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The Journal of Diabetic Association Medical College, Faridpur (JDAMC) is the official journal of Diabetic Association Medical College, Faridpur. The journal is published twice in a year i.e. January and July. It accepts original articles, review articles, and case reports. Complimentary copies of the journal are sent to libraries of all medical and other relevant academic institutions in the country and selected institutions abroad.

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From the Desk of the Editor-in-Chief

Congratulations

All praises to the Almighty. It is a great pleasure that Diabetic Association Medical College, Faridpur is the first private medical college in the South part of Bangladesh, going to publish it's 6th scientific journal. I solely praise our devoted researchers and doctors who contribute themselves to achieve this great task.

The aim of this journal is to enhance and upgrade the research work of our teachers in the field of medical science. It provides an integrative forum for medical researchers across the globe to exchange their knowledge and views. It also helps us to promote communication among fellow academicians and researchers worldwide. It provides an opportunity to academicians in exchanging their knowledge that is directly relevant to all domains of health sciences.

I would like to congratulate our journal committee and all concerned personnel for the publication of this sixth issue. I hope this journal will develop a new channel for authors for disseminating their research findings. Honorable medical researchers are invited to submit their research paper for the next issues.

Lastly, I express my heartfelt gratitude to all the researchers for their cordial Endeavour. I expect regular publication of the biannual issues of this journal would brighten the academic and research environment of this institution. I am very much hopeful for the better outcome of this journal.

Professor Dr. Jitesh Chandra Saha
Editor-in-Chief, JDAMC

Information for Authors

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Aims & Scope:

The Diabetic Association Medical College journal is a scientific journal dealing with clinical medicine, basic sciences, epidemiology, public health and various health care specialities. It is an official organ of Diabetic Association Medical College and going to be published bi-annually (January and July).

The journal publishes articles of authors from any part of the globe/country. It intends to publish the highest quality material on all aspects of medical science. It accepts original research articles, review articles, short communications, case reports and letters to editor. In addition, it provides readers with opinion regarding the articles published in the journal. Complimentary print copies of the journal are sent to libraries of all medical colleges and other relevant academic institutions in the country.

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Journal of Diabetic Association Medical College 2019;3(2)9-11

Editorial

Nipah Virus: A Zoonotic Pathogen Endemic to Bangladesh

Khandaker S

Introduction

'Nipah' called upon the name of a Malaysian village,Kampung Sungai Nipah , where the first outbreak was reported in 1999 among the pig farmers. Nipah Virus (NiV) is an emerging and serious zoonotic disease that has a high case fatality rate (approximately 70% or more). It is endemic primarily in the Indo-Bangladesh regions. Since 1997 NiV infection has emerged repeatedly in South East Asia including Bangladesh. From 2001-2018, Bangladesh reported 303 NiV cases, accounting for 211 deaths (approximately a 70 case fatality rate). NiV infection is associated with contact with animals; an environmental exposure, activity, or behavior; or contact with other NiV encephalitis patients. The high mortality rate, broad species tropism, multiple plausible modes of transmission, risk of person-person transmission and documented cases of health care workers being affected during outbreaks has made it a public health issue[1-5].

Bangladesh scenario

The second outbreak of NiV was a geographically upland location, in the Meherpur district of Bangladesh in April-May 2001 with 13 cases and 9 fatalities(69% mortality)[3]. Hereafter nearly annual outbreaks have occurred in Bangladesh and a total of 17 outbreaks have been reported till 2015[3]. All outbreaks were between December to May[4].The endemic districts were Naogaon, Manikganj, Rajbari, Faridpur,Tangail, Thakurgaon and Kustia[6]. In the most recent epidemic at least 15 people died due to NiV infection in Hatibandha, Lalmonirhat district in 2011 adding to the prior death total of 113[6]. Other territories possibly at risk for infection, as evidence of the virus has been found in *Pteropus* and several other bat species.[7]

Viral structure

Nipah virus is an enveloped paramyxovirus with negative-stranded polarity and a non-segmented RNA genome consisting of helical nucleocapsids. Two different strains of NiV- Malaysian and the Bangladeshi have been identified. The two strains are approximately 92% identical on sequencing but significantly different in their pathogenicity and transmissibility[8].

Natural history of disease

Bat urine and saliva are the main source of disease transmission in humans. When they drink raw unpasteurized juice, contaminated unwashed and unpeeled fruits may cause disease transmission. The subsequent outbreaks in Bangladesh and India occur in this way.[6]

Viruse's incubation period varies from 4 hours to 45 days. The estimated fatality rate is 40-75%[5]. Fruit bats of the family Pteropodidae – particularly species belonging to the Pteropus genus– are the natural hosts for NiV. There is no apparent disease in fruit bats due to natural immunity. Recently African fruit bats of same family genus Eidolono was found positive for antibodies against Nipah and Hendra viruses[9].

Human-to-human transmission of NiV has also been reported among family and care givers of infected patients through close contact with patients' secretions and excretions. Nipah outbreaks also reported among pigs and other domestic animals like horses, goats,sheep, cats and dogs and cows. Infection spreads among human by direct unprotected contact with infected animals and their contaminated tisuues[4-6].

After the incubation period, illness range from asymptomatic infection to acute respiratory infection (mild to severe) and fatal encephalitis.Infected people initially develop symptoms including fever, headaches, myalgia, vomiting and sore throat. This can be followed by dizziness, drowsiness, altered consciousness and neurological signs that indicate acute encephalitis[10]. Some people can also experience atypical pneumonia and severe respiratory problems, including acute respiratory distress. Encephalitis and seizures occur in severe cases, progressing to coma within 24 to 48 hours[11].Most people with acute encephalitis make a full recovery, but long term neurologic conditions have been reported in survivors. Approximately 20% of patients are left with residual neurological consequences such as seizure disorder and personality changes. A small number of people who recover subsequently relapse or develop delayed onset encephalitis.The case fatality rate is about 40% to 75%[9-12].

Nipah virus infection can be diagnosed with clinical history during the acute and convalescent phase of the disease. . Diagnosis is usually done by Virus isolation, the detection of antigens or nucleic acids by serology, histopathology from affected organ. The main tests used are real time polymerase chain reaction (RT-PCR) from bodily fluids like blood, throat swab, CSF and urine samples and antibody detection via Enzyme-Linked Immune-Sorbent Assay (ELISA). Viral antigens can be detected in formalin fixed tissues by IHC Antigens found in CNS, Lung and Kidney. Other tests used include PCR assay and virus isolation by cell culture including Vero(African green monkey Kidney), RK-13, BHK or

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porcine spleen. Virus can also be identified in cultures by immune-staining or virus neutralization. Electron microscopy and immune electron microscopy can aid in identification[1-6].

Prevention

- Immediate quarantine for suspected animals.
- Culling of infected animals by burial or incineration of carcasses to reduce the risk of transmission.
- Routine and thorough cleaning and disinfection of farms with appropriate detergents.
- Gloves and other protective clothing should be worn while handling sick animals or their tissues, and during slaughtering and culling procedures reduce the risk of human-to-human transmission[6].
- The only way to reduce or prevent infection among people by raising awareness on risk factors and by educating them on measures to be taken in reducing exposure to NiV.
- Prevention of transmission by decreasing bat access to date palm sap and other fresh food products.
- Measures to be taken in keeping bats away from sap collection sites with protective coverings.
- Freshly collected date palm juice should be boiled, and fruits should be thoroughly washed and peeled before consumption.
- Fruits with sign of bat bites should be discarded.
- Close unprotected physical contact with NiV-infected people should be avoided.
- Regular hand washing should be carried out after caring or visiting sick people.
- Health-care workers caring for patients with suspected or confirmed infection, or handling specimens from them, should follow standard infection control precautions at all times.
- Samples taken from people and animals with suspected NiV infection should be handled by trained staffs working in well equipped laboratories.
- Standard precautions, hand hygiene and use of personal protective equipment (PPE) should be the pillars of comprehensive infection prevention and control strategy.
- Precautions are to be taken while handling patients, handling the deceased, handling the specimens, cleaning and during waste disposal.
- Washing hands with soap and water or alcohol-based hand rub before and after patient contact.
- The affected person should be immediately transferred to local hospital or medical personal for treatment.
- Patient develops encephalitis symptoms like drowsiness, disorientation, convulsions, coma, respiratory distress like; Acute Respiratory Disease Syndrome (ARDS), should be transferred urgently to available intensive support care facility unit[13].

Treatment

At present no drugs or vaccines specific for NiV infection is available. Intensive supportive care is recommended to treat severe respiratory and neurologic complications[1]which may include mechanical ventilation, treatment of symptoms. Ribavirin is hopeful in some outbreaks but remains to be fully observed. So the most important aspect is isolation of the infected person and to send him to local hospital for diagnosis, treatment and for taking preventive measures[6].

Conclusion

Quarantine measures like closing of schools, avoidance of crowding in home, places should be imposed in the affected area. Most importantly media, local people's representative, health officials, government should take part actively in creating awareness, not to get panic and to explain what preventive measures to take in the affected area.

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Original Article

Evaluation of Hearing Status after Type-1 Tympanoplasty

Islam M S[1], Kashem M A[2], Awual S M A[3], Afrin A[4], Islam M R[5]

Abstract

Objective: To evaluate hearing outcome after type-1 tympanoplasty in inactive mucosal type of chronic otitis media.

Methods: This was an observational cross sectional study which was carried out in the department of Otolaryngology and Head Neck Surgery of Sir Salimullah Medical College Mitford Hospital during period of January 2016 to December 2016. A total of 50 patients who underwent successful type-1 tympanoplasty were collected. Majority of the patients were operated on under local anaesthesia. After 3 months pure tone audiometry was performed according to ISO standard. The hearing thresholds were measured at 500, 1000 & 2000 Hz. Air and bone conduction thresholds were determined with appropriate masking technique throughout.

Result: In this study, majority of the patients belong to age 21 to 30 years and most of patients were female. About 28 (56%) patients had inferior perforation and 31 (62%) had medium size perforation. Mean pre-operative air conduction threshold was 43.6 dB and significantly reduced to 32.0 dB after type-1 tympanoplasty. Mean change in air conduction threshold was 11.5 dB. Mean pre-operative air-bone gap was 33.1 dB and significantly reduced to 22.9 dB after type I tympanoplasty. Mean change in air-bone gap was 10.1 dB.

Conclusion: Overall improvement of air conduction threshold and AB gap after type I tympanoplasty was statistically significant. Thus from this study it can be concluded that type I tympanoplasty is an effective technique for hearing improvement in inactive mucous type of chronic otitis media.

Keywords: Tympanoplasty, Hearing improvement, Chronic otitis media, Audiometry.

Introduction

Ear is an important organ of hearing and balance for all living creature. A person deprived of hearing (or suffering from hearing loss) feels terribly handicapped, isolated, and ineffective in communication with others. It should be noted that this ability is susceptible to pathology that causes hearing impairment may also end up causing hearing disability.[1] In 1985, WHO estimated that there were 42 million deaf persons in the world.[2] More recent estimates put the number approximately 278 million people presented with moderate to profound hearing loss worldwide.[3] Despite being the most prevalent disabling condition globally and one of the major contributors to the global burden of disease, hearing loss has historically been ignored on global health care agendas.[4] The major preventable causes of hearing impairment in low and middle-income countries are middle ear infections, excessive noise, inappropriate use of certain drugs, problems during childbirth and vaccine-preventable infections. The burden of otitis media occurs overwhelmingly in the developing world with almost nine times more cases reported compared to developed countries.[5] The poor living standard, overcrowding, lack of personal hygiene, malnutrition, smoking, lack of health education, bottle feeding in supine position, repeated upper respiratory tract infection of viral origin and lack of access to healthcare all have been suggested for the wide spread prevalence of chronic otitis media in developing countries.[6] Thus a cycle of hearing loss contributing to poverty and poverty contributing to hearing loss may be perpetuated in the developing world.[4]It affects both sexes and all age groups. The overall prevalence rate is more in rural than urban population. It is also the single most important cause of hearing impairment in affected population.[7]

Perforation of tympanic membrane in chronic otitis media (COM) is one of the major reasons of hearing loss[8]. Chronic otitis media may be divided into active COM and inactive COM.

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In active COM there is active inflammation and production of pus and it is further divided into mucosal and squamosal variety. In inactive COM where middle ear mucosa is not inflamed but has the potential to become active. Among these types mucosal variety is the commonest [9].

Chronic otitis media can be managed medically or surgically or via a combination of both. Active mucosal chronic otitis media is managed via aural toileting and appropriate antibiotics (topical and systemic), nasal decongestants and vitamin (C and A) supplements to enhance healing.[10] Once total disease eradication and dryness is achieved the level of function loss is evaluated in order to decide the need for further surgical intervention in the form of type I tympanoplasty surgery. Three principal indications for surgery in inactive mucous type of chronic otitis media have been documented (a) prevention of recurrent otorrhoea, (b) to improve the conductive hearing loss and (c) desire to swim without wearing water proof material in the ear. The classification of tympanoplasty related to ideal and theoretical postoperative hearing outcomes, based on middle-ear mechanics, consists of five types, each of which is based on the most lateral intact structure that remains connected to the inner ear.[11] For the purpose of the current study type I tympanoplasty is investigated. When presenting with an inactive mucous type of chronic otitis media, one receives type I tympanoplasty procedure, to seal the eardrum.[12] Type I tympanoplasty refers to the grafting of the tympanic membrane without reconstruction of the ossicular chain.[13] The primary goal in type I tympanoplasty is the restoration of the integrity of the tympanic membrane, and this result can be obtained by means of surgical techniques based on the positioning of the connective tissue at the site of the ear drum perforation. Thus, the main purpose of surgery is to stimulate skin and mucosal regeneration, leading to permanent closure of the defect.[14]

It has been suggested that factors such as the age of the patient, site of the perforation, size of the perforation, length of time that the ear has been dry for prior to surgery, the presence of infection at the time of surgery, as well as the status of the opposite ear may all be influencing factors affecting outcome of type 1 tympanoplasty.[12]

The concept of surgical repair of tympanic membrane was first introduced by Berthold in 1878, whereby a thick skin graft by overlay technique was used. Wullstein and Zollner used the split skin grafts. In the 1960s and 1970s, homograft (cadaveric) materials, including tympanic membrane, dura, and pericardium, among others, were used with varying success.[10] Since then, over the period of many decades, different grafts and techniques evolved and tympanoplasty has gone through many changes in technique and materials.[10,15] Temporalis fascia continues to be the material of choice for reconstruction of the tympanic membrane.[10]

There are different criteria for assessing hearing status after ear surgery such as social hearing method, hearing gain method and mean A-B gap for each frequency but none are universally accepted method.[16] Japan Clinical Otology Committee has used following three criteria for calculation of the hearing improvement (a)postoperative hearing within 40 dB, (b)hearing gain exceeding 15 dB, (c)postoperative air-bone gape within 20 dB.[17] In this study Japan Clinical Otology Committee criteria's are followed. Thus the current study aimed to evaluate hearing outcome after type 1 tympanoplasty.

Methodology

This cross sectional study was conducted in the department of Otolaryngology & Head Neck Surgery, Sir Salimullah Medical College Mitford Hospital, Dhaka from January 2016 to December 2016. Study population included the patients of any sex who had undergone successful type-1 tympanoplasty in the department of Otolaryngology & Head Neck Surgery, Sir Salimullah Medical College and Mitford Hospital, Dhaka. A total of 50 patients who underwent successful type-1 tympanoplasty were collected from the department of Otolaryngology & Head Neck Surgery, Sir Salimullah Medical College Mitford Hospital, and Dhaka. The assessment of the patient was established on the basis of history, clinical examination and pure tone audiometry. Majority of the patients were operated on under local anaesthesia and rests were on under general anaesthesia. After post-auricular incision, temporalis fascia graft was taken and placed by underlay technique. After 3 months pure tone audiometry was performed according to ISO standard. The hearing thresholds were measured at 500, 1000 & 2000 Hz. Air and bone conduction thresholds were determined with appropriate masking technique throughout. Data were collected in a data collection sheet for each of the patient. Statistical analyses were carried out by using the Statistical Package for Social Sciences version 20.0 for Windows (SPSS Inc., Chicago, Illinois, USA). The quantitative observations were indicated by frequencies and percentages. The mean values were calculated for continuous variables. Paired t-test, Z test and ANOVA test was used to analyze the continuous variables, shown with mean and standard deviation. ANOVA test followed by Bonferroni t-test was used to measure the level of significance between groups. P values <0.05 was considered as statistically significant.

Results

Table 1: Distribution of respondents by age and sex (n=50)

Variables	Frequency (n)	Percentage
Age (years)		
10-20	13	26.0
21-30	22	44.0
31-40	8	16.0
41-50	7	14.0
Mean ± SD	27.88 ± 9.85	
Min-max	13-41	
Gender		
Male	22	44.0
Female	28	56.0

Table 1 shows distribution of age and sex of respondents, it was observed that majority (44.0%) of therespondents belonged to age 21-30 years. The mean age was found 27.88±9.85 years with range from 15 to 50 years. Twenty two (44.0%) respondents were male and 28 (56.0%) respondents were female. Male female ratio was 1:1.27.

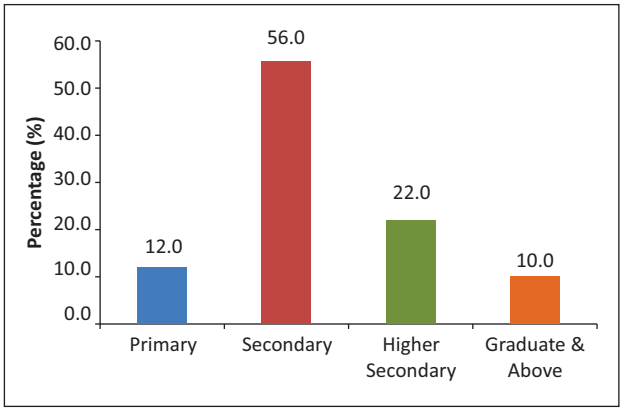

Figure 1: Bar Diagram showing distribution of respondents by Educational status (n=50)

Figure 1 shows educational status of respondents and it was observed that more than half of the patients 28 (56.0%) had completed secondary education followed by 11 (22.0%) had higher secondary, 6 (12.0%) had primary and 5 (10.0%) had graduate and above.

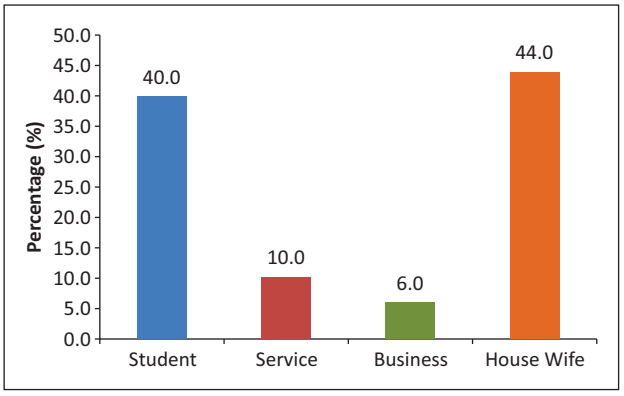

Figure 2: Bar Diagram showing distribution of respondents by Occupational status (n=50)

Occupational status of respondents shows that majority 22 (44.0%) patients were housewife followed by 20 (40.0%) were student, 5 (10.0%) were service holders and 3 (6.0%) were businessmen.

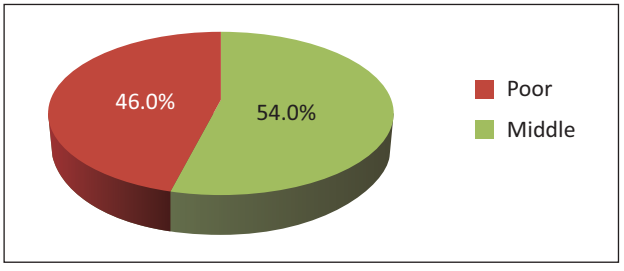

Figure 3: Pie Diagram showing distribution of respondents by Economic condition (n=50)

Figure 3 shows that 27 (54.0%) of the patients came from middle class family, 23 (46.0%) from poor family.

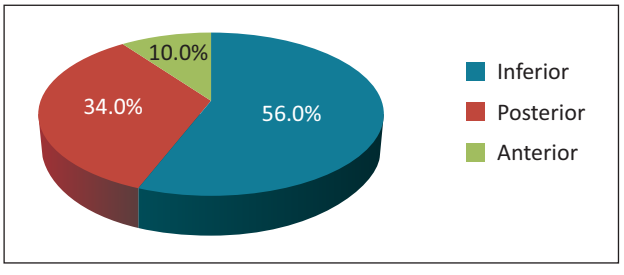

Figure 4: Pie diagram showing site of perforation of the respondents (n=50)

Figure 4 shows that majority 28 (56.0%) patients were inferior perforation followed by 17 (34.0%) posterior and 5 (10.0%) anterior perforation.

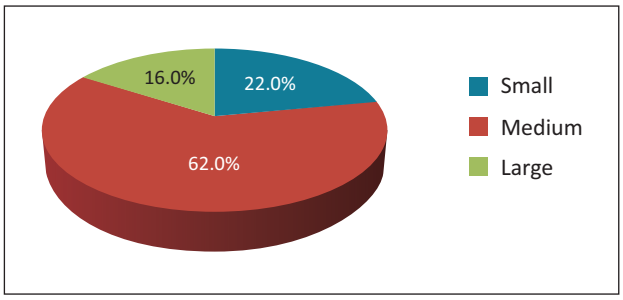

Figure 5: Pie diagram showing Size of perforation of the respondents (n=50)

Figure 5 shows that more than half of the respondents (62.0%) had medium size perforation followed by 11 (22.0%) small and 8 (16.0%) had large perforation.

Table 2: Distribution of respondents by pre-operative air conduction threshold (n=50)

Pre-operative air conduction threshold	Frequency (n)	Percentage
0-25 dB	0	0
26-40 dB	23	46.0
41-55 dB	26	52.0
56-70 dB	01	2.0

Table 2 shows maximum 26 (52.0%) patients' pre-operative air conduction threshold was 41-55 dB and 23 (46.0%) patients had 25-40 dB**.**

Table 3: Distribution of respondents by post-operative air conduction threshold (n=50)

Post operative air conduction threshold	Frequency (n)	Percentage
0-25 dB	1	2.0
26-40 dB	38	76.0
41-55 dB	11	22.0
56-70 dB	0	0

Table 3 shows maximum 38 (76.0%) patients' post-operative air conduction threshold was 25– 40 dB and 11 (22.0%) patients had 41-55 dB**.**

Table 4: Distribution of respondents by Preoperative hearing status (n=50)

Hearing outcome	Mean	p value
Pre operative air conduction threshold	43.6	
Post operative air conduction threshold	32.0	<0.001
Change in air conduction threshold	11.5	
Pre-operative air-bone gap	33.1	
Post operative air-bone gap	22.9	<0.001
Change in air-bone gap	10.1	

Table 5: Distribution of respondents by Post operative hearing outcome (n=50)

Hearing	Frequency (n)	Percentage
statusImproved	43	86.0
Not improved	7	14.0

Table 5 shows that hearing status was improved in 43 (86.0%) cases.

Discussion

In this present study it was observed that majority (44.0%) of the patients belonged to age 21-30 years. The mean age was found 27.88 ± 9.85 years with range from 15 to 50 years (Table 1). Biswas et al[18] found the age of the youngest patient was 12 year and age of the oldest patient was 46 years with mean age was 29 years. Islam et al[19] and Alam et al.[20] found age varied from 15 to 45 years with a mean age of 27 years and 15-45 years with highest number of patients was in the age group of 15-25 years respectively, which are closely resembled with the present study. Similarly, Joshi et al.[10] study found lowest and highest age of patients at presentation was 12 and 42 years respectively with a mean age of 25.5 years. Similar observations regarding the age ranged were also observed by Krishna and Devi[21].

Among 50 patients, twenty eight (56.0%) patients were female and 22(44.0%) patients were male. Male female ratio was 1:1.27 (*table- I*). Similarly, Krishna and Devi[21] and Shetty[22] found female predominant in their respective studies.

In this series it was observed that 28 (56.0%) patients had completed secondary education followed by 11 (22.0%) had higher secondary, 6 (12.0%) had primary, 5(10.0%) had graduate and above (*fig- 5*).

Occupation of the patients shows that majority (44.0%) patients were housewife, 20 (40.0%) were student, 5 (10.0%) were service holder and 3 (6.0%) were businessperson (*fig- 6*).

More than half (54.0%) of the patients came from poor family and 23 (46.0%) from middle class (*fig- 7*). Alam et al.[20] found majority of the patients came from middle class family (53.33%) and a significant number came from poor class family (30%).

In this series it was observed that majority (56.0%) patients had inferior perforation followed by 17 (34.0%) posterior and 5 (10.0%) anterior (*fig- 8*). In Bangladesh Islam et al. (2013) found anterior 45.0% and posterior 25.0%. Shetty[22] found majority (38.0%) of the patients had central malleolar perforation, followed by 28.0% big central, 14.0% anterior central & 10.0% of posterior central perforation. Shrestha and Sinha (2006) observed majority (44.0%) of the patients had big central perforation, followed by 34.0% central malleolar, 14.0% anterior central & 8.0% of posterior central perforation.

Regarding size of the perforation, more than half (62.0%) of the patients had medium size perforation followed by 11 (22.0%) small and 8 (16.0%) large perforation (*fig-9*). Similarly, in Bangladesh Islam et al. (2013) observed small size was found 10.0%, medium 60.0% and subtotal 30.0%. Medium sized perforations were most common in Joshi et al.[10] study. Mehta et al.[23] found 38.0% their patients presented with a moderate sized perforation (greater than 25% to 75% of the tympanic membrane) and 46.0% presented with a large perforation (greater than 75% of the tympanic membrane). Black & Wormald[8] found majority of the patient had small size perforation 36.96 %, followed by 20.85 % large, 18.0% medium & 11.84 % had subtotal perforation.

Regarding air conduction threshold within 40 db, was found 23 (46.0%) patients in preoperative and 38 (76.0%) in postoperative (table- 2 & 3). Using the proportion of patients with a postoperative hearing within 40 dB as the criterion, Shrestha and Sinha[24] study showed, 100% of patients achieved their hearing level within 40 dB. Similar, findings also observed by Alam et al.[20], where they showed that preoperatively 73.08% patients had air conduction threshold within 40 dB but postoperatively 100% patients were within 40 dB of air conduction threshold. Shetty[22]study showed that 19 (38%) patients had air conduction threshold within 40 dB preoperatively but 100% postoperatively.

In this present study it was observed that air conduction threshold was found 43.6 dB preoperatively and 32.0 dB post-operatively & AB gap was found 33.1 dB preoperatively and 22.9 dB post-operatively in all of 50 patients (Table 4). The difference were statistically significant ($p<0.05$) between preoperative and post-operative groups. In our country Biswas et al.[18] found the mean pre and postoperative air conduction threshold in the successful cases were 34 dB and 24 dB respectively, with a mean audiological improvement of 10 dB & improvement of mean air bone gap was 11 dB. In another study in Bangladesh Alam et al.[20] showed the mean pre and post operative air conduction threshold in the successful grafting cases were 31.43 dB and 21.43 dB respectively with a mean audiological improvement of 10 dB & improvement of mean air bone gap was 10.83 dB. Islam et al.[19] found the mean pre and post operative air conduction threshold in the successful grafting cases were 44.5 dB and 35.1 dB respectively with a mean audiological improvement of 9.4 dB & improvement of mean air bone gap was 10.1 dB. Similarly, Joshi al.[10] found the mean pre and post-operative air conduction threshold in the successful cases were 38.69 dB and 30.35 dB respectively with a mean audiological improvement of 8.34 dB & improvement of air bone gap was 10 dB. In another study Black & Wormald[25] found the average pre-operative air-bone gap was closed from 23.7 dB to 13.9 dB (improvement of AB gap 9.8 dB). Above findings are similar to or lower from the current study. But few studies showed greater improvement than this study, such as Shetty[22] observed 18.8 dB hearing improvement and Mehta et al.[23] showed the average improvement of air-bone gap was 13 dB. Vaiday et al.[26] and Sarker et al.[12] also foundgreater improvement than the present study.

In this study it was observed that hearing gain occurred in 43 (86.0%) patients (table- 5).Gain or loss of hearing of 0-10 dB were not considered as significant gain or loss. In that sense, no improvement was seen in 7 patients.Joshi et al[10]. (2013) found that hearing gain occurred in 29 ears (67.44%) and no improvement seen in 14 (32.56%) ears.The above findings are consistent with the current study.

Conclusion

Hearing loss is one of the most common presenting complaints in the chronic otitis media patient. Overall improvement of air conduction threshold and AB gap after type I tympanoplasty was statistically significant. Thus from this study it can be concluded that type I tympanoplasty is an effective technique for hearing improvement in inactive mucous type of chronic otitis media.

Limitations

1. The study population was selected from one selected hospital in Dhaka city, so that the results of the study may not be reflect the exact picture of the country.
2. The present study was conducted at a short period of time.
3. Small sample size was also a limitation of the present study.

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Original Article

Evaluation of Efficacy and Safety of Methyldopa and Labetalol in the Management of Pregnancy Induced Hypertension

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Abstract

The aim of the study was to compare the efficacy and compliance of methyldopa and labetalol in controlling blood pressure in pregnancy induced hypertension (PIH). A total of 120 patients having pregnancy induced hypertension (PIH) were taken and divided in to two groups. Group A was given Tab. Methyldopa 250mg and group B Tab. Labetalol 100 mg. In both the groups pre and post treatment blood pressure was measured on day 2nd, 7th and day 21st was compared. Reduction of blood pressure and side effects of methyldopa and labetalol were observed. The mean pre treatment blood pressure in group A was 157/104±10 mmHg which was reduced to 137/89±10 mmHg on 48th hours, 127/85±10 mmHg by 7th day and 120/78±10 mmHg by the 21st day. In group B mean pre treatment blood pressure was 162/108±10 mmHg which was reduced to 130/84±10 mmHg on 48th hours, 122/80±10 mmHg by 7th day and 115/74±10 mmHg by the 21st day. Methyldopa and Labetalol have effectively controlled the blood pressure in pregnancy induced hypertensive patients. The level of blood pressure in pregnancy induced hypertensive patients in both Methyldopa and Labetalol treated groups were significantly reduced after intervention but no statistically significant difference was observed between the two groups. The present study indicates that both Methyldopa and Labetalol reduced the blood pressure in PIH patients.

Keywords: Antihypertensive, Labetalol, Methyldopa, Pregnancy, Hypertension.

Introduction

Maternal mortality rate is high in Bangladesh despite progress and development in health care facilities. The analysis of causes of maternal deaths highlight the fact that majority of these deaths are preventable. Hypertension disorders seem to complicate approximately 10% of pregnancies and are important causes of maternal morbidity and mortality.[1] Globally around 6-8% of pregnancies are complicated by hypertension.[2,3] Hypertension is the most common medical problem encountered during pregnancy[4]. During this period the maternal and fetal condition are monitored along with control of hypertension.[5] The risk of developing complications of hypertension is reduced to half by using antihypertensive medications.[6] A wide spectrum of antihypertensive agents represents the key of successful treatment of pregnancy induced hypertension (PIH) and provide opportunity of choice.[7] Today, though medications are available and widely used for the treatment of PIH, the physicians still have to deal with many challenges. Antihypertensive drugs are often used to lower blood pressure with the aim of preventing its progression to adverse outcomes.[8,9] Methyldopa and Labetalol are acceptable oral antihypertensive medications in pregnant women with hypertension. Very little work was done in the past regarding comparative study of efficacy and safety of the above mentioned drugs. At the same time, results were not unambiguous. In the face of the conflicting results, the present study was undertaken to find the efficacy and safety of Methyldopa and Labetalol in PIH.

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Material and methods

The study was a comparative intervention of two antihypertensive drugs (Methyldopa & Labetalol) among pregnant women carried out in the department of Pharmacology, Sir Salimullah Medical College and Mitford Hospital & Shaheed Suhrawardy medical college hospital after approval from institutional Ethical committee. Study period was from July 2016 to June 2017. It was an open label trial.All pregnant women with PIH attending outpatient department of Gynecology and obstetrics Mitford hospital & Shaheed Suhrawardy medical college hospital who received methyldopa and labetalol were the study population. All pregnant women within 20th to 38th weeks of pregnancy with blood pressure more than 140/90 mmHg without any anti hypertensive drug at the time of enrollment were included in this study. Pregnant women having proteinuria, preeclampsia, diabetes mellitus, bronchial asthma, thyrotoxicosis, haematological disorder, multiple gestations were excluded from this study. The study group consisted of patients selected on the basis of inclusion and exclusion criteria. All patients were divided and randomized into two

groups, Group- A and Group-B. Group A consisted of 60 patients and received Tab. Methyldopa 250-500 mg twice daily. Group B consisted of 60 patients and received Tab Labetalol 100-400 mg twice daily. Before giving antihypertensive drugs blood pressure and pulse rate were recorded and urinary albumin was examined. Blood pressure was measured by using sphygmomanometer with patient in recumbent position after 20min rest. Patients were followed up at 48th hour, 1st week and 3rd week after initiation of treatment. At each follow up visit, patients BP was measured and maternal side effects such as hypotension, headache, flushing, nausea, vomiting after starting the antihypertensive drugs were observed and recorded.

Statistical analysis

Data was expressed as mean ± SD. Statistical analysis was done by using statistical package of social sciences (SPSS) for windows version 21. Unpaired 't' test was used as the tests of significance and P value <0.05 was considered as significant, P value <0.01was considered as moderately significant, P <0.001 was considered as highly significant and P > 0.05 was considered as not significant.

Results

Results were discussed in table. Table (I) shows the selected demographic characteristic of all pregnancy induced hypertensive patients. Considering demographic characteristics, there was no significant difference between the Methyldopa and Labetalol treated groups.

Before administration of methyldopa blood pressure level (mean±SD) was 157/104±10 mmHg which was reduced to 137/89±10 mmHg on 48th hours, 127/85±10 mmHg by 7th day and 120/78±10 mmHg by the 21st day (Table II). This change was statistically significant (P<.05). In labetalol treated group pretreatment blood pressure (mean ±SD) was 162/108±10 mmHg which was reduced to 130/84±10 mmHg on 48th hours, 122/80±10 mmHg by 7th day and 115/74±10 mmHg by the 21st day (Table III). This change was statistically significant too. But after intervention no statistically significant difference was found in between the two groups (p>.05).

Both Methyldopa and Labetalol were well tolerated by patients of the present study. Headache, drowsiness and postural hypotension were statistically significant in Methyldopa treated group and weakness was common in labetalol treated group. No serious adverse effects were seen in both the groups that needed dose adjustment or withdrawal of the drug.

Table 1: Selected demographic Characteristics of both groups before intervention

Characteristics	Methyldopa Group-A Mean±SD (n=60)	Labetalol Group-B Mean ± SD (n=60)	P-Value
Age (year)	25.20 ± 5.01	25.60 ± 5.21	0.669[a]
Gravida	1.51 ± 0.87	1.85 ± 1.19	0.089[Ø]
Gestational Age	32.05 ± 4.01	32.61 ± 4.09	0.446[a]
Body Weight (kg)	63.1 ± 9.5	64.8 ± 8.7	0.870[a]

n= number of patients in each group, values are expressed as mean ±SD, Ø chi squared test (x^2) was done to analyze the data, 'a' data was analyzed by using unpaired t -Test, P-value <0.05 = statistically significant.

Table 2: Effect of methyldopa at interval on Blood Pressure

Variables	Group-A (Methyldopa treated) (n = 60)		[G]p value	% Change
Systolic/ Diastolic Blood Pressure (mmHg)	Pre treatment 157±7.9/ 104±8.07	48 hr after treatment 137±6.65/ 89±13.17	<.001/ .001	30
	48 hr after treatment 137±6.65/ 89±13.17	7th day after treatment 127±7.2/ 85±5.95	<0.001/ 0.039	25
	7th day after treatment 127±7.2/ 85±5.95	21 day after treatment 120±6.38/78±5.14	.001/ .004	20

n= Number of patients in each group, values are expressed as mean ±SD, data was analyzed by using p value<.05 = statistically significant, [G]p= in each group as compared to baseline (Paired t-test).

Table 3: Effect of labetalol at interval on Blood Pressure

Variables	Group- B (Labetalol treated) (n = 60)		[G]p value	% Change
Systolic/ Diastolic Blood Pressure (mmHg)	Pre treatment 162±9.57/ 108±8.50	48 hr after treatment 130±7.13/ 84±6.7	<0.001/ <.001	35.42
	48 hr after B 130±7.13 /84±6.7	7th day after R 127±7.2/ 85±5.95	<.001/ .001	31
	7th day after R 122±8.7/ 80±7.13	21 day after treatment 115±5.97/ 74±6.09	<.001/ <.001	30

n= Number of patients in each group, values are expressed as mean ±SD, data was analyzed by using p value<.05 = statistically significant, [a]p = in each group as compared to baseline (Paired t-test).

Table 4: Inter group comparison of two drugs (Methyldopa and Labetalol) on blood pressure

Variables	Group-A (Methyldopa treated) (n=60)		Group B (labetalol treated)	P[b]
Systolic/ Diastolic Blood Pressure (mmHg)	Pre treatment	157±7.9/ 104±8.07	167±9.57/ 108±8.5	35.42
	48 hr after treatment	137±6.65/ 89±13.17	130±7.13/ 84±6.7	31
	7th day after treatment	127±7.2/ 85±5.95	115±5.97/ 74±6.0	30

n=number of patients in each group. P[b]= inter group comparison at baseline and after intervention (unpaired t-test)

Table 5: Distribution of the respondents by adverse drug reaction in both groups (n=120)

Adverse drug reaction	Group		p-value
	Methyldopa (n=60)	Labetalol (n=60)	
Headache	14 (23.3)	5 (8.3)	0.024*
Drowsiness	13 (21.7)	2 (3.3)	0.002**
Weakness	3 (5.0)	5 (8.3)	0.464[ns]
Postural hypotension	8 (13.3)	2 (3.3)	0.048*
Depression	4 (6.7)	1 (1.7)	0.171[ns]
Nausea	7 (11.7)	6 (10.0)	0.769[ns]
Vomiting	4 (6.7)	3 (5.0)	0.697[ns]

Chi-square test was done to measure the level of significance.

Discussion

In the present study pre and post treatment systolic and diastolic blood pressures were measured and compared between Methyldopa and Labetalol treated group on 2nd, 7th and 21st day after drug treatment. The mean pre treatment blood pressure in group A was 157/104±10 mmHg which was reduced to 137/89±10 mmHg on 48th hours, 127/85±10 mmHg by 7th day and 120/78±10 mmHg by the 21st day. In group B mean pre treatment blood pressure was 162/108±10 mmHg which was reduced to 130/84±10 mmHg on 48th hours, 122/80±10 mmHg by 7th day and 115/74±10 mmHg by the 21st day. The study observed the beneficial effects of Methyldopa and labetalol in controlling blood pressure. Both the drugs significantly reduced the blood pressure and then maintained normal BP level. In a study conducted by Cruickshank et al. (1992) labetalol did control the blood pressure in 45 among the 51 treated women (88%).[10] Several other workers have found similar response rates- Lardoux group 82%, CA Michel 92%. In Michael CA (1982) 81.4% patients receiving labetalol caused significant fall in BP as compared to methyldopa treated group which were(68.5% patients).[11] Brunton et al. (2011) stated that both methyldopa and labetalol provided efficient control of BP in PIH which also agrees with the past study. Cosme et al (2000) stated that both Metyldopa and Labetalol are equally effective in controlling blood pressure in pregnancy.McCowan et al (1998) found that Methyldopa and labetalol are equally effective in lowering pregnancy induced high blood pressure.[12] Koopmans et al (2009) stated that Methyldopa had particular benefit among PIH women in case of perinatal outcome and preterm delivery.[13] A prospective study conducted by Nita et al (2012) stated that Labetalol was more effective than Methyldopa in controlling blood pressure in patients with PIH.[14] Moll et al (1973) found that both the drugs were equally effective in controlling pregnancy induced blood pressure.[15] Regarding drug related adverse effects most common adverse effect was headache, 14 (23.3%) patients in methyldopa group and5 (8.3%) on labetalol treated group. The other adverse effects included drowsiness, postural hypotension which was more in patient treated with methyldopa. The incidence of side effects such as nausea, vomiting was similar in both groups. However statistically significant difference in adverse effect found in headache, drowsiness and postural hypotension. The other adverse effects were statistically insignificant. Study conducted by Verma et al. (2012) stats that adverse effects observed were lower in labetalol group compared to methyldopa group.[16] In a study by El-Qarmalawi et al. (1995) patients receiving methyldopa complained of side effects such as drowsiness (22.2%), headache (14.8%), nasal congestion (7.4%), postural hypotension (5.6%). Six patients in labetalol group complained of dyspnoea, no other side effects were noticed.[17]

Conclusion

Both Methyldopa and Labetalol have effectively controlled the blood pressure in pregnancy induced hypertensive patients. No significant change is observed between the two groups, although considering percentage changes of effects produce by the Labetalol appears better.

Ethical consideration

Ethical approval was taken from the ethical review committee of Sir Salimullah Medical College and written consent was taken from the patient with proper explanation. Besides these the participants had rights to withdraw them from the study at any point of time. It was assured that all records were kept confidential.

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Original Article

Breast Feeding Practice among the Educated Urban Women in Jashore

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Abstract

Background: Child feeding practices was directly influence nutritional status of a child. Maternal education level has long been associated with child feeding practices.

Objective: To describe the pattern of breast feeding practice (type of food given just after delivery, time of starting breast feeding, exclusive breast feeding, duration of breast feeding, and starting of complementary feeding) among the urban women of Bangladesh in Jashore in addition to age and education level of the respondents.

Methodology: This descriptive type of cross sectional study was carried out on breast feeding practices among urban women in Jashore from 1st January to 30th June 2019. By purposive sampling technique a total number of 100 respondents having child less than 5 years old were selected for this study. Data were collected by face to face interview through a pretested questionnaire.

Results: In this study 48.0% of the respondents were between 34 to 41 years age group. About 40.0% of the respondents were graduates, 34% were post graduates, 16% were SSC level, and 10% were ≥HSC level and no one was illiterate. Maximum 86.0% mothers gave breast milk, 6.0% gave honey, and 8.0% gave formula milk just after delivery. Majority (70.0%) of the respondents started breast feeding within 1 hour, 10.0% after 1 hour, 14.0% after 3 hours, and 6.0% after 4 hours. About four-fifth (80.0%) of the respondent fed exclusive breast feeding for 5 to 6 months, 16.0% fed up to 3-4 months, and 4.0% fed up to 1-2 months. Maximum 60.0 % fed 18-24 months, 26.0% fed >24 months and 4.0% fed 12-18 months. Most (88.0%) of them started complementary food within 6 months, 12.0% started after 6 months.

Conclusion: Mothers with higher education were more likely to initiate breastfeeding with the first hour of childbirth. Future interventions should focus on increasing girl's and women's education program through formal or non-formal education programs, respectively.

Key words: Breast Feeding, Urban Women, Weaning.

Introduction

Every year millions of infant die throughout the world, mostly in developing countries. In Bangladesh, infant has continued a notable decline but it is still high in Bangladesh compared to other South Asian countries. Various factors including community factors also influence infant mortality and improvement of public health and family planning. At the community level, infant mortality might be influenced by specific cultures and customs. In Bangladesh, breastfeeding in rural areas appears to be shaped by the beliefs of a community [1], which are further influenced by social, cultural, and economic factors. Feeding immediately after birth in Bangladesh is called pre-lacteal feeds. About 98% new born are traditionally fed "heating foods" such as honey, sugar water, or mustard oil with believe that these foods give strength and prevent colds during first few days of life and they also believed that honey makes babies' voice sweet.[2] Breast milk contains antibodies and live cells which protect infants from bacterial and viral pathogens and stimulates the infant's immune system[3]. There are two main reasons for poor breastfeeding rates in our country: (i) a lack of support for mothers to initiate and sustain breastfeeding and (ii) secondly the erosion in breastfeeding practices by the violations of the national and international codes for the marketing of breast milk substitutes by the milk companies. Human milk provides advantages with strongest defense as comes from colostrum, the substance produced in the first few days after birth, which provides the baby's first immunization. This works both before and during the time of feeding, the baby acquires active immunity through breast milk. The beneficial effects of breast milk depend on breastfeeding initiation, its duration, and the age at which the breast-feed child is weaned. [4] The Lancet 2003 Child survival series and from Karen

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Edmond's 2006 Pediatrics paper from Ghana[5] that universal optimal breastfeeding and complementary feeding are the most significant determinants of child mortality reduction in low and middle income countries. So, young child feeding practices are crucial for improving the health and nutritional status of children. Almost 96% of Bangladeshi children are breastfed for some period of time but only 9% initiate during the first hour of life and 48% within the first day of life [6]. In Bangladesh, tragically the majority of fewer than 5 deaths (80%) occur in the 1st year of life, out of them, 45% from neonatal infection, 30% from diarrheal, 18% from acute respiratory infection. The importance of exclusive breastfeeding and the immunological and nutritional values of breast milk have been demonstrated in deferent records. Breastfeeding is one of the most important determinants of birth spacing and prevention of childhood infections.[7] Early initiation of breastfeeding helps mothers and child to get extra contact which foster bonding between mother and child from first hours of baby's life.[8] Hence, the study with these relationships helps in orienting the breastfeeding promotional activities and for preventing a decline in initiation and duration of breastfeeding practices.

Materials and methods

A descriptive type of cross sectional study was carried out on breast feeding practices among urban women in Jashore from 1st January to 30th June 2019. Purposive sampling technique was followed and a total number of 100 respondents having child less than 5 years old were included as sample. Data were collected using a structured questionnaire duly pre-tested in line with stated study objectives. The contents were onset of breast-feeding, duration of breast-feeding, and weaning period. After collection, data were verified, edited for its consistency. The data were compiled, tabulated and processed in the computer according to the key variables.

Results

Table 1: Distribution of the respondents by age group (n=100)

Age (Years)	Frequency	Percentage
18-25	44	44
26-33	8	8
34-41	48	48
Total	100	100

Table 1 shows that majority of the respondents 48% were from 34-41 years age group. Mean age of respondents was 29.87 (±7.71) year.

Table 2: Distribution of the respondents by educational qualification (n=100)

Educational qualification	Frequency	Percentage
SSC	16	16
HSC	10	10
Graduation	40	40
Post-graduation	34	34
Total	100	100

Table 2 shows that majority 40 % of the respondents were graduate, 34% were post graduate, 16% were SSC level and 10% were ≥HSC level.

Table 3: Distribution of the respondents according to the type of food given just after delivery (n=100)

Type of food	Frequency	Percentage
Breast milk	86	86
Honey	6	6
Formula milk	8	8
Total	100	100

Table 3 shows that the maximum 86% mothers gave breast milk, 6% gave honey and 8% gave formula milk.

Table 4: Distribution of the respondents by starting-time of breast feeding after delivery (n=100)

Time to start	Frequency	Percentage
Within 1st hour	70	70
After 1st hour	10	10
After 3 hours	14	14
After 4 hours	6	6
Total	100	100

Table 4 shows that the majority 70% started breast feeding within 1 hour, 10% had after 1 hour, 14% after 3 hours, and 6% after 4 hours.

Table 5: Distribution of the respondents according to duration of exclusive breast feeding (n=100)

Duration of exclusive breast feeding in months	Frequency	Percentage
1-2	4	4
3-4	16	16
5-6	80	80
Total	100	100

Table 5 shows that the maximum 80% of the respondent fed exclusive breast feeding 5-6 months, 16% fed up to 3-4 months and rest 4% fed up to 1-2 month.

Table 6: Distribution of the respondents by total duration of breast feeding (n=100)

Total duration of breast feeding (In months)	Frequency	Percentage
<6	6	6
6-12	4	4
12-18	4	4
18-24	60	60
>24	26	26
Total	100	100

Table 6 shows that, the maximum 60% fed 18-24 months, 26% fed >24 months and 4% fed 12-18 months.

Table 7: Distribution of the respondents by the time of beginning complementary foods (n=100)

Time of starting complementary foods	Frequency	Percentage
Within 6 months	88	88
After 6 months	12	12
Total	100	100

Table 7 shows that maximum 88% started complementary food within 6 months and 12% after 6 months.

Discussion

The study attempted to describe the pattern of breast feeding practice among the urban women of Bangladesh with youngest child below 5 years of age. This study revealed that majority of the respondents 48% were from 34-41 years age group. Mean age of respondents was 29.87 (±7.71) years. One of the important variables of the study was the level of the education of the respondents. As per the study, the majority (40%) of the respondents were from graduation level. When the distribution of respondents according to type of food given just after delivery was considered, as per this study, it was found that 86% fed breast milk, 6% honey, 8% gave formula milk. In a study of Dinajpur Medical College J 2010 Jan found that 34.9% of the women chose honey as pre-lacteal for their new born infant and 70.9% adapted breast milk.[9] Delayed initiation of breast feeding is also common in Bangladesh. But this study revealed majority 70% were started breast feeding after within one hour. According to Mihrshahi et al study in 1996, only 9% started breast feeding immediately after birth. The recent DHS survey confirms 24% of the women initiated breast feeding within 1 hour and 83% one day after delivery. In Zeenath Rehana's study, 95% initiated within one hour and 48% within one day.[10] Holman DJ et al in their survey found that 59% initiated breast feeding within 4 hours and 88% within 12 hours of delivery.[11] A study conducted by ICDDR,B found out that 18% fed the newborn with breast milk within one hour and 23% within 2-3 hours. So the starting time of breast feeding is more or less similar with this study. While the distribution of respondents according to time of starting complementary food in months was recorded, as per this study it was found that 88% of mothers started it within 6 months, and 12% after 6 months of age. ICDDR,B study suggests that 11% of 1 month infants were started weaning food and 7.6% at 6 months of age.[10]

A study of ICDDR, B stated that 90% of the mothers did not know that the colostrum should be the first and only food (for 6 months) for the baby.[10] On the contrary according to this study only 4.4% did not know about the importance of colostrum and that it should be given to the child as his first food. Shameem Ahmed et al in their study said only 12% women knew about the significance of colostrum. Study conducted by Das and Ahmed found that 81% women discarded colostrum as did not feed it to the infants whereas the study shows only 8.4% women did not feed her infants with colostrum and rest 91.59% did.

The study showed that the Pattern of breast feeding Practice among the respondents of urban area of Bangladesh Correlates with the previous studies. The policy makers should provide proper health education about breast feeding. First of all, the practice of breast feeding has to be improved at the grassroots level.

Conclusion

Infants being the future generation of our society should be brought up healthy both physically and mentally for which breast feeding, weaning and rearing should be appropriate and in time. The results of this study shows that knowledge and practice regarding proper breast feeding practice among the urban women of Bangladesh is average while considering the fact that a lot other important variables were not considered and the study population was limited. Findings of the study suggest that it is important to raise awareness among the mothers.

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Original Article

Study on Association between Socio-demographic Characteristics and Food Security of Rural Adolescent Population of Bangladesh

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Abstract

This was a descriptive type of cross-sectional study carried out to assess the relationship between food security and socio-demographic characteristics of adolescent of the rural areas with a sample size of 108. Data were collected purposively from two selected villages using a semi structured questionnaire. On the basis of the score calculated, household food security was leveled as four categories: Food Secured, Mild food insecured, Moderate food insecured and extremely food insecured. The result shows that about 40% of the adolescents are Moderate food insecured. 31.5% adolescents were from extremely food insecured families. 18.5% respondents were from mild food insecured families and only 10.2 % respondents were from food secured families. Maximum of the respondents were from the age group of 15-16 years (31.5%).Mean ±SD = 14.54 ± 2.12 years. 64 % were male and 36% were female. Most of them were (81.5%) Muslim; 48.1% respondents were from families having monthly income 5000 to 8000 taka and 28.7% of them have more than 8000 taka income per month with Mean(±SD) income of 7245(±2126.27) taka. About 44.4 % of the respondents' had 5 members in families and 39.8% had 4 or less. Sixty percent had nuclear families; 46.3% of the respondents having primary level of education, followed by secondary level (32.4%). About 13.9% were illiterate, 72.2% attained their education from formal system, 11.1% from madrasa and 2.8% had non-formal education. Respondents were mainly students (75.9%). About 11.1%were agricultural workers. Most of the respondents were children of daily labours/rikshaw pullers (36.1%) followed by Farmers (24.1%) and Business men (21.3%); while 18.5 % of the respondents' fathers were service holders. Regarding housing condition about 42.6% respondents live in kacha houses followed by semi-pacca(28.7%) and 25.9% of them had tin-shed houses. Three fourth (75.9%) of the respondents were non- smokers. About 97.2% used tube well water for drinking purpose. Two third of the respondents (66.7%) used sanitary latrine. There is a strong association between household food security level and monthly family income ($p<0.01$), house type where the respondents live ($p<0.01$) and fathers' occupation ($p<0.05$). There is no association between respondents' age and their food security level, family size and household food security level, education level of respondents, occupation of respondents. The present study shows that economic condition of the respondents is the main factor for adolescent food security which should be address in the formulation of programs relating to food security.

Key words: Adolescents, Socio-demographic characteristics, Food security.

Introduction

Adolescence is the only time following infancy when the rate of physical growth actually increases. Adolescence is characterized by the onset of puberty and increased cognitive development, Middle adolescence increased independence, experimentation and it is a time for making important personal and occupational decisions.[1] Poor nutrition during any of these stages can have lasting consequences on an adolescent's cognitive development, resulting in decreased learning ability, poor concentration, and impaired school performance. Young people aged 10-24 years constitute about 32% of the Bangladesh population.[2] USAID defines food security as "When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life". Achieving food security requires that the aggregate availability of physical supplies of food is sufficient, that households have adequate access to those food supplies through their own production, through the market or through other sources, and that the utilization of those food supplies is appropriate to meet the specific dietary needs of individuals.[3]

"Food Insecurity" refers to limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire food in socially acceptable ways. It affects health and well-being throughout the life cycle, particularly in adolescent period as this time body and mind are building up rapidly for further survival.[4] Food security situation in Bangladesh has improved, yet the hungry population of over 60 million people-the third largest poor population in any country after China and India.[5]

Material and methods

This descriptive type of cross-sectional study was carried out to explore the association between socio-demographic characteristics and food security status of rural adolescents. The study was conducted in two villages namely Kuinchtara

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and Rupashi, under Delduar Upazilla of Tangail district from January to May, 2016 by using purposive sampling with a sample size of 108. A semi structured questionnaire was used to collect the socio-demographic data and a food security scaling table was used to calculate food security level. The instrument for calculating food security status was developed following Frongilloet et al.[6] Data were collected through face to face interview. Data editing and cleaning was done for any omission and commission. Data were processed and analyzed using SPSS version 19.

Results

Socio-demographic and economic variables such as, age of respondents, sex of respondents, religion of respondents, family monthly income, number of family members, family type, education level and type of education, occupation of respondents, father's occupation, type of house, marital status, and some other variables relating to health like smoking habit, supply of drinking water and sanitation status are analyzed and present here.

Table 1: Distribution of the respondents according to age group (n=108)

Age group (in years)	Number of respondents	Percentage
10-12	21	19.4
13-14	32	29.6
15-16	34	31.5
17-18	21	19.4
Total	108	100
Mean ±SD = 14.54 ± 2.12 years		

Table 1 shows that maximum respondents were from the age group of 15-16 years (31.5%).

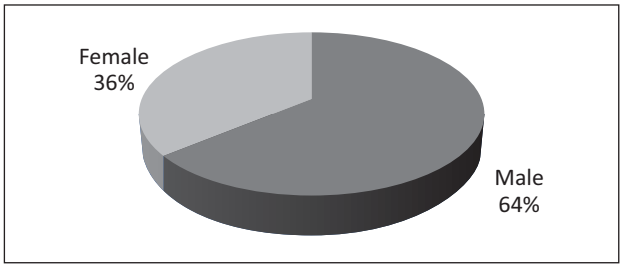

Figure 1: Distribution of the respondents according to sex (n= 108)

Figure 1 shows that among the respondents, 64 % are male and 36% are female.

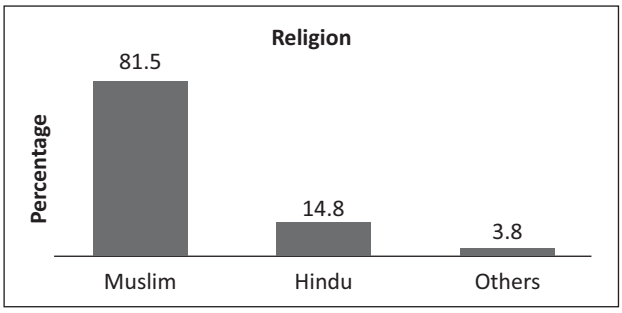

Figure 2: Distribution of the respondents according to religion (n= 108)

Figure 2 shows that majority of the respondents are Muslim (81.5%).

Table 2: Distribution of the respondents by monthly family income (n= 108)

Monthly family income (in taka)	Number of respondents	Percentage
< 5000	25	23.1
5000-8000	52	48.1
>8000	31	28.7
Total	108	100
Mean ± SD of monthly income is 7245±2126.27 taka		

Table 2 shows that near about half of the respondents (48.1%) are from families having monthly income 5000 to 8000 taka and 28.7% of them have more than 8000 taka income per month.

Table 3: Distribution of the respondents according to their number of family members (n=108)

Number of family members	Number of respondents	Percentage
≤ 4	43	39.8
5	48	44.4
≥ 6	17	15.7
Total	108	100
Mean ± SD = 4.73±0.92 persons		

Table 3 shows that about 44.4% of the respondents' have 5 members in their families and 39.8% of them have 4 or less members.

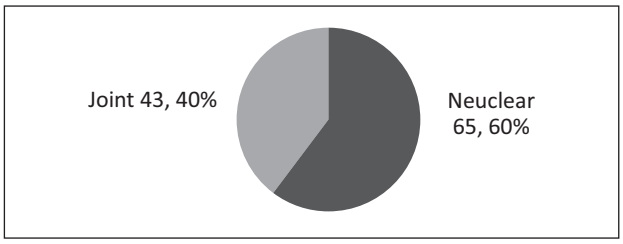

Figure 3: Distribution of the respondents according to family type (n=108)

Figure 3 shows that 60% of the families are nuclear in nature and rest 40% are joint families.

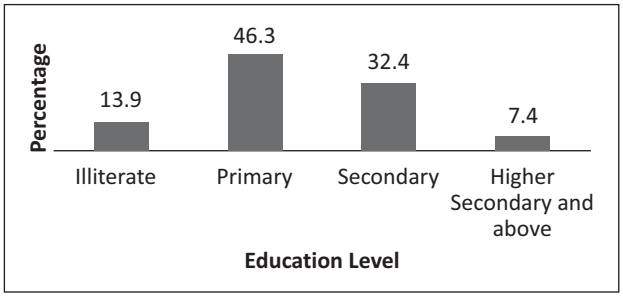

Figure 4: Distribution of the respondents according to level of education (n=108)

Figure 4 shows that 46.3% of the respondents having primary level of education, followed by secondary level of education (32.4%). About 14% of the respondents were illiterate.

Table 4: Distribution of the respondents according to type of education (n=108)

Type of education	Number of respondents	Percentage
Formal	78	72.2
Madrasa	12	11.1
Non-formal	3	2.8
Illiterate	15	13.9
Total	108	100

Table 4 shows that majority of the respondents attained their education from formal system of education like government or non-government schools (72.2%). About 11%had madrasa education and 2.8 % had non-formal education; while 13.9% were illiterate.

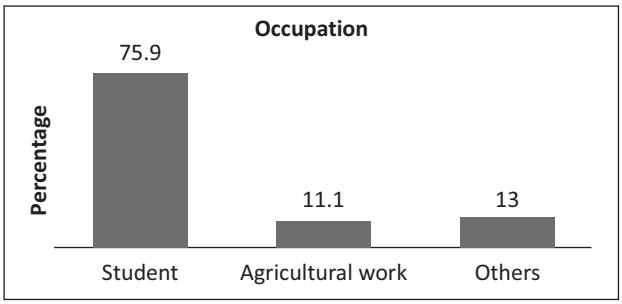

Figure 5: Distribution of the respondents according to their occupation (n=108)

Figure 5 shows that more than three fourth of the respondents are students (75.9%). About 11.1% of them are agricultural workers.

Table 5: Distribution of the respondents according to their fathers' occupation (n=108)

Fathers' Occupation	Number of respondents	Percentage
Service	20	18.5
Business	23	21.3
Dailylabour/ Rikshwapuller	39	36.1
Farmer	26	24.1
Total	108	100

Table 5 shows that most of the respondents are children of dailylabours/rikshawpullers (36.1%), followed by Farmers (24.1%) and Business men (21.3%); while18.5 % of the respondents' fathers were service holders.

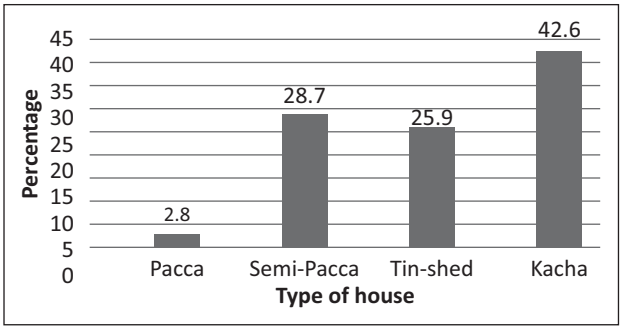

Figure 6: Distribution of respondents according to type of housing condition (n=108)

Figure 6 shows that 42.6% respondents live in kacha houses followed by semi-pacca houses(28.7%); 25.9% of them have tin-shed houses. Only 2.8% of the respondents have pacca houses.

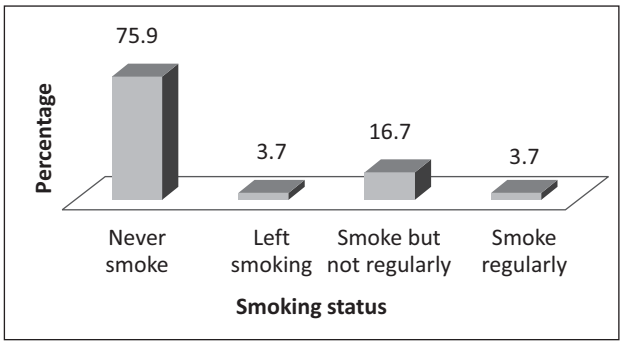

Figure 7: Distribution of the respondents by smoking habit (n=108)

More than three fourth (75.9%) of the respondents were non- smokers, and 16.7% respondents smoked but not regularly and 3.7 percent of them quitted smoking. Only 3.7% respondents smoked regularly.

Table 6: Distribution of the respondents according to consumption of drinking water from tube well (n=108)

Consumption ofdrinking tube well water	Number of respondents	Percentage
No	3	2.8
Yes	105	97.2
Total	108	100

Table 6 shows that about 97.2 % of the respondents used tube well water for drinking purpose.

Table 7: Distribution of the respondents according to use of sanitary latrine (n=108)

Use sanitary latrine	Number of respondents	Percentage
No	36	33.3
Yes	72	66.7
Total	108	100

Table 7 shows that approximately two third of the respondents (66.7%) used sanitary latrine and one third (33.3%) of them do not use sanitary latrine .

In this study the household food security was measured by 14 questions and these questions are as follows-

- Frequency of taking snacks in between meal in last 30 days?
- At what interval have you purchased rice during the last 30 days?
- Frequency of kanchabazar purchase in last 30 days?
- How often cooking usually take place in your house during the last 30 days?
- Frequency of taking complete meal per day in last 30 days?
- Frequency of taking fish/meat in last 30 days?
- Frequency of taking salt and chilly with rice only?
- Helping situation in last 30 days?
- Have you sold something to buy food during last 30 days?
- Frequency of taking borrow in last 30 days?
- When did you take festival food (like Polao, meat, shemai etc)?
- Did you ever go to sleep at night hungry in last 30 days?
- Frequency of being worried about availability of food in last 30days?
- Are you satisfied about your meal?

The results out of these questions are shown in the following table:

Table 8: Distribution of the respondents according to categories of food security measuring questions (n=108)

Questions for measuring food security	Category	Frequency	Percentage
Frequency of taking snacks in between meal in last 30 days?	Never	81	75
	1-2 times in day	27	25
At what interval have you purchased rice during the last 30 days?	Never	3	2.8
	1-3 times in 30 days	30	27.8
	Once in a week	26	24.1
	2-3 times in 7days	45	41.7
	4-5 times in 7days	4	3.7
Frequency of kanchabazar purchase in last 30 days?	1-3 times in 30 days	9	8.3
	Once in a week	26	24.1
	2-3 times in 7days	68	63.0
	4-5times in 7days	5	4.6
How often cooking usually take place in your house during the last 30 days?	Once a day	27	25.0
	Twice a day	70	64.8
	Three times a day	11	10.2
Frequency of taking complete meal per day in last 30 days?	One time	21	19.4
	Two times	72	66.7
	Three times	15	13.9
Frequency of taking fish/meat in last 30 days?	Never	1	0.9
	1-3 times in 30 days	39	36.1
	Once in a week	40	37.0
	2-3 times in 7days	28	25.9
Frequency of taking salt and chilly with rice only?	Never	21	19.4
	1-3 times in 30 days	44	40.7
	Once in a week	7	6.5
	2-3 times in 7days	24	22.2
	4-5times in 7days	12	11.1
Helping situation in last 30 days?	Help taken from other	20	18.5
	No help taken or given	80	74.1
	Helped others	8	7.4
Have you sold something to buy food during last 30 days?	Yes	2	1.8
	No	106	98.1
Frequency of taking borrow in last 30 days?	2-3 times in 7 days	13	12.0
	Once in a week	33	30.6
	1-3 times in 30 days	9	8.3
	Never	53	49.1
When did you take festival food (like Polao, meat, shemai etc)?	Never	54	50
	Once in month	52	48.1
	Weekly	2	1.9
Did you ever go to sleep at night hungry in last 30 days?	Yes	22	20.4
	No	86	79.6
Frequency of being worried about availability of food in last 30days?	Once in a week	38	35.2
	Only once ever	33	30.6
	Never	37	34.3
Are you satisfied about your meal?	No	61	56.5
	Yes	47	43.5

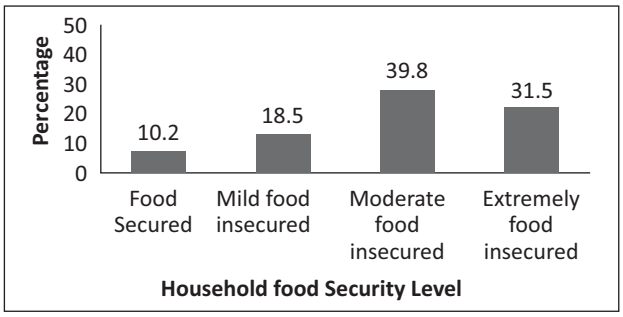

Figure 8: Distribution of respondents according to household food security level (n=108)

On the basis of the score calculated from the answers of the above 14 questions, household food security was level as four categories: Food Secured, Mild food insecured, Moderate food insecured and extremely food insecured. The result shows that about 40% of the adolescents are Moderate food insecured. 31.5% adolescents are from extremely food insecured families. 18.5% respondents are from mild food insecured families and only 10.2 % respondents are from food secured families.

Table 9: Association between household food security level and age of the respondents (n=108)

Age of respondent (in year)	Food security level				Total	χ^2& p-value
	Food Secured	Mild food insecured	Moderate food insecured	Extremely food insecured		
10-12	4 19.0%	1 4.8%	9 42.9%	7 33.3%	21 100%	χ^2=10.191, p=0.335
13-14	2 6.2%	4 12.5%	13 40.6%	13 40.6%	32 100%	
15-16	2 5.9%	9 26.5%	13 38.2%	10 29.4%	34 100%	
17-18	3 14.3%	6 28.6%	8 38.1%	4 19.0%	21 100%	
Total	11 10.2%	20 18.5%	43 39.8%	34 31.5%	108 100%	

Table- 9 shows that there was no association between respondents' age and their food security level.

Table 10: Association between household food security level and monthly family income (n=108)

Family monthly income (Tk)	Food security level				Total	χ^2& p-value
	Food Secured	Mild food insecured	Moderate food insecured	Extremely food insecured		
<5000	0 0%	2 8.0%	14 56.0%	9 36.0%	25 100	χ^2=34.029, p=0.00
5000-8000	2 3.8%	7 13.5%	20 38.5%	23 44.2%	52 100%	
>8000	9 29.0%	11 35.5%	9 29.0%	2 6.5%	31 100%	
Total	11 10.2%	20 18.5%	43 39.8%	34 31.5%	108 100%	

Table-10 shows that there was strong association between household food security level and family monthly income.

Table 11: Association between household food security level and family size (n=108)

Number of family members	Food security level				Total	χ^2& p-value
	Food Secured	Mild food insecured	Moderate food insecured	Extremely food insecured		
≤ 4	5 11.6%	7 16.3%	18 41.9%	13 30.2%	43 100%	χ^2=7.315, p=0.293
5	1 5.9%	7 41.2%	5 29.4%	4 23.5%	17 100%	
≥ 6	5 10.4%	6 12.5%	20 41.7%	17 35.4%	48 100%	
Total	11 10.2%	20 18.5%	43 39.8%	34 31.5%	108 100%	

Table 11 shows that there was no association between family size and household food security level.

Table 12: Association between food security level and education level of respondents (n=108)

Education level	Food security level				Total	χ^2& p-value
	Food Secured	Mild food insecured	Moderate food insecured	Extremely food insecured		
Illiterate	0 0%	1 6.7%	6 40.0%	8 53.3%	15 100%	χ^2=10.89, p=0.283
Primary	5 10%	8 16.0%	19 38.0%	18 36.0%	50 100%	
Secondary	4 11.4%	9 25.7%	15 42.9%	7 20.0%	35 100%	
Higher Secondary and above	2 25.0%	2 25.0%	3 37.5%	1 12.5%	8 100%	
Total	11 10.2%	20 18.5%	43 39.8%	34 31.5%	108 100%	

Table 12 shows that level of education of the respondents was not associated with household food security level.

Table 13: Association between occupation of respondents and food security level (n=108)

Occupation of respondents	Food security level				Total	χ^2& p-value
	Food Secured	Mild food insecured	Moderate food insecured	Extremely food insecured		
Student	10 12.2%	18 22.0%	31 37.8%	23 28.0%	82 100%	χ^2=9.907, p=0.129
Agricultural work	1 8.3%	1 8.3%	3 25.0%	7 58.3%	12 100%	
Others	0 0.0%	1 7.1%	9 64.3%	4 28.6.0%	14 100%	
Total	11 10.2%	20 18.5%	43 39.8%	34 31.5%	108 100%	

Table 13 shows that there was no association between occupation of respondents and their family food security.

Table 14: Association between fathers' occupation and food security level (n=108)

Fathers' Occupation	Food security level				Total	χ^2& p-value
	Food Secured	Mild food insecured	Moderate food insecured	Extremely food insecured		
Service	3 15.0%	5 25.0%	8 40.0%	4 20.0%	20 100%	χ^2=27.762, p=0.023
Business	4 17.4%	7 30.4%	9 39.1%	3 13.0%	23 100%	
Dailylabour	1 2.6%	3 7.7%	17 43.6%	18 46.2%	39 100%	
Farmer	3 11.5%	5 19.2%	9 34.6%	9 34.6%	26 100%	
Total	11 10.2%	20 18.5%	43 39.8%	34 31.5%	108 100%	

Table 14 shows that association between father's occupation and food security level. The cross table shows that fathers who were service holders or businessmen had more food security than those of daily laborers or farmers.

Table 15: Association between type of house and food security level (n=108)

Type of house	Food security level				Total	χ^2& p-value
	Food Secured	Mild food insecured	Moderate food insecured	Extremely food insecured		
Pacca	0 0.0%	1 33.3%	1 33.3%	1 33.3%	3 100%	χ^2=44.777, p=0.000)
Semi-pacca	9 29.0%	8 25.8%	10 32.3%	4 12.9%	31 100%	
Tin-shed	2 7.1%	8 28.6%	16 57.1%	2 7.1%	28 100%	
Kacha	0 0.0%	3 6.5%	16 34.8%	27 58.7%	46 100%	
Total	11 10.2%	20 18.5%	43 39.8%	34 31.5%	108 100%	

Table-15 shows that there was strong association between house type where the respondents live and household food insecurity

Discussion

On the basis of the score calculated from answers of the 14 questions, household food security was level as four categories: Food Secured, Mild food insecured, Moderate food insecured and extremely food insecured. The result showed that about 40% of the adolescents are Moderate food insecured, 31.5% adolescents were from extremely food insecured families, 18.5% respondents were from mild food insecured families and only 10.2 % respondents were from food secured families. However, according to a study, conducted in Nepal in 2010 showed that 69% of households were food secured.[7]

Maximum of the respondents were from the age group of 15-16 years (31.4%) which was followed by the age group 13-14 years (29.6%). Household food security level and age of the respondents were independent (p=0.335). Similarly, there was no association between respondents' age and their food security level.

There was a strong association between household food security level and family monthly income (p=0.00). It is evident that as family monthly income increases, food security level increases. In other orders, families with more monthly income were more food secured. Similar findings were observed in a study in Malaysia in 2014.[8]

In the current study, education level of respondents was not associated with household food security level. But In a study in Ethiopia, it was observed that food insecurity had negative consequences on school attendance.[9]

There was no association between occupation of respondents and their family food security (p=0.129). However, another study conducted in Bangladesh had found some association between occupation type and household food security.[10]

There was an association between father's occupation and food security level (p=0.023). There was a strong association between house type where the respondents live and household food insecurity (p=0.000). Similar findings were observed in a study in Northern India.[11]

Conclusion and recommendations

The present study showed that economic condition of the respondents was the main factor for adolescent food security which should be address in the formulation of programs relating to food security. To ensure future work force, problems behind food insecurity and malnutrition of rural adolescents should be addressed from government and non-government sectors.

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Review Article

Public Health Emergencies and Preparedness

Akhiruzzaman[1], Asaduzzaman A K M[2]

Introduction

The concept of a public health emergency is not limited to epidemic prone diseases but extends to biological, chemical and nuclear hazards, including the chemical or nuclear contamination of the environment and contaminated food and pharmaceuticals.[1] International Health Regulations (IHR) adopted by the World Health Assembly in 2005 are binding on all WHO member states and provide a regulatory framework for international management of public health emergencies.[2] The purpose of the IHR is to prevent and manage the public health risks arising from the international spread of disease while avoiding unnecessary interference with international traffic and trade.[3] Each country must develop and maintain the capacity to assess health risks within its territory and to notify WHO of all events that may constitute a public health emergency of international concern.[4] In South-East Asia the main public health issues are infectious diseases and communicable diseases[5] . This article describes the definition of public health emergencies, types of Public Health Emergencies, Public Health Emergencies of International Concern (PHEIC), examples of some public health emergencies in this century, public health emergencies preparedness (PHEP), key elements of public health emergency preparedness, capability assessment for public health emergency preparedness and response, and steps of developing preparedness and response capabilities planning model in deed.

Definition of public health emergencies

A situation becomes emergent when its health consequences have the potential to overwhelm routine community capabilities to address them. Thus, the proposed definition focuses on situations "whose scale, timing or unpredictability threatens to overwhelm routine capabilities."[6]

According to the National Disaster Medical System Federal Partners Memorandum of Agreement defines a public health emergency as *"an emergency need for health care [medical] services to respond to a disaster, significant outbreak of an infectious disease, bioterrorist attack or other significant or catastrophic event."*[7]

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Types of public health emergencies

1. Man-made emergencies

People have caused public health emergencies. Whether these events are planned or accidental, they render casualties, inflict, massive property damage and threaten survivors' sense of security.

- ❖ Bioterrorism**:** A growing number of terrorists are attempting to spread lethal diseases. The diseases that could be used in an attack are-
  - Anthrax
  - Smallpox
  - Tularemia
  - Plague e.t.c
- ❖ Chemical
- ❖ Fires
- ❖ Radiation

2. Natural disasters

County may faces weather-related challenges year-round. For examples:

- Earthquakes
- Extreme Heat
- Floods & Droughts
- Power Outages
- Tornadoes
- Lightening
- Winter Weather (Snow/Ice)

3. Other emergencies

- Foodborne Outbreaks
- Pandemic Flu[8].

Public Health Emergencies of International Concern (PHEIC)

PHEIC is defined as; an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response.[9]

A Public Health Emergency of International Concern (PHEIC) is a formally declared by the World Health

Organization (WHO) as “an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response", formulated when a situation arises that is "**serious**, **sudden**, **unusual** or **unexpected**", which "carries implications for public health beyond the affected state's national border" and "may require immediate international action".[10,11]

In order to declare a PHEIC, the WHO Director-General is required to take into account factors which include the risk to human health and international spread as well as advice from an internationally made up committee of experts. On an average each emergency response lasted approximately 4 months and used approximately 9.5% of our workforce.

Under the International Health Regulations (IHR) act, countries have a legal duty to respond promptly to a PHEIC.[12] After declaration of Public Health Emergency of International Concern, WHO member states have 24 hours, within which to report potential PHEIC events to the WHO.[13] It does not have to be a member state that reports a potential outbreak, hence reports to the WHO can also be received informally. [14]

The IHR decision algorithm assists WHO member states in deciding whether a potential PHEIC exists and the WHO should be notified. The WHO should be notified if any two of the four following questions are affirmed:[13]

- Is the public health impact of the event serious?
- Is the event unusual or unexpected?
- Is there a significant risk for international spread?
- Is there a significant risk for international travel or trade restrictions?

Some public health emergencies in this century

2009 swine flu declaration:

In the spring of 2009, a novel influenza A (H1N1) virus emerged. It was detected first in the United States and spread quickly across the US and the world.[15] On 26 April 2009, more than one month after its first emergence, the first PHEIC was declared when the H1N1 (or swine flu) pandemic was still in Phase Three.[16,17]

2014 polio declaration:

The second PHEIC was the 2014 polio declaration, issued in May 2014 with the resurgence of wild polio after its near-eradication, deemed "an extraordinary event".[18,19]

2014 Ebola declaration:

Confirmed cases of Ebola were being reported in Guinea and Liberia in March 2014 and Sierra Leone by May 2014. On Friday, 8 August 2014, following the occurrence of Ebola in the United States and Europe and with the already intense transmission ongoing in three other countries for months, the WHO declared its third PHEIC in response to the outbreak of Ebola in Western Africa.[20]

2016 Zika virus declaration:

On 1 February 2016, the WHO declared its fourth PHEIC in response to clusters of microcephaly and Guillain–Barré syndrome in the Americas, which at the time were suspected to be associated with the ongoing 2015–16 Zika virus epidemic.[21] Later research and evidence bore out these concerns; in April, the WHO stated that "there is scientific consensus that Zika virus is a cause of microcephaly and Guillain–Barré syndrome.[22]This was the first time a PHEIC was declared for a mosquito-borne disease.[23]

Public health emergencies preparedness (PHEP):

PHEP should include a full range of prevention, mitigation and recovery activities, not just those designed to enable responses to events. It also involves operational capabilities—the ability to quickly execute preparedness tasks. PHEP is not a steady state; it requires continuous improvement, including frequent testing of plans through drills and exercises and the formulation and execution of corrective action plans. PHEP also includes the practice of improving the health and resiliency of communities.[6]

Key elements of public health emergency preparedness

A prepared community is one that develops, maintains and uses a realistic preparedness plan integrated with routine practices and having the following components:

1. *Health risk assessment*: Identify the hazards and vulnerabilities (e.g., community health assessment, populations at risk, high-hazard industries and physical structures of importance) that will form the basis of planning.
2. *Legal climate*: Identify and address issues concerning legal authority and liability barriers to effectively monitor, prevent or respond to a public health emergency.
3. *Roles and responsibilities*: Clearly define, assign and test responsibilities in all sectors at all levels of government and with all individuals and ensure each group's integration.
4. *Incident Command System*: Develop, test and improve decision making and response capability using an integrated Incident Command System (ICS) at all response levels.
5. *Public engagement*: Educate, engage and mobilize the public to be full and active participants in public health emergency preparedness.
6. *Epidemiology functions*: Maintain and improve the systems to monitor, detect and investigate potential hazards, particularly those that are environmental, radiological, toxic or infectious.

7. *Laboratory functions*: Maintain and improve the systems to test for potential hazards, particularly those that are environmental, radiological, toxic or infectious.
8. *Countermeasures and mitigation strategies*: Develop, test and improve community mitigation strategies (e.g., isolation and quarantine, social distancing) and countermeasure distribution strategies when appropriate.
9. *Mass health care*: Develop, test and improve the capability to provide mass health care services.
10. *Public information and communication*: Develop, practice and improve the capability to rapidly provide accurate and credible information to the public in culturally appropriate ways.
11. *Robust supply chain*: Identify critical resources for public health emergency response and practice and improve the ability to deliver these resources throughout the supply chain.[6]

Capability assessment for public health emergency preparedness and response:

The National Preparedness Goal describes a vision for preparedness nationwide and identifies 32 core capabilities necessary to achieve that vision across five mission areas: *Prevention, Protection, Mitigation, Response* and *Recovery*. Among the core capabilities first 15 capabilities must be adaptable by jurisdictional public health agencies when responding to public health threats and emergencies within the context of their communities[24]

Capability 1 : Community Preparedness

Capability 2 : Community Recovery

Capability 3 : Emergency Operations Coordination

Capability 4 : Emergency Public Information and Warning

Capability 5 : Fatality Management

Capability 6 : Information Sharing

Capability 7 : Mass Care

Capability 8 : Medical Countermeasure Dispensing and Administration

Capability 9 : Medical Materiel Management and Distribution

Capability 10: Medical Surge

Capability 11: Non-pharmaceutical Interventions

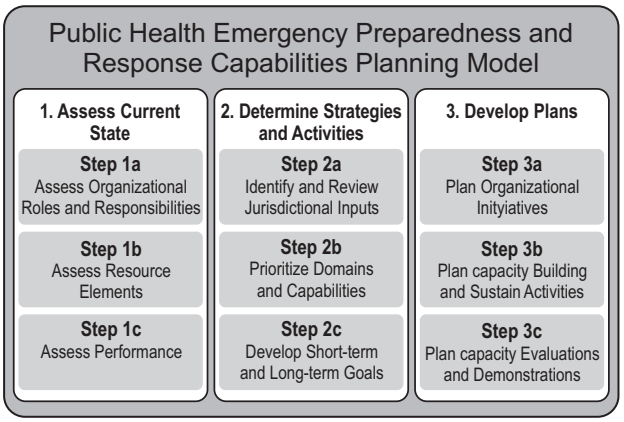
Capability 12: Public Health Laboratory Testing

Capability13 : Public Health Surveillance and Epidemiological Investigation

Capability 14: Responder Safety and Health

Capability 15: Volunteer Management[24]

Steps of developing preparedness and response capabilities planning model



Centers for Disease Control and Prevention, 2018.

Challenges for Bangladesh regarding PHEP and response:

Major challenges include:

- An overly- centralized health system
- Weak governance structure and regulatory framework
- Weak management and institutional capacity in the Ministry of Health and Family Welfare
- Fragmented public service delivery
- Inefficient allocation of public resources
- Lack of regulation of the private sector – which employs 58% of all physicians
- Shortage of human resources for health
- High turnover and absenteeism of health workers and
- Poor maintenance of health facilities and medical equipment

Conclusion

There are still several issues that Bangladesh health care system is yet to tackle. Despite of those challenges public health has improved markedly over the past two decades. Bangladesh shows strength during the all previous emergencies (eg- Polio eradication, measles outbreak, Dengue epidemic situation etc) and hope that all the experiences will help to make a strong preparedness plan with quick and adequate response against any further public health emergencies in future.

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Case Report

Bartter Syndrome

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Abstract

In 1962 Bartter et al. described a new disease entity in two African American who presented with metabolic alkalosis, hyperplasia of juxtaglomerular apparatus, and normotensive hyperaldosteronism. Over the years, several phenotypic and genotypic variants of the original descriptions of Bartters syndrome (BS) have been identified. It is an uncommon inherited renal tubular disorder with hyponatremia, hypokalemia, hypochloremic metabolic alkalosis, hypereninemia with normal blood pressure associated with increased urinary loss of sodium, potassium, calcium and chloride. A history of consanguineous marriage is present in many families. Most cases of BS are present in neonates. Prenatally, neonatal BS can be diagnosed by finding elevated amniotic fluid chloride and aldosterone levels.

Keywords: Bartter Syndrome, Metabolic disorder, Inherited renal tubular disorder.

Introduction

Bartter syndrome is a rare autosomal recessive disorder characterized by-

1. Hypokalemia
2. Metabolic alkalosis
3. Hyperreninemia
4. Hyperaldosteronism
5. Normal blood pressure
6. Urinary wasting of K^+, Na^+,Cl^- and Ca^+
7. Elevated urinary prostaglandin (PGE2) levels.

As the disorder is uncommon, the diagnosis is often missed. Children present in infancy with- Polyuria, Polydipsia, Vomiting, Constipation and Failure to thrive.

In the infantile form, hypercalciuria and nephrocalcinosis are seen. Fetal polyuria may cause polyhydramnios.

Older children may present with-

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Recurrent episodes of dehydration, muscle weakness, muscle cramps, blood pressure is low normal for age.

The molecular basis of Bartter syndrome is an inability to reabsorb chloride and sodium in the thick part of the ascending limb of loop of Henle due to defects in ion transporters.Increased delivery of sodium chloride to distal parts of the nephron leads to salt wasting, hypokalemia, polyuria, volume contraction and stimulation of the renin-angiotensin-aldosterone axis. While urinary sodium is recovered by an increase in aldosterone mediated activity of the epithelial sodium channel, loss of chloride with ammonium or potassium results in hypochloremic metabolic alkalosis and hypokalemia. Hypokalemia, volume contraction and elevated angiotensin increase intrarenal prostaglandin E2 synthesis, which stimulates the renin-angiotensin-aldosterone axis. BS should be suspected in any child with history of failure to thrive and metabolic alkalosis. Early diagnosis and treatment with NSAIDs are lifesaving. To the best of our knowledge our patient is the first reported case of Bartter syndrome in Bangladesh.

Case History

Nusrat (Figure 1) 1year 15 days old, duely immunized, severely underweight child of a non-consanguineous parent, admitted in Diabetic Association Medical College Hospital on 19 July 2018 at 10.30 am with the complaints of recurrent episode of vomiting after each feeding with progressive loss of weight, occasional loose motion for about 3 months. For those complaints she was admitted in Dhaka Medical College Hospital and diagnosed as a case of MAM (Moderate acute malnutrition) with dys-electrolytemia and received treatment. But there was no improvement rather worsening. Then she was admitted in Faridpur Medical College Hospital and diagnosed as SAM (Severe acute malnutrition) and got treatment. Despite the treatment her condition had been worsening day by day. She was admitted in Diabetic Association Medical College Hospital for better management. Her mother also said that she had been suffering from irregular fever for ten days, subsided by taking antipyretic. She was not exclusive breast fed. From four month of age she ate other feeding like solid foods. Her mother said that she usually drinks more

water and micturates large amount of urine. On general examination she looks miserable and irritable, weighs 5.2 kg, WHZ:< -3SD (severely malnourished- SAM), moderately anaemic, temperature 101ºF, BCG mark present. There was no skin rash .Her bowel and bladder habit was normal. Other systemic examination revealed no abnormality.

Investigations findings:

Hemoglobin Total Count	12.8g/dl	Differential Leucocyte Count	
WBC	14.31×10^9/L	Polymorphs	35.9%
RBC	5.35×10^{12}/L	Lymphocytes	52.7%
Platelets Count	216×10^9/L	Monocytes	10.3%
		Eosinophils	0.1%
		Basophils	1.0%

Serum Electrolytes report:

Name of Investigation	Finding according to date						
	1 June 2018	5 June 2018	7 June 2018	9 June 2018	13 June 2018	14 June 2018	19 June 2018
Serum Na^+	125	123	118	118	114	113	123
Serum K^+	1.9	1.8	1.8	1.46	1.9	1.6	1.8
Serum Cl^-	80	82	70	72	83	67	85

Other investigation reports:

Name of Investigation	Finding	Date
Serum $HCO3^-$	33 mmol/l	09-06-18
Serum P^H	8.0	10-06-18
Serum Ca	8.27 mg/dl	10-06-18
Blood for osmolality	236.2 mOsmol/kg	19.6.18
Spot Urine Electrolyte		
● Urine Cl^-	52 mmol/l	10-06-18
● Urinary calcium	130.60 mg/24 hr	11.6.18
USG of whole abdomen	Billateral mild hydronephrosis	19-07-18

We discharged the patient on 21-07-18 with advice to come with report of Serum Renin and Aldosterone level.

Aldosterone/Plasma renin Ratio (CLIA):

Posture	Ref range renin direct micro IU/ml	Ref range aldosterone ng/ml	Interpretation
Upright	4.4-46.1	2.52-39.2	normal
Supine	2.8-39.9	1.76-23.2	normal
Nusrat (patient)	>50000	76.50	

Thus, confirm diagnosis Bartter syndrome.

The case was prescribed IBUPROFEN (syrup) 30mg/kg in daily single dose along with other supportive treatment. She was discharged after 7 days with an advice to come after 1 month (Figure 2).

After 1 month she weighs 6.7kg as compared to 5.2 kg on admission, feeds well tolerated, polydipsia & polyuria almost subsided.

Comparative serum electrolyte reports after given treatment and follow up		
Name of Investigation	Finding according to date	
	20 August 18	14 October 18
Serum Na^+	135.7	136.4
Serum K^+	2.9	3.65
Serum Cl^-	96.1	98.8

Comparative serum bicarbonate reports before and after given treatment		
Name of Investigation	Finding according to date	
	09 June 18	14 October 18
Serum $HCO3^-$	33 mmol/l	21.16 mmol/L

Discussion

It is an uncommon inherited renal tubular disorder with hyponatremia, hypokalemia, hypochloremic metabolic alkalosis, hyperreninemia with normal blood pressure associated with increased urinary loss of sodium, potassium, calcium, and chloride.[1] The primary defect in BS is an impairment in one of the transporters involved in sodium chloride reabsorption in the thick ascending limb of loop of Henle viz., Na-K-2Cl cotransporter (NKCC2) or apical K channel (ROMK) or basolateral chloride channel (ClCNKB).[2] BS is transmitted as an autosomal recessive disorder. The estimated prevalence is approximately 1 per million for BS in the western population. However, the prevalence of heterozygotes may be as high as 1 percent.[3] A history of consanguineous marriage is present in many families. Most cases of BS are present in neonates. Prenatally, neonatal BS can be diagnosed by finding elevated amniotic fluid chloride and aldosterone levels. Only isolated case reports but no case series have been reported so far from Bangladesh.This is the largest series of BS reported so far from this subcontinent.[4-8]

BS should be suspected in any child with history of failure to thrive and metabolic alkalosis. Early diagnosis and treatment with NSAIDs are lifesaving.

To the best of so far our knowledge, it is the first case series to document the clinical profile of BS from Bangladesh. The exact incidence of BS is not known. In Costa Rica, incidence of neonatal Bartter's from live births is estimated

as one per 1.2 million.[9] In Kuwait, it was estimated as 1.7 per million population and in Sweden as 1.2 per million population.[10] The age at admission ranged from 2 to 15 months, with the mean age of 6.45 months which compares with the two published case series.[5-7] In this study, most of the children were male, whereas Abdel-al *et al*.'s series had female predominance and Dillon *et al*.'s series showed equal sex distribution.[5-7] In Abdel-al *et al*.'s study, 11patients (85%) had growth failure, two had nephrocalcinosis (15%), and one had renal failure.[10] The study by Garel *et al*. showed nephrocalcinosis in all the five children by computed tomography scan and ultrasonography.[11]

The study by Abdel-al *et al* also showed hypokalemia, hypochloremia, metabolic alkalosis, and hyperreninemia in all the patients.[10] None of the children in our series were hypertensive despite high renin and aldosterone levels.

Renal biopsy was not performed in our children. The study by Shalev *et al*. revealed mild focal tubulointerstitial fibrosis and minimal mesangial proliferation but no glomerulosclerosis in kidney biopsies from two 7-year-old patients.[12]

Dillon *et al*. used indomethacin in six of ten children for 6 to 24 months.[9] In the study by Abdel-al *et al*., all patients were treated with an aldosterone antagonist (spironolactone) and a prostaglandin synthetase inhibitor (indomethacin or aspirin) sequentially.[10] Growth hormone therapy was not given to our children. But studies have showed that nearly all patients with BS have growth retardation and are given growth hormone therapy along with potassium and indomethacin. A case report showed an association between BS and isolated familial growth hormone deficiency, with growth hormone therapy providing good results.[13]

Abdel *et al*. showed significant catch-up growth in 30.76% and increase in serum potassium value in 61.53%. One baby died (7.69%) of severe pneumonia with respiratory failure from hypokalemic myopathy.[10] The study by Dillon *et al*. showed catch-up growth in all patients treated with indomethacin therapy with remarkable clinical and biochemical improvement.[9] Usually prognosis in many cases is good, with patients being able to lead fairly normal lives.[6]

Genetic studies were not done in this case due to nonavailability of such specialized laboratories in our region. There is no direct correlation between the clinical phenotype and the underlying genotypic abnormality, even with well-characterized defects in a single transporter. However, more severe and earlier clinical manifestations may be seen with mutations leading to defects in Na-K-2Cl cotransporter and the luminal potassium channel.[14]

Figure 1: Nusrat on admission before diagnosis

Figure 2: Nusrat after diagnosis and starting of treatment and during discharge from hospital.

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