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CLASPS IN REMOVABLE ORTHODONTICS

Mustapha Mansuri, Varun Pratap Singh

Abstract

The success of removable orthodontic appliance mainly depends upon good retention of the appliance. Adequate retention of a removable orthodontic appliance is achieved by incorporating certain wire components, called clasp, which engages the undercuts on the teeth. Clasps are the retentive components of removable orthodontic appliances. There are various designs of clasps advocated for various clinical situations. This article presents an overview of various clasp designs with advantages and disadvantages of each type and their uses in particular clinical situations.

Key words: *Clasp, Removable orthodontic appliance, Retention.*

Introduction

Clasps are wire components that aid in retention of a removable appliance.^[1] These are the retentive components that aid in keeping the appliance in place and resist displacement of the appliance.

Mode of action

Clasps act by engaging constricted areas of the teeth, called *undercuts*. There are two types of undercuts found in natural dentition.

1. Buccal and Lingual cervical undercuts
2. Mesial and Distal proximal undercuts

The mesial and distal undercuts of the teeth begin below the contact points.^[2] These undercuts are accessible very soon after a tooth has erupted. The buccal and lingual undercuts are much less extensive and are not accessible until the teeth are fully erupted. Thus, a clasp that makes use of mesial and distal undercuts is more useful and more efficient than a clasp which makes use of buccal and lingual undercuts.

An ideal clasp should^[1]:-

- Offer adequate retention

- Permit usage in both fully and partially erupted teeth
- Be passive
- Be easy to fabricate
- Not impinge on the soft tissue
- Not interfere with normal occlusion

Different clasps are^{[1][3]}

1. 'C' clasp
2. Jackson's clasp
3. Arrowhead clasp
4. Adam's clasp
5. Delta clasp
6. Southend clasp
7. Triangular clasp
8. Ball-end clasp
9. Double ball-end clasp
10. Schwarz clasp
11. Crozat clasp
12. Duyzing clasp
13. Eyelet clasp
14. Plint clasp
15. Visick clasp

1. 'C' clasp

It is also known as three-quarter clasp (3/4 clasp) or Circumferential clasp. They are very simple clasp and engage bucco-cervical undercut.

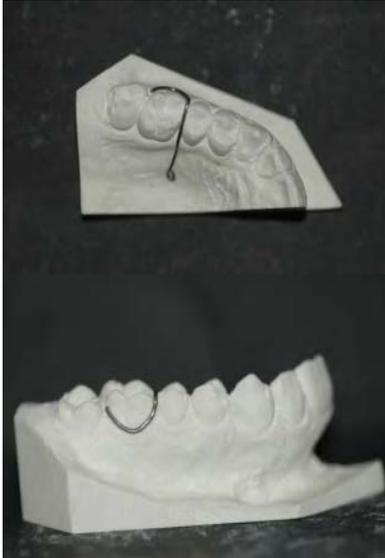


Fig. Circumferential Clasp

Advantages:-

- Easy to construct
- Simple design
- Prevent mesial migration of tooth

Disadvantage:-

- It can't be used in partially erupted teeth.

2. Jackson's clasp

It is also known as Full clasp or 'U' clasp. It was introduced by V H Jackson in 1906. This clasp makes use of bucco-cervical undercut and also the mesial and distal proximal undercuts.



Fig. Jackson's clasp

Advantages:-

- Simple to construct
- Offers adequate retention

Disadvantage:-

- Inadequate retention in partially erupted teeth.

3. Arrowhead Clasp

This clasp was introduced by A M Schwarz in 1956. This clasp makes use of mesial and distal undercuts. This clasp is made using half round or round stainless steel wire of 0.7 mm diameter. This clasp is made by use of a special plier called 'Tischler's plier'.



Fig. Arrowhead clasp

Advantages:-

- Good retention on partially erupted tooth
- Eruption of tooth is not hampered

Disadvantages:-

- Occupies large amount of buccal surface
- Requires special plier and adequate skill for construction.

Continuous Arrowhead clasp

This clasp carries 4-6 arrow clasps. It is one continuous wire with ends in acrylic mass.



Fig. Continuous arrowhead clasp

4. Adam's clasp

It is also known as Universal clasp or Modified arrowhead clasp or Liverpool clasp. This clasp was devised by C P Adam in 1948. This clasp makes use of mesial and distal undercuts. This is the most effective and most widely used orthodontic clasp today. This clasp is constructed using 0.7 mm hard round stainless steel wire.



Fig. Adam's clasp

Advantages:-

- This clasp is strong, simple and easily constructed.
- It can be used on any tooth (deciduous or permanent, partially or fully erupted, incisors or premolars or molars).
- It is comfortable to wear and resistant to breakage.
- It is small and occupies minimum space.
- It can be modified in a number of ways.
- No specialized instrument is needed for construction of clasp. Routinely used Young's Universal plier or Adam's plier can be used.

Parts of Adam's clasp

- Two arrowheads
- Bridge
- Two retentive arms

Bridge- It should be straight and midway between the occlusal surface and gingival margin. It should be 2mm away from the tooth surface and parallel to it. When viewed from the side, the bridge should be at 45° angle to tooth surface.

Arrowheads- should be parallel to each other and should sit in the mesial and distal undercuts.

Retentive arms- continue on the lingual or palatal surface that get embedded into the acrylic.

Modifications of Adam's clasp

- 4.1 Adam's clasp with single arrowhead
- 4.2 Adam's clasp with J hook
- 4.3 Adam's clasp with incorporated helix
- 4.4 Adam's clasp with additional arrowhead
- 4.5 Adam's clasp with soldered buccal tube
- 4.6 Adam's clasp with distal extension
- 4.7 Adam's clasp on incisors and premolars
- 4.8 Smart clasp:- A modified Adam's clasp

4.1 Adam's clasp with single arrowhead

This clasp consists of only single arrowhead instead of two arrowheads. This clasp combines characteristics of Adam's clasp and 'C' clasp. It is indicated in partially erupted tooth where the single arrowhead engages the mesial undercut and the bridge is modified to encircle the tooth distally. The partially erupted tooth is usually the last erupted molar.



Fig. Adam's clasp with single arrowhead

4.2 Adam's clasp with J hook

A 'J' shaped hook is soldered to the bridge of the Adam's clasp directed gingivally with the hook pointed distally. This hook is used to engage elastics.



Fig. Adam's clasp with J hook

4.3 Adam's clasp with incorporated helix

A helix is incorporated into the bridge of the Adam's clasp. This is also useful in engaging elastics. This modification is preferred on mandibular molars.

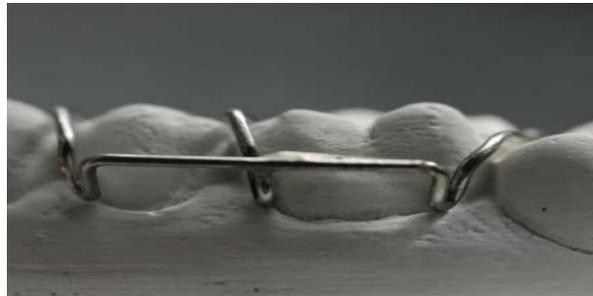


Fig. Adam's clasp with incorporated helix

4.4 Adam's clasp with additional arrowhead

An additional arrowhead is soldered onto the bridge of the Adam's clasp. This clasp is used when additional retention is required. The additional arrowhead fits to the undercut of adjacent tooth.

Fig. Adam's clasp with additional arrowhead



4.5 Adam's clasp with soldered buccal tube

Attachment of buccal tube to Adam's clasp was described by J C Stephenson. A buccal tube is soldered onto the bridge of the Adam's clasp. This modification is used when an extraoral anchorage is needed using headgear or other assembly.



Fig. Adam's clasp with soldered buccal tube

4.6 Adam’s clasp with distal extension

A small extension is incorporated distally in the distal arrowhead. This distal extension helps to engage elastics.



Fig. Adam’s clasp with distal extension

4.7 Adam’s clasp on incisors and premolars

This clasp is fabricated on incisors and premolars when retention is required in those areas. This clasp can be constructed in such a way that it can span a single tooth or two teeth.



Fig. Adam’s clasp on incisors

4.8 Smart Clasp: - A modified Adam’s clasp

This clasp was developed for use with magnetic activator device. The upper and lower plates, with incorporated magnets, of the appliance exert attracting or repelling force of about 600 gm. [3] A 2 mm loop on each side of arrowhead is given in the Adam’s clasp.

5. Delta clasp

This clasp was designed by William J. Clark. This clasp is similar to Adam’s clasp in principle. It engages interdental undercuts.

Adjustment: -hold retentive loop and twist inwards.

-bending towards interdental undercut as it emerges from acrylic.



Fig. Delta clasp

6. Southend clasp

This clasp was named as southend clasp because it was developed by Mr. DiBiase and Mr. Leavis of department of orthodontics, Southend hospital and was used at Bristol Hospital. It provides retention in the anterior region. The wire is adapted along the cervical margin of both the central incisors. The distal end of the wire crosses over the occlusal embrasures and end as retentive arms on the palatal side.



Fig. Southend clasp

Advantages:-

- Better patient compliance
- Suitable for rotated and spaced incisors.

7. Triangular Clasp

It has a small triangular shape that engages the proximal undercut of two adjacent teeth. It provides excellent retention. It doesn't cause irritation of gingiva. It is used when additional retention is required.

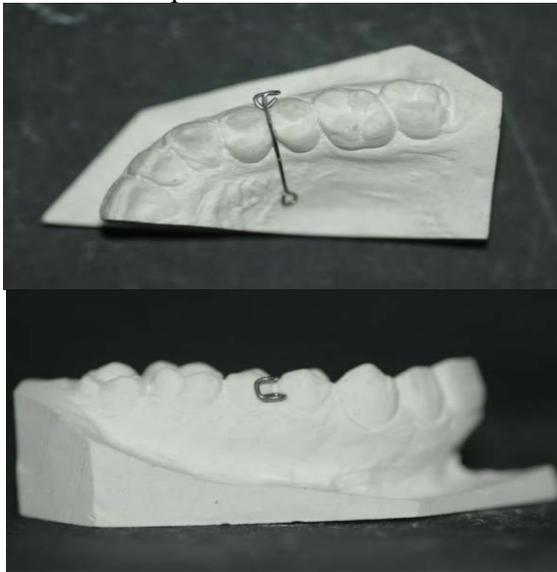


Fig. Triangular clasp

8. Ball End Clasp

This clasp is also known as *Schau anchor clasp*. This clasp has a ball at the end which engages the proximal undercut between two adjacent teeth (interdental area). Preformed wires having a ball at the end are used for making this clasp. The ball can also be made using silver solder. This clasp is used whenever additional retention is required.



Fig. Ball end clasp

9. Double Ball end Clasp

This clasp includes a stem embedded into and extending from the acrylic portion of the appliance. Two ball clasps extend from the stem and are laterally spaced apart from one another. Each ball clasp has an elongated flexible member and an enlarged exposed end. A bridge segment extends laterally between the flexible members of the first and second ball clasps. A bridge segment extends laterally between the flexible members of the first and second ball clasps. [6] This clasp does not exert any wedging force in the interdental embrasure like the single ball clasp. This clasp provides better retention.

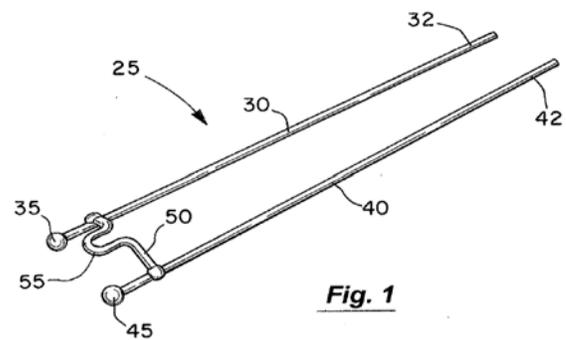


Fig. 1

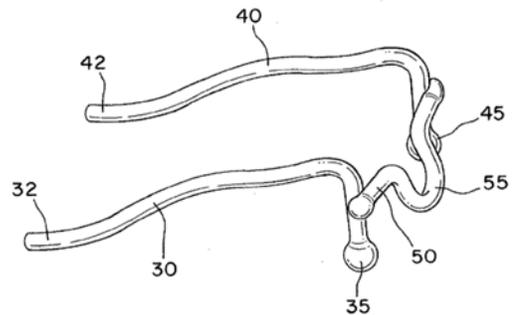


Fig. 3

Fig. Double boule end clasp

10. Schwarz Clasp

It is said to be predecessor of Adam’s clasp. This clasp has a number of arrowheads that engage the inter-proximal undercuts of posterior teeth.



Fig. Schwarz clasp

This clasp is not routinely used because:-

- It needs special arrowhead forming pliers.
- It occupies a large amount of space in the buccal vestibule.
- The arrowheads can injure the interdental soft tissues.
- It is difficult and time consuming to fabricate.

11. Crozat Clasp

This clasp was suggested by Crozat in 1920. It is modification of Jackson’s clasp. An additional piece of wire is soldered to the Jackson’s clasp which engages into the mesial and distal proximal undercuts. Thus, it provides better retention than the Full clasp. [9]



Fig. Crozat clasp

12. Duyzing Clasp

This clasp has two wires emerging from the plate that cross the occlusion over the anterior

and posterior contact point of the tooth clasped. Each wire then goes above the greatest circumference of the tooth to the middle of the tooth and again back below using undercuts. This clasp is used to engage the buccal undercuts of molars. If the situation demands, only half of the clasp can also be made. [5]



Fig. Duyzing’s clasp [12]

13. Eyelet Clasp

This clasp can be constructed as a single eyelet or continuous eyelet clasp. [5] An eyelet is made using a Young loop forming plier. Eyelets are placed in the embrasure. Three to four eyelets can be made depending upon the retention requirement. The size of the eyelet depends on the width of the interdental area of both anchor teeth. [9]



Fig. Eyelet clasp

14. Plint clasp

Plint clasp is also known as ‘Fly Over Clasp’.^[11] Plint clasp are useful when using a removable appliance in combination with a fixed appliance. These clasps are constructed using 0.7 mm stainless steel wire.^[4] This clasp is used to engage under the tube assembly on a molar band.^[10] Adjustment: - by moving the clasp under the molar tube.



Fig. Plint clasp

15. Visick Clasp

This clasp was given by H C Visick. This clasp is used on palatal side for active retention accompanying the base plate and molar clasp on buccal side. It is made using 0.7 mm stainless steel wire.^[3] Retention is increased with this clasp because both the buccal and palatal surfaces are engaged.^[3]

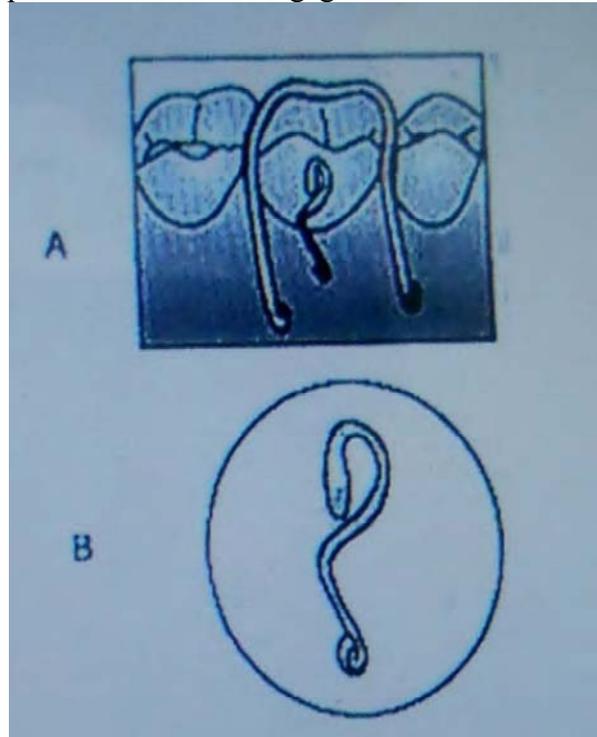


Fig. A. Visick clasp in place along with Jackson’s clasp;

Fig. B. Close up view of Visick clasp.^[12]

References:

1. **Bhalaji S I;** Orthodontics- The art and science, 4thedition, Arya (Medi) publishing house, New Delhi; 2009, page 298-304.
2. **Adams, C P;** The design, construction and use of removable orthodontic appliances, 6thedition, Varghese publishing house, Bombay; 1990, page 11.
3. **Lohakare S S;** Orthodontic Removable Appliances, 1st edition, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi; 2008, page 55-62.
4. **Martyn T C, Andrew T DiBiase;** Handbook of Orthodontics, 1st edition, Mosby Elsevier, 2010, page -213.

5. **Rani M S**, Removable Orthodontic Appliances design, construction, application and management; 1st edition, 1997, All India Publishers and Distributers, Chennai, 1997, page 40-41.
6. **Donal P Inman**, Clasp for Removable Dental Appliances, pub no. – US 2008/0057457/A1; pub date – March 6, 2008.
7. <http://ebookbrowse.com/principles-of-removable-appliances-bw-pdf-d321047256>
8. <http://www.e-moh.com/vb/t115325/>
9. http://www.o-atlas.de/eng/kapitel1_41.php;
http://www.o-atlas.de/eng/kapitel1_44.php;
http://www.o-atlas.de/eng/kapitel1_45.php;
http://www.o-atlas.de/eng/kapitel6_191.php;
http://www.o-atlas.de/eng/kapitel1_47.php;
10. <http://fx.damasgate.com/removable-appliances/>
11. http://universal-dental-techniques.com/Web_page/Fly_Over_Clap.html
12. **Shridhar Premkumar**; Orthodontics: Prep manual for undergraduates, Orthodontic appliances, Removable appliances, page 303-304; 2008 Elsevier.

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MODIFICATION OF DELIVERY PRACTICE IN RAJBANSHI MOTHERS OF NEPAL

Nawaraj Subba, Shishir Subba

Abstract

Introduction: This is a cross-sectional study with the objective of identifying modification in delivery practice in Rajbanshi mothers of Nepal.

Methodology: Both qualitative and quantitative tools were used. Semi-structured questionnaires covering 375 samples of its resident districts Morang, Jhapa and Sunsari districts and check lists for in-depth interview were used in the study.

Results: People were adopting both traditional and modern care practices concurrently. Among 375 households; 40% adopted local clinic/ hospital/ traditional healer concurrently. Similarly 31.20% adopted local clinic/ traditional healer/ hospital, 10.67% adopted hospital/traditional healer. There were 11.47% (urban 0.54% and rural 10.93%) respondents were having traditional care system as a first choice. During first delivery among 375 mothers 265 (70.67%) had traditional home delivery and 110 (29.33%) had hospital delivery. During last delivery, this was 115 (30.67%) in traditional home delivery and 260 (69.33%) in hospital delivery. Therefore trend of hospital delivery was increasing whereas trend of traditional home delivery was decreasing. It was statistically highly significant ($p < 0.0001$). There was also remarkable increased in using trained Health Worker/Nurse/Doctor at hospitals is 66.4% during last delivery which was only 6.13% during first delivery. It is statistically highly significant ($p = < .0001$).

Conclusion: Trend of hospital delivery was increasing (from 30.67% to 69.33%) and trend of home delivery was decreasing (from 69.33% to 29.23%) in between first and last child delivery. There was remarkable increased in using trained HW/Nurse/Doctor at hospitals is 66.4% during last delivery which was only 6.13% during first delivery. Traditional care was more practiced in rural than in urban population.

Keywords: *Traditional home delivery, Modern hospital delivery, Rajbansi, Nepal*

Introduction

The word Rajbanshi means "dynasty of king". Rajbanshi were dwelt and over populated in the Koc-Bod area of upper Tibetan plateau was known as Koch or Koches. These people came down to southern region and also Bramhaputra river valley sometime between 7000 to 5000 B.C. and so physical changes through various doors i.e. hilly paths or passages. When

Koches were over populated in the Koc-Bod areas one branch of the common stock achieved prominence around the Kochi (Koshi or Kosi) river banks and in areas between lower Nepal and north Bihar (1).

Rajbanshi themselves considered as Kchhetriya of Hindu caste system. Anthropologists have opined that they are the kiths and kin of the peripheral Koch people of the adjacent states of West Bengal and Asom

(Assam) in India. As described in the blogspot of Social Organization of Rajbanshi Aborigines soranepal, they are having Mongoloid features - they consider themselves as a branch of the Kirants. They have a lifted T bone over their throat a little higher than the average height. The structure of their eyes and forehead, etc is like those of a mix of Aryan-Mongloid, Austric, Negrito, Dravidian. They wear clothes conforming to climate and weather. Their physical characteristics are similar with local indigenous people like Tharu, Meche, Dhimal, Nuniya and Batar.

Refering to Ridge⁽²⁾ has mentioned in article that there are different kinds of Rajbanshis such as Koch Rajbanshi, Poundra Rajbanshi, Mech Rajbanshi, Newar Rajbanshi, and Khataha Rajbanshi in Nepal. There are mainly more than four types of Rajbanshi found in Nepal. Khotaha Rajbanshi- They are Maithil language speaking. They have poor economic or social condition. They even take alcohol and eat pork, chicken, rat and a kind of snail ghongi. They believed that during Ramayan era when Parshu Ram started genocide against Kchhetryas some run away from their place to hide northern part which is now territory of Nepal and they have been settled here since Ramayan era. According to Shrestha⁽³⁾ their castes are called- Teli, Baniya, Gwar, Kahal, Khatwe, Kipat, Dhanuk, Nuniya, Amat, Kalawar, Kamat, Koiry, Sharma, Pandit, Ganesh, Chuhan, Chanda and Mana Chanda. They are habited in Biratnagar city covering from east of Sindhiya river and have marital linkage with Rajbanshi of Purniya in Bihar. Rajput Rajbanshi- They believed that they are proceeder of Rajbanshi dynasty as pure Kchhetriya. Their habitat is located west of Morang to Saptari. According to Shrestha ⁽³⁾ their castes are called as- Chandel, Chauhan, Kachwaha, Parihar, Ponwar, Rathaur, Bhisaudiya, Solankhi, Tinwar, Yadav, Jaath, Gujer etc. Newar Rajbanshi- during Malla dynasty in Kathmandu Valley Malla king married Koch princess. So, it is believed that

since Malla dynasty or before Newar Rajbanshi or Koch are living in Kathmandu as Newar Rajbanshi. Newar Rajbanshi has Newar culture and language in Kathmandu valley. Bangali Rajbanshi- is also known as Petani Rajbanshi since they wear dress called Petani by women Rajbanshi. Their tradition and culture are similar with Rajbanshi of West Bengal and Assam. These Rajbanshi in Nepal are living before unification of Nepal. Apart from these Rajbanshi there are Bongaha, Hadi, Paliya, Majhi and Gosai Rajbanshi found in Nepal.

In Nepal there are 59 indigenous people dwelling. Rajbanshi is one of the indigenous people of their habitat terai region. People speaking the Rajbanshi language was 85,559 in census held in 1991, which increased to 1, 29,829 in 2001's census. And according to census 2011 there is 122,214 in numbers speaks Rajbanshi. Rajbanshis are found to have settled in most of the villages in Jhapa and Morang. They are agro-based people but now they are working in different occupation like labour, service and business.

Methods and Tools

1. Household Survey: general information taken from head of household and detailed questionnaire filled with mother's interview (n=375). 2. Observation: of housing and traditional practices. Tools: 1. Questionnaire (Semi-structured), 2. Check list for Observations. Study Sites: (1) Jhapa and (2) Morang and (3) Sunsari districts. Data entered and analyzed with SPSS-20 software in computer.

Findings

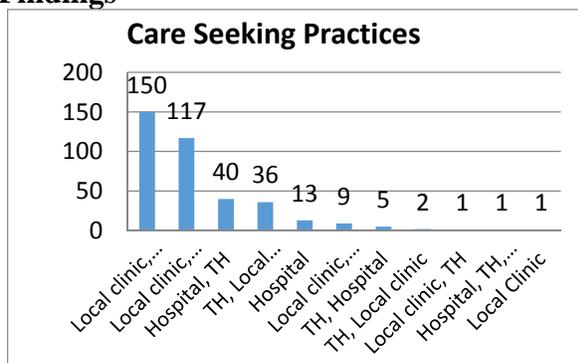


Figure 1 Care Seeking Practices

Figure 1 shows health care practice during sickness. People were practicing multiple care and treatment concurrently. Among 375 sample 40% (150) of sample preferred local clinic/ hospital/ traditional healer (TH), Which is followed by local clinic/traditional healer/ hospital 31.2% (117), hospital/ traditional healer 10.67% (40), traditional healer/ local clinic/hospital 9.6% (36), hospital only 3.47% (13), local clinic/hospital 2.4% (9), traditional healer/hospital 1.33% (5), traditional healer/local clinic 0.53% (2), local clinic/traditional healer 0.27% (1), hospital/traditional healer/local clinic 0.27% (1) and local clinic 0.27% (1).

Table 1. Change in Delivery Practices

Trend of delivery Practice (n=375)			
	1st delivery	Last delivery	P-value
Home	265	115	P = <0.0001 $\chi^2=118.4264$
Hospital	110	260	
Total	375	375	

Table 1 shows that during first delivery among 375 mothers 265 (70.67%) had traditional home delivery and 110 (29.33%) had hospital delivery. During last delivery, this was decreased by 115 (30.67%) in traditional home delivery and increased by 260 (69.33%) in

hospital delivery. Therefore trend of hospital delivery was increasing whereas trend of traditional home delivery was decreasing. Statistically highly significant ($p < 0.0001$).

Table 2. Change in Use of Service Providers

Trend of Service Provider Used (n= 375)			
Service Provider	First Delivery	Last Delivery	P-value
TBAs	30	7	p= <.0001 $\chi^2=297.78$
HWs	25	5	
TBA/CHW	254	102	
HW/Nurse	43	12	
HW/Nurse/Doctor	23	249	

Table 2 indicates practice of using service providers. Among 375 mothers regarding using TBAs, 8% used in first delivery and only 1.87% in last delivery. Similarly, there is also change in using Health workers at community level was 6.67% first and 1.33% at last delivery. Use of TBA/CHW was 67.73% at first delivery and decreased to 27.2% at last delivery. Using HW/Nurse was 11.47 at first delivery and 3.2% at last delivery. But, there was remarkable increased in using HW/Nurse/Doctor at hospitals was 66.4% at last delivery which was only 6.13% at first delivery. Therefore there was increasing in practice of modern health system in Rajbanshi community since it is statistically highly significant ($p = <.0001$).

Table 3. Traditional practice of Rajbanshi as first choice by urban-rural Setting

First choice of Traditional Care by Urban-Rural (n=375)		
Setting	Number	Traditional Care
Urban	49	2
Rural	326	41
Total	375	43 (11.47%)

Table 3 indicates that 11.47% Rajbanshi had practiced traditional care as first choice. In urban area it is 0.54% and in rural area it is 10.93%.

A Traditional Birth Attendant (TBA) said: "There is huge difference between today and before. During past days there were traditional healer who used to *jharphuk* and chanting mantras in water pot with holy basil *tulasi* leaf and gave pregnant woman to drink and some water sprinkled on the body. After that they used to call TBA and started to massage over stomach. It was risky practice. They didn't have suggested for even antenatal check up. So, maternal death was reported. But today, every woman goes for ANC, take TT, and Iron tabs. They also go to health institutions to take suggestion from health workers. Most of them go to hospital for delivery. Some people still call TBAs for home delivery but when it gets prolonged then I referred to the hospital." (TBA1)

Discussion

Nepal is a country considered having high maternal mortality rate 229/100,000.(4) and high Child mortality 54/1000 in the region.(5) A variety of traditional care systems exist in Nepal. Ayurveda, Tibetan medicine, indigenous care and faith healing are the major traditional medical systems or folk medicine. Modern or Western allopathic medicine was introduced in the seventeenth century but became dominant from the middle of the 20th century. Multiple and Alternative medical systems are popular in all community in Nepal. This variety is reflected in a tolerant co-existence and co-operation between differing forms of therapeutic practice (3,6,7). A study done before in *Katahari* and *Baijanathpur* VDCs of Morang district in same community had noted that Rajbanshi community was adopting modern, self and alternative medications. Modern medication was equally

popular in both poor and rich or educated and uneducated.(8) Similarly, a study conducted in *Jajarkot* also find people were adopting modern, traditional, and natural treatment through the use of herbal medicine and the home/family treatment by food and local herbs.(9)

A cross-sectional study was conducted with 482 Hindu women who were pregnant in Maitha, Uttar Pradesh, India.(10) Maternal health care service use among both upper and lower caste women was very low. Upper caste women were almost three times more likely to use antenatal care. Five times more likely to have a trained birth attendant compared to the lower caste women. Caste was a significant determinant of tetanus toxoid use and trained birth attendant even after adjusting for socio-demographic factors. Various trends of practices are seen in US.(11) The study noted two more that are of interest to us. First, there is the multi-disciplinary approach becoming more and more widely recognized. Dualism describes a situation where one sector of society is developed and "Westernized" and the other sector remains "traditional".(12). Even within a particular culture these two sectors have limited interactions and operate parallel to each other. In addition, the existence of cultural diversity within a particular society could produce the different types of explanations and interpretations.(13)

This study noted that people were both traditional and modern care practices concurrently. Among 375 households; 40% adopted local clinic/ hospital/ traditional healer concurrently. Similarly 31.20% adopted local clinic/ traditional healer/ hospital, 10.67% adopted hospital/traditional healer, 9.6% adopted traditional healer/ local clinic/ hospital, 3.47% adopted hospital practice, 2.4% adopted local clinic/hospital, and 1.33% adopted traditional healer/hospital concurrently. Local clinics were first choice

65% respondents which is modern care and mainly due to availability at local level. 19% respondents reported the first choice for treatment was hospitals. 11.47% respondents reported first choice was traditional care system. Study uncovered that 83.50% respondents went to local clinics when mothers or child get sick, 11.50% visited traditional healer and 5% of respondents went to hospitals directly. Therefore, most people were practicing modern care system than traditional when mother and child care.

Changes in traditional practices

Traditional healers are a part of health care system in Rajbanshi community. They know their limitations and so they do refer to health institutions. Since traditional healers have got trainings from health posts they are aware of modern medications. They treat a case and hold normally for 1-2 days and if there is no sign of progress resulted be referred. Usually they are doing referred people to clinics or hospitals due to social construction of their behavior change. Rajbanshi communities are habited geographically on plain areas so that they have easy access of transportation to get health institutions. Due to efforts of government's public health programs focused especially on mother and child and availability of health workers and volunteers were more attracted with modern health system. Regarding the trend of care seeking practices among 375 mothers 69.33% had traditional home delivery at first baby and birth was decreased to 30.67% at last delivery. So, in Rajbanshi the practice of traditional home delivery has been decreased and hospital delivery has been increased remarkably within the decade.

Changes in Modern Care Practice

There was change noted within modern care practice. Practice of hospital delivery was

increasing. During first delivery 70.67% had home delivery and 29.33% had hospital delivery during first delivery (n=375). It was transformed to when their last delivery as 30.67% home delivery and 69.33% hospital delivery. Therefore trend of hospital delivery was increasing whereas trend of home delivery was decreasing. That was statistically highly significant ($p < 0.0001$). It was because of the government's policy and program being conducted in the name of safe motherhood. In the program government of Nepal has managed incentives for both mothers and health workers. Woman gets Rs 500 from government for transportation. Health workers and hospitals also received incentives for delivery. These are claimed by government on their annual reports.(14) Mothers' behavior has been socially constructed to have hospital delivery for safer child births.

There was also change in use of service providers in between first and last delivery. Use of doctors or skill birth attendants was increasing and demand of hospital environment with skilled health workers has been socially constructed. Among 375 mothers, use of TBAs was 8% at first delivery and only 1.87% used at last delivery. Similarly, use of Health workers at community was 6.67% at first delivery and 1.33% at last delivery. Use of TBA/CHW was 67.73% at first delivery that decreased to 27.2% at last delivery. Using HW/Nurse was 11.47 at first delivery also decreased to 3.2% at last delivery. But, there was remarkable increase in using Doctors/Nurse/HW at hospitals which was 6.13% at first delivery and was increased to 66.4% at last delivery. Therefore there was changes in use of skilled service providers that was statistically highly significant ($p < 0.0001$).

Traditional healers are a part of health care system in Rajbanshi community. They know their limitations and so they do refer to health

institutions. Since traditional healers have got trainings from health posts they are aware of modern medications. They treat a case and hold normally for 1-2 days and if there is no sign of progress resulted be referred. Usually they are doing referred people to clinics or hospitals due to social construction of their behavior change. Rajbanshi communities are habited geographically on plain areas so that they have easy access of transportation to get health institutions. Due to efforts of government's public health programs focused especially on mother and child and availability of health workers and volunteers were more attracted with modern health system.

Conclusion

People were adopting both traditional and modern care practices concurrently. Among 375 households; 40% adopted local clinic/hospital/ traditional healer concurrently. Similarly 31.20% adopted local clinic/traditional healer/ hospital, 10.67% adopted hospital/traditional healer, 9.6% adopted traditional healer/ local clinic/ hospital, 3.47% adopted hospital practice, 2.4% adopted local clinic/hospital, and 1.33% adopted traditional healer/hospital concurrently. There were 11.47% (urban 0.54% and rural 10.93%) respondents were having traditional care system as a first choice. During first delivery 70.67% had home delivery and 29.33% had hospital delivery was transformed to 30.67% home delivery and 69.33% hospital delivery during last delivery. Therefore trend of hospital delivery was increasing whereas trend of home delivery was decreasing. That was statistically highly significant ($p < 0.0001$). There was also remarkable increased in using trained HW/Nurse/Doctor at hospitals is 66.4% at last delivery which was only 6.13% at first delivery. It is statistically highly significant ($p < 0.0001$).

References

1. **Chaudhary A.C.** Koch Rajbonshi jono gosthir itihasaru sanskriti. Unic printers; 1969.
2. **Ridge O.** A physical anthropological profile of the Koch of Darrang district, Assam; 1991
3. **Shrestha I.G.** Mohini-3 Rajbanshi. Published by Jamuna Shrestha, Biratnagar, Nepal; 2042
4. **MMMS.** Nepal Maternal Mortality and Morbidity Survey, 2008/2008, Ministry of Health, Department of Health Services, Family Health Division, Kathmandu, Nepal; (2008/09).
5. **NDHS .** Nepal Demographic and Health Survey 2011: Preliminary Report, Population Division, MoHP, Government of Nepal; 2011
6. **Hitchcock J.** Spirit Possession in the Nepal Himalayas. Warmister. Aris and Philips; 1976
7. **Hawran D.** Vergleichende Untersuchungen uber Krankheitsauffassungen und Krankheitsverhalten in zwei nepalesischen Dofern. Freiburg: Unpublished Dissertation, cited from Boker, H. (1992) Concepts of Mental Illness: An Ethnographic Study, Contributions to Nepalese Studies. 1992;19 (1)
8. **Subba N.R.** Health Seeking Behavior of Rajbanshi Community in Katahari and Baijanathpur of Morang District, Nepal, Journal of Nepal Health Research Council. 2004;2 (1)
9. **Subba S.** Perception of disease and illness among health providers and health seekers in Jajarkot district, Nepal. The University of Copenhagen, 2003; P.262
10. **Saroha A.** Altarac M. Caste and Maternal Health Care Service Use Among Rural Hindu Women in Maitha, Uttar Pradesh, India, Journal of Midwifery and Women's Health, Volume 53, Issue 5, September-October 2008; 41-47,
11. **DeClue, J.** A Journal of Midwifery and Women's Health, Bulletin of the American College of Nurse-Midwifery. 2004; 6(4) :16-20
12. **Kim, U.** Berry J.W Indigenous Psychologies: Research and Experience in cultural Context, SAGE Publication, New Delhi; (1993). **Moghaddam, F.M.** Traditional and Modern Psychologies in competing cultural Systems: Lessons from Iran 1978-1981, Indigenous Psychologies: Research and Experience in cultural context, SAGE Publication, New Delhi; (1986). p118-131.
13. **DoHS.** Annual Report of FY 2067/68, Department of Health Services, Teku, Kathmandu, Nepal; 2069/70

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PREVALENCE OF HYPERURICEMIA AMONG PEOPLE OF MORANG DISTRICT OF NEPAL

Shrawan Kumar yadav, Niraj Nepal and DilliRam Niroula.

Abstract

Hyperuricemia refers to an elevation in the serum uric acid concentration. The blood levels of uric acid are a function of the balance between the breakdown of purines & the rate of uric acid excretion. Theoretically, alterations in this balance may account for hyperuricemia. Prolonged hyperuricemia often associated with gout, is an important risk factor for damaged joints. The present study is undertaken with the aim to find out the prevalence of hyperuricemia by age & sex, to establish the statistically significant correlation between serum creatinine & triglyceride concentration with uric acid concentration & to study the relation between alcohol drinking & hyperuricemia in Morang District, by routine health examinations in the out Patients Department (OPD) of Nobel Medical College, Biratnagar from January 2012 to January 2013. The study reveals that 28.57% (male – 30.06%, female -26.61%) of patients have been suffering from hyperuricemia. It indirectly indicates hyperuricemia is very frequent in developing country like Nepal. The present study denoted that hyperuricemia is directly related to alcohol consumption in both male & female.

Key words: *Hyperuricemia, Gout*

Introduction

Hippocrates, in the fifth century B.C, recognized the distinctive clinical features of gouty arthritis, which he inscribed in the oldest recorded medical text¹. The term gout was given by de Vielehardouin in the 13th century.² Uric acid was first isolated from urine by Karl Wilhelm Scheele in 1776³. In 1907, Emil Fisher established uric acid to be a purine compound.⁴ The British physician Alfred Baring Garrod demonstrated by the murexide test in increased amount of uric acid in the blood of gouty subjects.⁵ He also recognized asymptomatic hyperuricemia, the cause and effect relationship of urate deposition and gouty inflammation, the implication of impaired renal function in gout, the relation of hyperuricemia to gout and treatment changes in urate levels preceding gouty attacks.

Uric acid is the final product of purine metabolism in human beings. Unlike allantoin, the more soluble end product found in lower animals, uric acid is a poorly soluble, end product of purine metabolism in humans. Humans have higher levels of uric acid because of a deficiency of the hepatic enzyme, uricase, and a lower fractional excretion of uric acid. Approximately, two thirds of total body urate is produced endogenously, while the remaining one third is accounted for by dietary purines. About 70% of the urate produced daily is excreted by kidneys, while the rest is eliminated by the intestines.

Hyperuricemia refers to an elevation in the serum uric acid concentration. The blood levels of uric acid are a function of the balance between the breakdown of purines and the rate of uric acid excretion. Theoretically, alterations in this balance may account for hyperuricemia, although clinically defective

elimination accounts for most cases of hyperuricemia.

Prolonged hyperuricemia often associated with gout, is an important risk factor for damaged joints.⁶ Hyperuricemia has been shown to be associated with several components of metabolic syndrome (Mets) and investigators have postulated that increased concentrations of uric acid may be another important component of the syndrome.⁷ In some epidemiologic studies, a close relationship between hyperuricemia and hypertension, insulin resistance and cardiovascular disease risk factors (such as obesity and smoking) has been reported.⁸⁻¹¹ Hyperuricemia is diagnosed in 5-30% of the general population, although the prevalence is higher among some ethnic groups (e.g, Japanese) and appears to be increasing worldwide.¹² Serum uric acid concentrations are known to increase with age and are further increased after menopause in women.¹³ Considering current increases in the incidence and prevalence of obesity and Mets worldwide, as well as emerging evidence documenting associations between hyperuricemia and cardiovascular complications further investigations are required.

Acheson and Chan¹⁴ have expressed the situation well by stating, "The associates of a high uric acid are the associates of plenty."

On the other hands, with rapid economic development, possibility of improved nutrition and promotion of successful health, life expectancy has been prolonged and the elderly population has increased this has true in Morang, a district of Nepal also. Among common disorders of elderly, high serum uric acid levels are found to be directly correlated to hypertension, heart disease, diabetes, kidney disease, dietary habits and nutrition.

Traditionally, they eat foods that are high in purine such as red meat, beans, cabbage, cauliflower, alcohol and so on.

Little information however exists concerning the prevalence and epidemiological

characteristics of hyperuricemia in Nepal. Therefore, the present study is to find out the prevalence of hyperuricemia among Nepali community by routine health examinations in the out patients Department (OPD) of Nobel Medical College, Biratnagar.

Material and Methods

This study was conducted from January 2012 to January 2013 in Nobel Medical College, Biratnagar, Nepal. In course of study, 287 patients were sent for the investigation of serum uric acid from different Out Patients Department (OPD) of this Hospital. These patients were selected for the study. History and clinical examination records of selected patients were collected.

Selected patients were called on next morning in order to collect fasting blood samples. Median cubital vein of the forearm was used for venipuncture.

The age, sex, alcohol habit and all the biochemical parameters were recorded in pre-designed close end Proforma. Later on all the information was entered in a computer programmed. Mean & standard deviation was calculated by excel programmed.

The following tests were carried out in the clinical biochemistry laboratory. All the necessary quality control measures were applied. Measurement of these parameters has been done on Semi-autoanalyzer.

1. Serum uric acid – by uricase/POD method
2. Blood sugar – by GOD – POD method.
3. Serum creatinine – by Jaffe's method
4. Serum triglycerides – by Glycerol -3-phosphate – oxidase (GPO).

Results

The study was carried out at Department of Biochemistry, Nobel Medical College, Biratnagar. The subjects were taken from Out Patients Department (OPD) of this hospital.

The study was carried out among the patient attending from January 2012 to January 2013. The total no. of case was 287.

Table No. 4.1 Distribution of Patients according to Sex.

Sex	No. of patients	Percentage
Male	163	56.79%
Female	124	43.21%
Total	287	100%

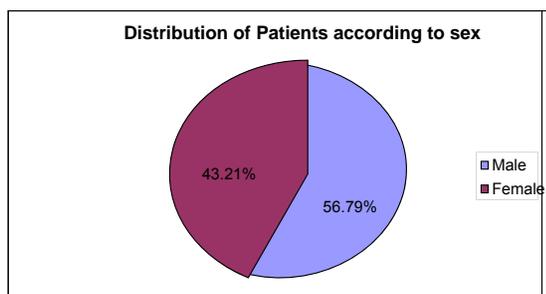


Chart No. 4.1

The majority of the patients in the study were males (56.79%) compared to the females (43.21%).

Table No. 4.2 Distribution of Patients according to Age

Age Group (Years)	No. of patients	Percentage
20-34	96	33.45%
35-49	96	33.45%
50-64	63	21.95%
≥65	32	11.15%

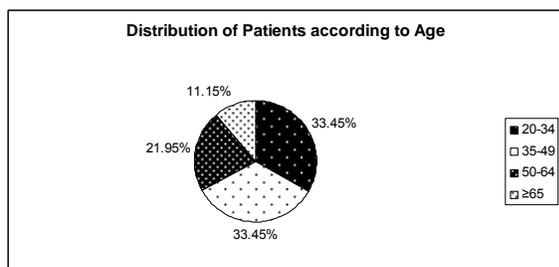


Chart No. 4.2

Above table shows that majority of patients were those who belonged to 20-34 age group and 35-49 (33.45%). However, 50-64 group was 21.95% and ≥65 group was 11.15%.

Table No. 4.3 Prevalence of Hyperuricemia by Sex

Sex	No.	Average age in Years Mean (SD)	Average Uric acid (mg/dl) Mean (SD)	Prevalence of Hyperuricemia
Male	163	43.58 (15.56)	6.37 (1.58)	30.06%
Female	124	43.10 (15.75)	5.39 (1.53)	26.61%
Both	287	43.37 (15.64)	5.95 (1.63)	28.57%

SD = Standard Deviation

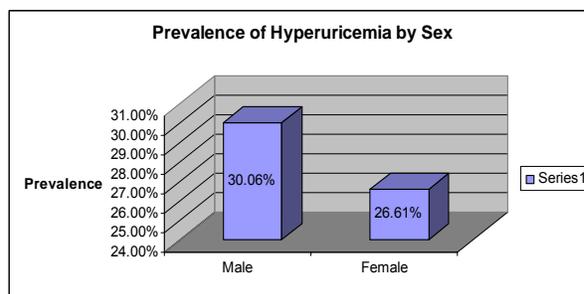


Chart No. 4.3

Above table shows that an average uric acid level in male was 6.67±1.58 and for the female was 5.39±1.53. The prevalence rate of Hyperuricemia for male was 30.06% and for the female 26.61%.

Table No. 4.4 Prevalence of Hyperuricemia by Age.

Years	No.	Average Uric acid (Mg/dl) Mean (SD)	Prevalence of Hyperuricemia
20-34	96	5.63 (1.36)	22.92%
35-49	96	5.73(1.33)	25.00%
50-64	63	5.91(1.43)	28.57%
≥65	32	7.61(2.39)	56.25%

SD = Standard Deviation

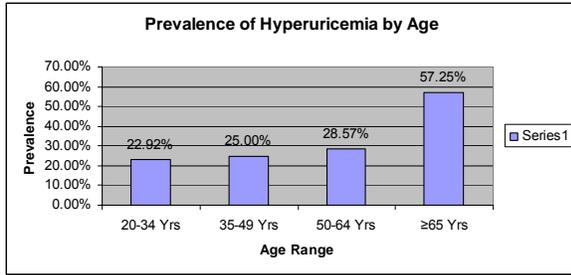


Chart No. 4.4

In above table – highest average uric acid value (7.61 ± 2.39) was found to be in the age group of ≥ 65 . The prevalence rate of Hyperuricemia was highest in more than ≥ 65 years group (56.25%).

Table No. 4.5 Single Variable Analysis of Hyperuricemia and Measurements

Measurements	Hyperuricemia (n=82)	Normal uric acid (n=205)	P-value
Uric acid value (mg/dl) Mean (SD)	7.82(1.50)	5.19(0.90)	<0.001
Age(years) Mean (SD)	48.04(18.18)	41.39(14.11)	0.0029
Creatinine(mg/dl) Mean (SD)	1.08(0.26)	0.90(0.17)	<0.001
Fasting blood sugar (mg/dl) Mean(SD)	91.24(22.00)	90.01(23.30)	NS
Triglyceride(mg/dl) Mean (SD)	218.20(99.24)	151.98(59.60)	<0.001

NS = no statistical significance
SD= Standard Deviation

This table showed that hyperuricemia is related to increased age, Creatinine and Triglyceride and it is not related to blood sugar.

Table No. 4.6 Single Variable Analysis of Hyperuricemia and Drinking Alcohol.

Drinking Alcohol	Uric acid		χ^2	P-Value
	High	Normal		
Yes	48	67	16.	0.000
No	34	138	30	1

This table showed that hyperuricemia is related to the intake of alcohol.

Discussion

Serum uric acid has been shown to be related to risk of hypertension, cardiovascular diseases and type 2 diabetes in clinical and epidemiological studies, in addition to gout, which is specific disease caused by high uric acid¹³⁰⁻¹³³. This study has tried to know the prevalence of hyperuricemia, Morang District and also to know the important risk factors that elevate the serum uric acid levels.

The main observations of the present study are the followings:-

- Firstly the prevalence of the hyperuricemia was high in Male.
- Secondly, a particularly strong association was found between serum uric acid levels and triglycerides.
- Thirdly, a significant relationship between serum uric acid and creatinine was found.

The present study has revealed that the prevalence of hyperuricemia among the patients, attending Nobel Medical College was 28.33% (male 30.06%, female 26.61%). This value is quite higher than reported for several other populations earlier. The 10.6% prevalence of hyperuricemia was noted among the men and women,⁵⁶ while Nagahama and colleagues⁵⁵ reported that 24.4%. were diagnosed hyperuricemia in Japan. In Saudi men and women, hyperuricemia is estimated to 8.4%.⁵⁸ In European countries and United States; hyperuricemia is estimated to 2 to 18% of the total population¹³⁴.

According to my studies, it was found that serum uric acid levels were higher in men (6.37 ± 1.58 mg/dl) than in women (5.39 ± 1.53 mg/dl) which is similar to other observations. Studies in Europe and the United states have shown that average uric acid value

in male is around 5.0 to 5.7 mg/dl and slightly lower in female at 3.7 to 5.0 mg/dl¹³⁵.

The prevalence of hyperuricemia is age dependent. In the present study, hyperuricemia was relatively less common among younger subjects (22.92% in the 20-34 years age group) but increased considerably to 25% in the 35-49 years and 56.25% was found in ≥ 65 years age group. Similar patterns of increase prevalence of hyperuricemia with increasing age have been reported by several other investigators.^{133, 136}

In present study serum uric acid concentration was statistically significant and positively correlated with serum triglyceride concentration ($p < 0.0001$) and serum creatinine concentration ($p < 0.0001$). These associations were generally similar to those reported by other investigators.^{91, 92, 134, 135} The potential mechanisms related hyperuricemia to fasting hypertriglyceridemia are unknown. It has been speculated to be due to an increase in NADPH requirement for de novo fatty acid synthesis in obese men. With increased NADPH, uric acid production is enhanced, and this might increase serum uric acid level¹³⁷.

My observation showed that alcohol drinking was found to be closely related to hyperuricemia. Alcohol is useful for excretion of uric acid and that the excretion rate of uric acid by the kidney does not decline because of drinking. Alcohol consumption causes accelerated hepatic break down of ATP and increase urate production and also may cause hyperlacticacidemia which competitively blocks the uric acid secretion.¹²¹ The higher purine content in some alcoholic beverage such as beer may be a factor that increases the uric acid level in blood.¹²²

In present study it was not found statically significant relationship between fasting blood sugar and hyperuricemia. Many studies showed similar patterns of finding.^{138,139}

Age appeared to be related to hyperuricemia in present study, which was

consistent and adjacent with other studies. As the present study showed average age for hyperuricemia was 48.04 ± 18.18 with respect to average age of normal uric acid patients 41.39 ± 14.11 . However, some Asian studies age was reported as risk factors for hyperuricemia in women but in men hyperuricemia was found to decrease with age.^{57,140} This study also emphasized the prevalence of hyperuricemia increased with age (table no. 4.4). Increasing patterns of serum uric acid level with age might be due to impaired renal function, use of diuretics, hypertension as common in elderly patients^{34,117,118}.

Although many risks factors that could affect the level of uric acid; unfortunately I did not collect detailed information of other determinations of hyperuricemia.

References

1. **Hippocrates.** The Genuine works of Hippocrates, Vols. 1 and 2. Translated from the Greek with a preliminary discourse and annotations by Francis Adams. New York, Wood, 1886.
2. **Copeman, W.S.C:** A short History of the Gout, Blerkeley, University of California Press, 1964.
3. **Scheele, K.W.:** Exameen chemicum calculi urinarii. Opuscul, 2:73,1776.
4. **Fischer, E:** Unter suchungen in der Puringruppe. Berlin, Springer, 1907.
5. **Garrod, A.B:** Treatise on Gout and Rheumatic Gout (Rheumatoid Arthritis). 3rd Ed. London, Longmans, Green, 1876.
6. **Choi HK, Mount DB, Reginato AM.** Pathogenesis of gout. Ann Intern Med 2005;143:499-516.
7. **Bonora E, Targher G, Zenere MB, Saggiani F, Cacciatori V, Tosi F, et al,** Relationship of uric acid concentration to cardiovascular risk factors in young men. Role of obesity and central fat distribution. The Verona Young Men Atherosclerosis Risk Factors Study. Int J Obes Relat Metab Disord 1996; 20:975-980.
8. **Conen D, Wietlisbach V, Bovet P, Shamlaye C, Riesen W, Paccud F, et al,** Prevalence of hyperuricemia and relation of serum uric acid with cardiovascular risk factors in a developing country, BMC Public Health 2004; 25:4-9.

9. **Jossa F, Farinaro F, Panico S, Krogh V, Celentano E, Galasso R, et al.** serum uric acid and hypertension; the Oliveti heart study. *J Hum Hypertens* 1994; 8:677-681.
10. **Taniguchi Y, Hayashi T, Tsumura K, Endo G, Fujii S, Okada K.** serum uric acid and the risk for hypertension and Type 2 diabetes in Japanese men: The Osaka Health Survey. *J Hypertens* 2001; 19:1209-1215.
11. **Selby JV, Friedman GD, Queensberry CP Jr.** Precursors of essential hypertension; Pulmonary function, heart rate, uric acid, serum cholesterol and other serum chemistries. *Am J Epidemiol* 1990; 131:101-1027.

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CO-MORBIDITIES IN CHILDREN WITH CEREBRAL PALSY UNDERGOING EARLY SPINE FUSION FOR SCOLIOSIS

Prakash Sitoula and Freeman Miller

Abstract

Introduction: Children with Cerebral Palsy (CP) may have multisystem involvement the occurrence of which increases with severity of involvement. Scoliosis is also found to be more prevalent in severely involved children with CP.

Aims: This study aimed to describe co-morbidities in children with CP undergoing early spine fusion for scoliosis.

Methods: A retrospective review of patients with CP Scoliosis between 1989 and 2006 who were <10 years at spine fusion was done. Demographics, mental status, pre-operative weight and height and body-mass index (BMI), curve characteristics, geographic pattern of involvement and GMFCS level were reported. Co-morbidities were broadly categorized as those involving central nervous system, gastrointestinal system and respiratory system.

Results: 42 patients (24 male and 18 female) with mean age of 8.1 ± 1.6 years at surgery were identified. The mean preoperative weight, height, and BMI were 22 ± 6.8 kilograms, 115 ± 11.8 centimeters and 16 ± 3.7 respectively. All patients were mentally retarded and quadriplegic. GMFCS level was V in 40 patients and IV in 2 patients. The mean Cobb angle was $83.4^\circ \pm 18.3^\circ$ and pelvic tilt was $18^\circ \pm 10^\circ$. Seizure disorder and GER were present in 98% and 69% of patients respectively. 88% patients had gastrostomy-tube for feeding. 31% patients were tracheostomized; 46% of them were ventilator dependent. Asthma/ reactive airway disease, restrictive lung disease and obstructive respiratory disease/ sleep apnea were present in 29%, 17% and 5% of patients respectively. 19% patients had recurrent aspiration pneumonitis.

Conclusion: Our study showed that children with CP Scoliosis progressing to surgical range before 10 years of age are severely involved with co-morbidities encompassing multiple organ-systems.

Key words: *Cerebral Palsy, Scoliosis, Co-morbidities, Spine fusion*

Introduction

Cerebral Palsy (CP) is caused by an ischemic insult to immature brain. In this condition, the primary lesion remains static, however the motor manifestations evolve with time due to spasticity (1, 2). Scoliosis is found to be more

common in non-ambulatory spastic quadriplegic children with CP with reported prevalence of up to 75% (3-6).

Multisystem involvement is common in children with CP and the prevalence increases with severity of involvement (2, 7, 8). Seizure is commonly associated with CP (2, 9).

Occurrence of oral-motor dysfunction has been reported in this patient population leading to poor nutrition and growth (8, 10). Assistive feeding in the form of gastrostomy-tube or nasogastric-tube is warranted. Respiratory system involvement is also common in severely involved children with CP(11, 12).

Larger curves are often associated with high pelvic obliquity and need surgery. The aim of surgical treatment in this patient population is to improve sitting or standing balance and facilitate nursing care (13). Presence of co-morbidities often complicates treatment process. The literature is scarce on treatment of scoliosis in children with CP less than 10 year of age (14) and there are no studies describing co-morbidities in this patient population. The aim of this study was to describe co-morbidities in children with CP undergoing spine fusion before 10 years of age for scoliosis.

Methods

After an institutional review board approval (Nemours/ A. I. duPont Hospital for Children, Delaware, USA), a review of patients with cerebral palsy undergoing early spine fusion for scoliosis between 1989 and 2006 was done. The inclusion criteria were: (1) patients with CP with scoliosis and (2) age less than 10 years at spine fusion.

The following parameters were recorded after appraisal of the medical records: age at surgery, gender, mental status, mobility, Gross Motor Classification System (GMFCS) level and type of CP based on geographic pattern of involvement (quadriplegic/diplegic/hemiplegic).

Preoperative height and weight were also recorded and body mass index was calculated from these parameters. Height was measured by arm-board measurement technique described by Miller and Koreska (15).

In this patient population, scoliotic curves of 60° or more were managed surgically. The Cobb angle for scoliosis, thoracic kyphosis and lumbar lordosis were measured by the Cobb method (16).

The co-morbidities were broadly classified as those affecting: (1) central nervous system (Seizure disorder); (2) respiratory system (reactive airway disease and asthma; restrictive airway disease; recurrent aspiration pneumonitis; obstructive airway disease; tracheostomy and need for ventilator); (3) gastrointestinal system [gastrostomy-feeding tube for nutrition; gastroesophageal reflux (GER) with or without the need for Nissen fundoplication].

Statistical analysis

Data was examined for normality prior to hypothesis testing. Mean and SD were used for summary statistics for continuous variables and frequency and percentages were used for categorical variables. STATA version 12.0 (STATA Corp, College Station, TX) was used for data analysis.

Results

Forty-two patients, male 24 (57%) and female 18 (43%), met the inclusion criteria and formed the cohort for this study. The mean age at surgery was 8.1 ±1.6 years (range, 4.4 - 9.9). The mean preoperative body weight was 22 ±6.8 kilograms (range, 10 - 37) and height was 115 ±11.8 centimeters (range, 92 - 147). The mean body mass index was 16 ±3.7 (range, 10 - 27) (Table 1).

All patients in this series were quadriplegic with 95% of them being bedridden and completely dependent for all their activities of daily living. Remaining 5% were capable of transfer from wheelchair with support. Similarly, all patients were mentally retarded;

95% of patients had severe mental retardation (MR) while remaining 5% had moderate MR.

Table 1. Demographics

Variable	Frequency	Percentage	Mean	SD	Range
Gender					
Male	24	57			
Female	18	43			
Geographic pattern					
Quadriplegia	42	100			
Ambulation					
Bedridden	40	95			
Sitter	2	5			
Mental Retardation					
Severe	40	95			
Moderate	2	5			
Age at Surgery (years)			8.1	1.6	4.4 - 9.9
Weight (Kg)			22	6.8	10 - 37
Height (cm)			115	11.8	92 - 147
BMI			16	3.7	10 - 27

The mean Cobb angle was $83.4^\circ \pm 18.3^\circ$ (range, $50^\circ - 118^\circ$), pelvic tilt was $18^\circ \pm 10^\circ$ (range, $2^\circ - 45^\circ$), thoracic kyphosis was $53.4^\circ \pm 28.4^\circ$ ($-3^\circ - 113^\circ$) and lumbar lordosis was $32.3^\circ \pm 33^\circ$ (range, $-64^\circ - 100^\circ$) (Table 2).

Table 2. Curve Characteristics

Variable	Mean	SD	Range
Cobb angle	83.4	18.3	50 - 118
Pelvic tilt	18	10	2 - 45
Thoracic kyphosis	53.4	28.4	-3 - 113
Lumbar Lordosis	32.3	33	-64 - 100

All patients but one had at least single co-morbidity (Table 4). Seizure disorder was present in 98% of the patients. Eighty-eight percent patients had gastrostomy-tube for feeding. GER was present in 69% of patients out of which 65.5% had Nissen Fundoplication. Thirty-one percent patients had tracheostomy tube for breathing; 46% of these were ventilator dependent. Respiratory system involvement included obstructive, restrictive and reactive airway diseases. Obstructive respiratory disease/ sleep apnea was present in 5% of patients. Restrictive lung disease and asthma/ reactive airway

disease was seen in 17% and 29% of patients respectively. Nineteen percent patients had recurrent aspiration pneumonitis (Table 3).

Table 3. Co-Morbidities

Variable	Frequency	Percentage
Gastrostomy-tube feeding		
Yes	37	88
No	5	12
Gastroesophageal reflux	29	69
Nissen Fundoplication (NF)	19	65.5
No NF	10	35.5
Seizure disorder		
Yes	41	98
No	1	2
Tracheostomy	13	31
Ventilator dependent	6	46
Non-ventilator dependent	7	54
Obstructive Respiratory Disease/Sleep apnea		
Yes	2	5
No	40	95
Restrictive Lung Disease		
Yes	7	17
No	35	83
Asthma/ Reactive Airway Disease		
Yes	12	29
No	30	71
Recurrent Aspiration Pneumonitis		
Yes	8	19

No 34 81

Table 4. Number of Co-morbidities

Number of Co-morbidities	Frequency	Percentage
0	1	2.4
1	1	2.4
2	7	16.7
3	13	31
4	7	16.7
5	11	26.2
6	2	4.8

Discussion

Prevalence of scoliosis in CP patients increases with severity of involvement with ambulation potential being a significant predictor for development these curves (4, 5, 17). We found children who develop surgical curve early in their life often have number of co-morbidities.

Ninety-five percent of patients in the present series were bedridden with complete dependence for activities of daily living while remaining 5% were capable of wheelchair transfer. In a series of institutionalized patients with CP, Saito et al(6) reported development of severe scoliosis in 67% of patients with total body involvement and 100% of patients who were bedridden. All patients in the current series were mentally retarded: 95% of the cohort had severe MR and remaining 5% had moderate MR. Kalen et al(13) reported severe MR in all 14 institutionalized CP adult patients with curves $>45^\circ$ as opposed to 74% (n=42) of those with curves $<45^\circ$.

Majority of patients in the current series had poor nutritional status as depicted by low BMI (mean BMI=16). Eighty-eight percent patients needed gastrostomy-tube for feeding. In a prospective longitudinal study by Sullivan et al(8) to show the effect of gastrostomy feeding in children with CP, two-

thirds of patients (43 of 57) had spastic quadriplegia. The oral-motor dysfunction is found to be more prevalent in severely involved children with CP needing feeding support. This study showed significant improvement in nutritional status of the children with CP following enteral feeding as indicated by body weight, limb growth and subcutaneous fat deposition.

Ninety-eight percent of patients in the present series had seizure disorder. Venkateswaran and Shevell(2) described seizure in 47% of their cohort with CP. Similarly, in a series of 323 patients with CP, Hadjipanayis et al(9) reported this condition in 41.8% of overall cohort and in about 50% of patients with spastic tetraplegia. Higher incidence of seizure disorder in the current series may have been due to greater severity of involvement of patients. However, fewer numbers of patients leading to sparse data bias cannot be negated. Gastroesophageal reflux was observed in 69% of cohort in the present series. The reported incidence of GER in children with CP ranges from 26% to 91% (18, 19). This condition has been found to be associated with number of pulmonary diseases in children. In a series of otherwise normal children with GER, Euler et al(11) reported recurrent pneumonitis in 94%. In a similar cohort of patients with steroid dependent asthma, Shapiro et al(12) demonstrated GER in 43% of patients. In the present series, recurrent aspiration pneumonitis and asthma/ reactive airway disease were documented in 19% and 29% patients respectively.

This study has number of limitations. This is a retrospective study with its inherent biases. There may have been sparse data bias due to fewer numbers of patients as this study deals with rare surgical entity in pediatric orthopedics.

Conclusion

Our study showed that children with CP needing surgery for scoliosis before 10 years

of age are severely involved with co-morbidities encompassing multiple organ-systems. These children need multidisciplinary team approach for management of their medical conditions before and after surgery.

References

1. **Badawi N, Watson L, Petterson B, Blair E, Slee J, Haan E, et al.** What constitutes cerebral palsy? *Dev Med Child Neurol.* 1998;40(8):520-7.
2. **Venkateswaran S, Shevell MI.** Comorbidities and clinical determinants of outcome in children with spastic quadriplegic cerebral palsy. *Dev Med Child Neurol.* 2008;50(3):216-22.
3. **Edebol-Tysk K.** Epidemiology of spastic tetraplegic cerebral palsy in Sweden. I. Impairments and disabilities. *Neuropediatrics.* 1989;20(1):41-5.
4. **Persson-Bunke M, Hagglund G, Lauge-Pedersen H, Wagner P, Westbom L.** Scoliosis in a total population of children with cerebral palsy. *Spine.* 2012;37(12):E708-13.
5. **Robson P.** The prevalence of scoliosis in adolescents and young adults with cerebral palsy. *Dev Med Child Neurol.* 1968;10(4):447-52.
6. **Saito N, Ebara S, Ohotsuka K, Kumeta H, Takaoka K.** Natural history of scoliosis in spastic cerebral palsy. *Lancet.* 1998;351(9117):1687-92.
7. **Shevell MI, Dagenais L, Hall N.** Comorbidities in cerebral palsy and their relationship to neurologic subtype and GMFCS level. *Neurology.* 2009;72(24):2090-
8. **Sullivan PB, Juszczak E, Bachlet AM, Lambert B, Vernon-Roberts A, Grant HW, et al.** Gastrostomy tube feeding in children with cerebral palsy: a prospective, longitudinal study. *Dev Med Child Neurol.* 2005;47(2):77-85.
9. **Hadjipanayis A, Hadjichristodoulou C, Youroukos S.** Epilepsy in patients with cerebral palsy. *Dev Med Child Neurol.* 1997;39(10):659-63.
10. **Dahl M, Thommessen M, Rasmussen M, Selberg T.** Feeding and nutritional characteristics in children with moderate or severe cerebral palsy. *Acta paediatrica (Oslo, Norway : 1992).* 1996;85(6):697-701.
11. **Euler AR, Byrne WJ, Ament ME, Fonkalsrud EW, Strobel CT, Siegel SC, et al.** Recurrent pulmonary disease in children: a complication of gastroesophageal reflux. *Pediatrics.* 1979;63(1):47-51.
12. **Shapiro GG C, DL, Pierson WE, et al.** Gastroesophageal reflux in asthmatic children. *abstracted I Allergy Clin Immunol.* 1978;61(137).
13. **Kalen V, Conklin MM, Sherman FC.** Untreated scoliosis in severe cerebral palsy. *J Pediatr Orthop.* 1992;12(3):337-40.
14. **McElroy MJ, Sponseller PD, Dattilo JR, Thompson GH, Akbarnia BA, Shah SA, et al.** Growing rods for the treatment of scoliosis in children with cerebral palsy: a critical assessment. *Spine.* 2012;37(24):E1504-10.
15. **Miller F, Koreska J.** Height measurement of patients with neuromuscular disease and contractures. *Dev Med Child Neurol.* 1992;34(1):55-60.
16. **Cobb JR.** **Outline for the study of scoliosis.** In: American Academy of Orthopaedic Surgeons, ed *Instructional Course Lectures.* Ann Arbor, MI: JW Edwards; 1948. p. 261-75.
17. **Madigan RR, Wallace SL.** Scoliosis in the institutionalized cerebral palsy population. *Spine.* 1981;6(6):583-90.
18. **Drvaric DM, Roberts JM, Burke SW, King AG, Falterman K.** Gastroesophageal evaluation in totally involved cerebral palsy patients. *J Pediatr Orthop.* 1987;7(2):187-90.
19. **Spiroglou K, Xinias I, Karatzas N, Karatza E, Arsos G, Panteliadis C.** Gastric emptying in children with cerebral palsy and gastroesophageal reflux. *Pediatr Neurol.* 2004;31(3):177-82.

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CLINICAL PROFILE AND MANAGEMENT OF GALL BLADDER CANCER: OUR EARLY EXPERIENCE

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N Belbase, SJ Shrestha, S Agrawal*

Abstract

Objective: To evaluate the clinical profile of patients with gallbladder cancer.

Methodology: This is a single institution based retrospective study of patients with gallbladder cancer who presented at College of Medical Sciences and Teaching Hospital, Bharatpur, Chitwan, Nepal. Patients presenting during the two years period from August 2011 to July 2013 were reviewed.

Result: Out of 12 patients, 9 were females (75%) and 3 were males (25%), showing female preponderance. Most of the patients (75%) were in age group of 51-70 years. Only one patient (8%) was below 50 years of age. Main symptom was pain associated with anorexia, nausea & vomiting. Major signs were palpable mass, hepatomegaly and jaundice. All the histopathological reports were adenocarcinoma. 8 patients (66.66%) presented with advanced disease and were managed with extended cholecystectomy followed by systemic chemotherapy.

Conclusions: Prevalence of gall bladder cancer is higher in females in our series. Most of the patients were in fifth to seventh decade of life and presented in advanced stage. Gallbladder cancer showed association with gallstones.

Key Words: *Gallbladder cancer, extended cholecystectomy, cholelithiasis.*

Introduction

Carcinoma of the gallbladder (GBC) is the most frequent malignant tumor of the biliary tract and the fifth most common cancer of the digestive tract. Gallbladder cancer is an aggressive malignancy and carries extremely poor prognosis. Patients commonly present in late stage as it has no disease specific presenting symptoms. Have no specific presenting symptoms and therefore presentation with late – stage disease is common. In the United States and European countries, GBC is an uncommon tumor accounting for less than 2% of all cancer reported annually. However, 6000 to 7000

new cases are reported annually in the United States. Ethnicity plays an important role in the development of GBC with highest incidence in the women population from India and Pakistan. Among North American populations, Native Americans and immigrants from Latin America have the highest rate. The reasons for these geographical or ethnic variations for biliary tract cancer are not clear, but some unknown environmental risk factors or a genetic susceptibility are suspected. Most of the patients reported are female over 50 years of age and with concomitant gall stone. Presence of gallbladder stone is considered as the primary risk factor and larger stone (>3cm)

carry an increased risk of cancer development. It is 7 times more common in patients with cholelithiasis. The risk of gallbladder cancer increases with certain risk factors like abnormal pancreaticobiliary junction (APBJ), choledochal cyst, primary sclerosing cholangitis (PSC), porcelain gallbladder and GB polyps larger than 10 mm.

Other factors that are associated with GBC are pregnancy, female sex hormones, low fiber, vitamin A intake and high fat intake. There may be an association between chronic typhoid infections and subsequent development of gallbladder cancer and the likelihood of such a progression is six times higher than in normal subjects. The commonest histological type is adenocarcinoma. This may be glandular, medullary, scirrhous, papillary or colloid. It appears that papillary forms have a better prognosis than the nodular infiltrate form. Occasionally, undifferentiated carcinoma, squamous cell carcinoma, carcinoma in situ and a mixed group of rarities are reported. Very rarely, malignancy may develop from non-papillary adenomas, especially large ones over one centimeter in diameter.

The purpose of conducting this study was to evaluate the clinical profile of patients presenting to us and subsequently diagnosed with GBC.

Methodology

Patient and Study design

This is a retrospective study conducted at College of Medical Science and Teaching Hospital (COMS-TH), Bharatpur, Nepal after the approval from the ethical committee. Data were collected from the OT register and medical record files. There were total 12 cases of GBC admitted in between August 2011 and July 2013. Each patient's record was examined carefully to obtain the following data: age, sex, duration of symptom, presenting symptoms and signs, type of

operative procedure, operative findings, presence or absence of stones in gallbladder, histopathology of the resected specimen, perioperative complications and adjunctive therapy.

Results

The mean age in the study was between 51-70 years. Nine out of the total 12 patients comprising 75 % were females and 25% (n=3) were males. Age and sex distribution of these patients is given in Table-I.

Table 1. Age and Sex distribution of study population.

Age	Male	Female	Total Percentage (%)
<50	1	1	16.66 (n= 2)
51-70	1	7	66.66 (n= 8)
>70	1	1	16.66 (n= 2)
Total	3	9	100%

Table 2. Clinical presentation

SN	Symptoms	Percentage (%)
1	Non-specific chronic abdominal pain, nausea, vomiting	58.33
2	Early satiety, abdominal fullness, anorexia	16.66
3	Jaundice	16.66
4	Weight loss, pruritus	8.33
	Total	100
	Signs	
1	Palpable RUQ mass with hepatomegaly	58.33
2	Emaciation and Cachexia	16.66
3	Ascites and peripheral edema	16.66
4	Acute cholecystitis	8.33
	Total	100

Mean duration of presentation was variable which ranged from 2 days to 10 years. Patient presenting with the features of acute cholecystitis that underwent cholecystectomy and histopathologically diagnosed as GBC was the one who presented with the shortest duration of symptom. Among the remaining cases, majority of the patients presented with the symptoms like chronic epigastric pain, nausea and vomiting comprising 58.33% (n=7) while early satiety, sense of fullness and anorexia was present in 16.66 % and 16.66% presented with jaundice. Weight loss, abdominal distention and pruritus were associated with the late stage of the disease which was observed in 8.33%. Palpable right upper quadrant mass and hepatomegaly were present in 58.33% of the patients which was the major sign in our study. Of the study population, 16.66% presented with emaciation and cachexia while ascites and peripheral edema was seen in two patients (16.66%). Remaining 8.33% presented with features of acute cholecystitis. Imaging modalities, mainly USG, revealed gallstones in 75% (n=9) and gallbladder mass in 25% (n=3). Extended cholecystectomy was performed in 5 cases and completion extended cholecystectomy was done in 1 case who had undergone open cholecystectomy for acute cholecystitis, while 6 out of the 12 cases were inoperable. Systemic chemotherapy was initiated in all of the 12 patients. The histopathology report of the 6 resected specimens confirmed adenocarcinoma of gallbladder. The rest of the patients who were designated as inoperable by CT scan of abdomen and pelvis were diagnosed to have GBC on the basis of USG guided tissue biopsy. The intra-operative findings seen in the study population is demonstrated in the Table-III. There was no significant perioperative complications noted.

Table 3. Intraoperative findings (n=6)

S.N.	Findings	Percentage (%)
1	Pericystic LN involvement.	33.33(n=2)
2	Liver metastases (including completion extended cholecystectomy)	49.99(n=3)
3	Limited to gallbladder	16.66(n=1)

LN=Lymph Node

Discussion

In our study, GBC was predominant in female with the ratio of 3:1(F:M) and is similar to the findings as reported in by Patrick G et al. Most of the patient in our study were in the age group of 51-70 years. This data is consistent with the data in different literature where it has been found that in more than 75 % of the cases of the GBC mean age was more than 65 years. Because 90% of gallbladder cancer originate in the fundus or body, they don't produce symptoms until the disease is advanced. In our series, 58.33% of population presented with nonspecific symptoms like abdominal pain, nausea and vomiting. Mirsa S et al has also mentioned that due to the nonspecific symptoms and signs, establishing a proper diagnosis is difficult in case of gallbladder carcinoma. In our series, association of gallstone with gallbladder cancer was found in 75% while Marcus CB has shown that 95% of the cases with GBC have gallstones. The histopathological report in Kyriacou E revealed adenocarcinoma of gallbladder and similar result was seen in our study too. Resection of the gallbladder cancer remains the only potential for cure. Patients are divided into four specific sub-group of presentation – patient with an incidental polyps on imaging, patient with an incidental finding of gallbladder cancer at time of or

following cholecystectomy, patients suspected of having gallbladder cancer preoperatively and patients with advanced disease at presentation. For polyp and gallbladder cancer following cholecystectomy with T1a & b, simple cholecystectomy is sufficient as long as the margins are negative. However, the perilymphatic and vascular invasion is high with the T1b stage so extended cholecystectomy directed at obtaining R0 resection with excision of draining lymph node is the treatment of choice. For T2, T3 and T4 stages, radical cholecystectomy is indicated. Debulking without possibility of complete resection has no role in the management of gallbladder cancer. When disease is too advanced, only palliative procedures are done. In our study, extended cholecystectomy was done in all the operated cases (n=6) and followed by oral gemcitabine. Most of the patients were discharged with the mean duration of hospital stay of 10 days ranging from 7 to 20 days.

Conclusion

Gallbladder is a rare entity with silent progression thus present in advanced stage carrying high rate of mortality and morbidity. It is more common in female than in male. Presence of gallstone has higher risk of malignancy. Therefore, early cholecystectomy for cholelithiasis is the best way to prevent gallbladder cancer to some extent. Different literatures suggest that overall survival of the gallbladder cancer is less than 15 % with median survival of 13 months in metastatic disease. The five year survival couldn't be commented on this study because of short

duration of follow up and the timing of study performed.

References

1. **Patrik GJ and Steven RTE. Biliary System.** In: Townsend CM, Beauchamp RD, Evers BM et al, editors. Sabiston Text Book of Surgery The Biological Basis of Modern Surgical Practice. 19th ed. Philadelphia:Elsevier Saunders. 2012;1476-514.
2. **Misra S, Chaturvedi A, Misra NC. Gallbladder cancer.** Curr Treat Options Gastroenterol. 2006;9:95-106.
3. **Greenlee RT, Hill-Harmon MB, Murray T, Thun M.** Cancer statistics, 2001. CA Cancer J Clin. 2001;51:15-36.
4. **Malik IA.** Gallbladder cancer: current status. Expert Opin Pharmacother. 2004;5:1271-7.
5. **Ahmad M, Khan AH, Mansoor A.** The pattern of malignant tumours in northern Pakistan. J Pak Med Assoc. 1991;41:270-3.
6. **Rizvi TJ, Zuberi SJ.** Risk factors for gall bladder cancer in Karachi. J Ayub Med Coll Abbottabad. 2003;15:16-8.
7. **Welton JC, Marr JS, Friedman SM.** Association between hepatobiliary cancer and typhoid carrier state. Lancet. 1979;1:791-4.
8. **Carriaga MT, Henson DE.** Liver, gallbladder, extrahepatic bile ducts, and pancreas. Cancer. 1995;75:171-90.
9. **Ravi SC, Simul AS. Biliary System.** In: Townsend CM, Beauchamp RD, Evers BM et al, editors. Sabiston Text Book of Surgery The Biological Basis of Modern Surgical Practice. 18th ed. Philadelphia:Elsevier Saunders.2008;1547-87.
10. **Misra S, Chaturvedi A, Misra NC, Sharma ID.** Carcinoma of the gallbladder. Lancet Oncol. 2003;4:167-76.
11. **Marcus CB, Tand and Steven M, Strasberg.** Biliary Surgery. In: Mary EK, Abdulhameed A, Ankit B, Amy CF, Matthew RP. editors. Washington Manual TM of Surgery. 6th ed. New Delhi; Walters Kluwer.2012;363-86.
12. **Kyriacou E. Carcinoma of the gall-bladder.** J Gastroenterol Hepatol. 1999 Mar;14(3):215-9.

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CLINICAL PROFILE OF PATIENTS WITH PARTIAL SEIZURE

Dilli Ram Kafle

Abstract

In partial seizure the epileptic discharge begins in one area of the brain and may or may not spread to other areas of the brain. When the discharge spreads to both the hemisphere it may lead to partial seizure with secondary generalization. It is a descriptive cross sectional study carried out at Tribhuvan University Teaching Hospital between April 2012 to April 2013. A total of 70 patients with partial seizure attended medical opd and admitted to medical ward. There were 40 males and 30 females. Age distribution of patient's presentation with partial seizure was as follows. Less than 20 years of age: 27 patients. 20-40: 24 Patients. 41-60: 21 Patients. 60-80: 8 patients. 20 patients had simple partial seizure. 20 patients had complex partial seizure: 30 patients had partial seizure with secondary generalization. Age at onset of partial seizure: Less than 20 years: 45 Patients. 21-40 years: 12 patients 41-60 years: 20 patients. More than 60 years: 3 patients. Duration before starting treatment: Less than 6 months: 33 Patients. 6 month – 1 year: 6 patients. More than 1 year: 31 Patients. Status epilepticus: 3 patients. Drug history: carbamazepine, Phenytoin.

EEG : Normal in 36 patients. Abnormal in 34 patients. Neuroimaging: Tuberculoma: 6 patients, Calcified granuloma: 39 patients, Tuberos sclerosis: 2 patients, mesial temporal sclerosis: 3 Patients, Cerebral infarction: 12 Patients. Normal : 18 patients. Family history of seizure was present in 10 patients.

Key word: *Seizure, Electroencephalography, Epilepsy.*

Introduction

Epilepsy is one of the most common neurologic problems worldwide. In recent years, important advances have been made in the diagnosis and treatment of seizure disorders.¹ However, our understanding of the cellular and molecular mechanisms by which epilepsy develops, or epileptogenesis, is still incomplete.

Classification of Epilepsy

The term “epilepsy” encompasses a number of different syndromes whose cardinal feature is a predisposition to recurrent unprovoked seizures. Although specific seizures can be classified according to their clinical features

(e.g., complex partial seizures and generalized tonic-clonic seizures),² epilepsy syndromes can also be classified according to the type of seizure, the presence or absence of neurologic or developmental abnormalities, and electroencephalographic (EEG) findings.³ For example, the syndrome of juvenile myoclonic epilepsy is characterized by the onset of myoclonic seizures, generalized tonic-clonic seizures, and less frequently absence seizures in adolescents who have normal intellectual function, with EEG findings of rapid, generalized spike-wave and polyspike-wave discharges.⁴

Epilepsy syndromes fall into two broad categories: generalized and partial (or localization-related) syndromes.^{3,4} In generalized epilepsies, the predominant type

of seizures begins simultaneously in both cerebral hemispheres. Many forms of generalized epilepsy have a strong genetic component; in most, neurologic function is normal. In partial epilepsies, by contrast, seizures originate in one or more localized foci, although they can spread to involve the entire brain. Most partial epilepsies are believed to be the result of one or more central nervous system insults, but in many cases the nature of the insult is never identified.

Mechanism of Partial epilepsy Mesial Temporal-Lobe Epilepsy

We know much less about the mechanisms underlying partial-seizure disorders than we do about generalized epileptogenesis, even though partial seizures are the most common seizure disorder in adults, often stemming from focal lesions such as head trauma, strokes, and tumors.⁵ The most prevalent of these syndromes features complex partial seizures arising from the mesial temporal lobe.^{4,6} Recordings from intracranial depth electrodes have clearly demonstrated an ictal onset in mesial temporal structures such as the hippocampus, amygdala, and adjacent parahippocampal cortex; surgical resection of these areas in suitable patients usually abolishes the seizures.⁷ These seizures can begin with olfactory or gustatory hallucinations, an epigastric sensation, or psychic symptoms such as déjà vu or depersonalization. Once the seizures progress to a loss of awareness, the patients may stare blankly, speak unintelligibly, or exhibit lip smacking, picking at clothing, or other automatisms.⁸

Although studies of mesial temporal-lobe epilepsy have yielded useful information, there are other plausible mechanisms of partial epileptogenesis that are not suggested by this syndrome. Some partial epilepsies, for example, are genetically determined.

Autosomal dominant nocturnal frontal-lobe epilepsy, in which single-gene mutations have been identified, has turned out to be a channelopathy that affects the neuronal nicotinic acetylcholine receptor, which serves as a ligand-gated sodium channel.⁹ Why mutations in this receptor, which is widely expressed throughout the brain, should cause partial seizures in the frontal lobe is just one of many mysteries. Some genetically determined partial epilepsies, such as benign epilepsy with centrotemporal spikes (also called benign rolandic epilepsy), are age-limited syndromes, suggesting the importance of developmental influences.^{4,10,11} For many patients with partial epilepsy, there may be an underlying genetic predisposition that becomes manifest only after a sufficient environmental insult. Obviously, understanding what molecular mechanisms are at work in patients with such a predisposition is of considerable clinical interest.

Methodology

It was a descriptive analytical cross-sectional study carried out at Tribhuvan University Teaching Hospital. Clinical characteristics of all the patients attending medical OPD and patients admitted to medical ward with history of partial seizure were recorded between from April 2012 to April 2013.

Result

From April 2012 to April 2013 a total of 70 patients with partial seizure attended medical opd and admitted to medical ward. There were 40 males and 30 females. Age distribution of patient's presentation with partial seizure was as follows. Less than 20 years of age: 27 patients. 20-40: 24 Patients. 41-60: 21 Patients. 60-80: 8 patients. Simple Partial seizure: 20. Complex Partial seizure: 20

Partial seizure with secondary generalization:30.Age at onset of partial seizure: Less than 20 years:45 Patients. 21-40 years:12 patients,41-60 years:20 patients and more than 60 years:3 patients. Duration before starting treatment:Less than 6 months:33 Patients: 6 month – 1year:6 patients and more than 1 year: 31 Patients.3 patients had history of Status epilepticus. Most of the patients were taking carbamazepine, Phenytoin as monotherapy. EEG : Normal in 36 patients.Abnormal in 34 patients. Neuroimaging: Tuberculoma: 6 patients. Calcified granuloma:39 patients.Tuberous sclerosis:2 patients. Mesial temporal sclerosis: 3 Patients. Cerebral infarction: 12 Patients. Normal :18 patients. Family history of seizure: 10 patients.

Discussion:

The study highlights the current scenario of the pattern of seizure cases in a tertiary care .The fact that seizures affects commonly the productive age group and occurs due to secondary causes in over a third of cases are issues for concern.

A recent meta-analysis study showed that the age-specific prevalence rates were higher in the younger age group, with the onset of epileptic seizures reported mostly in the first three decades of the sample population's lives.

[12] Mean age of onset of epilepsy was 14.8 years in contrast to our study (25 years). [13]

Family history of epilepsy in a study carried out in Sudan was present in 20% cases, which were higher than our observations of 10%.

The common causes of partial seizure in patients attending to medical opd or admitted to medical ward in decreasing order was calcified granuloma:39 ,Cerebral infarction:12 Patients; Tuberculoma: 6 patients, Mesial temporal sclerosis:3 Patients and tuberous sclerosis:2

patients.Neuroimaging was normal in 18 patients.

EEG was abnormal in 48.6% of patients. This was comparable to a study carried out by Joseph et all in india in which EEG was abnormal in 47.1% of patients.¹⁴

Majority of patients were maintained on monotherapy of phenytoin or carbamazepine.

References

1. **Schachter SC.** Epilepsy. *Neurol Clin* 2001;19:57-78
2. **Commission on Classification and Terminology of the International League against Epilepsy.** Proposal for revised clinical and electroencephalographic classification of epileptic seizures. *Epilepsia* 1981; 22: 489-501
3. **Commission on Classification and Terminology of the International League against Epilepsy.** Proposal for revised classification of epilepsies and epileptic syndromes. *Epilepsia* 1989;30:389-399
4. **Benbadis SR.** Epileptic seizures and syndromes. *Neurol Clin* 2001;19:251-270
5. **Annegers JF.** The epidemiology of epilepsy. In: Wyllie E, ed. *The treatment of epilepsy: principles and practice.* 3rd ed. Philadelphia: Lippincott Williams & Wilkins, 2001:131-8.
6. **Engel J Jr.** Mesial temporal lobe epilepsy: what have we learned? *Neuroscientist* 2001;7:340-352
7. **Kim R, Spencer D.** Surgery for mesial temporal sclerosis. In: Lüders HO, Comair YG. *Epilepsy surgery.* 2nd ed. Philadelphia: Lippincott Williams & Wilkins, 2001:643-52.
8. **French JA, Williamson PD, Thadani VM, et al.** Characteristics of medial temporal lobe epilepsy. I. Results of history and physical examination. *Ann Neurol* 1993;34:774-780
9. **Steinlein OK, Mulley JC, Propping P, et al.** A missense mutation in the neuronal nicotinic acetylcholine receptor alpha 4 subunit is associated with autosomal dominant nocturnal frontal lobe epilepsy. *Nat Genet* 1995;11:201-203
10. **Sanchez RM, Jensen FE.** Maturational aspects of epilepsy mechanisms and consequences for the immature brain. *Epilepsia* 2001;42:577-585
11. **Ottman R.** Progress in the genetics of the partial epilepsies. *Epilepsia* 2001;42:Suppl 5:24-30
12. **Sridharan R, Murthy BN.** Prevalence and pattern of epilepsy in India. *Epilepsia* 1999;40:631-6

13. **Thomas SV, Sarma PS, Alexander M, Pandit L, Shekhar L, Trivedi C, et al.** Epilepsy care in six Indian cities: A multicenter study on management and service. *J Neurol Sci* 2001;188:73-7.
14. **Nitin Joseph, Ganesh S Kumar, Maria Nelliyanil.** Pattern of seizure cases in tertiary care hospitals in Karnataka state of India. *Ann of Indian Academy of Neurol* 2013; 16:347-35

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INDOOR AIR POLLUTION DUE TO INADEQUATE VENTILATION AND ITS IMPACT ON HEALTH AMONG CHILDREN OF LESS THAN FIVE YEARS IN EASTERN NEPAL

Bijay Thapa and Nitendra Chaurasia

Abstract

Introduction: According to WHO, half of the developing world's population depend on biomass (wood, dung and agricultural residues) and coal for such basic needs as cooking and heating. The smoke produced from the burning of these solid fuels on open fires or traditional stoves is referred to as indoor air pollution. IAP increases the risk of COPD and of acute respiratory illness in childhood, the most important cause of death among children less than 5 years of age in developing countries.

Objectives: To find out the prevalence of IAP in terms of housing, overcrowding & ventilation. To assess the frequency, extent of biomass exposure and hazards on child health.

Materials and methods: The cross sectional study was carried out in the Urban area of Kathahari V.D.C. 4,6,7,8 for the duration of 6 months from February to August 2013 among 200 households. Lottery method was used to choose the wards and households. Data were analyzed using percentages, proportions and statistical test (chi-square test).

Results: Due to excessive production of smoke and inadequate ventilation/chimney in the kitchen, such houses showed more prevalence of respiratory problems. Fifty percent of children were ill more than four times and 46% were seen at least twice. Almost all of them had experienced respiratory problems and 20% children were diagnosed with pneumonia in health facilities and treated. Ill ventilated kitchen, rooms along with dampness and absence of day light were the main factors contributing to the diseases comprising of 56%.

Key words: *Chulho, knowledge, ventilation, air pollution, awareness, Risk factors.*

Introduction

Around 3 billion people (half of the world's population) use regularly and almost deeply rely on solid fuels (e.g. dung, wood, agricultural residues, charcoal, coal) for their basic energy needs.¹⁻² In most developing countries like Nepal, these fuels are burned in open fires or rudimentary stoves that give off black smoke. Children, often carried on their mother's back during cooking, are most

exposed. The indoor smoke inhaled leads to pneumonia and other respiratory infections the biggest killer of children under 5 years of age. Indoor air pollution is responsible for nearly half of the more than 2 million deaths each year that are caused by acute respiratory infections.³ Immediate effects may show up after a single exposure or repeated exposures. These include irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue.

Symptoms of some diseases, including asthma, hypersensitivity pneumonitis, and humidifier fever, may also show up soon after exposure to some indoor air pollutants. Certain immediate effects are similar to those from colds or other viral diseases, so it is often difficult to determine if the symptoms are a result of exposure to indoor air pollution. Some studies suggest that fine particles have stronger respiratory effects in children than large particles.⁴

In analyses by the WHO, the indoor smoke from solid fuels accounted for the third highest disability-adjusted life years (DALYs) for children 0 to 4 years of age.⁵ Open fire cooking stoves produce heavy smoke containing Fine particles are Carbon monoxide (CO), Polycyclic aromatic hydrocarbons (PAHs), Strongly linked to pneumonia, Suggested link to low birth weight and in adults: chronic obstructive and pulmonary disease, lung cancer.^{6,7} Two important components are (a) the level in the home, and (b) the length of time for which each person in the home is exposed to that level. We know that typically women and young children (until they can walk), and girls (as they learn kitchen skills) are often exposed for at least 3–5 hours a day, often more. In some communities, and where it is cold, exposure will be for a much longer period each day.⁸

Methods

The cross sectional study was carried out in the Urban area of Katahari V.D.C. 4,6,7,8 and 9 for the duration of 6 months from February to August 2013 among 200 households and “child cohort” of less than 5 years and. Lottery method was used to choose the wards. The knowledge on indoor air pollution and its risk factors, signs or symptoms and complications was assessed among householders mainly mothers, by checking ventilation’s presence in all rooms as well as

in kitchen along with “chulho” type used. Quantitative as well as qualitative data were collected. Data were analyzed using percentages, proportions and statistical test (chi-square test). The survey obtained informed consent from each respondent (in this case, mothers of the children included in the analysis) before asking questions. Ethical consent was taken.

Results

A total of 200 household were recruited and interviewed with mothers or the main person who cooked most of the times. Table 1 shows the types of family and the population of children in the village. In spite of the modern trend of inclining towards nuclear family in our country, this village has been following the same pattern comprising 76% of joint or extended family. Most of the household had minimum of 2 children who were under 5 years of age comprising of 62.5%. extended family had upto 4 children residing at a house but were less in number contributing only 1% to it. Single child were present in 28.5% of the households.

Table 1: Family and child rearing pattern [N= 200]

Variables	Frequency	Per. (%)
Family Type		
Nuclear	48	24.0
Joint or extended	152	76.0
No. of children		
1 child	57	28.5
2 children	125	62.5
3 children	16	8.0
4 children	2	1.0

Housing standards were the main components assessed for quality life but in this study most of the houses could not meet the required standards. So, table 2 is depicting the housing standards where 73% of the houses were seen of kaccha type having nearly 20% of pukka type. Only 7.5% of the house had good cross

ventilation and alarmingly having 56.5% and 36% of partial ventilation and ill ventilation respectively.

Table 2. Housing standards components of households [N= 200]

Variables	Frequency	(%)
House type		
Kachha	146	73.0
Semipucca	15	07.5
pucca	39	19.5
Room ventilation		
well ventilated	15	7.5
semi ventilated	113	56.5
ill ventilated	72	36.0
Walls		
mud or thati	185	92.5
cemented or bricks	15	7.5
Roof		
Thatched	146	73.0
cemented	15	7.5
tinned	39	19.5
Room No.		
1-2	94	47.0
3-4	98	49.0
>4	8	4.0
Dampness		
Yes	168	84.0
No	32	16.0
Kitchen		
ill ventilated	157	78.5
semi ventilated	23	11.5
well ventilated	20	10.0

Almost 93% of the houses have mud or thati walled which of course were the best places for harboring infectious agents. Accordingly, 73% of the houses were thatched or hay roofed while a bit improved tinned roof were seen in almost 20% of houses. Remaining was cemented roof of pukka house. As these villagers were living under poor socio economic condition status, most of the houses

had less than 2 rooms having 47% and 49% of house had number of rooms from two to four. Only 4% of the houses had enough rooms with more than 4 rooms. Dampness was seen in more than two third of the houses. Almost 84% of the house were damp and were seen contributing to the unhealthy living conditions. Kitchen where the cooking was performed and mother working sitting children nearby were 78.5% which were ill ventilated. Smokes were seen circulating inside the kitchen and the room where children slept. Even kitchen were set outside the room on lawn, smoke still affected the room. Unfortunately only 10% of the houses had good ventilation as required.

Table 3: Relationship between frequencies of illness among children

Variables	Frequency of illness [N (%)]		P value	OR
	< 2 times	> 2 times		
Kitchen type				
Ill ventilated	78 (39)	92(46)	0.01	0.36
ventilated	21(10.5)	9 (4.5)		
Light				
Adequate	9(4.5)	5(2.5)	0.31	1.5
inadequate	90(45)	96(48)		
Damp				
Yes	78(39)	90(45)	0.04	
No	21(10.5)	11(5.5)		
Room ventilation				
Well vent	10 (5)	5(2.5)		
Ill vent	40 (20)	73(36.5)	0.00	-
Semi vent	49(24.5)	23(11.5)		

Table 3 shows the relationship in between frequency of illness and the different variables. Ill ventilated kitchen type, absence of light in room, dampness presence and mostly ill ventilated kitchen had significant role in contributing respiratory illness more than twice in 6 months. Most significant relation in between absence of room ventilation was seen in this study comprising

36.5% to have illness more than twice and 20% less than twice. Absence of lighting inside the room comprised 48% where as almost equal percentage of 45% is seen for less than twice frequency of illness. Forty five percent of the children are affected more than twice and 39% are less than 2 times.

Discussion

Due to excessive production of smoke and inadequate ventilation/chimney in the kitchen, such houses showed more prevalence of respiratory problems. Practice of carrying children alongside while cooking was more seen in developing countries. Due to this reason the adverse effect of smoke was seen both in mother and children. Despite the knowledge about smokeless/improved *chulo* and its benefits, use of such *chulos* was found to be minimum, the main reasons being poverty, easily accessible firewood and coal, lack of proper trainees for construction of smokeless *chulo*.

Results of this study also coincide with a meta-analysis of 24 studies by Dherani et al. produced a summary estimate of 1.78 (95% CI: 1.45, 2.18) for the relationship between household use of solid fuels (wood, dung, charcoal, and coal), relative to use of fuels considered “clean” (electricity, gas, or kerosene), and ALRI in children < 5 years of age.⁹

In this study the association between absence of adequate lighting standard and the frequency of illness is significant. It means the frequency of respiratory illness in children was directly related with the bright rooms with adequate lights. As found in more recent studies, ALRI risks of a similar magnitude associated with solid fuel use, our study also have concluded with the same results.¹⁰⁻¹¹

To our knowledge, most of the study have concluded that the solid fuel use was the main factor for respiratory illness which is also proven in a study done in the Dhading district,

Nepal attributed approximately 50% of ALRI in children < 5 years of age to household use of solid fuel-burning stoves.¹² This results coincides almost with our study as the scenario of our country coincides comprising of 56%. It may be the fact that solid fuels basically “cow dung” are mostly used in terai region. In this study use of kerosene and LPG were less commonly found because of the socio- economic status of the population. As the study period was from February month during the cold season so, the exposure could have been for a long time.

Our analysis also evaluated a range of socioeconomic factors like including parental occupation and education, land ownership, house size and construction materials, and house ownership which is not shown in this article. As we have in this study mostly focused on the child’s health, father’s occupation has no strong relationship nevertheless we shall not deny that absolutely. In a study done in Zimbabwe about two-thirds (66%) of children lived in households using biomass fuels and 16% suffered from ARI during the 2 weeks preceding the survey interview¹³ where our study also shows near about results which added the strength to our study. Information on ARI is based on mothers’ reports and no clinical measurements were undertaken, and smoke exposure was ascertained from type of fuel used for cooking. Although the symptomatic definition used here is intended to measure acute lower respiratory infections (ALRI) in children, some acute upper respiratory illness may have been included in the reported prevalence. Because it is not possible to separate ALRI from these data, we use the term ARI in this study, not ALRI. In developing countries such as Nepal, where clinical data on ARI are usually not available or very weak, the symptomatic definition of illness used here has been shown to provide a fairly accurate assessment of ARI in the population.¹⁴ Moreover, indoor air pollution

measurements in several developing countries have shown fuel type to be the best single indirect indicator of household pollution levels.¹⁵ Despite these problems in the measurement of smoke exposure and ARI, the consistency in the size of crude and adjusted effects of biomass fuel use on childhood ARI suggests a possible ‘exposure–response’ relationship. To validate this relationship, our research needs to be followed by carefully designed epidemiological studies, with direct measures of smoke exposure and clinical measures of ARI. Such research is important because a large proportion of households in Nepal and other developing countries rely on biomass fuels for household energy and ARI are a leading cause of ill health and death in young children.

References

1. **Bonjour S, Adair-Rohani H, Wolf J, Bruce N, Mehta S, Pruss-Ustun A, et al.** In press. Solid fuel use for household cooking: country and regional estimates for 1980–2010. *Environ Health Perspect*
2. **Bruce N, Perez-Padilla R, Albalak R.** 2000. Indoor air pollution in developing countries: a major environmental and public health challenge. *Bull WHO* 78(9):1078–1092.
3. **Gordon B et al.** Inheriting the world, the Atlas on Children's Health and the Environment. Geneva, World Health Organization, 2004
4. World Health Organization. Air Quality Guidelines. Geneva, World Health Organization: Department of Protection of the Human Environment, 2005.
5. World Health Report 2002 (www.who.int/whr/2002/en/).
6. Environmental threats to children. In: Children in the New Millennium, Environmental Impact on Health. UNEP, UNICEF & WHO, 2002
7. **Smith KR et al.** Chapter 18: Indoor smoke from household use of solid fuels. In: Ezzati Eds. Comparative quantification of health risks: The global burden of disease due to selected risk factors, Vol 2. Geneva: World Health Organization, 2004
8. Addressing the links between indoor air pollution, household energy and human health. Based on the WHO-USAID Consultation on the Health Impact of Household Energy in Developing Countries (Meeting report). Geneva, World Health Organization, 2002.
9. **Dherani M, Pope D, Mascarenhas M, Smith KR, Weber M, Bruce N.** 2008. Indoor air pollution from unprocessed solid fuel use and pneumonia risk in children aged under five years: a systematic review and meta-analysis. *Bull WHO* 86(5):390–398.
10. **Bautista LE, Correa A, Baumgartner J, Breyse P, Matanoski GM.** 2009. Indoor charcoal smoke and acute respiratory infections in young children in the Dominican Republic. *Am J Epidemiol* 169(5):572–580.
11. **Rehfuess EA, Tzala L, Best N, Briggs DJ, Joffe M.** 2009. Solid fuel use and cooking practices as a major risk factor for ALRI mortality among African children. *J Epidemiol Community Health* 63(11):887–892.
12. **Dhimal M, Dhakal P, Shrestha N, Baral K, Maskey M.** 2010. Environmental burden of acute respiratory infection and pneumonia due to indoor smoke in Dhading. *J Nepal Health Res Counc* 8(1):1–4.
13. **Mishra V.** Indoor air pollution from biomass combustion and acute respiratory illness in preschool age children in Zimbabwe *International Journal of Epidemiology* 2003;32:847–853
14. **Cabaraban, MC.** Rural Mother's Management of Acute Respiratory Infection (ARI) in Region 10: Project Report to the Health Research Network. Cagayan de Oro, Philippines: Research Institute for Mindanao Culture, Xavier University. 1993.
15. **Mehta S, Smith KR, Balakrishnan K et al.** Using household characteristics to predict respirable particulate levels in rural households in Andhra Pradesh, India. Paper presented at the 9th International Conference on Indoor Air Quality and Climate, Monterey, California. June 30–July 5 2002.

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EFFECT ON LUNG STRUCTURE, INFLAMMATORY AND NUTRITIONAL STATUS OF COPD PATIENTS WITH FIBROTIC AND PROLIFERATIVE TUBERCULOSIS CHANGES IN CHEST IMAGING

Hridaya Bibhu Ghimire, Jian Guo Li, Zhuan Sun Yong Xun

Abstract

Background and objectives Tuberculosis and COPD are common diseases in developing countries, sharing risk factors like smoking and low socio-economic status but little is known about the specific relationship between tuberculosis and COPD.

Methods Retrospective analysis was done. All COPD patients with either fibrotic and proliferative tubercular changes in chest imaging or none of the features of tuberculosis (in chest imaging, sputum test, skin test or history) admitted in Sun Yat- Sen Memorial Hospital, China from the year 2007 to 2010 were taken for the study. Clinical features along with post-bronchodilator FEV1/FVC<70% were used as a basis for the diagnosis of COPD.

Results Among 84 COPD patients with fibrotic and proliferative tuberculosis changes in chest imaging, 20 of them had bullae or blebs in their radiologic examination whereas only 11 of 105 non-tuberculosis COPD cases had those features, Pearson Chi Square value=6.05, p=0.014. COPD patients with fibrotic and proliferative tuberculosis changes had lower blood iron, transferrin, albumin but higher high sensitive CRP (hsCRP) (p=0.010, 0.003, 0.010 and 0.032 respectively) compared to non-tuberculosis COPD cases.

Conclusions Fibrotic and proliferative tuberculosis changes in COPD results in greater inflammation and damage to lung tissue (determined by increase bullae formation, higher hsCRP level) with decrease in basic nutritional elements.

Key words: *Biochemistry, COPD, Inflammation, Lung injury, Tuberculosis*

Introduction

COPD and tuberculosis mainly affect lungs and are major causes of morbidity and mortality worldwide. Around a third of world population is infected with tuberculosis, with about eight million new cases being reported every year ¹. Prevalence of COPD is increasing. It is estimated that COPD will become the third-leading cause of death by 2020 ². Both COPD and tuberculosis have common risk factors such as smoking and low

socio-economic status ^{2,3}. So, it is necessary to know the relationship between tuberculosis and COPD.

This study was conducted in a hospital of southern China where tuberculosis and COPD are among the most common diseases seen in respiratory department. Aims of this study were to investigate any structural changes in lungs as well as to assess any inflammatory and nutritional changes in COPD patients with fibrotic and proliferative

tuberculosis changes in chest imaging compared to non-tuberculosis COPD cases.

Methodology

Patient Selection and Data collection: This was a retrospective study approved by our hospital's institutional review board. All the COPD patients either with fibrotic and proliferative tuberculosis changes in chest imaging or none of the features of tuberculosis (in imaging, sputum test, skin test or history) from the year 2007 to 2010 were taken for the study. Diagnosis of COPD was confirmed by the clinical features and post-bronchodilator FEV₁/FVC less than 70%. These patients were admitted in respiratory department due to acute exacerbation of COPD. Among these 189 COPD patients; 84 of them had fibrotic and proliferative tubercular changes in chest imaging with negative tubercular sputum smear test and PPD value less than 10mm whereas rest 105 of them had all these three tests negative.

There was no statistical difference in age and pack year between COPD patients with fibrotic and proliferative tuberculosis changes compared to non-tuberculosis COPD cases. Average age of COPD patients with tubercular changes was 75(69-79) years old compared to 72(67-77) years old in non-tuberculosis COPD cases, $p=0.076$. Average smoking pack-years in tuberculosis group was 40(30-50) compared to 40 (20-60) in non-tuberculosis group, $p=0.537$. There was also no statistical difference in gender in between the two groups, Pearson Chi-square value being 3.188, $p=0.074$ (as shown in table 1).

Table 1. Baseline parameters of the COPD patients in our study

Parameters	Tuberculosis	Non-tuberculosis	p value
Number	84	105	
Gender(male: female)	72:12	79:26	0.149

Age	75(69-79)years	72(67-77)years	0.076
Smoking	40(30-50)pack-year	40(20-60)pack-year	0.537

Exclusion Criteria: COPD patients with active tuberculosis, occupational lung diseases, asthma, any part of the documented cancer, liver and kidney diseases were all excluded in this study.

Statistics: SPSS 16 was used for the analysis. Normality test was done and normal cases were analyzed with independent sample t-test whereas Mann-Whitney test was done for those not following normal distribution. Chi-square test was used for qualitative data. A p value of <0.05 was considered to be statistically significant.

Results

Comparison of bullae or blebs formation in COPD patients with proliferative tuberculosis changes compared to non-tuberculosis COPD cases. Out of 84 COPD patients with fibrotic and proliferative tuberculosis changes in chest imaging, 20 (23.8%) of them had significant bullae or blebs in their chest images. But in case of 105 non-tuberculosis COPD cases, obvious bullae were seen only on 11 patients (10.5%) in their chest imaging. Chi Square test was done to compare the incidence of bullae in two groups and it was found that COPD patients with fibrotic and proliferative tuberculosis changes in chest imaging had higher incidence of bullae or blebs compared to non-tuberculosis COPD cases, with Pearson Chi Square value of 6.05, $p=0.014$.

Comparing inflammatory and nutritional status in COPD patients with fibrotic and proliferative tuberculosis changes compared to non-tuberculosis COPD case. While investigating the difference in Hb, high sensitive CRP (hsCRP), calcium, albumin, iron, transferrin between COPD patients with

fibrotic and proliferative tuberculosis changes and non-tuberculosis COPD cases, we first did normality test. Those following normal distribution were done independent sample t-test to find out the difference, and the result showed statistical difference in blood albumin (37.7±3.6 g/L vs. 39.0±3.1 g/L, p=0.010) and transferrin (1.82±0.36 g/L vs. 1.97±0.34 g/L, p=0.003) in tuberculosis group compared to non-tuberculosis COPD patients. Mann-Whitney non-parametric test was done for those not following normal distribution. Result showed statistical difference in hsCRP {21.1(4.9-80.5) mg/L vs. 10.3(2.3-44.3) mg/L, p=0.032}, blood iron {8.8(5.6- 17.3) µmol/L vs. 12.2 (8.0-17.3) µmol/L, p=0.010} in COPD patients with fibrotic and proliferative tuberculosis changes in chest imaging compared to non-tuberculosis COPD cases (shown in table 2).

Table 2: Inflammatory and nutritional markers in two different COPD groups

Parameters	Non Tuberculosis	Tuberculosis	p value
hsCRP *	10.3(2.3-44.3)mg/L	21.1(4.9-80.5)mg/L	0.032
Iron	12.2(8.0-17.3)µmol/L	8.8(5.6-17.3)µmol/L	0.010
Albumin	39.0±3.1g/L	37.7±3.6g/L	0.010
Calcium	2.22(2.10-2.30)mmol/L	2.20(2.07-2.30)mmol/L	0.227
Hb	133(122-140)g/L	132(122-141)g/L	0.949
Transferrin	1.97± 0.34 g/L	1.82± 0.36 g/L	0.003

*hsCRP: high sensitive CRP

Discussion

Structural changes of lung in COPD patients with fibrotic and proliferative tuberculosis changes compared to non-tuberculosis COPD patients.

In this study, there was higher incidence of bullae or blebs in COPD patients with fibrotic and proliferative tuberculosis changes in chest imaging compared to non-tuberculosis COPD individuals, Pearson Chi square value 6.05, p=0.014. Tuberculosis can increase the activity of matrix

metalloproteinase (MMP) enzymes, similar to that done by smoke exposure, thereby damaging the lung tissue⁴. Increase in activity of MMP enzymes results in destruction of collagen and other internal structures of lung parenchyma. This may result in increased formation of bullae in these groups. Tuberculosis results in scarring of lung tissue and thereby pulls the normal lung tissue towards affected part. This can be the pathological mechanism for increase in bullae formation in tuberculosis infected COPD patients.

Inflammation and nutritional derangement in COPD patients with pulmonary tuberculosis.

To best of our knowledge, this is the first study evaluating inflammation and nutritional status in COPD patients with fibrotic and proliferative tuberculosis changes in chest imaging compared to non-tuberculosis COPD cases. It was found that COPD patients with pulmonary tuberculosis infection had higher hsCRP but lower blood iron, albumin, and transferrin compared to COPD patients without tuberculosis.

CRP is an acute phase protein produced by liver under the influence of IL in response to injury or tissue damage. A high sensitivity CRP (hsCRP) measures even low level of CRP. Circulating CRP levels are elevated in blood of stable COPD patients⁵. CRP is also used to predict the prognosis in terms of hazard ratios for hospitalization and death from COPD⁶. In this study, higher hsCRP value in COPD patients with fibrotic and proliferative tubercular changes in chest imaging than COPD patients without pulmonary tuberculosis suggests that there can be greater damage to lung and can have more severe form of COPD leading to poorer prognosis in the former subtype.

In this study, it was found that COPD patients with fibrotic and proliferative tubercular changes in chest imaging had lower blood iron and transferrin value

compared to COPD patients without tuberculosis. This can be the scenario of chronic illness. Ratledge had described the role of iron in the pathogenesis of tuberculosis⁷. Host tries to limit infection by lowering iron. But pathogens adapt by increasing the expression of virulence factors and cause damage to the host. Administration of iron in this condition is unfavourable, as increased availability of iron can help the bacteria to multiply. Lower blood iron in COPD patients with proliferative tuberculosis changes can have some protective role in preventing the conversion of this old tuberculosis into active form or it can be due to metabolism of iron in chronic disease. Large scale study is needed to confirm the role of iron in tuberculosis infected COPD patients.

Levels of transferrin decreases in inflammation⁸ and is referred as a negative acute phase reactant. Although transferrin is the principal iron binding protein in serum, it is also present in airway mucosa and alveolar lining fluids⁹. Transferrin functions as an antioxidant by tightly binding extracellular iron and thereby inhibiting oxidant induced lipid peroxidation both in serum and lower respiratory tract^{10, 11}. It may also have important antibacterial effects in lower respiratory tract by sequestering iron that is needed for bacterial multiplication¹². Decrease in transferrin level in COPD patients with fibrotic and proliferative tuberculosis changes compared to non-tuberculosis COPD cases can therefore point out that there is greater inflammation ongoing in these former patients.

Some studies had shown that there is reduced serum albumin in patient with active tuberculosis¹³⁻¹⁵. Little is known about albumin level in patients with radiologic features of old pulmonary tuberculosis. Ugur et al reported that serum albumin decreased with decline in lung function¹⁶. Like transferrin, albumin level decreases during inflammation and is also referred as negative

acute phase reactant⁸. In this study, it is found that COPD patients with fibrotic and proliferative tuberculosis changes in their chest imaging had lower blood albumin value compared to COPD patients without tuberculosis. This finding may be due to greater damage in lung leading to more severe inflammation in tuberculosis infected group.

COPD phenotype is a hot topic in recent literatures. It is considered that COPD patient with fibrotic and proliferative tuberculosis changes in chest imaging should be recognized as a new phenotype and should be treated with great caution, as the use of inhaled corticosteroid (as an anti-inflammatory treatment) in this subtype carries certain risk of conversion of old tuberculosis into active form. Whether to treat COPD patient with fibrotic and proliferative tuberculosis changes in chest imaging with anti-tuberculosis therapy is also of great concern, making this phenotype to be given greater emphasis in coming days.

In conclusion, COPD patients with fibrotic and proliferative tuberculosis changes in chest imaging had greater inflammation and damage to lung tissue (determined by increase bullae formation, higher hsCRP level) with decrease in basic nutritional elements compared to non-tuberculosis COPD cases.

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References

1. **Dye C.** Global epidemiology of tuberculosis. *Lancet* 2006; 367: 938–40.
2. **Calverley PM, Walker P.** Chronic obstructive pulmonary disease. *Lancet* 2003; 362: 1053–61.
3. **Lonnroth K, Jaramillo E, Williams BG et al.** Drivers of tuberculosis epidemics: the role of risk factors and social determinants. *Soc Sci Med* 2009; 68: 2240–6

4. **Elkington PT, Friedland JS.** Matrix metalloproteinases in destructive pulmonary pathology. *Thorax* 2006; 61:259–66.
5. **M. Dentener, E. Creutzberg, A. Schols et al.** Systemic anti-inflammatory mediators in COPD: increase in soluble interleukin 1 receptor II during treatment of exacerbations. *Thorax* 2001;56:721-6
6. **M. Dahl, J. Vestbo, P. Lange et al.** Tybjaerg-Hansen and B. Nordestgaard, C-reactive protein as predictor of prognosis in chronic obstructive pulmonary disease. *Am J Respir Crit Care Med.* 2007; 175: 250-5
7. **Ratledge C.** Iron mycobacteria and tuberculosis. *Tuberculosis* 2004; 84: 110-30.
8. **Ritchie RF, Palomaki GE, Neveux LM et al.** Reference distributions for negative acute phase serum proteins, albumin, transferrin and transthyretin: a practical, simple and clinically relevant approach in a large cohort. *J. Clin. Lab. Anal.* 1999; 13: 6: 273-9.
9. **Thompson AB, Bohling T, Payvandi F, et al.** Lower respiratory tract lactoferrin and lysozyme arise primarily in the airways and are elevated in association with chronic bronchitis. *J Lab Clin Med* 1990; 115:148-58
10. **Pacht ER, Davis WB.** Role of transferrin and ceruloplasmin in antioxidant activity of lung epithelial lining fluid. *J Appl Physiol* 1988; 64:2092-99
11. **Gutteridge JME, Quinlan GJ.** Antioxidant protection against Organic and inorganic oxygen radicals by normal human plasma: the important primary role for iron-binding and ironoxidizing proteins. *Biochem Biophys Acta* 1992; 1159:248-54
12. **Romero A, Perez-Arellano JL, Gonzalez-Villaron C, et al.** Effect of transferrin concentration on bacterial growth in human ascitic fluid from cirrhotic and neoplastic patients. *Eur J Clin Invest* 1993; 23:699-705
13. **Kuppamuthu Ramakrishnan, Rajaiah Shenbagarathai, Karuppusamy Kavitha et al.** Serum zinc and albumin level s in pulmonary tuberculosis patient with and without HIV. *Jpn. J. Infect. Dis.* 2008; 61: 202-4.
14. **Adedapo K. S, Arinola O. G, Ige O.M et al.** Combination of Reduced Levels of Serum Albumin and Alpha-2-Macroglobulin Differentiates Newly Diagnosed Pulmonary Tuberculosis Patients from Patients on Chemotherapy. *African Journal of Biomedical Research.* 2006; 9: 169 – 172
15. **Elvina Karyadi, Werner Schultink, Ronald H. H. Nelwan et al.** Poor Micronutrient Status of Active Pulmonary Tuberculosis Patients in Indonesia. *Journal of Nutrition* 2000; 130: 2953-8
16. **Ugur Gonlugur and Tanseli E. Gonlugur.** A Retrospective Analysis of Nutritional Parameters in Chronic Obstructive Pulmonary Disease between Sexes. *J Clin Biochem Nutr.* 2007; 41(3): 175–8.

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BURDEN OF DEVELOPMENTAL AND BEHAVIORAL PROBLEMS AMONG CHILDREN - A DESCRIPTIVE HOSPITAL BASED STUDY

Hem Sagar Rimal, Archana Pokharel, Vijay Saha, Arun Giri, Basudha Ghimire, Shiva Raja and Bijoy Verghease

Abstract

The child development is a dynamic process that utilizes the genetic potential of the baby to achieve full potential within the context of available environment. Throughout the world, there are growing concerns about developmental, behavioural, social and emotional wellbeing of children. The management of these issues is possible only with an organized approach through a multidisciplinary team

Objective:

To estimate the prevalence of developmental and behavioral disorders in children.

Method:

Data were collected from primary caregivers of children presented to a developmental and behavioral pediatrics clinic over a period of 12 months. Standard screening and assessment tools like Strength and Difficulty Questionnaire (SDQ), Spence anxiety scale and Vanderbilt rating scale for ADHD were used. Cases were referred to the Psychiatrist, psychologist, speech therapist and physiotherapist for assessment and management when needed.

Results:

A total of 85 children with developmental problems presented to our clinic which gives clinic prevalence of 8.5%. There were 51 (60%) of male and 34 (40%) of female. The majority of these children were from Morang district 39 (46%), Sunsari district 13 (15%) and Jhapa District 9 (10.6%). The most common diagnosis were speech and language delay (22.4%), behavioral problems 21.2%, Anxiety disorders 18.8% , cerebral palsy 14.1% and Global developmental delay of 11.8% and several others. The highest number of children i.e 27 (31.8%), were referred to the psychologist/Psychiatrist followed by speech therapist 25 (29.4%) and physiotherapist 21(24.7%). Behavioral modification strategies and CBT were provided to children.

Key words: *Developmental and behavioral problems, anxiety disorders, Depression, Cognitive behavioral therapy, Behavioral modification strategies.*

Introduction

The child development is a dynamic process that utilizes the genetic potential of the baby to achieve full potential within the context of available environment. Throughout the world, there are growing concerns about

developmental, behavioural, social and emotional wellbeing of children.¹ One of the multicentre study done in 5 developing country including India found the prevalence of self-reported mental health problem as high as 10.5% with conduct and emotional problems being most common.² Now, all the

pediatricians have crucial role to play in early diagnosis and management of developmental and behavioral problems in children because they have high prevalence in our region. The management of these issues is possible only with an organized approach through a multidisciplinary team.

Objective

To estimate the prevalence of developmental and behavioral disorders in children.

Method

Data for this study were collected during interviews with primary caregivers of children presented to a developmental and behavioral pediatrics clinic at the Nobel Medical College over a period of 12 months. Information was also received from the child as appropriate. We used standard screening and assessment tools like Strength and Difficulty Questionnaire (SDQ), Spence anxiety scale and Vanderbilt ADHD rating scale. Cases were to the Psychiatrist, psychologist, speech therapist and physiotherapist for assessment and management when needed.

The final diagnosis after complete assessment was entered into the database and result was analyzed using standard software (SPSS 16.1) using the Strength and Difficulties Questionnaire (SDQ). The SDQ is an instrument that has been widely used to assess mental health problems, emotional and behavioral problems and strength among children and adolescents³. The final conclusion on the presence or absence of mental health problems as measured by SDQ is ideally computed from the combined reports from parents, teachers, and self-report by child⁴. However, self reports may be sufficient screening tool for adolescents aged 11 years or older⁵.

Spence anxiety scale

The Spence Children's Anxiety Scale was

developed to assess the severity of anxiety symptoms broadly in line with the dimensions of anxiety disorder proposed by the DSM-IV. The scale assesses six domains of anxiety including generalized anxiety, panic/agoraphobia, social phobia, separation anxiety, obsessive compulsive disorder and physical injury fears. This measure consists of 44 items; of which 38 reflect specific symptoms of anxiety and 6 relate to positive, filler items to reduce negative response bias.

Vanderbilt ADHD rating scale

This rating scale includes the 18 ADHD symptoms described in DSM-IV, which are rated on a 4-point likert scale(0-3) that indicates whether each ADHD symptom occurs never(score of 0), occasionally(score of 1), often(score of 2) or very often(score of 3). Diagnosis is made based on DSM-IV criteria. It has 9 items that assess inattentive symptoms and 9 items that assess hyperactive and impulsive symptoms. The ADHS Rating Scale has been developed and standardized as a rating scale for children.

Result

Table1: Demographic characteristics of Study population

Variable	N=85(100%)
Gender	
Male	51(60%)
Female	34(40%)
Type of family	
Nuclear family	41(48%)
Joint family	37(43.5%)
Extended/separated family	7(8.5%)

As shown in Table 1. There were 85 children presented to the hospital which gives clinic prevalence of developmental and behavioral pediatrics problem among children of 8.5%.The mean age of participants in this study was 6 years. Among the participants, male and female children were 51 (60%) and 34 (40%) respectively. The majority of these

children were from Morang district 39 (46%) Sunsari district 13 (15%), Jhapa district 9 (10.6%) and 7 (8.2%) were from India. Rest of the children were from Bhojpur, Dhangadhi, Ilam, khotang, Okhaldhunga, Sankhuwasabha, Siraha, Saptari, Terhathum and Udaypur that made total of 17 (20%).

Among those children, 37 (43.5%) of them were from Joint family, 41 (48%) from nuclear family and rest were from extended family and separated parents.

In this study , 19 (22.4%) of participants had Language and speech delay, 18 (21.1%) had behavioral problems , 16 (18.8%) had anxiety disorder , 14 (16.5%) had Enuresis, 12 (14.1%) had cerebral palsy, 12 (14%) had intellectual disability including learning difficulties, 10 (11.8%) had seizure disorder, 10 (11.8%) had Global developmental Delay(GDD), 9 (10.6%) children had Autism Spectrum Disorder(ASD), 8 (10%) had ADHD, 7 (8.2%) had adjustment problem, 4 (4.7%) had depression, 12 (14.1%) had cerebral palsy, 8 (9.4%) had conversion disorder, 7 (8.2%) each had Recurrent abdominal pain and Tics. There were only 3.5% cases of child abuse and 4 (5.9%) had suicidal ideation. Table 2, shows the data about referral of patients to various Departments.

Table 2: Diagnosis using different tools And clinical evaluation

Diagnosis	Number (percentage)
Speech and language problems	19(22.4%)
Behavioral problems	18(21.2%)
Anxiety disorders	16(18.8%)
Enuresis	14(16.5%)
Cerebral Palsy	12(14.1%)
Intellectual disability including learning difficulties	12(14%)
Seizure disorder	10(11.8%)
Global Developmental delay	10(11.8%)

Autism Spectrum disorder(ASD)	9(10.6%)
Attention Deficit Hyper activity Disorder	8(10%)
Conversion disorder	8(10%)
Adjustment problem	7(8.2%)
Recurrent abdominal pain	7(8.2%)
Tics	7(8.2%)
Child abuse	3(3.5%)
Suicidal ideation	5(6%)

The highest number of children i.e 27 (31.8%), were referred to the psychologist/Psychiatrist followed by speech therapist 25 (29.4%) , physiotherapist 21 (24.7%), Otorhinolaryngologist 12 (14.11%) and Ophthalmologist 8 (9.4%). Table 3, shows the analyzed data regarding the intervention services provided to those children. Behavioral modification strategies were provided to 14 (16.4%) and Cognitive behavioral therapy were provided to 13 (15%) children.

Table 3: Professionals involved in the care of children

Professional	Number of cases seen(percentage)
Psychiatrist/Psychologist	27(31.8%)
Speech pathologist	25(29.4%)
Physiotherapist	21(24.7%)
Otorhinolaryngologist	12(14.11%)
Ophthalmologist	8 (9.4%)

Discussion

Over the past decades the public health relevance of mental health conditions in children and adolescents has been of growing concern for everyone⁶. In this study the prevalence of developmental- behavioral problems in children is 8.5 % which is comparable to the study done in another multicentre study done in 5 developing country including India found the prevalence of self –reported mental health problem as

high as 10.5% with conduct and emotional problems being most common².

Speech and language problem was found to be the most common problem which was 25.8%, followed by behavioral problem 21.2%, anxiety disorder of 18.8% and cerebral palsy of 14.1%. These findings are comparable to the findings of a study done in India by Nair et al⁷. In a study, based in a rural, socio-economically disadvantaged area of South Africa, aimed to examine the prevalence of children's psychological problems found the prevalence of anxiety/depression being 14% and this study has higher prevalence (18.8%) than this study which may be due to undue stress in school and home environment⁸. There is a consensus opinion that children and adolescents living with adversities and the experience of psychosocial difficulties are more vulnerable to have psychological and behavioral problems. But these inferences are mostly taken from the researches done in affluent and developed countries⁹⁻¹¹.

The prevalence of Attention Deficit Hyperactivity Disorder (ADHD) was reported to be 10% which is comparable to one of the study conducted by national center for health statistics in the year 2007 in USA where parent reported diagnosed prevalence of ADHD for all the children ages 6-17 years was 8.2% (95%CI 7.7-8.7)¹². Another study done in Mumbai, India in preschool children and the prevalence was noted to be 12.2%¹³.

In this study 10% of children were diagnosed with Autism spectrum disorder which is higher than the findings of US Centre for Disease Control (CDC) reporting that the autism prevalence rate in 2008 in 8-year-old US children was 1 in 88¹⁴. The Prevalence of conversion disorder is lower in our study 10% vs 14.3% in the study done at Institute of Medicine, Teaching hospital by Chapagain, Manisha et al¹⁵. The recurrent abdominal pain was found in 8.2% of children which is lower than the findings from a large,

population-based, cohort study, (The Avon Longitudinal Study of Parents And Children where prevalence RAP was found to be 11.8% of 6 years old children¹⁶.

Developmental-Behavioral pediatrics (DBP) practice relies heavily on a team approach to blend pediatrics, mental health, and allied health that includes psychologist, speech therapist, physiotherapist and occupational therapist¹⁷. In this study we referred very high number of cases 27 (31.8%) to psychologist and 23 (25.8%) to the speech therapist. In a study done among Australian pediatrician, it was noted that their management choices included referral to a multidisciplinary team (16%), referral elsewhere (10%) and manage alone (7%)¹⁸. The higher rate of referral in our center is probably due to higher prevalence of cases of anxiety disorders, behavioral problems, Speech and language delay.

The adequate functional development of children during infancy and early childhood period reflects the potential for the central nervous system of children for later development. Hence early detection of these problems and appropriate early intervention will improve the outcomes of children with developmental impairments¹⁹. Counseling services was offered to the parents, speech therapy and physiotherapy for the children who needed these services. Behavioral modification strategies were suggested to 16.4% of children with behavioral problems. There is plenty of evidence to support that cognitive behavioral therapy is a very important modality of management of anxiety disorders and depressive illness. In this study 21.2% of children received Cognitive behavioral therapy provided by a clinical psychologist.

Conclusion

In the context of having limited data about developmental and behavioral pediatrics

problem in Nepali Children, this study has added some data in this area. It has also highlighted the need for pediatricians to be aware of these problems and develop pragmatic approach to such problems through multi-disciplinary team involvement. Further multi center researches are needed to have the estimation of burden of such problems in our country.

References

1. **Blanchard LT, Gurka MJ, Blackman JA.** Emotional, developmental, and behavioral health of American children and their families: a report from the 2003 National Survey of Children's Health. *Pediatrics.* 2006;117(6):e1202-12. Epub 2006/06/03.
2. **Atilola O, Singh Balhara YP, Stevanovic D, Avicenna M, Kandemir H.** Self-reported mental health problems among adolescents in developing countries: results from an international pilot sample. *Journal of developmental and behavioral pediatrics.* 2013;34(2):129-37. Epub 2013/02/02.
3. **G. R. The Strengths and Difficulties Questionnaire:** a research note. *Journal of child psychology and psychiatry, and allied disciplines.* 1997(38):581-6.
4. **Goodman R MH, Bailey V. The Strengths and Difficulties Questionnaire:** a pilot study on the validity of the self-report version. *Eur Child Adolesc Psychiatry.* 1998;7:125-30.
5. **Muris P MC, van Den Berg F. The Strengths and Difficulties Questionnaire (SDQ):** further evidence for its reliability and validity in a community sample of Dutch children and adolescents. *Eur Child Adolesc Psychiatry* 2003;12:1-8.
6. **Ravens-Sieberer U, Erhart M, Gosch A, Wille N.** Mental health of children and adolescents in 12 European countries-results from the European KIDSCREEN study. *Clinical psychology & psychotherapy.* 2008;15(3):154-63. Epub 2008/12/31.
7. **Nair MK, George B, Padma K, Potti N, Elizabeth KE, Jeyaseelan L.** Developmental Evaluation Clinic--CDC experience. *Indian pediatrics.* 2009;46 Suppl:s63-6. Epub 2009/05/16.
8. **Cortina MA, Fazel M, Hlungwani TM, Kahn K, Tollman S, Cortina-Borja M, et al.** Childhood psychological problems in school settings in rural Southern Africa. *PloS one.* 2013;8(6):e65041. Epub 2013/06/19.
9. **Barbarin OA RL. Adversity and psychosocial competence of South African children.** *The American journal of orthopsychiatry.* 1999; 69:319-27.
10. **ML. R. Psychosocial adversity and child psychopathology.** *Br JPsychiatry Res.* 1999;174:480-93.
11. **Hackett R HL, Bhakta P, et al.** Life events in a South Indian population and their association with psychiatric disorder in children. *Int J Soc Psychiatry.* 2000(46):201-7.
12. **Kandyce Larson SAR, Robert S. Kahn, Neal Halfon.** Patterns of Comorbidity, Functioning, and Service Use for US Children With ADHD, 2007. *Pediatrics.* 2011 (127): 462-70.
13. **Suvarna BS, Kamath A.** Prevalence of attention deficit disorder among preschool age children. *Nepal Medical College journal.* 2009;11(1):1-4. Epub 2009/09/23.
14. **Taylor B, Jick H, Maclaughlin D.** Prevalence and incidence rates of autism in the UK: time trend from 2004-2010 in children aged 8 years. *BMJ open.* 2013;3(10):2013-003219.
15. **Manisha Chapagai KMD, Pratiksha Tulachan.** A Study Of Psychiatric Morbidty Amongst Children Attending A Child Guidance Clinic At A Tertiary Level Teaching Hospital In Nepal *Journal of Nobel Medical College* 2013; 2(1:3):55-63.
16. **Ramchandani PG, Hotopf M, Sandhu B, Stein A.** The epidemiology of recurrent abdominal pain from 2 to 6 years of age: results of a large, population-based study. *Pediatrics.* 2005;116(1):46-50.
17. **Nielsen BA, Baum RA, Soares NS.** Navigating ethical issues with electronic health records in developmental-behavioral pediatric practice. *Journal of developmental and behavioral pediatrics : JDBP.* 2013;34(1):45-51. Epub 2013/01/01.
18. **Holt JM, McDowell MJ.** Developmental-behavioural problems in general paediatrics. *Journal of paediatrics and child health.* 1998;34(3):245-9. Epub 1998/06/20.
19. **M. G.** The Effectiveness of Early Intervention. 1997:11-2.

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FACTORS AFFECTING HEALTH SEEKING BEHAVIOR OF SENIOR CITIZENS OF DHARAN

Dewa Adhikari and Dagendra Prasad Rijal

Abstract

Objectives: To determine the health status and the factors affecting health seeking behavior of the senior citizens aged 60 years and above.

Materials and methods: A descriptive cross-sectional study based on household survey was adapted. The sample consisted 400 senior citizens resident of Dharan. Simple random sampling technique was employed to select the study subject. Individuals were interviewed through self-developed semi-structured pre-tested questionnaires. Descriptive and inferential statistics (chi-square test) were used.

Results: Among 400 respondents, the most frequently reported illness were hypertension(29.3%), diabetes mellitus(8.3%), arthritis/joint pain(24.8%), eye problems(19.0%), hearing problems(3.3%), oral health problems(17.5%), digestive system problems(17.8%), respiratory problems(11.0%), heart disease(3.8%), renal problem(5.3%), skin diseases(7.5%), tuberculosis(3.0%), liver disease(3.0%), mental illness(5.75%), fracture(1.0%), Gynecological problems(7.3%) and male genital (6.3%) problems were also noted. Faith healers were the first treatment choice (97.2%) irrespective of age, gender or ethnicity. After that they visited BPKIHS (36.3%), private practitioner (26.3%), self-treatment (11.3%) and self-drug-use (6.8%). Half of the respondents utilized formal health institutions only in major chronic conditions. Poverty emerged as a major determinant of health seeking behavior and treatment was considered waste of money (indirect effect 64%) and lack of money (35.5%) followed by poor attitude of health worker (41%)

Key Words: *Senior Citizens, Mental Illness, Liver diseases, Arthritis*

Introduction

Aging is a natural process.¹ with reduced ability to generate resources, the elderly lack basic needs that affect their health status and health seeking behavior. Attribution of ill health to ageing, low economic status and negative attitude of health workers towards the care of the elderly are some of the factors associated with delay in seeking health care.²

There has been a global rise in the population of elderly over past 20 years. The developed countries are now having 16-20%

of their population above the age of 65 years. The most rapid increase is expected between the years 2010 and 2030, when the 'baby boom' generation reaches age 65. By 2030, there would be about 70 million elderly; they would represent 20% of the population.³

In Nepal 6.5% are elderly of the total population, increasing faster than population growth rate.⁴ In Sunsari District 35079 are elderly People or 5.6 % of the total population. The total population of Dharan is 95,332 and 5.7% of the population are above 60 years of age.⁵

Health status of older people possesses unique challenges because of the multiple dimensions that influence with passing the age. Old age is not a disease in itself, but it becomes a problem when the obvious physical mental changes brought by the advancing age and make them unable to do their own basic things.⁶ Prevalence of disease rises with the lengthening of the life span and increasing availability of high technical medical care. Older adults have at least one chronic condition and many have multiple conditions. The most frequently occurring conditions from 2000 to 2001 period were hypertension (49.2%), arthritis (36.1%), heart disease (31.1%), cancer (20%), sinusitis (15.1%), and diabetes.⁷

WHO defines *Health* as a state of complete physical, mental and social as well as spiritual well being not merely the absence of disease and infirmity.¹ Oxford Learner's dictionary defines *Seeking* means having, doing, looking etc. and *Behaviour* means habit, performance, culturally and socially motivated activities. Health Seeking Behaviour is a usual habit of the people of a community that is resulted by the interaction and balance between health needs, health resources, and socio-economic, cultural as well as political and national / international contextual factors. Strategic policy formation in all health care systems should be based on information relating to health promoting and should be based on information relating to health promoting and seeking behaviour and the factors affecting these behaviours. The factors affecting the health seeking behaviours are seen in various contexts: physical, socio-economic, cultural and political. Therefore, the utilization of a health care system, public or private, formal or non-formal, may depend on socio-demographic factors, social structures, level of education, cultural beliefs and practices, gender discrimination, status of women, economic and political systems environmental conditions, and the disease pattern and health care system itself.

Methods

This was a descriptive cross-sectional study design based on house hold survey of Dharan municipality, ward No. 3,4,7,8,9,11,13,15,16 and 18. Study population was Senior citizen of 60 years and above residing in Dharan Municipality. Both male and female senior citizens were interviewed. Senior citizens who did not agree for the interview were excluded from the study. Sample was 400 individuals (10% of the elderly) which targets at least 20% of the population having health seeking behaviour among senior citizens of Dharan Municipality, considering 20% of permissible error.

From 19 wards of Dharan Municipality, 10 wards were selected through simple random sampling lottery method (non- replacement). As the population in 10 wards of Dharan are heterogeneously distributed a total number of 2489 old aged person were proportionately allocated to each ward. The number of sample (400) from each ward was calculated by.

$$n_h = \frac{n}{N} N_h$$

here h = selected 10 wards and n = require sample size (400)

N = total population of 60+ age (2489) of the selected ten wards, $N_h = 60+$ population of h^{th} ward

First house was selected by the pen rotating tip direction way with simple random sampling. The old age persons were interviewed till the number of samples been collected. If the selected first house did not belong to any member of the geriatric age, this house was excluded and again next selection was made. Data was obtained by face to face interview technique using semi- structured questionnaire. Health problem was found out as reported by the subject or respondent.

The collected data were edited and value of every variable was coded by manually before computer entry. Data were entered in Microsoft Excel and then analyzed by means of statistical

package for social sciences (SPSS) 11.5 version for window. Findings were presented with suitable charts, graphs and frequency tables. The Chi-square test was used to identify the association of health seeking behaviour and various factors.

Ethical Consideration

This study was conducted after the approval of concerned authority from college of Nursing BPKIHS Dharan and from the authority of Dharan municipality. The data was collected after obtaining an informed consent and without any compulsion. A high degree of confidentiality of the personal data was maintained.

Results

A total number of 400 senior citizens participated in this survey. Out of which 201 (50.3%) were males and 199(49.8%) were females. The age of subjects was categorized in to six groups as: 60-64(28male +45, female=73), 65-69(55 male+62 female=117), 70-74(45 male+46 female), 75-79(21male +45 female=66), and 80-84(16male +9female=25) and above 85(12male +16 female=28). Age differences range from 60 to 99, mean age was 70.65 and the standard deviation was ± 7.353 .

Table 1. Prevalence of reported health problems of the respondents for last one year

Characteristics	Categories	Frequency	Percentage %
Health problem	Hypertension	117	29.3
	Diabetes Mellitus	33	8.3
	Arthritis/Joint pain	99	24.8
	Eye Problems	76	19.0
	Hearing Problems	13	3.3
	Oral health Problems	70	17.5

GIT Problems	71	17.8
Respiratory Problems	44	11.0
Heart Disease	15	3.8
Renal problem	21	5.3
Skin Disease	30	7.5
Tuberculosis(TB)	12	3.0
Liver Disease	12	3.0
Mental Illness	23	5.27
Fracture	4	1.0
Fever/ fatigue	29	7.3
Genital diseases	25	6.3

* The percentage was not equal to 100 because of multiple responses Table 1, shows the distribution of respondents by illness for last one year. The frequently reported illnesses were hypertension in 117 (29.3%), diabetes mellitus in 33(8.3%), arthritis/joint pain 99(24.8%), eye problems in 76(19.0%), hearing problems in 13 (3.3%), oral- dental health problems in 70(17.5%), GIT problems in 71(9.7%), respiratory problems in 44(11.0%), heart disease in 15(3.8%), renal problem 21(5.3%), skin disease in 30(7.5%), tuberculosis in 12(3.0%), liver disease in 12 (3.0%), mental illness in 23(5.27%), fracture in 4(1.0%), Fever/ fatigue in 29 (7.3%) and genital problems/diseases in 25 (6.3%).

Health seeking behavior of the respondents Table 2. Types of first approach of seeking health for the reported illness and faith of the respondents on traditional healer

Characteristics	Categories	Frequency (n= 400)	Percentage (%)
Faith on	Dhami/ Jhakri	101	25.3
	Pandit/ Lama/Guvaju	47	11.8
	Astrologer	64	16.0
	Mata/ Budhibaju	33	8.3
	Pitri/Kulpoo	115	28.8

	ja		
	Pray about it at church/masjid	29	7.3
	None	11	2.8

Table 2. shows most of the respondents 97.2% were used to seek help for their health problems first time from different categories of faith healer. Dhami/ Jhakri (25.3%), Pandit/ Lama/Guvaju (11.8%), Astrologer (16.0%), Mata/ Budhi baju (8.3%), Pitri/Kulpooja (28.8%) and Pray about it at church/masjid (7.3%).

Table 3. Distribution of health care utilization for reported illness among the senior citizens.

Characteristics	Categories	Frequency	Percent age %
Health seeking behaviour	Self treatment	45	11.3
	Private practitioner/nursing home	105	26.3
	Drug over counter	84	21
	BPKIHS	145	36.3
	HP/SHP/GON hospital/welfare	13	3.2%
	Alternative medicine (Baidya)	8	2.0

Table 3: The pattern of health seeking habits was evaluated using numerical codes. The subjects opting for: self treatment during illness was 45(11.3%), visit to a private practitioner/ nursing home was 105(26.3%), used of drug over counter from nearest pharmacy 84(21%), visited to BPKIHS Hospital was 145(36.3%), visited to health post/subhealth post/Government hospital/welfare was 13(3.2%), visited to alternative medicine was 8(2%).

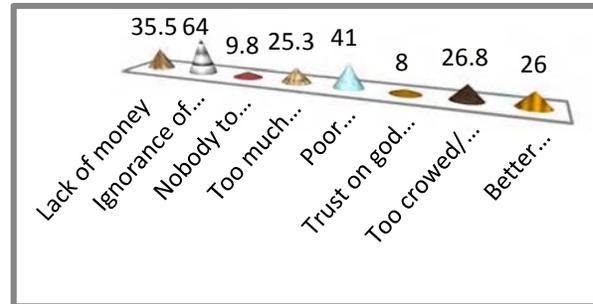


Fig. 1: Percentage distribution of factors hindering for utilization of the health care facilities

Fig. 1: shows reasons for not seeking the health care facility were 142(35.5%) respondents denied for the health care due to poverty and lack of money, ignorance due to old age were 256 (64.0%), 164(41%) complained about the poor attitude of health care workers towards their health needs and treatment, 101(25.3%) complained the facility is too far/ too much work to do at home , 107(26.8%) were too crowd and avoided due to lengthy process to get treated and 104(26%), said that other centers had better treatment facility. Nobody to take me to hospital 39(9.8) and trust on god for healing were 32 (8%).

Table 4. Association between socio-economic factors and health service utilization practice of the respondents (n= 400)

Characteristics	Categories	Utilization		P Value
		Yes (n=271)	No (n=129)	
Occupation of respondent	House hold work	126	61	<0.203
	Agriculture	52	17	
	Business	51	23	
	unskilled Labour/ Skilled worker/ Service	28	14	

	Social work	14	14	
Other sources of income	Own property	94	26	<0.003
	Dependent on care taker	75	35	
	Old age incentive	45	32	
	Retirement pension	38	24	
	Supported by children	18	7	
	Social support	1	5	
Family income /month	Up to 5000	78	43	<0.010
	5001 to 10000	193	47	
	Above 10000	62	26	
Education	Illiterate	167	81	<0.459
	Informal	32	57	
	Primary	14	14	
	Secondary and higher	19	16	

*Chi-square test *significant at <0.05

Table 4: depicts that the occupational status of respondents was not found significant (p=0.199) for utilization of health service, whereas other sources of income were highly significant (p =0.003). Occupation of the respondents and care taker were not associated with health seeking practices. Factors affecting health seeking is associated with per-capita income of the respondent and their family member (p =0.01) was highly significant at 95% confidence interval. The relationship between the non utilization of health service and educational status of the respondents was not statistically significant (p=0.459) between health service utilization and not utilization.

Table 5. Association between perception of respondents towards illness and reason for choosing health seeking practices (n= 400)

Characteristics	Categories	Utilization		P value
		Yes (n= 271)	No (n= 129)	
Disease conditions or severity of diseases	Only after not responding other treatment	58	29	<0.001
	Only in emergency conditions	109	4	
	Only in major chronic diseases	104	96	
Number of diseases	Single	105	64	<0.035
	Two	113	36	
	Three	44	21	
	≥ Four	9	8	
Source of information for seeking help	Health personal	70	5	<0.001
	Family member	28	16	
	Friends	57	43	
	Media(F/M, Radio, Television, News paper)	99	15	
	Faith healers	60	7	
Reason for choosing seeking help	Better treatment/ specialty service	145	7	<0.001
	Accessible/acceptable/affordable/ short waiting hour	97	32	
	Others	38	81	

*Chi-square test *significant at <0.05

Table 5: shows that severity of illness was significantly associated (p=<0.001) with health service utilization and non utilization that (96.4%) of the respondents visited formal health institution only in emergency condition followed by (52%) visited only in major chronic condition. Number of disease was also statistically significant (p=<0.035) that majority of the respondents (75.8%) visited health facility with having number two diseases as compared to the respondents seek their health problems equally i.e. 52% from formal and non formal health facility with having ≥four diseases. Source of information for seeking help was significantly associated (p=<0.001) that most of the respondents (93%) were utilized health facility as getting information by the health personal and 89.5% get information by faith

healer as compared to 66.3% utilized health service as suggested by the family member. Reason for choice of health care facilities were strongly significant ($p < 0.001$) between utilization and non utilization of the formal health institution was most of the respondents (95.3%) visited for better treatment as compared to the respondents (31%) visited for other reason at the formal health institution.

Table 6: Association between knowledge about availability of health facilities and health seeking behavior

Characteristics	Categories	Utilization		P value
		Yes (No=271)	No (No=129)	
Available health facilities	No	163 (62%)	101 (38%)	<0.001*
	Yes	108 (80%)	28 (20%)	
Types of health facilities	Private	38 (72%)	15 (28%)	<0.031
	Governmental / BPKIHS	70 (84.4%)	13 (15.6%)	
Distance of nearest health facility	<30 minutes	87 (84.5%)	16 (15.5%)	<0.001*
	>30 minutes	184 (63.2%)	113 (36.8%)	

* Chi square test *significant at < 0.05

Evaluation of the knowledge of the existing health services to the senior citizen such as subsidized treatment, old age allowance, free treatment, less waiting hours, preservation of hospital beds in the Government health services table 15 shows the higher proportion (80%) of health service utilization was found among the respondent who had knowledge about health facility as compared to the respondents who had not knowledge (62%). The association was strongly significant ($p = 0.001$). Regarding the knowledge about available health facility most of the respondent (84.4%) utilized Governmental /

BPKIHS followed by private health facilities (62%). The association was statistically significant ($p = 0.031$). The distance of nearest health facility from home played some role in health seeking behavior that less than 30 minutes of the distance (84.5%) utilize health facility (BPKIHS as main centre to visit for treatment) (63.2%) opted for private clinics and services for their nearness and readily available services on demand ($p = 0.001$).

Discussion

Research finding constituted with multidimensional ethnic castes. More than half of the respondents were 202 (51%), disadvantaged Janajati followed by others were (49%). cast/ Ethnicity was significantly associated ($p = 0.002$) health service utilization. Factors affecting health seeking behaviour was significant associated with decision making by self (72.5%) of the respondents were sought their health problems with formal health facilities ($p < 0.03$).

Factors affecting health seeking behaviour was significant associated with decision making by self (72.5%) of the respondents were sought their health problems with formal health facilities ($p < 0.03$).

Study findings also stressed the importance of economical barriers to health care seeking behaviour. Other sources of income and socio-economical status of the family income of the respondents were depicted to have significant association ($p < 0.001$) with the health service utilization.

This study showed a significant association ($p < 0.001$) between disease condition or severity of illness and utilization of the health service. Reason for not seeking the health care facility: the respondents were deprived of the health care due to lack of money (35.3%), and ignorance due to old age (64.0%).

Health Needs Assessment and Determinants of Health seeking behavior among 756 elderly Nigerians states poverty emerged as a major (50.3%) determinant of health care seeking behaviour followed by nature of illness (28.5%).

The number of diseases were significantly associated ($p < 0.035$) with health seeking behavior with utilization of health services.

Among the 295 respondents 64% had no problem to afford and 106 could not afford for the treatment. Among the respondents who could not afford for the treatment 36% took loans to get treated from BPKIHS and private practitioners, ask the social support, requested for free health services and reaming, opted for community welfare schemes for the senior citizens ($p < 0.05$). The evaluation of the sources of information between the availability of the health services and treatment seeking habit showed significant association ($p < 0.001$). This study found significant association ($p < 0.001$) between health seeking behaviour and respondents perception regarding reason for choice of health service for seeking help as 96% visited formal health institution for better treatment/ specialty service. The respondent's knowledge regarding available health facilities is not adequate for utilization of health facilities. Which was significantly associated ($p < 0.001$) between utilization and availability of the health facilities.

Conclusion

Findings of this study showed that the factors affecting health seeking behaviour were significantly associated with type of response of family members,, source of income and economical status of the family, decision makers, severity of illness, cost of treatment, source of information, availability of health facilities, types of health facilities, distance of nearest health facility, ignorance of disease

due to old age (deeply rooted cultural belief e.g. old body ill health, stage of setting sun, lack of knowledge regarding the self care etc), poverty, poor attitudes of health worker, lengthy treatment process, trust on God for healing if ill, living alone and lack of someone to take them to hospitals and feelings of better treatment available elsewhere rather than formal health institutions.

References

1. **Park K. Park's Textbook of Preventive and Social Medicine.** 20th ed. M/s Banarsidas Bhanot, Prem Nagar, Jabalpur, India; 2009. p. 412 - 14.
2. **Waweru LM., Kabiru EW., MBITHI JN., and Some ES.** Health status and health seeking Behaviour of the Elderly Persons in Dagoretti Division, Nairobi. East African Medical Journal 2003; 80: 62-7
3. **Joice M. Black. Jane Hokanson Hawks, Annabelle M. Keene.** Medical Surgical Nursing clinical Management for positive Outcomes. 6th ed. Harcourt, New Delhi, India; 2002. p.45 -47.
4. **Status Report on Elderly People (60+) in Nepal on Health, Nutrition and Social Status Focusing on Research Needs.** Government of Nepal Ministry of Health and Population Ramshahpath, Kathmandu, Nepal; 2010
5. **Village development committee, Profile of Nepal.** Intensive study and research center; 2008.
6. **Gautom PC.** Introducing geriatric medicine to Nepal, An outline of a training programme and a model for the delivery of service. Kathmandu University Medical Journal 2008; 6(1):135-140.
7. **Stanhope M, Lancaster J. Public Health Nursing.** Population centered Health care in the community.6th ed. Mosby Elsevier; 2008. P. 665 - 672.
8. **Katung PY.** Socio-economic factors responsible for poor utilization of PHC services in rural community in Nigeria Niger J Med 2001; 10:28–29.
9. **World Bank.** Towards a health sector strategy. Washington DC: Health, Nutrition and Population Unit, South Asia Region; 1997.
10. **Dixit H.** The quest for Health, Educational Enterprises Kathmandu Nepal; 1999.
11. **WHO Scientific Group.** The uses of Epidemiology in the study of the elderly, WHO technical report series 706, Geneva: WHO 1984.

12. **Acharya P. Senior Citizens and the Elderly Homes.** A Survey from Kathmandu, Dhaulagiri Journal of Sociology and Anthropology 2008; 2: 212 - 24.
13. **Upadhaya MP, Koirala S, Kannan AT, Jha N.** Sunary health interview survey. B.p. Koirala institute of health sciences dharan, Nepal; 1994.
14. **Cotter, Valerie T, Strumpf, Neville E.** Advanced Practice Nursing with Older Adults: Clinical Guidelines. McGraw-Hill Medical. ISBN 0071341579; (2001)
15. **Nyamongo IK.** Health careswitching behavior of malaria patients in a Kenyan rural community. Soc Sci Med 2002; 54:377–386.
16. **Delgado E, Sorenson SC, Van der Stuyft P.** Health seeking behaviour and self assessment for common childhood symptoms in rural Guatemala. A Soc Belg Med Trop 1994; 74:161–168.
17. **Nakagawa YM Ozasa K, Yamadu N, Shimouchi A.** Gender difference in delays to diagnosis and health care seeking behavior in a rural area of Nepal. Int J Tuberc Lung Dis 2001; 5: 24–31.
18. **Yip WC, Wang H, Liu Y.** Determinants of choice of medical provider: a case study in rural China. Health Policy Plan 1998; 13: 311–322.
19. **Geissler PW Nokes K, Prince RJ., Achieng R, Odhiambo, j. Aagaard-Hansen and J.H ouma.** Children and medicines: self treatment of common illnesses among Luo schoolchildren in western Kenya. Soc Sci Med 2000; 50 : 1771–1783.
20. **Nakagawa YM Ozasa K, Yamadu N, Shimouchi A.** Gender difference in delays to diagnosis and health care seeking behavior in a rural area of Nepal. Int J Tuberc Lung Dis 2001; 5: 24–31.
21. **Alix-Dancer P.** Access to health care in developing countries. In: Developing countries, society and technology. Stockholm: Royal Institute of Technology (KTH); 2003.
22. **Rani M, Bonu S.** Rural Indian women’s care seeking behavior and choice of provider for gynecological symptoms. Stud Fam Plannin 2003; 34 :173–185.
23. **Ahmed SM, Adams AM, Chowdhury M, Bhuiya A.** Gender, socioeconomic development and health seeking behavior in Bangladesh. Soc Sci Med 2000; 51:361–371.
24. **Mumtaz Z, Salway S, Waseem M, Umer N.** Gender-based barriers to Primary health care provision in Pakistan: the experience of female providers. Health Policy Plan 2003; 18: 261–269.
25. **World Health Organization.** World Health report 2000. Health systems: improving performance. Geneva; 2000.
26. **Navaneetham K, Dharmalingam A.** Utilization of maternal health care services in Southern India. Soc Sci Med 2002; 55: 1849–1869.

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THE MICROBIAL INVASION OF GASTRO INTESTINAL TRACT AND HABIT OF DRINKING WATER IMMEDIATELY AFTER MEALS

Kamal Prasad Parajuli, Durga Devi Chaulagain, Ganesh Singh and Medhabi Shrestha

Abstract

The prime role of the hydrochloric acid secreted by the parietal cells of the stomach is to assist in digestion of food. The another important role of it is to assist in immunity. The presence and secretion of the hydrochloric acid is a part of innate immunity that fights against the pathogens that enter our body through oral route. However if a person drinks fluids while eating food, the hydrochloric acid whose pH is 2-3, is greatly diluted and as a result the acid cannot effectively prevent the invasion of the GI tract by pathogens that are present in our food and water. This study reveals that those subjects who do not drink water while eating food but drink it after one hour of consumption of food are less likely to be infected with pathogens through GI tracts. Whereas those people who drink water while taking food are more prone to be infected by the pathogens.

Key words: *Parietal cells, Churning action, hypochlorhydria, Lugol's iodine solution*

Introduction

In developing countries like Nepal, parasitic infection of Gastro Intestinal Tract is rampant and the parasitic infection is one of the reasons for impairment of mental capabilities. It has been pointed out by various researches that the parasitic infection, particularly by the intestinal nematodes during childhood leads into poor mental IQs. (1,2)

Water is essential for life but provision of safe drinking water is still far from reach in poor people of developing countries. Unsafe drinking water is the cause of death of thousands of people in these countries. Such use of unsafe water for the preparation of meals and for drinking purposes is the root cause of various water borne diseases and faeco-oral transmitted diseases. Cholera, Dysentery, Typhoid fever, Viral diarrhea, Ascariasis, Amoebiasis, Giardiasis, etc are

some of the diseases that are transmitted by consumption of contaminated water. (3,4)

The food that we eat may contain large number of pathogenic organisms including viruses, bacteria and parasites if it is prepared in dirty utensils, cooked mealy and not covered properly after it has been cooked. Unhygienic preparation and consumption of such food is also one of the reasons for large number of parasitic infection in Nepal.

Hydrochloric acid in our body is secreted by parietal cells and poured into the stomach contents along with gastric juice. The main function of the hydrochloric acid is to aid in the digestion of food. Apart from this the hydrochloric acid also helps to attenuate any pathogens that enter into our GI system through food because most pathogens could not survive low pH of the hydrochloric acid. Once a person eats the food, the churning action of muscles of stomach inter-mixes the

food completely with the acid so that pathogens that are present in the food cannot escape the deleterious action of the acid. However drinking of water during consumption of meals results into dilution of the acid, and as a result the pathogens escape unhurt and start showing their pathogenic effects once they reach small intestines. So drinking water while eating weakens our primary defense against the invading pathogens and thus we expose our self to harmful effects of microbial infections of the GI system. However if we drink water one hour after consumption of food we are safe from such types of infection. The aim of the study is to find out whether drinking of water at an appropriate time really decreases the burden of the microbial infection of GI system.

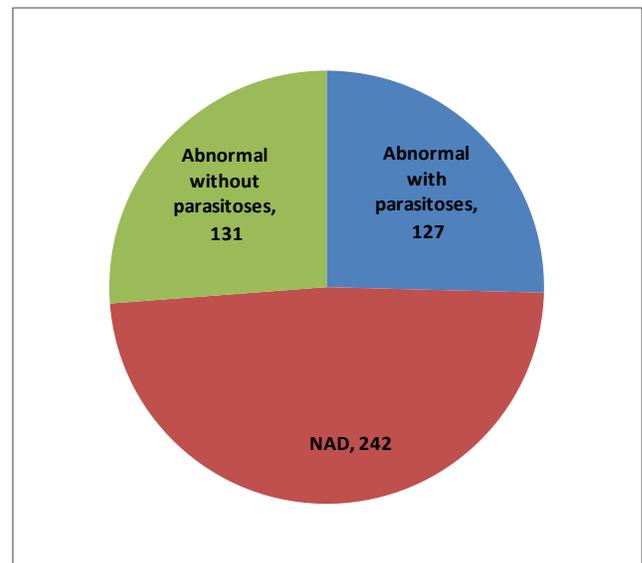
Methods and Materials

The study was conducted in the Department of Microbiology, at Nobel Medical College and Teaching Hospital, Biratnagar, Nepal. The questionnaires were prepared, after some basic information about the study the written consent was taken from the patients or from visitors who came to Microbiology lab to submit the stool samples and were enrolled in the study. All together 500 stool samples of both outdoor patients and indoor patients who had come to Nobel Medical College to seek treatment in between 15/8/2011 to 25/10/2011 were included in the study. The patients were given wide mouthed, clean and dry container and samples were processed within 30 minutes of collection of the stool samples. Microscopic Examination of stool samples – done according to standard protocol (5) Preparation of saline solution and Lugol's Iodine solution- prepared as according to the Standard Protocol (6) Any abnormal findings like ova and larva of Helminthes, and cysts and trophozoites of

Protozoan , pus cells , red blood cells , yeast cells , undigested food particles, etc were noted down. Presences of mucus, frank blood, consistency, etc were also noted macroscopically.

Results

Figure1 Sample frequency based on analysis (N=500)



Out of 500 stool Fig. 1 shows samples analyzed 127 samples were found to have some sort of intestinal parasites ie Endameba histolytica, Giardia lamblia Hookworm, Ascaris lumbricoides , Hymenolepis nana or Strongyloides stercoralis. Though parasites like Trichuris trichiura, Enterobius vermicularis, Taenia species etc are frequently observed during routine examination, they were not encountered during the study. 131 samples were abnormal by having pus cells, red blood cells, yeast cells etc but they did not have presence of any parasites. And finally 242 samples were completely free from any parasites or any other form of abnormalities. Identified with their frequencies according to habit of

drinking water while examining stool samples. The frequency of parasites in infected persons who drank water before meals were less and similar was the result in those who drank water after meals. But most of the patients who harbored the parasites were the ones who drank water while taking foods.

subjects, 5 and 24 drank water before and after meals respectively and still they had some abnormal findings in the stool samples. 102 subjects said they took water while eating foods.

Figure2: Frequency of parasites isolated according to habit of drinking water

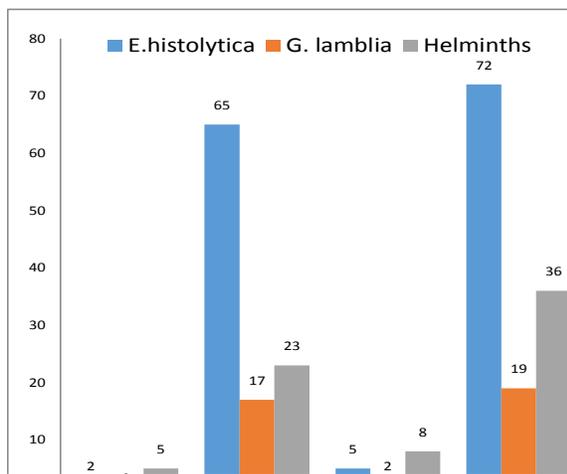
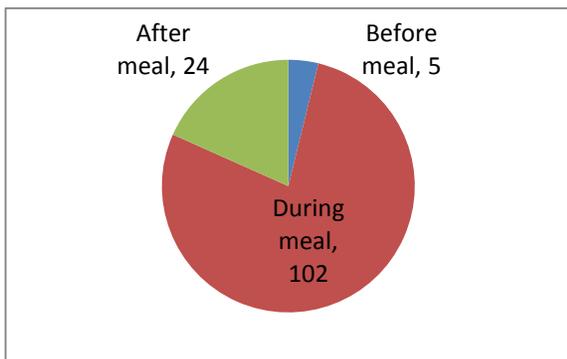


Figure 3 Habit of drinking water among the abnormal samples without parasitoses (n=131)



The figure shows the habit of drinking water among the abnormal samples without parasitosis but had some sort of abnormal findings in the stool examined .Out of 131

Discussion

From the above study it has been found that people who drank water during the meals are more vulnerable to the microbial infections. This is because when water is taken along with food it is obvious that the hydrochloric acid secreted by the parietal cells get diluted, as a result its potency will not be as strong as when it is undiluted (7). So because of that reason the parasitic ova and cysts that enter our GIT cannot be destroyed by the acid. We all know that presence of hydrochloric acid in the stomach bars many pathogenic organisms entering into the GI system (8). Similar to what the author has found, this article points out that the acid prevents the harmful microorganisms entering into the GI system and the role of the acid is minimized once people start gulping water and food together. Facts like “10⁶ Vibrio cholerae administered to normochlohydric volunteers without food and buffer did not produce infection while the same dose given along with food and buffer caused the clinical cholera,”(9) suggests that presence of hydrochloric acid in stomach prevents infections. In certain helminthes infections like Hookworm and Strongyloides stercoralis infections, though the mode of transmission is not the faeco-oral route, but still they come to stomach. The larval form of these parasites remains in the stomach for certain period of time and along with the food they migrate to the small intestines, their final destination. The secretion of Hydrochloric acid is high in the gastric phase but again if it is diluted, these parasites pass unhurt from the stomach to the intestines and cause infections.

Similar to other studies conducted by various authors in different part of Nepal (10, 11), Amoebiasis is the highest among the subjects and second to this is giardiasis. Both these disease are mostly transmitted by the faeco-oral route mainly by consumption of contaminated food and water. If people instead of drinking water while eating food start taking water after some time of taking of food these parasitic infections can be prevented.

Conclusion

The study reveals that appropriate time for drinking water is necessary to avoid various intestinal ailments due to microorganisms and the best time to do so is not during or immediately after the intake of foods but after some time of the intake of foods.

Acknowledgement

The study was conducted in the Microbiology lab of Nobel Medical College and Teaching Hospital, so the author is indebted to all the patients who took part in the study. It is needless to say that without the help of Mr Binod Yadav, Miss Srijana Rai , Miss Kabita Chaudhary and Mr Birendra Sardar , who gave their valuable time in processing the stool samples in the department, the study would not have been possible. The author

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References

1. Correlation between intestinal parasitosis, physical growth and pschymotor development among infants and children from rural Nicaragua, -American Journal of Tropical Medicine and Hygiene ,58:470-475
2. The contribution of *Ascaris lumbricoides* to malnutrition to children, Parasitology 81, 221
3. Epidemiology of Amoebiasis, Pasitol,6,1
4. **Bull. N.Y.** Amoebiasis as world problem, Acad.Med. 47,438
5. **L. S Garcia.** Diagnostic Medical Parasitology by 4th Edition, Page 741-746.
6. **L.S. Garcia.** Diagnostic Medical Parasitology by 4th Edition, page 744.
7. Diseases associated with low HCL, Gallbladder attack.com
8. **Micheal Mc Evoy.** Your Digestive Fire: The Vital Role of Stomach Acid
9. **R Ananthanarayan and CK Panikar** Text book of Microbiology, 5th edition ,page 286.
10. Small scale survey on status of intestinal parasites infection in rural villages in Nepal, Korean Journal of Parasites, 38(4) :275-277
11. **Shakya B.** Intestinal parasites, Journal of Institute of Medicine, December 2009, 31:3

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KNOWLEDGE OF URBAN POPULATION REGARDING DIABETES MELLITUS AND ITS COMPLICATION: A COMMUNITY BASED STUDY

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Abstract

Aim: To assess the knowledge on diabetes among diabetic patients of urban poor.

Background: Diabetes has been a major threat to public health as 3.2 million deaths are attributed to diabetes every year. The management of diabetes depends on knowledge of patient, self care activities and knowledge on symptoms and complications.

Materials and methods: The study was carried out in the Urban Health Center area of Belgaum. The knowledge on diabetes, signs or symptoms and complications was assessed among diabetic patients, by using scoring system. Data were analyzed using percentages, proportions and statistical test (chi-square test) was used for categorical data.

Results: The study revealed that 108(56.25%) knew about diabetes out of 192 diabetic patients. More than half, 142 (73.93%) patient knew the impact of diabetes on other organs. Sixteen (11.26%) said kidneys, 13(9.13%) as heart and 45(31.69%) said that diabetes affects multiple organs. Majority 142 (73.95%) of patients had knowledge of complications.

Key words: *Diabetes, knowledge, symptoms, Complications, awareness, risk factors.*

Introduction

An epidemic of Non Communicable Diseases has set in developing countries posing a major health burden. The world wide prevalence of diabetes is estimated to increase to 5.4% by 2025 and developing countries will be responsible for 75% of diabetics in 2025.¹ The highest burden will be on India being the second most population country in the world, which is predicted to almost 70 million Diabetics in India by 2025.²

The co-morbidities and complications can affect the quality of life of diabetics and can be severe or fatal if not detected and treated promptly. Especially among vulnerable population groups including urban

poor, low income groups, illiterates' etc.³ Diabetes has been a major threat to public health as 3.2 million deaths are attributed to diabetes every year.⁴

The management of diabetes depends on knowledge of patient on self care activities, knowledge on symptoms, complications etc. The diabetes is a lifelong disease and poses a huge economic burden on patients especially treatment and management of complications. World Bank estimated that diabetes will account for 18,70,000 disability adjusted life years (DALY) in India, with per capital health expenditure of \$21.⁵

Awareness of disease, its risk factor, associated symptoms and complications is

equally important in preventing complications and managing disease condition as treatment and restriction of diet. There are evidences that, diabetic patients often have inadequate knowledge on disease and its complications which markedly increase their risk of CVD, stroke, kidney failure etc.⁶

A study done by Tan et al showed that, the education intervention improved diabetics' knowledge and long term control of diabetes.⁷ The questions are whether our patients especially, vulnerable population is aware about their disease, its symptoms and complications .There is a need to assess the level of awareness about diabetes and assess educational needs of diabetic patients; hence, the study was planned to provide base line information to develop an appropriate education tool for intervention program.

Materials and methods

The study was carried out in the Urban Health Center area of Khasbag, Belgaum, where in an, underprivileged population resides. The study was conducted over a period of one year (2008-2009). The house to house survey was conducted in ward no: 21 and all known adult diabetic patients were included in the study. A pre designed and pre tested questionnaire was used as study tool which comprised of general information, knowledge on diabetes, its risk factors, signs or symptoms and complications. The level of awareness was assessed by using scoring system. Each correct answer was awarded with maximum score 2, not sure answers was given 1 and incorrect response was given 0 point. Data were analyzed using percentages, proportions and statistical test (chi-square test) was used for categorical data.

Results

A total of 192 subjects were identified and included in the study. Among the

interviewed 107(55.73%) were males and 85(44.27%) were females. Out of 192 diabetics, 120(62%) were literates and majority 115(59.88%) belonged to class IV and V socio-economic status.

More than half (53.64%) of diabetic patients belonged to 36 to 60 yrs which is the most productive age group. The overall knowledge of diabetic patients was average (63%) fig1. The study revealed that 108 (56.25%) knew about diabetes and said that it is rapidly increasing, but only 11(10.18%) knew about the types of diabetes.

Most of the patients 160(83.33%) knew one or other symptoms of diabetes mellitus table 1.

Table No 1. Knowledge regarding symptoms of diabetes Mellitus among diabetic patients.

Knowledge of Symptoms	No	Percentage
Yes	160	83.33
No	32	16.66
Types of Symptoms		
Itching	8	5.00
Drowsiness	8	5.00
Weight loss	9	5.62
Sweating	9	5.62
Slow healing	10	6.26
Visual disturbances	15	9.37
Excessive hunger	16	10.00
Thirst	16	10.00
Excessive urination	19	11.88
Multiple	50	31.25*

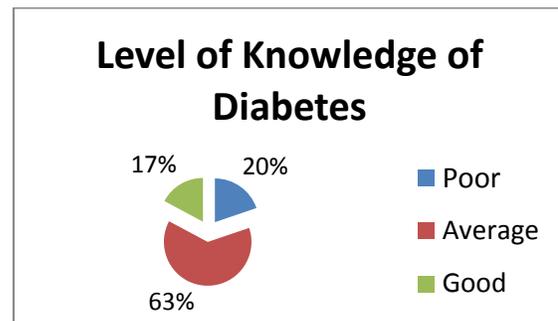


Fig 1 Level of Knowledge

The knowledge about impact of diabetes on other organs and complications of diabetes was also assessed among the patients. More than half, 142 (73.93%) patient knew the impact of diabetes on other organs. Among them 18(12.67%) said it affects eyes, 16(11.26%) said kidneys, 13(9.13%) as heart and 45(31.69%) said that diabetes affects multiple organs. Majority 142 (73.95%) of patients had knowledge of complications associated with diabetes mellitus table 2.

Table No 2. Knowledge regarding complication of diabetes mellitus among diabetic patients.

Knowledge of Complications	No	Percentage
Yes	142	73.95
No	50	26.05
Knowledge of various Complications		
Oral complications	2	1.40
Fever	2	1.40
Joint pains	4	2.82
Raised Blood pressure	9	6.33
Gangrene/foot ulcer	10	7.04
Hypoglycemia	11	7.74
Digestive problems	12	8.46
Heart	13	9.17
Nephropathy / Kidney problems	16	11.26
Retinopathy / eye problems	18	12.68
Multiple	45	31.70*
Total	142	100

*Multiple response

The knowledge of men was better than females and the association of knowledge and gender was significant. The knowledge among business men was average and knowledge among people in unorganized sector was poor. The significant association was found between knowledge of diabetes and occupation table 3.

Table No 3. Association of level of knowledge on Diabetes and Gender, Socio-economic and Education status.

Level of Knowledge	Poor	Average	Good	Total
Gender				
Male	12(11.21%)	70(65.42%)	25(23.36%)	107
Female	26(30.58%)	51(60.00%)	8(9.41%)	85
		p=.001		
Education				
Illiterate	29(39.73%)	44(60.27%)	0.00	73
Primary School	7(11.11%)	50(79.36%)	6(9.52%)	63
Secondary School	2(5.55%)	18(50.00%)	16(44.44%)	20
PUC & above	0.00	9(45%)	11(55.00%)	
		p = .001		
Socio-Economic				
Class I	0.00	3(42.85%)	4(57.15%)	7
Class II	2(13.33%)	9(60.00%)	4(26.66%)	15
Class III	2(3.63%)	38(69.09%)	4(26.66%)	55
Class IV	2(3.63%)	46(64.78%)	15(27.77%)	71
Class V	16(22.53%)	25(56.81%)	9(12.67%)	44
	18(40.90%)	p=.001	1(2.27%)	

Discussion

Diabetes is a life time problem and its management is most complex one with poor awareness about the disease. Many studies have showed poor general awareness of disease among patients, which varied from place to place. The socio demographic profile of our patients revealed that, 59.88% belonged to poor (class 1V and V) socio economic status and 51.05% used to work in unorganized sector. In present study 56% had correct knowledge of diabetes and 90% did not know about its types. In Nepal study 82% knew about the disease they suffering.⁸ And a study conducted in Chennai revealed that 75% of population knew about disease.⁹ The knowledge about disease among patients was slightly better than our population. And it varied from place to place.

Fifty percent patients knew about risk factors of diabetes where as in a study conducted in Ludhiyana 71.3% did not know about the risk factors of a disease¹⁰. The urban population had better knowledge about risk factors. One third of patients in Belgaum knew multiple symptoms of DM where as in Karachi, Pakistan 42.2% patient could not name a single symptom of disease⁶. In the present study 73.95% subject were aware about complications of diabetes and one third of patients knew multiple complications. Similar study in southern Indian city showed that less than 30% patients were aware of complications of diabetes which was poor compared to our study subjects ¹¹.

Though overall knowledge of diabetes was good, many patients were unaware about the symptoms and complications associated with diabetes. There is a need to improve the knowledge level of patients regarding symptoms and complications of diabetes, which they suffer from.

The study also conclude that there is an urgent need for cost effective, new strategies like shared care approach in health promotion programs, which will have a significant benefit with regard to disease prevention, detection, patient compliance to the treatment and prevention & management of complications. The health education program is the need of the time, which aids self-care and improve the quality of life and life span of diabetic patients.

There may be various others factors associated poor knowledge about disease. There is a need to understand the determinants of poor awareness level. This may help us to improve the quality of life of diabetic patients and in turn improve the management of co morbidities associated with diabetes mellitus.

References

1. **Arun Bal**, Diabetes: ethical, social and economical aspects. IJME 2008; 8(3). File <http://www.G/imr/g2.htm>. (11/9/2008 12.37pm).
2. **Shashank R Joshi, A.K.Das, V.J.Vijay, V.Mohan** challenges in diabetes care in India: sheer numbers, lack of awareness and Inadequate control. J.Assoc physician India 2008; 56:443-450.
3. **M.Bhaskara Rao, Manja Prasek, Zeliko Metelko**. Organization of diabetes health care in Indian rural areas. Diabetogia Croatica 2002; 31(3): 161-171.
4. **Unwin N, Malin A**, Report on diabetes action now 2004; 49 available http://www.who.int/diabetes/actionnow/en/DAN_booklet.pdf.
5. The economic of Diabetes. 1998, Diabetes Care, 21 (supp 3): 7-10.
6. **G.Rafique, S.I.Azam and F.White**. Diabetes knowledge, beliefs and practices among people with diabetes attending a university hospital in Karachi Pakistan. Eastern Mediterranean Health Journal 2006; 12 (5): 590-598.
7. **KY Tham, JJY Ong, DKL Tan, KY How**. How much do diabetic patients know about diabetes mellitus and its complications? Annals Academy of Medicine 2004; 33(4): 503-509.
8. **Kamel H M, Ismail A M, Deib R A, Khattab S M**, Predictors of self-care behaviors in adults type II diabetes mellitus in Abu Khalifa village Ismailia- Egypt. Suez Canal University Medical Journal 2003; 6:185-195.
9. **Deepa M, Deepa R, Shanthirani CS et al**. Awareness and knowledge of diabetes in Chennai- The Chennai Urban Rural epidemiology study [CURE 9].J.Assoc physician India 2005; 53: 283-287.
10. **Gulabani M, John M, Isaac Rajesh**. Knowledge of diabetes, its treatment and complications amongst diabetic patients in Tertiary Care Hospital. Indian J of Community Med 2008; 33: 204-206.
11. **Murgesan N, Snehalatha C, Shobhana R, Roglic G, Ramchandran A**. Awareness about disease and its complication in general and diabetic population in city in southern India. Diabetes Res Clin Pract 2007; 77: 433-437.

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PREDICTION OF STATURE BASED ON FOOT LENGTH

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Abstract

Background

Estimation of body height from its segments or dismember parts has important considerations for identifications of living or dead human body or remains recovered from mass disaster or other similar conditions.

Objective

Stature is an important consideration in determining the identity. Our aim of the study was to investigate the relationship between foot length and body height and to derive a regression equation for stature estimation from foot length and to find out the correlation between body height and foot length.

Methods

The present study was conducted on 200 medical students of age group 18 to 23 years studying in MGM Medical College, Navi Mumbai, Maharashtra, India. Body height and foot length were measured in centimeter. All the measurements were taken by using standard measuring devices and standard anthropometric techniques.

Results

Correlation coefficients between stature and foot dimensions were found to be positive and statistically highly significant. Prediction of stature was found to be most accurate by multiple regression analysis.

Conclusions

In population similar to our subjects, stature and gender estimation can be done by using foot measurements and it will be helpful for Anatomists, Anthropologists and forensic experts to calculate stature based on foot length.

Keywords: *Body Height, Stature, Foot length, Correlation, Regression Equation.*

Introduction

Anthropometry as adopted by medical scientist is described as a technique of expressing the form of human body quantitatively as it is the systematic collection and correlation of measurement of the human body.¹ Dimensional relationship between body

segments and the whole body has been the focus of anatomists, scientists, and anthropologists for many years.² Body proportions and the dimensions of various body segments, including the long bones of their limbs and the bones of the foot and hand have been used to estimate stature.³ Furthermore, the relationship between body

segments has been used to compare and highlight variations between different ethnic groups and to relate them to locomotor patterns, energy expenditure, and lifestyle. Prediction of the dimensions of body segments is useful in many areas of modern science.⁴ The long bones of the limbs, however, have been the most widely studied.⁵ Determination of stature from incomplete skeletal and decomposing human remains is predominantly important in personal identification. Stature of a person can be said to be the sum of the length of certain bones and appendages of the body. Stature provides insight into various features of a population including nutrition, health and genetics. Various studies in past have been undertaken to study the relation between height of a person and various body parts but not much has been done to have it from the foot length. Therefore purpose of the present study is to study the anthropometric relationship between foot length and body height in normal young adults and its sexual dimorphism.

Material and Methods

Two hundred medical students (100 male and 100 female) of age group 18 to 23 years studying in MGM Medical College, Navi Mumbai, Maharashtra, India were the subject for this study. Ethical clearance was obtained from the IERC [Institute Ethical Review Committee] before starting the study. Informed consent of participants was

taken and socio-demographic indices like age and sex was noted. Each student was studied for the measurements of stature and foot length. The measurements were taken by using standard anthropometric instruments. The height of the individual was measured between the vertex and floor, with the person standing erect, in anatomical position and the head in the Frankfort plane, using a standing height measuring instrument. Foot length for the both sides was measured as the distance from the most prominent part of the heel backward to the most distal part of the longest toe (2nd or 1st). Measurements were recorded in centimeters to the nearest millimeter using standard anthropometrical instrument. Students having any disease, deformity, injury, fracture, amputation or record of any surgical procedures of either hand or foot were disqualified from the study. The measurements were taken at a fixed time between 2.00 to 4.00pm to eliminate the possibility of diurnal variation and by only one observer in order to avoid inter-observer error. The data obtained were computed and analyzed using SPSS (Statistical Package for Social Sciences) computer and results drawn. The linear and multiple regression models with the explanatory variables or regressors, foot length and hand length was used as a statistical model to explain the relation or the variation in stature, the response or dependent variable.

Results

Table 1. Descriptive statistics for stature and measurements (in cm) of feet in male and females.

A. For Male

Variable	Male [N = 100]				
	Mean	SD	SEM	Min.	Max.
Age in year	18.99	0.785	0.0785	18	22
Body weight in kg	70.58	13.797	1.38	46	108
Stature	172.246	5.8727	0.5873	158.9	186.0
Right foot length (RFL)	25.541	1.5633	0.1563	22.4	29.5
Left foot length (LFL)	25.506	1.5399	0.1540	22.3	29.6

B. For Female

Variable	Female [N = 100]					t- value (Sex diff. M vs F)	p value Significance (of 2 tables)
	Mean	SD	SEM	Min.	Max.		
Age in year	18.77	0.908	0.091	18	23	1.832	.068 (NS)
Body weight in kg	55.27	10.084	1.008	35	81	8.955	<0.001
Stature	158.091	6.3102	0.6310	136.3	172.8	16.421	<0.001
Right foot length (RFL)	23.381	1.5712	0.1571	20.4	28.8	9.745	<0.001
Left foot length (LFL)	23.177	1.4269	0.1427	20.0	26.4	11.094	<0.001

Table 2. Bilateral differences in measurement (in cm) of feet in males & females.

Variable	Males [N = 100]		p value	Female [N = 100]		t - value	p value
	Mean difference (right – left)± SD	t - value		Mean difference (right – left)± SD			
FL	0.035 ± 0.3374	1.037	0.32	0.204 ± 0.7802	2.615	0.010*	

P value significant at <0.05 ; *Significant ; FL -Foot length

Table 3. Linear and multiple regression equation for estimation of stature (cm) from measurement of feet.

Males		Females	
Linear regression equations	±SEE	Linear regression equations	± SEE
S = 128.951+1.695(RFL)	0.339	S = 118.533 +1.692 (RFL)	0.368
S = 106.265 +2.236 (LFL)	0.385	S = 128.233 +1.726 (LFL)	0.344
Multiple regression equations±SEE		Multiple regression equations±SEE	
S = 128.039+0.761 (RFL)+0.971 (LFL)	3.176	S = 106.623+0.297(RFL)+2.520 (LFL)	1.492

S= Stature RFL = Right foot length LFL = Left foot length

Table 4. Comparison of actual stature and stature estimated (cm) from measurement of feet.

Estimated stature using regression Equations for	Males			Female		
	Estimated stature			Estimated stature		
	Minimum	Maximum	Mean	Minimum	Maximum	Mean
Right foot length	166.90	179.00	172.20	153.00	167.30	158.10
Left foot length	166.70	179.30	172.30	151.00	165.30	158.10
Actual stature	158.90	186.00	172.24	136.30	172.80	158.09

Discussion

The conducted study is a cross sectional descriptive Study and performed in year 2010-11 in Department of Anatomy, MGM Medical College, Navi Mumbai as per the study design. Measurement by standard anthropometric instruments of stature and foot length were taken of two hundred young and healthy students (100 males and 100 females), in the 18 to 23 year age group.

The mean age (in years) among males was 18.99 with SD of 0.785, the mean age in years among female was 18.77 with SD of 0.908 and it was not found to be statistically significant. The mean body weight among male subjects was found to be 70.58 ± 13.79 kg and that among females was 55.27 ± 10.08 kg. The difference in body weight among male and female subjects were found to be statistically significant (p value < 0.001). Our finding is similar to the study conducted by Ozden H et al (2005)⁶ conducted in Turkey in this regard. The mean stature of male was found to be 172.24 ± 5.87 cm and that among female was 158.09 ± 6.31 cm. The difference in stature between two gender were found to be statistically significant (p value < 0.001). The mean foot length on both sides in male was larger than female. The difference in these measurements was found to be statistically significant between male and female (p - value < 0.001). These findings are in line to the study conducted by H. Ozdan et al (2005)⁶ in Turkish

population, Sanli et al (2005)⁷ and Krishan and Sharma (2007)⁸ amongst North Indian population (Rajputs), in which foot length and foot breadth on both sides were statistically significantly greater in males when compared to females. The difference in right and left foot length among males were found to be statistically insignificant. However the difference in female foot length was found to be statistically significant. Male stature was found to be significantly correlated with right foot length ($r=0.451$, $p<0.001$) and left foot length ($r=0.452$, $p<0.001$). Similar statistically significant correlation was seen between stature and right ($r=0.421$) and left ($r=0.506$) foot dimensions of females. Our finding replicates the finding of the study conducted by Krishan and Sharma (2007)⁸ in the North Indian population (Rajputs) which found that bilateral hand and foot length in both male and females exhibit statistically significant correlation coefficient with stature. Our finding also replicates the finding of study conducted by Sen and Ghosh (2008)⁹, in which the statistically significant correlation was found between stature of both sex and their foot length. Similar conclusion was drawn by Patel SM et al (2007)¹⁰ and Mansur DI et. al (2012)¹¹ that if either of the measurement (foot length or total height) is known the other can be calculated and this fact may be of practical use in Medico-legal investigations and in Anthropometry. Linear

and multiple regression equation were evolved and it was found that applying these equations, the calculated estimated mean stature was found to be almost same as mean actual stature using various explanatory variables.

Conclusion

This study indicates that stature can be predicted accurately by linear and multiple regression analysis even when identity is unknown from foot length - a problem frequently encountered in medico-legal investigations. This study also found that foot measurements can be used to calculate stature with reasonable accuracy using statistical considerations and it is revealed that a single dimension can estimate the stature of a person with a great accuracy and small standard error. Sexual dimorphism with female consistently having smaller stature, lesser body weight and smaller foot length compared to their male counterparts was also found. Our findings suggest that the relationship between stature and foot length is of practical use for anatomists, medico-legal, anthropology, archaeological and other related studies.

References

1. **Wilbur AK.** The utility of hand and foot bones for the determination of sex and the estimation of stature in a prehistoric population from west-central Illinois. *International Journal of Osteoarchaeology* 1998; 8:180–191.
2. **Charnalia VM.** Anthropological study of the foot and its relationship to stature in different castes and tribes of Pondicherry state. *Journal of Anatomical Society of India* 1961; 10: 26-30.
3. **Telkka A.** On the prediction of human stature from the long bones. *Acta Anat. (Basel)* 1950; 9: 103–317.
4. **Athawale MC.** Anthropological study of height from length of forearm bones: A study of one hundred Maharashtrian male adults of ages between twenty five and thirty years. *American Journal of Physical Anthropology* 1963; 21: 105-12.
5. **Sharma VK, Garg RK, Chattopadhyay PK.** Calculation of stature from foot measurements: a study of Gaur Brahmins. *Coll. Antropol* 1978; 2: 194–195.
6. **Ozden H, Balci Y, Demirustu C, Turgut A, Ertugrul M.** Stature and sex estimate using foot and shoe dimensions. *Forensic Sci Int.* 2005; 147:181–184.
7. **Sanli SG, Kizilkanat ED, Boyan N, Ozsahin ET, Bozkir MG, Soames R et al.** Stature Estimation Based on Hand Length and Foot Length. *Clin.Anat.* 2005;18:589–596.
8. **Krishan K, Sharma A.** Estimation of stature from dimension of hand and feet in a north Indian population. *J Forensic and Legal Medicine*, Aug. 2007; 14(6):327-332.
9. **Sen J, Ghosh S.** Estimation of stature from foot length and foot breadth among the Rajbanshi: an indigenous population of North Bengal. *Forensic Sci. Int.* 2008; 181:55e1–55e6.
10. **Patel SM, Shah GV, Patel S.V.** Estimation of height from measurements of foot length in Gujarat region. *J. Anat. Soc. India* 2007; 56(1): 25-27.
11. **Mansur DI, Haque MK, Sharma K, Karki RK, Khanal K, Karna R.** Estimation of Stature from Foot Length in Adult Nepalese Population and its Clinical Relevance. *KUMJ* 2012;10(1): 16-19.

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BILATERAL THALAMIC GLIOMA –A RARE TUMOUR

Vivek Rauniyar, Bing Qin, Huan Yang

Abstract

We report a case of 48-year old woman who presented with dementia, progressive mental decline, personality change, paresis of the right lower extremity, and gait ataxia. Magnetic resonance imaging (MRI) T1-weighted image revealed bilateral thalamic swelling with homogenous low signal intensity and mild contrast enhancement with gadolinium. The T2-weighted image showed high intensity lesions in the bilateral thalamus, septum pellucidum and fornix. A CT-guided stereotactic biopsy of the lesion revealed fibrillary astrocytoma grade III as per WHO classification. Bilateral thalamic gliomas are very rare tumours and when present may resemble other benign diseases having similar clinical presentations.

Key words: *Thalamic glioma; stereotactic biopsy; fibrillary astrocytoma;*

Introduction

Gliomas of astrocytic, oligodendroglial and ependymal origin account for more than 70% of all the brain tumors (1). However, primary thalamic tumors are rare and bilateral thalamic gliomas are even more rare (2). Thalamic astrocytomas are not easily diagnosed as their clinical presentation are often nonspecific and conventional neuroimaging findings are not typical for the tumors, and can be easily mistaken for other diseases (3,4,5). Dementia, personality changes, cognitive impairments with or without paresis are presenting clinical features of the bilateral thalamic gliomas in adults (6) and can mimic other infective, demyelinating, and inflammatory disorders. It might require a high degree of suspicion and invasive diagnostic test to arrive at correct diagnosis.

Case report

A 48-year-old woman was admitted to our department with complaints of progressive

memory loss, personality changes, dizziness, ataxia and weakness in her extremities for five months. Two months back, she was treated at local county hospital suspected of having neurosyphilis as she was serum positive for anti-treponemal antibody. She did not improve with the treatment and landed at our hospital.

On admission to our department, her examination revealed memory impairment, decreased spontaneous eye movement, paresis of the right extremity, and gait ataxia. On brief neuropsychiatric assessment, she had MMSE score of 14/30 along with obvious mild to medium cognitive impairment, recent memory and recall loss. Language expression, comprehension and calculation abilities were also found to be mildly affected. The routine laboratory tests of blood, serum biochemistry, urine, and stool failed to reveal any abnormality and serum anti-treponemal antibody was negative. The cerebrospinal fluid was clear, colourless, with a mild increase of IgG 0.05mg/L (normal 0-0.03

mg/L), along with a normal opening pressure, cell count, protein, and glucose and negative for cytology, anti-treponemal antibody. EEG showed diffuse nonspecific slow waves. MRI T2 weighted image showed high intensity at bilateral thalamus, septum pellucidum and fornix. (Fig.1).

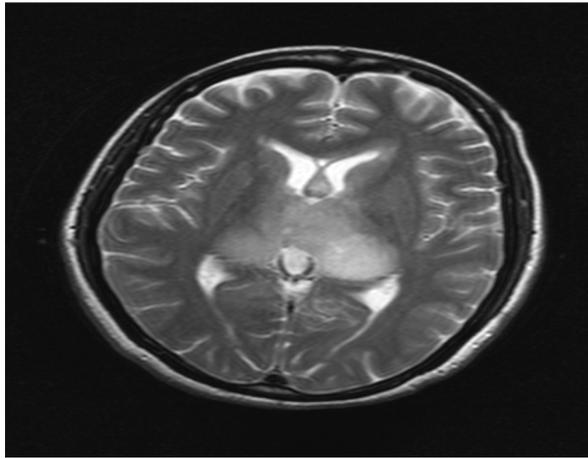


Figure 1

T2 coronal image at the level of thalamus showing bilateral thalamic glioma. Slight enhancement of these lesions could be observed with Gd-DTPA (Fig.2) and MRA was normal.

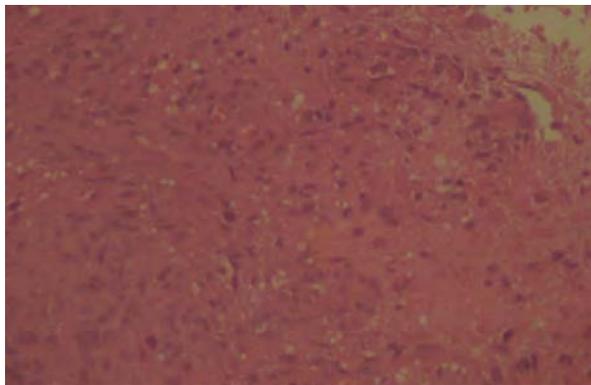


Figure 2

Biopsied tissue of Bilateral Thalamic Glioma (grade III) on histopathological examination.

A CT-guided stereotactic biopsy was performed with consultation of neurosurgeons

which revealed prominent proliferation of fibrillary astrocytes, mitoses, pleomorphic nuclei, and vascular endothelial hyperplasia on histopathological examination consistent with the fibrillary astrocytoma grade III as per WHO classification (fig3).

She was transferred to neurosurgery department for therapeutic work-up.

Discussion

Bilateral thalamic involvement is rare, nonetheless, can be found in various types of benign as well as malignant disorders such as viral infections, bacterial infections, demyelinating disorders, metabolic diseases, and degenerative diseases (7). There is a long list of differential diagnoses of benign disorders that can affect the thalamus bilaterally. And intriguingly these benign disorders have similar clinical presentations. Interestingly, because the thalamus is affected bilaterally, the symptom complex is not typical for any disorder. Neurosyphilis may present with bi-thalamic lesions and the most common manifestations are the personality changes and memory impairment (8). Similarly, Viral infections caused by the flavivirus family-e.g. Japanese encephalitis virus and others typically affects the subcortical gray matter including the thalamus bilaterally (9). Likewise, tuberculous meningo-encephalitis, malaria have been rarely reported presenting with bilateral thalamic lesions (10,11). Also Acute Demyelinating Encephalomyelitis (ADEM) has been reported with bilateral thalamic lesions in 40 % of ADEM cases (12).

The principle clinical manifestations in our case were dementia, personality change,

cognitive deficits, paresis of the right extremity, and gait ataxia. Personality changes and mental deterioration possibly indicate the destruction of medial and intralaminar nuclei of thalamus(13). Similarly paresis of the right extremity and gait ataxia are common finding in thalamic tumours and may indicate the involvement of the dorsomedial nuclei of the thalamus which project to prefrontal area(13). Though thalamic tumours are usually associated with increased intracranial pressure(14), in our subject there were no signs of raised ICP. Hence, the case we have presented here exhibits a rare clinical encounter and illustrate the rarity and difficulty of diagnosing rare bilateral thalamic gliomas.

References

1. Ohgaki H. , Kleihues P., Epidemiology and etiology of gliomas. Acta Neuropathol. 2005;109:93-108.
- 2., Carpio-O'Donovan R, Melanson D, Peters TM (1992) Bilateral thalamic glioma: review of eight cases with personality change and mental deterioration. Am J Neuroradiol. 13:1225-1230.
3. Krouwer HGJ, Prados MD (1995) Infiltrative astrocytomas of the thalamus. J Neurosurg. 82:548-557.
4. Rogers LR, Weinstein MA, Estes ML, Cairncross JG, Strachan T (1994) Diffuse bilateral cerebral astrocytomas with atypical neuroimaging studies. J Neurosurg. 81:817-821.
5. Russell DS, Rubinstein LJ (1989) Pathology of tumors of the nervous system, 5th edn. Arnold, London, Melbourne Auckland
6. S. Nishio, T. Morioka, S. Suzuki, I. Takeshita, M. Fukui. Thalamic Glioma: a clinicopathologic analysis of 20 cases with reference to patient age. Acta Neurochirurgica(wien) (1997) 139:336-342.
7. Jennifer L., Adrian D., Lisa Ann H., Klaus C. S., Hartmut B., Differential diagnosis of Bilateral Thalamic Lesions. Clin. Neuroradiol. 2007; 17:3-22.
8. Roberts M. C., Emsley R.A., Psychiatric manifestations of Neurosyphilis. SAMJ 1992 Nov. (82):335-37.
9. Kalita J, Misra UK. Comparison of CT scan and MRI findings in the diagnosis of Japanese encephalitis. J Neurol Sci. 2000; 174:3-8.
10. Wakai M, Hayashi M, Honda K, et al. Acute onset of tuberculous meningoencephalitis presenting with symmetric linear lesions in the bilateral thalamus: a case report. Rinsho Shinkeigaku 2001;41:519-22.
11. Cordoliani YS, Sarrazin JL, Felten D, et al. MR of cerebral malaria. AJNR Am J Neuroradiol 1998;19:871-4.
12. Garg RK. Acute disseminated encephalomyelitis. Postgrad Med J 2003; 79:11-7.
13. Uchino M, Kitajima S, Miyazaki C, Shibata I, Miura M. Bilateral thalamic glioma-case report. Neurol Med Chir (Tokyo). 2002 Oct;42(10):443-6.
14. Cheek WR., Taveras M. Thalamic tumors. J Neurosurgery 24:505-513, 1966.
15. Francois Este`ve, Sylvie Grand, Christophe Rubin, Dominique Hoffmann, Basile Pasquier, Danielle Graveron-Demilly, Rachid Mahdjoub, and Jean-Francois Le Bas. MR Spectroscopy of Bilateral Thalamic Gliomas. AJNR Am J Neuroradiol May 1999;20:876-881.

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