2 |
| Don't know | 28 | 4.0 |

Majority (83.3%) of children received colostrums and similarly 74.3% and 13.7% of children received breast milk within one hour of birth and within first day of life respectively.

Fig 1: Status of breast-feeding




74.3% (526) children were put to breast feeding within 1 hour of birth. 80.1% children were fed exclusively with breast milk, while 63% children aged 5-8 months received solid, semi-solid or soft foods.

## DISCUSSION

A total of 708 children of age less than 3 years and their mothers were selected for this study. 74.2% (525) of the mothers were aged between 20 and 29 years, while 7.2% (51) mothers were in their teens (16-19 year). Mean age of mother was 25.01± 4.39 years. Mean age of children was 44.8% (317), 31.5% (223) and 23.7% (168) out of 708 children were 0-12 months, 13-24 months and 25-35 months of age respectively. Median age of children was 14.5 months. 64.3% of the mothers were illiterate and 7.2% passed the secondary level. Overall female literacy status was 35.7%.

Participants were asked if they had heard of iron and vitamin A. On response, around eight in ten (85.7%) and seven in ten (72.8%) reported that they had heard of iron and vitamin A respectively. Regarding knowledge of the source of iron, participants reported that green leafy vegetables (74.9%), legumes (39.8%) and meat (33.9%) are good sources of iron. Nine in ten participants reported that green leafy vegetables contain vitamin A. Yellow fruits and animal foods were also mentioned by a considerable number of participants as the source of vitamin A.

Joshi, Adhikari *et al*. studied respondents, who said that green leafy vegetables (69.3%), legumes (52.2%) and meat or liver (53%) are good sources of iron[5]. Eight in ten participants said that green leafy vegetables contain vitamin A while yellow fruits and animal foods were also mentioned by a considerable number of participants as the source of vitamin A. This difference could be due to regional differences of participants.

Majority (83.3%) of children received colostrums and similarly 74.3% and 13.7% of children received breast milk within one hour of birth and within first day of life respectively. According to NDHS report, initiation of breast feeding within one hour and within first day of birth is 31.3% and 63.8% respectively in central Terai of Nepal. This difference could be due to a smaller sample size of our study.

Feeding practices play a critical role in child development. Poor feeding practices can adversely impact the health and nutritional status of children, which in turn has dire consequences for their mental and physical development. Early initiation of breast feeding is important for both the mother and the child. Early suckling stimulates the release of prolactin, which helps in the production of milk, and oxytocin, which is responsible for the ejection of milk. It also stimulates contraction of the uterus after child birth and reduces postpartum blood loss. The first liquid to come from the breast, known as colostrum, is produced in the first few days, after delivery. Colostrum is highly nutritious and contains antibodies that provide natural immunity to the infant.

74.3% (526) children were put to breast feeding within 1 hour of birth. 80.1% children were fed exclusively with breast milk, while 63% children aged 5-8 months received solid, semi-solid or soft foods. Subedi, Paudel *et al* studied in Nepal and they found out that three out of four children were fed colostrums by their mother[8]. About 82% of the mothers had practiced exclusive breast feeding and 90% of them had initiated complementary feeding at the age of six months of their child. This difference could be due to a distinct study area and study population.

## CONCLUSIONS

From the findings of the study it was found that 25.7% mothers did not initiate breast feeding within 1 hour of birth and 19.9% mothers of children aged 6 months or more did not exclusively breastfed their babies up to 6 months. Participants response that eight in ten (85.7%) and seven in ten (72.8%)

reported that they had heard of iron and vitamin A respectively. Lack of adequate knowledge of the mothers, culturally prevailing misconceptions and lack of sustained support and motivation of mothers, particularly working mothers are major contributors to the prevailing situation. Thus to make a good rapport between health workers and community people and increase the acceptance of services there should be regular provision of services, and the supply should be made timely. To achieve this it is important to increase and strengthen the IEC activities being served in the communities so that they understand the need, utility, and importance of various health services components.

## ACKNOWLEDGEMENTS

We wish to express our sincere thanks to Mahottari District Health Office for providing permission to conduct this study, to the Ethical Committee for ethical approval and FCHVs for their willingness to take on the extra workload involved in the interventions. We are also indebted to all the participants for their active participation in this study.

## REFERENCES

1. World Health Organization, Turning the tide of malnutrition responding to the challenge of the 21st century. Nutrition for Health and Development (NHD): CH-1211 Geneva, Switzerland, 2000.
2. Codling K. Accelerating progress in reducing maternal and child undernutrition in Nepal. World Bank, 2011.
3. Das N, *et al.* Infant and young child feeding perceptions and practices among mothers in a rural area of West Bengal, India. *Ann Med Health Sci Res.* 2013; 3(3): 370-5.
4. Jones G, *et al*. How many child deaths can we prevent this year? *The Lancet*. 2003; 362: 65-71.
5. Joshi N, *et al.* Micronutrient supplementation for children in food insecure districts, in second round compliance report. New Era and World Food Program, Nepal, 2011.
6. Ministry of Health and Population, Nepal Demographic and Health Survey. 2011.
7. Prudhon C, *et al.* Proceedings of the WHO, UNICEF, and SCN informal consultation on community-based management of severe malnutrition in children. *Food Nutr Bull*. 2006; 27(3 Suppl): S99-104.
8. Subedi N, *et al.* Infant and young child feeding practices in Chepang communities. *J Nepal Health Res Counc.* 2012; 10(21): 141-46.
9. Black RE, *et al.* Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet.* 2008; 371(9608): 243-60.
10. Kilaru A, *et al.* Community-based nutrition education for improving infant growth in rural Karnataka. *Indian Pediatr*. 2005; 42(5): 425-32.
11. Shrestha BP, *et al.* Community interventions to reduce child mortality in Dhanusha, Nepal: study protocol for a cluster randomized controlled trial. *Trials Journal*. 2011; 12(136): 1-14.
12. Central Bureau of Statistics. Census report. Central Bureau of Statistics, Kathmandu, Nepal, 2011.
13. Malekafzali H, *et al.* Community-based nutritional intervention for reducing malnutrition among children under 5 years of age in the Islamic Republic of Iran. *East Mediterr Health J.* 2000. 6(2): 238-45.
14. Horodynski MA, Stommel M. Nutrition education aimed at toddlers: an intervention study. *Pediatr Nurs.* 2005. 31(5): 364, 367-72.
15. District Health Office. District Annual Report. Mahottari District Health Office, Jaleshwar, Nepal, 2013.
16. Kabahenda MK. Developing an intervention to improve the child-feeding behaviors of rural mothers in western Uganda, in Graduate Faculty, University of Georgia: Athens, Georgia, 2002.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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# Prevalence of Obesity Among Marwari Women of Kathmandu Valley

**Sharma TD[1], Gautam S[2]**

*[1]Dietician, Department of Medicine, Gandaki Medical College, Pokhara, Nepal*
*[2]Lecturer, Community Medicine Department, Gandaki Medical College, Pokhara, Nepal*

**Key words**:
Marwari,
Central obesity,
BMI,
Waist - Hip Ratio (WHR),
Wasit Circumference (WC),
Kathmandu.

## ABSTRACT

**Objectives:** The main objective of this study was to evaluate the prevalence of obesity among Marwari women residing Kathmandu valley 2009-2010.

**Methods:** This was a cross-sectional study that comprised 50 subjects using stratified cluster sampling. Interviewers recorded the data using the multidimensional questionnaire and anthropometric indexes. Body mass index (BMI) ≥23 Kg/m$^2$, Waist circumference ≥94 cm were categorized as overweight and central obesity for women respectively.

**Results:** Out of 55 cases in this study about 44% and 46% were found to be obese and overweight based on BMI and about 84% and 70% were found to be obese according to waist hip ratio and waist circumference. Central obesity was significantly associated with age, urbanization, luxurious life style and lack of physical exercises.

**Conclusions:** Central obesity was high and which might be the most serious health problem in the Marwari women where central obesity was more prevalent in married women than unmarried. Socio-demographic factors such as younger age, urbanization, marital status and sedentary life style were associated with central obesity. Further studies are necessary to establish the association between central obesity and various diseases due to obesity in the Marwari women residing in Kathmandu valley.

## INTRODUCTION

In today's world, obesity is no longer defined as a syndrome of wealthy societies; it is rather defined as a serious ailment that needs to be treated and is considered a major public health problem[1]. There are various risk factors, which are responsible for the weight gain and obesity in humans. Both the metabolic and behavioral factors such as leptin and life style can effect on overweight and obesity[2]. Obesity is a well-established risk factor for cardiovascular disease in the general population[3,4,5]. Cardiovascular disease is a leading cause of mortality and morbidity in developed and developing countries including Nepal. According to World Health Organization data, obesity is responsible for 80% of type 2 diabetes, 35% ischemic heart disease and 55% of hypertension[6]. Obesity lead to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance, Type 2 diabetes and hypertension rises steeply with increasing body fatness. Raised BMI also increases the risks of cancer of the breast, colon, prostate, kidney and gallbladder.

Overall about 2.5 million deaths are attributed to overweight/obesity worldwide[7,8]. The WHO definition is: a BMI greater than or equal to 25 is overweight and a BMI greater than or equal to 30 is obesity[9,10]. The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. In Europe, the prevalence of obesity (body mass index ≥30 Kg/m$^2$) in men ranged from 4.0% to 28.3% and in women from 6.2% to 36.5%[10]. Obesity is a major public health problem in developed countries especially in the United States, with one-third to one-half of adults affected.

**Correspondence:**
*Tara Devi Gautam ( Sharma)*
*Dietician, Department of Medicine*
*Gandaki Medical College, Pokhara, Nepal*
*Email:tara.devi390@gmail.com*

Nowadays, it also occurs in the developing countries. Obesity is associated with five out of ten leading causes of death and disability such as heart disease, diabetes, cancer, hypertension and stroke. An estimated 300,000 people die each year of illnesses related to obesity, more than the number killed by pneumonia, motor vehicle accidents and airlines crashes combined.

The main conclusion drawn from WHO MONICA project was that the prevalence of obesity is increasing worldwide at an alarming rate in both developed and developing countries. In many developing countries, obesity coexists with under nutrition.

In economically advanced regions even in the developing countries the prevalence rates of obesity may be as high as in developed countries. Another significant finding from the WHO MONICA project is that women generally have higher rates of obesity than men. Many other studies have also shown that the prevalence of obesity among women was higher than men.

For the past two decades, rapid and marked socioeconomic advancement in developing countries has brought about significant changes in the lifestyles of communities. These include significant changes in the dietary patterns, Changes in meal patterns are also evident where more families eat out, busy, executives skip meals, and the younger generations miss breakfast and rely too much on fast food.

The National Health and Morbidity Survey, conducted by the Ministry of Health in 1996 and 1997, found that 4.4 per cent and 16.6 per cent of the population were obese and overweight respectively. A study of 14,425 subjects in Nepal found that 32% were obese, 28% were overweight, 6.3% were diabetic and 34% had hypertension. Prevalence was higher in the less educated, those working at home and women[11].

The above mentioned evidence shows that the obesity is high in women and it is becoming a serious health problem to women and this is the reason behind doing the study for being familiar.

## METHODS

This was a cross sectional study conducted among 20-55 years Marwari women visiting VLCC Health care Pvt Ltd, residing in Kathmandu, Nepal from November 2008 to November 2009.

### Interviews and physical examination

A structured questionnaire was used to collect sociodemographic and clinical information including age, sex, ethnic group, marital status, 24 hours dietary recall (the number of meals, numbers of serving, amount and snacks eaten) and level of education. For weight measurement, participants wore only lightweight clothes and no shoes; the weighing scale was calibrated at the beginning of every session. Weight was recorded to the nearest 0.5 Kg. Their height was measured, to the nearest 0.5 cm. With the footwear removed, standing straight and looking forward, the participant's height was recorded at the point when the arm of the measuring rod was resting on the head. Height and weight were used to calculate body mass index (BMI) for each individual. BMI, WC and WHR were calculated and obesity was assessed. The BMI was calculated as the weight in kilograms divided by the height in square meters ($Kg/m^2$) as guided by World Health Organization (WHO 2000).

Table 1: BMI cut-offs for Asian population (WHO 2000)[12].

| Body Mass Index (BMI) kg/m2 | Classification |
|---|---|
| < 18.5 | Underweight |
| 18.5-22.9 | Normal |
| 23.0-24.9 | Overweight |
| >25.0 | Obese |

### RESULTS

Body Mass Index provides the most useful measure of obesity and it can be used to estimate the prevalence of obesity (WHO 1998). Therefore in present study, the prevalence of obesity was calculated according to the BMI as recommended by WHO 2000[12].

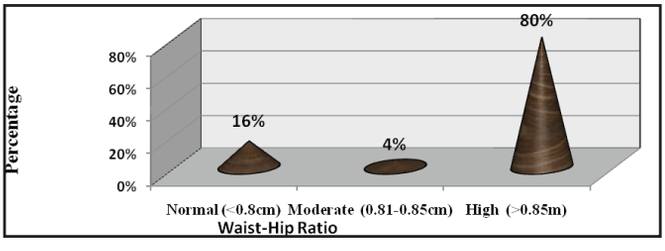
During the study period, 50 Marwari women were interviewed, out of which 84% respondents lived in their own house and 16% lived in rented house (Flat, homes, bungolos etc) and 90% were married and rest of 10% were unmarried. It is also found that all the respondents were literate and leading a luxorious life.

Table 2: Prevalence of obesity among Marwari women, BMI

| S No | BMI | Number | percentage |
|---|---|---|---|
| 1 | Normal | 5 | 10 |
| 2 | Overweight | 22 | 44 |
| 3 | Obese | 23 | 46 |
| | Total | 50 | 100 |

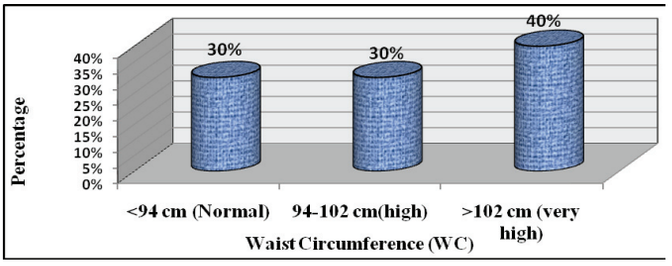
The study showed that 46 percent were obese, 44 percent were overweight and 10 percent were found to be normal or well noursihed according to the WHO 2000 classification of BMI.

Fig 1: Prevalence of central/ abdominal obesity according to waist-hip ratio (WHR)




According to WHR, 80% women were found more than 0.85 cm, 4% were found to be 0.81 to o.85 cm and 16 percent were found to be less than 0.8 cm which indicates the normal.

Fig 2: Prevalence of central /abdominal obesity according to waist circumference (WC)




Similarly, according to the waist circumference, 70% were high WC and 30 percent were normal. Most of the obese and overweight women were married (90%) and house wives and age groups 35 and above years.

## DISCUSSION

The results indicate that overweight and obesity are a major public health problem in Marwari women of Kathmandu valley. Obesity is a progressive problem, both in the developed and developing countries. In South Asia, social and environmental changes are occurring rapidly. These are increasing urbanization, changing life styles and reduced physical activity, with consequent increased propensity for obesity. In this study 46%, 44% and 10% were found to be obese, over weight and normal respectively according to the WHO classification of BMI (Cut off point, WHO 2000)[12]. These rates were similar to the rates reported by Das M *et al*[13] and Malik VS *et al*[14]. According to National report, NDHS (2006) 15, 24% and 9% of women were under and overnourished/ obesity respectively. In the same way IDHS (2005/6)[16], 36% of women were undernourished and 13% of women were overweight/ obesity.

Prevalence of abdominal and central obesity according to WC and WHR has also been found more in Marwari women. These rates were similar to the rates reported to Das M *et al*[13], showed that the 41.8 percent Marwari women had high waist-hip ratio (WHR) than men (22.7%) and according to WC, 81.34 percent had high abdominal adiposity rates was quoted by Khokhar KK *et al*[17].

This obesity and overweight in Marwari women is might be the genetics factors, their diet intake, from the present study they were found to be fond of eating fat foods, lack of physical exercise, their income which is sufficient to lead the sedentary life and the most important is the daily calorie intake per day. Khanan *et al*[10] studied the attitude of UK Bangladeshi women and noticed that large fractions, 96% of obese and overweight women were not interested in physical exercise so as was found even in Nepalese Marwari women .

## CONCLUSIONS

It can be concluded from the present study that obesity and overweight are quite prevalent among Marwari women especially 20-55 years and above.

From the present study it is shown that majority respondents Marwari women residing in Kathmandu valley are obese and likely to be obese due to this they are more prone to various diseases, and so they are likely to be treated and it is outmost to design health policies targeting specifically women in order to educate them on healthy diet and necessity of physical activity.this might be an impactful way to combat many life style diseases such as diabetes, coronary heart diseases as well as cancer whose burden and mortality is highest in developed as well as developing countries, whose risk factors are highly associated with obesity.

Fundamental to treatment of obesity is reduction in the number of calories consumed. An overall decrease in the number of calories is necessary for weight loss to occur, with emphasis on consumption of raw fruits and vegetables, protein, fiber, and should be sufficient in nutrients and vitamins. Decreasing intake of processed foods, sugars, salts, fats, oils, and nutritionally-dense foods should be encouraged. The specific diet is best developed in consultation with a registered dietician.

## REFERENCES

1. World Health Organization (WHO). European Charter on Counteracting Obesity, WHO European Ministerial Conference on Counteracting Obesity Conference Report, WHO, 2007.
2. Auwerx J, Staels B. Leptin. *Lancet.* 1998; 351: 737-42.
3. Rimm EB, Stampfer MJ, Giovannucci E, Ascherio A, Spiegelman D, Colditz GA, Willett WC. Body size and fat distribution as predictors of coronary heart disease among middle-aged and older US men. *Am J Epidemiol.* 1995; 141: 1117-1127.
4. National Institutes of Health, National Heart, Lung, and Blood Institute. Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults-the evidence report. *Obes Res*. 1998; 6(Suppl 2): 51S-209S.
5. World Health Organization (WHO). Preventing Chronic Disease-A Vital Investment. WHO and The Public Health Agency of Canada. Geneva: WHO, 2005.
6. Branca F, Nikogosian H, Lobstein T eds. World Health Organization (WHO). The challenge of obesity in the WHO European Region and the strategies for response, WHO Publications, Denmark, 2007.
7. Krause RM, Winston M, Fletcher BJ, Grundy SM: Obesity. Impact on cardiovascular disease. *Circulation.* 1998, 98: 1472-1476.
8. World Health Organization (WHO): Obesity. Preventing and Managing the Global epidemic. Report of WHO consultation on Obesity 3-5th June 1997, WHO Geneva, 2011.
9. WHO. (2012 May). Obesity and Overweight. Retrieved September 29, 2012, from http://www.who.int/mediacentre/factsheets/fs3 11/en/
10. Berghofer, A., Pischon, T., Reinhold, T., Apovian, M. C., Sharma, M. A., & Willich, N. S. Obesity prevalence from

a European Perspective: A Systematic Review. *BMC Public*. 2008.

11. Sharma SK, Ghimire A, Radhakrishnan J, Thapa L, Shrestha NR, Paudel N, *et al*. Prevalence of hypertension, obesity, diabetes, and metabolic syndrome in Nepal. *Int J Hypertens*. 2011.
12. Wilborn C, Beckham J, Campbell B, *et al*. Obesity: prevalence, theories, medical consequences, management, and research directions. *J Int Soc Sports Nutr*. 2005; 2: 4-31.
13. Das M, Bose K. Presence of high rates of overweight and obesity among adult Marwaris of Howrah, West Bengal, India. *Coll Antropol*. 2006; 30: 81-6.
14. Malik VS, Schulze MB, Hu FB. Intake of sugar-sweetened beverages and weight gain: a systematic review. *Am J Clin Nutr*. 2006; 84: 274-88.
15. Nepal Demographic Health survey (2006), http://www.measuredhs.com/
16. India DHS report- (2005-2006), Available at http://www.measuredhs.com/pubs/pdf
17. Khokhar KK, Kaur G, Sidhu S. Prevalence of obesity in working premenopausal and postmenopausal women of Jalandhar district, Punjab. *J Hum Ecol*. 2010; 29(1): 57-62.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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*Case Report*

# Phantom Pain at the Site of Extracted Teeth

**Baral P[1], Banstola D[2], Nepal D[3]**

[1]*Anatomy department, Gandaki Medical College, Pokhara, Nepal*
[2]*Physiology department, Institute of Medicine, Kathmandu, Nepal*
[3]*Paediatric department, Kanti Children Hospital, Kathmandu, Nepal*

**Key words**:
Phantom pain,
Oro-facial,
Reassurance,
Counseling

## ABSTRACT

Patients who have undergone excision of a body part often experience a sense of awareness of the missing part called the phantom phenomenon. It is quite uncommon in oro-facial region. A case of phantom pain in oro-facial region has been found recently. A male patient, 71 year old, complained of aching type pain in the region of extracted teeth. He incurred psychological fear of having malignancy. To overcome it, he took medical advice. Pain is not much bothersome requiring drugs to relieve it. He is examined and investigated thoroughly, reassured and counseled properly.

## INTRODUCTION

Oro-facial region is the most common site of pain with diverse origin. Source of pain is frequently evident that can be diagnosed easily and treated well but sometimes source of pain is not distinct, accompanied with vague pain. Thus, diagnosis is difficult and treatment does not meet patient's satisfaction. Atypical facial pain can be cited as its evidence. There are several modalities of atypical facial pain like atypical odontologia, phantom pain at site of extracted teeth, neuralgia due to neuroma, trigeminal neuralgia, pain in oro-facial region without known cause in depressive and menopause women etc.

Patients who have undergone excision of a body part often experience a sense of awareness of the missing part called the phantom phenomenon.

Phantom pain, at the site of extracted teeth, is a kind of atypical facial pain where person complains of pain in teeth which had been extracted already. A case of phantom pain has been reported in community wellbeing dental care center, Masbar, Pokhara.

**Correspondence:**
*Dr. Prakash Baral*
*Associate Professor, Anatomy Department*
*Gandaki Medical College, Pokhara,Nepal.*
*Emai: prakashbaral2002@gmail.com*

## CASE REPORT

An old male person aged 71 years came to community wellbeing dental care center, Pokhara, Nepal with complaint of pain in teeth in right lower posterior region. Pain was mild to moderate followed by continuous aching type. It was not aggravated by hot and cold foods. He did not feel pain during work but noticed it at rest.

Intraoral examination showed there was loss of entire right lower posterior teeth. There was no swelling and gingival mucosa appeared normal.

An IOPA-dental x-ray was advised to check for any root stumps. There was neither any root stump nor any bone pathology seen on X-ray. The past history revealed that the extraction of teeth were uneventful. They were all very mobile and could be easily extracted. He was not replacing the missing teeth with dental prosthesis.

Medical examination showed he was hypertensive and diabetic but under control with medications. There were no pathological changes in oral mucosa due to his medical condition. Since the pain was within limit of tolerance, he was not taking any painkillers to relieve the pain.

The pain was bothersome when he was not at any work and his mind was not occupied. Pain was not disturbing his sleep, as no pain was felt during sleep. Psychologically, he was very stressful with that pain as he suffered fear of cancer. Thus he

was seeking medical advice and came to community wellbeing dental care centre at Masbar, Pokhara.

## TREATMENT

The dental x-ray did not reveal any pathological changes in that region and pain did not seem quite bothersome so the patient was not seeking drugs to relieve the pain.

A diagnosis of phantom pain has been made and patient has been reassured that he is not requiring any further treatment as he was having normal condition. He had been convinced that he was not suffering from any sort of malignancy and pain was not due to cancer (malignancy).

He was further counseled that pain did not exist in real sense. He was having an illusion of pain in that region called as phantom pain.

If pain was quite bothersome for the patient, a tricyclic antidepressants (aminotryptyline) could have been prescribed but patient did not seem to bother with the pain, thus no medication was prescribed. As he was seeking to rule out the cancerous pain, he had been counseled properly that he was not having any sign of cancer.

## DISCUSSION

Dysaesthesia is defective sensation like burning, stabbing or burrowing type or a phantom pain meaning thereby experiencing the same pain that was there prior to the treatment. For example, pain of pulpitis after tooth extraction or pain in tongue after glossectomy. Phantom pain is also a dysaesthesia.

Phantom pain is uncommon in oro-facial region. Rarely do we encounter the problem in our dental profession. This is the first report in this dental care center in a span of 9 years.

But in cases of limb amputation, where phantom phenomenon is best known, painful in approximately 30% of cases and persist for more than one year in 10%.

Before diagnosing the phantom pain, first of all we should carry out thorough examination, investigation and analyze the finding. If the examination finding and investigation report do not detect the abnormality in surrounding areas of pain and patient feels pain in lost part of body then only phantom pain can be diagnosed.

Paroxysms of phantom pain are of approximately 10 minutes duration and are described as stabbing with extreme itching or deep burning and of pressure of the missing part. They may be triggered by tactile stimulation and usually are relieved by local anesthetic block of the peripheral nerve stumps. Although much little is known of the incidence and pathogenesis of phantom pain in the maxillofacial region, it should be given consideration in the differential diagnosis of facial pain and not dismissed as evidence of a psychological disorder.

Although neuromas occurring at the regenerated nerve stump surface may contribute to phantoms, it appears that the primary site of pain mechanisms is in the brain stem.

After limb amputation, about half of the associated neurons die and the regenerated fibers of the stump are usually small, poorly myelinated and slow conducting. Stimulation of these stump tissues therefore may have the effects of activating an imbalanced gate control mechanisms in the brain stem and cause inappropriate sensory phenomena such as phantom pain.

Palpation and diagnostic block may reveal the presence of a contributing neuroma, and re-amputation of nerves at more proximal levels may be successful in this cases. Carbamazepine therapy results in varying degrees of success and supportive care and reassurance is often adequate in less severe cases because phantom pain seems to diminish with time.

## REFERENCES

1. Howe JF. Phantom limb pain - a reafferentation syndrome. *Pain*. 1983; 15: 101.
2. Kapoor V. Text book of oral and maxillofacial surgery. 1st edition. Arya (medi) publishing house, New Delhi. 1996; 268.
3. White JC, Sweet WH: Pain and the neurosurgeon, Springfield. 1969; 111.
4. Kruger GU. Text book of oral and maxillo-facial surgery. 6th edition. Jaypeebrothers. New Delhi. 1990; 729.
5. Orgel MG. Experimental studies with clinical application to peripheral nerve injury; a review of the past decade. *Clin Orthop*.1998; 163.

Journal of Gandaki Medical College - Nepal, July-Dec 2013, Vol. 6, Issue 2

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Dr. K R Reddy

Editor-In-Chief

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

Email:journal@gmc.edu.np

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Tel: 00977-61-561718

Website: www.gmc.edu.np

The Journal of GMC Nepal has a worldwide website at: http// www.gmc.edu.np

This Issue of the Journal of GMC Nepal is

Designed by:

***Deepak Kumal***

Printed at :

***Tanahun offset press***, Nayabazar-9, Pokhara, Nepal

Phone : 061-522428