

Contents

Vol. 2, No. 2, July 2018

<b>Editorial:</b> <b>Dengue Crisis : A New Challenge for Bangladesh</b> <i>Huda SMN</i>	9
<b>Original Articles:</b> Clinico-Pathologycal Study in Women with Hirsutism in a Rural Tertiary Hospital of Bangladesh Walid KM, Khan MMU, Tasnim M, Haque KMN, Haque MS, Islam MN, Biswas MA, Khan MIA	11
Salivary Acetylcholine Concentration and Dementia: A Comparative Study in Dhaka City of Bangladesh Kabir MA, Islam TB, Akhiruzzaman, Ferdous S, Parveen M, Sarker F, Akter H,	15
<b>Reproductive Health Problems among the Adolescent Girls of Khulna Government Girls High School</b> <i>Ferdaus F , Zahan R, Akhiruzzaman</i>	18
Outcome of Treatment of Locally Advanced Oral Cavity Cancer with Concurrent Chemo-Radiation in Comparison to Radiotherapy Alone <i>Akter H, Hosen MMA, Khatun J, Ahmed S</i>	21
Study on Knowledge, Attitude and Practice of Mothers on the Use of Oral Rehydration Salt (ORS) in Children with Diarrhoea Miah MAM, Choudhury MU, Tarafdar MA	26
<b>Review Article:</b> Health and Environmental Sustainability: Public Health Issues for Present and Future Tarafdar MA	31
<b>Case Reports:</b> Gastroduodenal Intussusception of a Gastrointestinal Stromal Tumour Rahman MM, Rahman MM, Chowdhury AAMAM, Rahman MS, Qaiyum MA, Akter H	36



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# Journal of Diabetic Association Medical College, Faridpur (JDAMC)

Vol. 2, No. 2, July 2018

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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 fourth 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 first 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

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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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# **Dengue Crisis : A New Challenge for Bangladesh**

Huda SMN

# Introduction

Dengue, a viral infection spread by the infamous Aedes aegypti mosquito, is the fastest growing mosquito-borne disease in the world today. It is now a major international public health concerns. Over the past three decades there has been dramatic global increase in the frequency of dengue fever, dengue haemorhagic fever and dengue shock syndrome and their epidemics. It is found in tropical and subtropical regions around the world. Some 2.5 billion people i.e two fifth of the world's population in tropical and subtropical countries are at risk of the disease. An estimated 50 million dengue infection occurs worldwide annually and about 500,000 people with dengue haemorrhagic fever require hospitalization each year. Approximately 90 per cent of them are children aged less than five years, and about 2.5 per cent of those affected die. During epidemics, infection rate among those who have not been previously exposed to the virus are often 40 to 50 per cent, but can also reach 80 to 90 per cent.<sup>1</sup>

The population of Aedes aegypti fluctuates with rainfall and water storage. Its life span is influenced by temperature and humidity, survives best between  $16^{\circ}C-30^{\circ}C$  and a relative humidity of 60-80 per cent. It breeds in the containers in and around the houses. Being a domestic breeder, it is a endophagic and endophilic. However, even with a 2°C increase in temperature the extrinsic incubation period of dengue virus will be shortened and more infected mosquitos are available for a longer duration. Besides that the mosquitos will bite more frequently because of dehydration and this increase man-moquito contact.<sup>2,3</sup>

It is characterised by flu-like symptoms, including piercing headaches, muscle and joint pains, fever and fullbody rashes. But this year it shows "atypical" symptoms like low grade fever instead of high fever, no body rashes and minimum joint pain but affecting vital organs like brain, heart, and liver.4 The escalating dengue situation in Bangladesh has been emerging as a serious public health problem in terms of morbidity and mortality. Results of analysis of 40,476 cases of Bangladesh occurring during 2000-2017 indicated that 49.73% of the dengue cases occurred during the monsoon season (May-August) and 49.22% during the post-monsoon season (September-December).<sup>5</sup> There are seasonal fluctuations in dengue incidence, with year-to-year variation in the timing and magnitude of seasonal peaks. Climate and resulting changes in mosquito populations along with the inter-

**Correspondence to:** Dr. S.M. Nazmul Huda; MBBS Lecturer, Department of Community Medicine Diabetic Association Medical College, Faridpur. Email: nazmulbappi14@gmail.com annual variation in DENV activity drive these changes. During 2015-2017, in the pre-monsoon season, the dengue cases were reported to be more than seven times higher compared to the previous 14 years. The findings closely correlate with those of the pre-monsoon Aedes vector survey which revealed the presence of high density of larva and pupa of the dengue vectors in the environment all the year round. The threat of a growing dengue outbreak has been looming over Bangladesh, hitting the country earlier than usual this year with higher levels of rainfall. Thus, stagnant water sources are widespread in the capital – Dhaka, where dengue is most-reported. 61 out the country's 64 districts have reported cases of dengue.<sup>4-6</sup>

According to DGHS there are total 87,953 reported cases till 30 September since 1st January, 2019. Total no of admitted patient was 1,481. Total no of released patient was 86,241 till to date. About 231 death reports were sent to The Institute of Epidemiology Disease Control & Research (IEDCR). Among them IEDCR investigate 136 cases and confirmed 81 death cases due to dengue.<sup>7</sup>

In addition to the routine monsoon survey at households in July 2019, Disease Control division, DGHS conducted an additional survey in public places (Bus terminals, Railway station, Slum areas, Metro rail projects, Police line, Hospitals etc.). A total of 4 entomology teams surveyed 14 areas during 31 Jul – 04 Aug, 2019. Which reveals 12 out of 14 sites had Breteau Index (BI) > 20, Bus terminal / depot, rail station are most aedes-dense areas, Discarded tires are the most potential breeding sources.<sup>89</sup>

# Viral Characteristics

All four serotypes of dengue fever have been detected in Bangladesh, with DENV-3 predominance until 2002<sup>10,11</sup>. After that, no DENV-3 or DENV-4 was reported from Bangladesh. The Institute of Epidemiology Disease Control & Research (IEDCR) under the Ministry of Health and Family Welfare, a mandated organization for outbreak investigation and surveillance in the country, found DENV-1 and DENV-2 in circulation (2013-2016) and predicted that because serotypes DENV-3 and DENV-4 are circulating in neighbouring countries, they may create epidemics of secondary dengue in the near future<sup>12</sup>. In 2017, re-emergence of DENV-3 was identified; subsequently there was a sharp rise in dengue cases from the beginning of the monsoon season in 2018. With the expansion of the outbreak, more dengue cases with deaths were also reported compared to the last 15 years. Subsequent infection with different strain of dengue causes dengue haemorrhagic fever and shock syndrome is the main cause of death.<sup>1</sup>

# **Prevention and Control**

Dengue control is very challenging because aedes mosquito is highly domesticated, strongly anthropophilic, nervous feeder and discordant species. Aedes aegypti, which has adapted to living near areas of human habitation. It feeds during the day and prefers human beings to other animals. Mosquito-borne disease transmission is climate sensitive for several reasons; mosquitoes require standing water to breed, and a warm ambient temperature is needed for their development. If the climate is too cold, viral development is slow and mosquitoes are unlikely to survive long enough to become infectious. Moreover when mosquito gets infected there transovarian transmission occurs where virus enters fully developed eggs at the time of oviposition. No effective vaccine or drug treatment for dengue fever is yet available. So management of the disease has relied on vector control measures, such as reduction of breeding sites and use of insecticides. To eradicate dengue fever we will have to fight against the growth of the Aedes aegypti mosquito which requires the virus to thrive. These mosquitoes rapidly grows in clear standing water and by serial spraying of anti-mosquito agents their growth can be hindered. We should strongly discourage standing water and ponds near residential areas. The personal prophylactic measures are wearing of full sleeves shirts and pants; use of mosquito repellent creams, liquids, coils, mats etc; use of bednets for sleeping infants and young children during day time to prevent mosquito bite.14-18

# Conclusion

The emergence of dengue and its upcoming challenges need to handle properly. For this to be possible, a collaboration between the common man, community health personnel, NGO's and the Government should be encouraged. Lets fight against dengue together.

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# Clinico-Pathologycal Study in Women with Hirsutism in a Rural Tertiary Hospital of Bangladesh

*Walid KM<sup>t</sup>*, *Khan MMU<sup>2</sup>*, *Tasnim M<sup>t</sup>*, *Haque KMN<sup>t</sup>*, *Haque MS<sup>s</sup>*, *Islam MN<sup>s</sup>*, *Biswas MA<sup>7</sup>*, *Khan MIA<sup>8</sup>* 

# Abstract

The objective of the study was to find out the status of clinical features, gonadotrophins, testosterone and ovarian ultrasonography with hirsutism in female of Bangladesh, in addition to socio-demographic characteristics of the respondents. A descriptive cross-sectional record review was done among 51 patients with hirsutism in Diabetic Association Medical College, Faridpur during the period from February, 2015 to April, 2017 using preformed checklist. History of ovarian dysfunction and BMI were assessed and testosterone, LH, FSH and ovarian ultrasonography findings were recorded. Inclusion criteria included hirsutism in reproductive age, between menarche to 40 years of age with exclusion of any known cause for hirsutism. Among the patients 16 (31.37%) were within twenty years and 30 (58.83%) were between twenty-one to thirty years of age. 7 (13.72%) patients were overweight and 31 (60.78%) patients were obese. 46 (90.2%) patients had either oligomenorrhoea or amenorrhea. Only 5 (9.8%) of the patient had raised testosterone while 43 (84.31%) had LH:FSH >1. Abdominal ultrasonography showed 17 (33.33%) patients had obvious polycystic ovary and 20 (39.22%) had normal ovary. Polycystic ovarian syndrome is the commonest cause of hirsutism in Bangladesh. Usually the patients are below thirty years of age and above normal bodyweight, most of them have altered LH to FSH ratio but not raised testosterone.

Keywords: Hirsutism, Hyperandrogenism, Gonadotropins, polycystic ovarian syndrome.

## Introduction

Hirsutism, a feature of hyperandogenism, is a common but generally overlooked disorder, especially in the rural area of Bangladesh. Hirsutism is defined as excessive terminal hair

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Dr. Khalifa Mahmud Walid; MBBS, DEM Assistant Professor, Department of Endocrinology Diabetic Association Medical College, Faridpur. E-mail: drkmwalid@yahoo.com that appears in a male pattern in a woman.Terminal body hairs are normally seen in men on the face, chest, abdomen and back, and which are not normal in women<sup>1</sup>. Numerous scoring systems are available for quantifying hirsutism. One of the most detailed scales was proposed by Ferriman and Gallwey<sup>2</sup>. It is a common clinical condition which affects 5–10% of women of reproductive age. Hirsutism is extremely distressing for patients and has a significant negative impact on their psychosocial health<sup>3</sup>.Polycystic ovary syndrome (PCOS) and idiopathic hirsutism (HI) are the two most common causes of hirsutism<sup>4</sup>.

PCOS is the most common endocrinopathy in women which is characterized by hyperandrogenemia and chronic anovulation. Rotterdam criteria have been generally used to describe PCOS, based on the exclusion of other androgen excess disorders and the presence of any two of oligoovulation or anovulation, clinical and/or biochemical hyperandrogenism, and polycystic ovaries on ultrasonography<sup>5</sup>.

HI, the second most common cause of hirsutism after PCOS, is considered when hirsutism is associated with normal ovulatory function and normal circulating serum androgen concentrations. The pathogenesis of HI is still unclear, although increased activity of peripheral 5-alpha reductase enzyme<sup>6</sup>, androgen receptor gene polymorphism<sup>7</sup>, and increased sensitivity of hair follicles to androgens have been proposed<sup>8</sup>.

In Bangladesh, especially in rural area, hirsutism is underdiagnosed and untreated condition due to lack of unawareness of the patients as well as lack of access to required health resources like specialist doctor and Clinico-Pathologycal Study in Women with Hirsutism in a Rural Tertiary Hospital of Bangladesh

hormonal assessment<sup>9</sup>. The objective of the study was to find out the status of clinical features, gonadotrophins, testosterone and ovarian ultrasonography with patients with hirsutism.

# **Materials and Methods**

In the study total 51 patients of reproductive age were under record review in between the period of February, 2015 to April, 2017. All of them were outpatients at the Endocrinology of the Diabetic Association Medical College, Faridpur.

It was a descriptive cross-sectional record review. The patients with hirsutism were nonpregnant woman of reproductive age, between menarche to 40 years, not taking medication like oral contraceptive pill (OCP), antidiabetic or antihypertensive medicine for last six months. Exclusion criteria of the study group were primary amenorrhoea; pregnancy; systemic disease (liver, kidney, heart or any other systemic diseases); age >40 years and <13 years; patient taking any of the above mentioned medications and associated other endocrine disorders(e.g. hypothyroidism, hyperprolactinemia and congenital adrenal hyperplasia) related to hirsutism.

Detail history related to hirsutism, features of hyperandrogenism (i.e. acne, baldness) and menstruation was recorded. Height in cm (using free-standing stadiometer in bare foot), weight in kg (in a weighting scale, bare foot, light clothing) were recorded including body mass index (BMI) using the formula: BMI=weight (in kg)/height (in metre<sup>2</sup>) and used Asia-Pacific guideline BMI cut off for categorizing patients into four groups: underweight (<18.5 kg/m<sup>2</sup>), normal weight (18.5-22.9 kg/m<sup>2</sup>), overweight  $(23-24.9 \text{ kg/m}^2)$ , and obese (>25  $kg/m^{2})^{9}$ . Hormone profile was recorded on between day two and day four of menstrual cycle. For amenorrhic patients, blood assayed record after menstruation induced using progesterone. FSH, LH and total testosterone were also taken in consideration. Adnominal ultrasonography was also taken into consideration to look for gonadal structure.

# Results

**Table 1:** Distribution of the patient according to age group (n=51)

Age (in years)	Number	Percentage
≤20	16	31.37%
21 - 30	30	58.83%
31 - 40	5	9.80%
Total	51	100%

Table 1 shows that among the patients, seeking for the management of hirsutism, 16 (31.37%) were less than twenty years and 30 (58.83%) were twenty to thirty years of age.



**Figure 1:** Distribution of the patients according to Marital status.

Number of the married and unmarried patient was almost equal (26 vs 25).



Figure 2: Distribution of the patients according to menstrual pattern.

Figure 2 shows that 46 (90.2%) of the patients suffering from hirsutism had menstrual abnormalities, either oligomenorrhoea or amenorrhoea.

 Table 2: Distribution of the patients according to Body

 Mass Index (BMI) (n=51)

Category	Number	Percentage
Underweight (<18.5 kg/m <sup>2</sup> )	2	3.92%
Normal weight (18.5–22.9 kg/m <sup>2</sup> )	11	21.57%
Overweight (23–24.9 kg/m <sup>2</sup> )	7	13.73%
Obese ( $\geq 25 \text{ kg/m}^2$ )	31	60.78%
Total	51	100%

Table 2 shows that about two-third of the patients were overweight to obese (13.73% + 60.78% = 74.51%) according to recorded BMI; lowest was 17.7kg/m<sup>2</sup> and highest was 37.6kg/m<sup>2</sup> with a median 25.6kg/m<sup>2</sup>.

**Table 3:** Distribution of the respondents according to hormonal profile (n=51)

Hormonal profile	Number (Multiple Answer)	percentage
Raised testosterone	5	9.80
Raised LH	12	23.53
LH:FSH >1	43	84.31
Total	51	100%

Table 3 shows that, only 9.8% of the patient had raised level of testosterone, 23.53% patient had raised luteinizing hormone but most of the patient (84.31%) had altered luteinizing and follicle stimulating hormone pattern that is LH to FSH ratio became >1.

**Table 4:** Distribution of the patients according to abdominal ultrasonography finding (n=51)

Finding	Number	Percentage
Polycystic	17	33.33
Prominent	9	17.65
Single cyst	5	9.80
Normal	20	39.22
Total	51	100%

Table 4 shows that, 33.33% of the patient had polycystic changes with another 17.65% prominent ovaries which is also suggesting PCO while 39.22% showed normal ovarian picture.

# Discussion

Hirsutism feels to be more a cosmetic problem and affects the patient psychology very adversely, especially in Bangladeshi socio-cultural context. As referral system is not adequately developed and endocrinologists are not yet well familiar and adequately found beyond metropolitan cities in Bangladesh and often female are not well aware of the disorder, patients with hirsutism are not commonly treated in rural areas. That's why we could include small number of patients in our study and this is an important limitation of our study.

Patients with hirsutism, seeking treatment, were relatively younger (90.2% were within thirty years aged) and half of them were unmarried. It reflects that hirsutism is a disease of young age and women are more concerned cosmetically at unmarried or early married life. This also shows the increased incidence of weight gain in young generations, even in rural areas of Bangladesh. Previous studies also reported an association between obesity and hirsutism<sup>10,11</sup>.

Hirsutism is a major clinical sign of hyperandrogenism <sup>12</sup>. In the study we found only 5(9.8%) patient had raised circulating testosterone level. According to the study finding 47 (92.16%) patients had polycystic ovarian disease. The 2003 Rotterdam consensus workshop concluded that PCOS is a syndrome of ovarian dysfunction along with the cardinal features hyperandrogenism and polycystic ovary (PCO) morphology <sup>5</sup>.Notably, only two small studies in patients with PCOS (n= 24 and 58 respectively) did not identify significant differences in circulating androgens between patients with hirsutism and those without hirsutism <sup>13-15</sup>. On the other hand, we should emphasize that circulating androgens were measured in multiple centers by immunoassay method which quality and accuracy could not be confirmed. This represents a limitation of our study as well.

In conclusion, besides hyperandrogenaemia, abdominal obesity and young age are independently associated with the presence of hirsutism. According to the study finding, 47 (92.16%) patients with hirsutism had polycystic ovarian disease. In the study by Carmin E (n=950), PCOD was the cause of hirsutism in 72.1% of patients<sup>16</sup>. Higher number of PCOD cases was found as cause in this study may reflects ethnic susceptibility for hirsutism or failure to exclude some other important causes of hirsutism. Given the beneficial effects of lifestyle changes on both circulating androgens, obesity and PCOS<sup>17</sup>, they should be encouraged as the cost effective first-line intervention for the management as well as prevention of hirsutism in Bangladesh, especially in younger women.

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# Salivary Acetylcholine Concentration and Dementia: A Comparative Study in Dhaka City of Bangladesh

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# Abstract

This comparative cross sectional study was carried out to evaluate the relationship of salivary acetylcholine concentration with the events of dementia during the period of July 2014 to June 2015. For this study total 120 respondents were selected purposively. Among them 60 respondents were suffering from dementia (Diagnosed by medicine specialist) and rest 60 were without dementia selected as comparison group.

Out of all study subjects, mean( $\pm$ SD) age of dementia patients was 73.10( $\pm$ 4.93) years with the age range of 62 to 84 years and that of in comparative group was 71.20( $\pm$ 5.89) years with the age range of 64 to 85 years. Male (60.0%) was predominant in dementia patients. The mean( $\pm$ SD) value of Salivary acetylcholine in dementia group was found 153.93( $\pm$ 98.04) pg/ml and that of in comparative group was 411.50( $\pm$ 112.50) pg/ml. Here Salivary acetylcholine was found lower in dementia patients than comparative group and therefore it can be concluded that salivary acetylcholine level can help to diagnose the risk of development of early dementia.

Keywords: Dementia, Acetylcholine, Salivary acetylcholine, Bangladesh

# Introduction

Dementia is rapidly becoming the major public health problem worldwide, as the prevalence of dementia is rising day by day. Therefore, early diagnosis of dementia is necessary to limit as well as early management of physicians.

Dementia is derived from Latin word demense means "without mind". It was first discovered by German

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Associate Professor, Department of Biochemistry Diabetic Association Medical College, Faridpur Email: akasiul99@gmail.com neurologist Alois Alzheimer's in 1906. Global prevalence of dementia from all causes to be between 5% and 7% of adults age 60+.<sup>1</sup> The biggest risk factor for dementia is age. Epidemiological data shows that dementia is more prevalent in the people with low education level. Alzheimer's disease (AD) is the most common form of dementia.

The worldwide number of dementia in 2010 is about 35.6 million and expected to double after every two decades, this number will be estimated nearly about 76 million in 2030 and 135.4 million in 2050.<sup>2</sup>

Bangladesh bearing the world's eighth-largest population of more than 160 million, the expected number of people over 60 years is projected to be increase to 9% by 2025 and 21% by 2050. The burden of people with dementia is presumed to enhance dramatically.<sup>3</sup>

The pathology of alzheimers disease involves deficit in acetylcholine, the presence of neurofibrillary tangle and the formation of senile plaques.<sup>4</sup> Acetylcholine (Ach) was the first neurotransmitter to be identified by Henry Hallett Dale in 1915. In early stages, the cholinergic neurons primarily undergo degeneration and result in a notable decrease in acetylcholine. Studies revealed that in patients with alzheimers disease, AChE activity was appreciably lower than in their age matched counterparts, suggesting the salivary level of cholinergic activity could be a biomarker.<sup>5</sup>

In dementia a high prevalence of acetylcholine deficiency is found. So it can be assumed that acetylcholine concentration could play a potential role in pathogenesis of dementia. But there was scarcity or lack of information in this prospect in context of Bangladesh. So, this study has been planned to find out the relationship of salivary acetylcholine level in the patients with dementia in Dhaka city of Bangladesh.

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# **Materials and Methods**

This comparative cross sectional study was carried out to evaluate the relationship of salivary acetylcholine concentration with the events of dementia during the period of July 2014 to June 2015. For this study total 120 respondents were selected. Among them 60 respondents were suffering from dementia (Diagnosed by medicine specialist) and rest 60 were without dementia selected as comparative group. Dementia group patients were selected purposively from the Bangladesh Institute of Research and Rehabilitation for Diabetes, Endocrine and Metabolic Disorder (BIRDEM), National Institute of Neuroscience (NINS) and Dementia Care Project of Sir William Beveridge Foundation. The other without dementia group also selected purposively from the BIRDEM General Hospital, Dhaka. A structured questionnaire was filled up for each patient to collect socio demographic data. Salivary acetylcholine concentration was measured in bed side of the patient by using ELISA kit (which was collected from abroad) from both group. After taking written consent a saliva sample was collected and then centrifuge sample for 20 minutes at 1000×g at (2-8)°C. Supernatant parts was collected and carryout the test immediately.

# Results

All the findings were analyzed and presented in the form of tables and graphs.

	Group				
Variable	Dementia patients (n=60)	Without Dementia (n=60)			
Age (year)	·				
$\leq 70$	17 (28.3%)	25 (41.7%)			
> 70	43 (71.7%)	35 (58.3%)			
Mean(±SD)	73.10± 4.93	71.98± 5.24			
Range	62 to 84 years	64 to 85 years			

Table1: Distribution of the respondents by age

Table 1 shows that among dementia patients 43(71.7%) were more than 70 years of age group whereas 35(58.3%) were more than 70 years age group among respondents having no Dementia.





Figure 1 shows that 36(60.0%) were male among dementia patients and 30(50.0%) among without dementia group



**Figure 2:** Distribution of the respondents by average Acetylcholine concentration among two groups

Figure 2 shows that average salivary acetylcholine concentration was significantly lower (153.9 pg/ml) in dementia patients than comparative group (411.5 pg/ml).

# Discussion

The prevalence of dementia is rising day by day. In an epidemiological study findings found that in 2001, 60.1% of all people with dementia were living in developing countries; this proportion is expected to rise to 71.2% by 2040 which is alarming for these countries.<sup>67</sup> So, early diagnosis of dementia is necessary to limit as well as early management of physicians.

There is scarcity on publication demonstrating salivary level of acetylcholine in dementia. However, there are several articles on salivary acetylcholinesterase in dementia specially Alzeimer's disease, some of it done on the sample of Cerebro Spinal Fluid (CSF). But it was hardly found any articles on salivary acetylcholine level in case of dementia. We compared our study findings with result of some other published articles elsewhere in the world to verify our results.<sup>58,9</sup>

According to age analysis, mean( $\pm$ SD) age of dementia patients was 73.10( $\pm$ 4.93) with the age range of 62 to 84 years. This result is consistent with some other study done in the world.<sup>7</sup>

Salivary acetylcholine was significantly lower in dementia patients than control group (p value <0.01). The mean( $\pm$ SD) value of Salivary acetylcholine in dementia group was found 153.93( $\pm$ 98.04) pg/ml and that of in control group 411.50( $\pm$ 112.50) pg/ml. Frölich et al.<sup>8</sup> measured acetylcholine in CSF and found as using high pressure liquid chromatography (HPLC), ACh concentrations were greatly reduced in the dementia of Alzheimer-type group (3.75 $\pm$ 1.40 pmol/ml CSF) as compared to the controls (6.14 $\pm$ 1.39 pmol/ml CSF). Sayer et al.<sup>5</sup> accounted the activity of the enzyme Salivary acetylcholinesterase enzyme (AChE) was significantly lower in people with Alzheimer's disease (AD) than in agematched controls which is in accordance of our study. Tohgi et al.<sup>9</sup> investigated the acetylcholine (ACh) concentrations in the cerebrospinal fluid. The ACh concentration in patients with Alzheimer-type dementia was found to be significantly lower than in controls (73%, p <0.01). In vascular dementia of the Binswanger type patients, the ACh concentration was significantly lower than in controls (p < 0.01).

# Conclusion

Salivary acetylcholine was significantly lower in dementia patients than comparison group. So, it can be concluded that salivary acetylcholine level can help to diagnose the risk of development of early dementia and thus recommended a large scale study with well supported statistical interpretation.

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# Reproductive Health Problems among the Adolescent Girls of Khulna Government Girls High School

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# Abstract

The period of adolescence for a girl is a period of physical and psychological preparation for safe motherhood. Several factors contribute to the adolescents' growth. A vast majority of adolescent girls in Bangladesh are suffering from menstrual problems, reproductive morbidities and nutritional deficiencies such as dysmenorrhoea, pre-menstrual syndrome, irregular menses, heavy menstrual bleeding, amenorrhoea, white discharge per vagina, UTI, anaemia etc. The present study was carried out to assess menstrual problems, reproductive health problems and nutritional status of adolescent girls of Khulna Government Girls High School. Among respondents, 32 (32%) had painful bleeding (Dysmenorrhoea), 12 (12%) had excessive bleeding (Menorrhogea), 6 (6%) complained of irregular bleeding and 8 (8%) suffered from scanty bleeding (Oligomenorrhoea). Regarding other reproductive health related problems, majority 66 (66%) respondents mentioned no problem and rest 34 (34%) mentioned about some problems. The study may conclude that majority of the adolescent girls suffer from reproductive health related problems, education and appropriate health care facilities as well as mental support to improve their reproductive health.

Keywords: Adolescent girls, Menstrual Problems, Nutritional status, Reproductive health morbidities

# Introduction

World Health Organization has defined adolescence as a period between 10-19 years of age.<sup>1</sup>Adolescence is defined as period of personal development during which young people develops a personal sense of individual identity and feeling of self-worth, which also includes an alteration of his or her body image, adaptation to more mature intellectual abilities, adjustment to society's demand for behavioral maturity, internalizing personal value system and preparing for adult role<sup>2</sup>. It is a changing stage of physical, physiological and psychological development from puberty to adulthood. At present, more than 1.2 billion are adolescents in the world this means that roughly one in every six persons is an adolescent<sup>3</sup>. About 21% of Bangladeshi population is adolescents (about Bangladesh has the largest adolescent 243 million) population in the world. They are the future of the nation, forming a major demographic and economic force. It is a period of preparation for undertaking greater responsibilities like familial, social, cultural and economic issues in adulthood. It is particularly a special period in girl's life that requires specific and special attention. The study was undertaken to assess menstrual problems, reproductive health problems and nutritional status of adolescent girls.

# **Materials and Methods**

This cross sectional study was conducted among the female

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Dr. Farhana Ferdaus, Assistant Professor and Head, Department of Community Medicine, Khulna City Medical College and Hospital E-mail: farhanasumi87@yahoo.com students of class eight to ten of Khulna Government Girls High School, Boyra, Khulna. Total students of this institution were 750. It was possible to collect data from 100 respondents during the scheduled period of data collection. Structured questionnaires were prepared, which include the basic sociodemographic profile, menstrual and other reproductive health problems. The questionnaire was pre-tested in few selected female students. The pre-test was conducted near the study area which had similar characteristics to the areas where the actual study was carried out. A purposive type of nonprobability sampling is applied, therefore sample size of the study was finalized to 100 respondents.

## Results

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

Age in year	Number	Percentage
13-15	35	35
16-18	65	65
Total	100	100

Table 1 shows that among 100 respondents, 65 (65%) respondents was in 16-18 years of age and 35 (35%) was in 13-15 years of age. The mean age of respondents was 16 years.

Table	2:	Distribution	of	respondents	by	their	age	at
menar	che	(n=100)						

Age in year	Number	Percentage
10	6	6
11	10	10
12	54	54
13	20	20
14	10	10
Total	100	100

Table 2 shows among 100 respondents, 54 (54%) started their menstruation at age 12 years, and only 6 (6%) respondents had their menarche at age 10 years.

 Table 3: Distribution of respondents according to menstrual problems (n=100)

Menstrual Problems	Number	Percentage
Scanty bleeding	08	08
Excessive bleeding	12	12
Painful bleeding	32	32
Irregular bleeding	06	06
Other problems	00	00
No problems	42	42
Total	100	100

Table-3 shows that 32 (32%) respondents had painful bleeding, 12 (12%) had excessive bleeding, most of the respondents 42 (42%) mentioned about having no menstrual problems.

**Table 4:** Respondents according to their other reproductivehealth problems in genitalia (n=100)

Problems in genital area	Number	Percentage
Whitish discharge	28	28
Itching	6	6
Swelling/Ulceration/Others	00	00
No problems	66	66
Total	100	100

Table 4 shows that majority of the respondents 66% had no problem in genital area. Only 28% suffered from per vaginal whitish discharge and 6% suffered from itching.

Table 5: Association	among economic stat	us of adolescen	nt girls and painfu	ıl menstrual	bleeding and per	vaginal	whitish
discharge (n=100)							

Economic Status	Painful Mens	rual Bleeding $\chi^2$ value and		Per vaginal Whitish Discharge		$\chi^2$ value and
	Present	Absent	p value	Present	Absent	p value
Lower middle class	14 (35%)	26 (65%)		18 (45%)	22 (55%)	
Upper middle class	12 (28.57%)	30 (71.43%)	0.407	4 (9.52%)	38 (90.48%)	13.1 and
Upper class	6 (33.33%)	12 (66.67%)	>0.05	6 (33.33%)	12 (66.67%)	< 0.05
Total	32 (32%)	68 (68%)		28 (28%)	72 (72%)	

Table 5 shows that dysmenorrhea was poorly present in respondents of upper class family which was 6 (33.33%) and relatively high in lower middle class family that was 14 (35%). So there was no association between economic status and painful menstrual bleeding, but there was statistically significant association (p<0.05) between economic status and per vaginal whitish discharge.

**Table 6:** Association among preventive measures of painful bleeding and per vaginal whitish discharge during menstruation of adolescent girls (n=100)

Preventive	Dysme	norrhea	Total $\chi^2$ value and		Leucorrhea		Total	$\chi^2$ value and
measures	Present	Absent		p value	Present	Absent		p value
Hygienic (use sanitary pads)	18 (31.03%)	40 (68.97%)	58 (58%)	0.0592	4 (6.89%)	54 (93.11%)	58 (58%)	30.51
Unhygienic	14 (33.33%)	28 (66.67%)	42 (42%)	And >0.05	24 (57.14%)	18 (42.86%)	42 (42%)	And <0.05
Total	32 (32%)	68 (68%)	100 (100%)		28 (28%)	72 (72%)	100 (100%)	

Table 6 shows that most of the respondents were practicing preventive hygienic measures among which 18 (31.03%) suffered from dysmenorrhea and 4 (6.89%) suffered from leucorrhea. Among 42 (42%) respondents practicing unhygienic protective measures, 14 (33.33%) had painful bleeding and 24 (57.14%) suffered from leucorrhea. So there was no significant association between protective measures during menstruation and painful bleeding but there was significant association (p<.05) between preventive measures and per vaginal whitish discharge.

Ferdaus F

# Discussion

In this study, total sample was 100 among them the highest and lowest variation of age was 18 and 13 years respectively. The mean age of respondents was 16 years. Out of 100 adolescent girls the highest percentage (54%) started their menstruation at the age of 12 years. These findings were consistent with the study done by BANS 94. where mean age at menarche was 12.6 years & by 13.9 years, 90% of female adolescents attained their menarche. Another study in Mumbai (India) revealed similar findings, where the mean age at menarche was 12 years. This similarity (12 and 12.6 years) may be due to same socio-economic status &living standard of the adolescent girls 5-7. Regarding menstrual problems, total 58% complained some sort of problems. Among them 32% had painful bleeding, 12% had excessive bleeding, 6% mentioned about irregular bleeding and 8% suffered from scanty bleeding. This observation was closely related with BIRPERHT study where they found, over 65% adolescent girls had menarche with menstrual problems<sup>8</sup>. In this study, it also revealed that majority 66% had no problems in genital area while 28% and 6% suffered from whitish discharge and itching respectively. A study was conducted by BRAC showed that most of the adolescent girl complaints of whitish discharge accompanied severe abdominal pain which may be due to improper drying of reused sanitary napkin /cloth that become a source of fungal infection and ultimately leads to vaginal discharge<sup>9</sup>. In this study we observed no association between economic status and painful menstrual bleeding, but there was significant association (p<0.05) between economic status and per vaginal whitish discharge statistically. There was statistical significant association of among hygienic and unhygienic practiced by adolescent girls. It may be due to improper cleaning procedure of menstrual protective measures like cleaning without using disinfectant and improper preservation place of sanitary napkin/cloth. The frequently reuse of sanitary napkin/cloth and longtime preservation may lead to infection.

## Conclusion

For many adolescents who need sexual and reproductive health services, such as appropriate information, contraception and treatment for sexually transmitted infections, these are either not available or are provided in a way that makes adolescents feel unwelcome and embarrassed. Health services have to be sensitive to the needs and developmental attributes of adolescents to be able to attract them. Initiatives should be taken to develop adolescent-friendly health services and strengthening them. Parents should be involved in the reproductive education and one-to-one home-based counselling.

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# Outcome of Treatment of Locally Advanced Oral Cavity Cancer with Concurrent Chemo-Radiation in Comparison to Radiotherapy Alone

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# Abstract

According to the World Health Report 2004, Oral cancer is more common in developing than developed countries. At least 95% of the head-neck cancers are squamous cell carcinoma and arising most commonly in the oral cavity. Non operative treatment strategies for oral cancer involving radiation and chemotherapy continue to evolve with the most current trend being that of concurrent chemoradiotherapy. The study was conducted to compare the outcome of concurrent chemo-radiation therapy and radiotherapy alone in locally advanced squamous cell carcinoma of the oral cavity. The study was designed with 62 patients of squamous cell carcinoma of oral cavity and was divided into two study groups. Concurrent chemo-radiation group (Group A) consisting 31 patients treated by radiotherapy of 66 Gy in 33 fraction for 6.5 weeks and concurrent chemotherapy with three cycles of cisplatin (75mg/m<sup>2</sup>) per day 3 weeks apart . Another 31 patients (Group-B) were treated with radiotherapy alone by 66 Gy in 33 fractions for 6.5 weeks. Comparison between concurrent chemo-radiation and radiotherapy alone were studied. In this study, in chemo-radiotherapy group (Group-A) complete response (CR) was found in 20 (64.52%) cases and partial response (PR) was found in 11 (35.48%) cases. In radiotherapy group (Group-B) complete response (CR) was found in 12 (38.71%) cases and partial response (PR) was found in 19 (61.29%) cases. It was found that complete and partial response was 100%. Calculated  $\chi^2$  value was 4.14 which is greater than the table value of  $\chi^2$  i.e. 3.84. Statistically the result was significant (P<0.05). So, for better treatment outcome concurrent chemoradiotherapy can be offered for loco-regionally advanced squamous cell carcinoma originating from oral cavity region.

Keywords: Chemo-radiation, Squamous cell carcinoma, oral cavity, Cisplatin.

# Introduction

Cancer is one of the major threats to public health in the developed world and increasing in the developing world. It is one of the major causes of morbidity and mortality among the non-communicable diseases in Bangladesh. Cancer is the sixth cause of mortality in Bangladesh and more than half of the cancer patients die within five years of diagnosis. In south-central Asia, cancer of the oral cavity ranks among the three most common types of cancer. At least 95% of the head-neck cancers are squamous cell carcinoma and arising most commonly in the oral cavity – about 55% are several histological types of oral cancers and around 90% are squamous cell carcinoma. Oral cancer may arise as a primary lesion originating in any tissues in the mouth or by metastasis from a distant site of origin or by extension from

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Dr. Hasnina Akter, Assistant Professor, Department of Oncology, Diabetic Association Medical College Hospital, Faridpur Email: hasnina.akter84@gmail.com. a neighboring anatomic structure, such as the nasal cavity<sup>1</sup>. The anatomical sites conventionally regarded as constituting the oral cavity are buccal mucosa, upper and lower alveolus, retro molar trigone, hard palate, tongue (anterior two thirds) and floor of the mouth<sup>2</sup>. As the oral cavity constitute the beginning of the upper aero digestive tract, important functions like mastication, speech, swallowing and respiration can be severely impaired by the development of a cancer in this location. A variety of etiological factors such as smoking, tobacco chewing, poor dental and oral hygiene and heavy consumption of alcohol have been linked to the development of this cancer. Tobacco use is the most important risk factor for oral cancer. In the treatment plan surgery, radiotherapy and chemotherapy play the major role'. Early and intermediate stage of disease can be cured with surgery and / or radiotherapy alone. Locally advanced disease required chemotherapy. For a long time, definitive radiotherapy has been standard treatment for locally advanced squamous cell carcinoma of head and neck<sup>4</sup>. Advances in surgical techniques continue to improve operative outcome, the overall morbidity associated with resection of advanced oral cancer remains substantial. Non operative treatment strategies involving radiation and chemotherapy continue to evolve with the most current trend being that of concurrent chemo-radiotherapy.

The main objective of the study is to demonstrate the outcome of concurrent chemo-radiation therapy in comparison to radiotherapy alone in locally advanced squamous cell carcinoma of the oral cavity.

## **Materials and Methods**

This was a randomized controlled trial from January to December 2015. Patient with oral cancer attended at the

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radiotherapy department of RMCH (Rajshahi Medical College Hospital) and DMCH (Dhaka Medical College Hospital) was included in the study according to the inclusion and exclusion criteria. Inclusion criteria: histologically proved squamous cell carcinoma of oral cavity; stage III or IV disease without distant metastasis, patients within age 18-70 years, patients having ECOG performance status score up to grade 2, both sex. Exclusion criteria: non- squamous cell carcinoma, prior treatment by radiotherapy or chemotherapy, patients with initial surgery (excluding diagnostic biopsy) of the primary site, patients dropped out or lost to follow up before completion of study, patients with double primaries, patients with uncontrolled infection, pregnant or lactating mother, prisoner. A total of 62 patients with histologically proved squamous cell carcinoma of oral cavity were selected according to the predefined inclusion/exclusion criteria and were divided into two groups. Every alternate patient was enrolled for each group. Group-A: 31 patients were treated with concurrent chemo-radiotherapy. Radiation dose of 66 Gy in 33 fractions 200 c Gy per day, 5 days in a week for 6.5 weeks by LINACmachine (6MV energy) and concurrent chemotherapy with cisplatin 75  $mg/m^2$  three weekly for 3 cycles. Group-B: 31 patients were treated with radiotherapy. Radiation dose of 66 Gy in 33 fractions (200 cGy per day, 5 days in a week for 6.5 weeks by LINAC machine (6MV energy). Data analysis was done by using SPSS (Statistical Package for Social Science) software program. Permissions were taken from the concerned department and institutional review board for the study.

# Results

 
 Table 1: Distribution of the respondents according Sociodemographic characteristics. n=62

		Therapy		
Socio-demographic characteristics		Chemoradiation (Group- A) %	Radiation (Group- B) %	
Age (years)	Up to 50	13 (41.94)	15 (48.39)	
	51-60	13 (41.94)	11 (35.48)	
	Above 60	5 (16.13)	6 (19.35)	
Sex	Male	15 (48.38)	15 (48.38)	
	Female	16 (51.61)	16 (51.61)	
Monthly family	< 10000 Tk	18 (58.06)	18 (58.06)	
income (Tk.)	10000-20000	8 (25.81)	9 (29.03)	
	>20000	5 (16.13)	4 (12.90)	
Educational	Illiterate	17 (54.84)	17 (54.84)	
status	Primary	8 (25.81)	12 (38.71)	
	Up to graduate	6 (19.35)	2 (6.45)	

Table 1 shows that, in case of Group A patients, mean age was  $52.58 \pm 12$  years and in Group B patients age was  $52.29 \pm 12.71$  years. According to sex 48.38% patients were male and 51.61% patients were female in Group A. In

Group B 48.38% patients were male and 51.61% patients were female.

Regarding monthly family income in Group A, <10000 Tk. was 58.06%, 10000-19999 Tk. was 25.81% and >20000 Tk. was 16.13%. In Group B, <10000 Tk. was 58.06%, 10000-19999 Tk. was 29.03% and >20000 Tk. was 12.90%. Most of the patients of both groups were illiterate (54.84%). Primary passed were 25.81% in Group A and 38.71% in group B. Upto graduate patients were 19.35% in Group A and 6.45% in Group B.



Figure1: Distribution of the respondents according to oral cavity cancer

Figure 1 shows among all the patients, 30 (48.39%) had cancer in buccal mucosa, 14 (22.58%) patients had cancer in tongue, 7 (11.29%) patients were in retromolar trigone, 5 (8.06%) patients were in lower alveolus, 3 (4.84%) patients were in hard palate, 2 (3.23%) patients were floor of the mouth, 1 (1.61%) patients had cancer in lip.



Figure 2: Distribution of patients according to risk factors

In group A as risk factor of smoking was found in 8 patients; smoking, betel nut and leaf in 5 patients; betel nut and leaf in 4 patients; betel nut, leaf and jorda in 5 patients; tobacco leaf (gul) in 1 patient; alcohol and smoking in 1 patient.7 patients were found with no risk factor. In group B as a risk factor of smoking was found in 7 patients; smoking, betel nut and leaf in 6 patients; betel nut and leaf in 3 patients; betel nut, leaf, and jorda in 9 patients; tobacco leaf (gul) in 2 patients; alcohol and smoking in 0 patient. 4 patients were found with no risk factor (Figure-2)



**Figure 3:** Distribution of the patient by the treatment group and tumor category (n=62)

Figure 3 shows- Out of patients 31 in Group A, 8 (25.80%) patients had T2, 17 (54.83%) patients had T3 and 6 (19.35%) had T4 tumour category. Out of patients 31 in Group B, 9 (29.03%) patients had T2, 17 (54.83%) patients had in T3 and 5 (16.13%) patients had T4 tumour category



**Figure 4:** Distribution of the patient by the treatment Group and nodal category (n=62)

Figure 4 shows- In Group A, nodal status were 9 (29.03%), 12 (38.70%), 10 (32.25%) for N0, N1, N2 respectively and in Group B, nodal status were 10 (32.45%), 10 (32.45%), 11 (35.48%) for N0, N1, N2 respectively (Figure-II)



Figure 5: Distribution of the patient by the treatment group and tumour stage

Figure 5 shows that, most of the patients presented with stage III oral cancer in both groups. In group A, 20 (64.51%) patients were in stage III and 11 (35.48%) patients were in stage IV. In group B, 22 (70.96%) patients were in stage III and 9 (29.03%) patients were in stage IV.

**Table 2:** Distribution of the oral cavity cancer patients by local examination findings of the tumour and the treatment Groups before treatment. n=62

Local examination findings of lump		Therapy		
		Chemoradiation (Group- A) N%	Radiation (Group- B) N%	
Tenderness	Present	25 (80.7%)	23 (74.1%)	
	Absent	06 (19.3%)	08 (25.8%)	
Bleeding	Present	12 (38.7%)	10 (32.2%)	
	Absent	19 (61.2%)	21 (67.4%)	
Fixation	Present	11 (35.4%)	08 (25.8%)	
	Absent	20 (64.5%)	23 (74.1%)	

Table 2 shows that, in Group A tenderness was present in (80.7%) of patients and in Group B tenderness was present in (74.1%) of patients. Bleeding was present in (38.7%) of patients in Group A and in (32.2%) of patients in Group B. In case of fixation, (35.4%) patients in Group A and (25.8%) patients in Group B had fixity of tumour.

**Table 3:** Comparison the effects of concurrent chemoradiation and radiation on oral cavity tumour size by weekly

Time of treatment	Comparison group	Mean tumour (cm)	Mean differences (cm)	t value	p valuep <0.05
Before treatment	Chemo- radiation	3.60	-0.08	-0.279	Not significant
	Radiation	3.68			
1 <sup>st</sup> week	Chemo- radiation	3.31	-0.15	-0.543	Not significant
	Radiation	3.46			
2 <sup>nd</sup> week	Chemo- radiation	3.03	-0.17	-0.69	Not significant
	Radiation	3.20			
3 <sup>rd</sup> week	Chemo- radiation	2.61	-0.24	-0.98	Not significant
	Radiation	2.85			
4 <sup>th</sup> week	Chemo- radiation	2.12	-0.34	-1.52	Not significant
	Radiation	2.46			
5 <sup>th</sup> week	Chemo- radiation	1.58	-0.48	-2.16	Significant
	Radiation	2.06			
6 <sup>th</sup> week	Chemo- radiation	0.94	-0.64	-2.97	Significant
	Radiation	1.58			
6 weeks after	Chemo- radiation	0.46	-0.55	-2.77	Significant
treatment	Radiation	1.01			

Before the treatment mean tumour size in Group A was 3.60 cm and 3.68 cm in Group B. No significant differences were seen before treatment. It was noted that, P value decreases weekly and at  $5^{th}$  week, it tend to become significant. At  $6^{th}$  week and 6 weeks after treatment the reduction of tumour size between two groups became statistically significant (Table-3)

**Table 4:** Overall treatment response on oral cavity cancer(n=62)

Type of treatment	Treatmen	t response	Total N (%)
	Complete response N (%)	Partial response N (%)	
Chemo-radiation	20 (64.5%)	11 (35.5%)	31 (50%)
Radiation	12 (38.7%)	19 (61.3%)	31 (50%)
Total n (%)	32 (51.6%)	30 (48.4%)	62 (100%)
3			

 $\chi^2$ =4.14, df=1, p = <0.05

Table 4 shows that among the patient of Group A (concurrent chemo-radiation), 64.5% of them had complete response and 35.5% had partial response by concurrent chemo-radiotherapy. Among the patients of Group B (radiotherapy), 38.7% of them had complete response and 61.3% had partial response by radiotherapy alone. This table also showed that the response by chemo-radiotherapy in Group A was much better than radiotherapy alone in Group B, which was statistically significant (p<0.05).



Figure 6: Complete response according to stage

Figure 6 shows that it was found that in case of stage III patients 15 (48.38 %) complete response found in Group A and 8 (25.80 %) complete response found in Group B patients. For stage IV 5 (16.12%) complete response found in Group A and 4 (12.90%) in Group B patients.

# Discussion

The study was done to compare the effects of concurrent chemo radiotherapy and radiotherapy alone, and to observed the loco-regional control and early side effects in treating locally advanced oral cavity cancer.

In this study most of the patients in the both groups are between the ages of 30-60 years. In Group-A mean age was  $52.58 \pm 12.42$  years and in Group-B mean age was  $52.29 \pm 12.71$  years respectively. This observation correlates with Perez et al (2013) and DeVita et al (2014)<sup>5.6</sup>.

The Meta-Analysis of Chemotherapy on Head and Neck Cancer (MACH-NC) included 63 randomized trails published from 1965 to 1993, all of which compared locoregional treatment with or without chemotherapy, here survival benefit diminished with patient age and , on subset analysis, was not significant in patients over 70 years of age. Head and neck cancers are very rare below 18 years of age, so 18 to 70 years age group was considered in this study.

Regarding the site of involvement in both groups, it revealed that buccal mucosa and oral tongue were major primary sites. Buccal mucosa cancer was found in 30 (48.39%) patients and oral tongue cancer in 14(22.58%) patients. In USA. The most common subsite for squamous cell carcinoma of the oral cavity cancer is the oral tongue. In a review of 3,308 cases of oral cavity cancer treated at the University of Texas M.D. Anderson Cancer Center between 1970 and 1999, 32% involved the oral tongue. The floor of the mouth is the second most common subsite where oral cavity carcinomas may arise. Similarly, carcinoma of the buccal mucosa is rare in the United States but it is the most common carcinoma of the oral cavity in South east Asia because of the widespread use of betel nut<sup>5</sup>. This reflects that there is a little bit variation of disease distribution in this study due to random sampling.

In the study in both groups 25.8% patients had long history of smoking with or without habit of betel nut and leaf, 16.12% of them had habit of betel leaf, nut and jorda. 3.22% of patient gave history of consuming tobacco leaf (gul). Consumption of alcohol is only in 1.5% patient due to rate of alcohol consumption in Bangladesh is lower than Western countries. There is a strong causal relationship between smoking and cancer of the oral cavity. Smoking is identified as an independent risk factor in 80% to 90% of patients. Tobacco users have a fivefold to 25-fold higher risk of oral cavity and oropharyngeal cancer. Cessation of smoking is associated with a decline in the risk of cancer of the oral cavity. Abstaining from the use of cigarettes results in a 30% reduction in the risk of cancer in those who quit after 1 to 9 years; the risk is reduced by 50% in those who quit for more than 9 years. In India the habit of chewing betel nut leaves rolled with lime and tobacco (mixture known as "pan"), which results in prolonged carcinogen exposure to the oral mucosa, is thought to be the leading cause of oral cancer. The practice of "reverse smoking" (smoking with the lighted end of the cigar in the mouth, also known as Chutta), peculiar to certain parts of India, is associated with an increase in cancer of the hard palate. The combined use of alcohol and tobacco may have a synergistic effect on carcinogenesis'.

In this study most of the patients of both groups came from lower socioeconomic class. In Group-A 58.06 % came from lower socioeconomic class, 25.81% from middle class and 16.13% from upper class. In Group-B 58.06% patients came from lower socioeconomic class, 29.03% from middle class and 12.90% from upper class. The reason more number of low to middle class patients were may be due to that, higher class patients can go to private sector or aboard to get treatment by cost of money which is not possible for low to middle class patients.

In case of oral cancer male: female ratio is 2:1<sup>7</sup>. In my study, Male: Female ratio of oral cancer is 2: 2.1. In our country smoking is less in female and habit of ignorance of disease is high. So very few poor female patients came to hospital for treatment.

After clinical staging it has been observed that patients of group A 20 (64.51%) patients were in stage III and the remaining 11(35.48%) patients were in stage IV. In arm B, 22(70.96%) patients were in stage III and 9(29.03%) patients were in stage IV. In this study it was found that in case of stage III patients 15 (48.38%) complete response found in group A and 8(25.80%) complete response found in group B patients. For stage IV 5 (16.12%) complete response found in group A and 4 (12.90%) in group B patients.

In group-A, patients treated with concurrent chemo radiotherapy, complete response (CR) observed in 20 (64.5%) out of 31 patients. In Arm-B, treated with radiotherapy, complete response (CR) observed in 12 (38.7%) out of 31 patients. the response by chemo-radiotherapy in group A was much better than radiotherapy alone in group B, which was statistically significant (p<0.05).

# Conclusion

Oral cavity squamous cell carcinoma is relatively common, curable and controllable disease. Radiotherapy gives good control with preservation of organ function and cosmetic outcome. Result of treatment with concurrent chemo-radiotherapy is comparable to surgical management. Platinum based cytotoxic agents; Cisplatin gave better result providing significant local control of disease in this study. Significant better result was noted in primary cancer developed from oral cavity of stage III and IV disease. So for better treatment outcome concurrent chemo-radiotherapy can be offered for loco-regionally advanced squamous cell carcinoma originating from oral cavity region. In conclusion it may be said that concurrent chemo-radiotherapy is more effective than radiotherapy alone in loco-regional control of oral cavity cancers.

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# Study on Knowledge, Attitude and Practice of Mothers on the Use of Oral Rehydration Salt (ORS) in Children with Diarrhoea

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# Abstract

This descriptive cross sectional study was carried out among 394 purposively selected mothers in a rural area of Jakigong, Sylhet to study the status of knowledge, attitude and practice of mother on Oral Rehydration Salt (ORS) in diarrhoea. Data were collected by face to face interview by using a semi structured questionnaire. About 68.3% mothers defined diarrhoea appropriately and majority (88.8%) of the respondents used ORS till diarrhea cure. Among the respondents majority (93.4%) said right answer and rest (6.4%) of them gave wrong answer regarding amount of water use for ORS preparation. About 16.5% used boiled cool water, 11.2% used tap water and 72.3% were used tube-well water to dissolve packet ORS. Only 37.6% mothers use ½ liter water bottle for measuring of water. Although 33% knew that the prepared ORS could be used for 6 hours and 28.4% didn't know about it. Most (82.7%) of the mother used handmade ORS when packed ORS were not available. About 95.5% reported that ORS is good in diarrhea and 86% did not stop ORS feeding during diarrhea. About half of the respondents consult with their doctor, 47.7% feed at home and only 1.5% waits when their children suffer from diarrhoea and dehydration. About 58.6% did not stop ORS feeding during vomiting and 41.4% stopped it during vomiting. Among all the respondents 72.1% used anti-diarrheal drug during diarrhea and 27.9% didn't use any drug. Awareness campaigns can improve the use of ORS and can pay regular visits by the health workers can improve knowledge, attitude as well as practice regarding the use of ORS among rural people.

Keywords: Diarrhoea, Oral Rehydration Salt (ORS), Knowledge, Attitude, Practice

# Introduction

Diarrhoea, is the condition of having at least three loose or liquid bowel movements each day. It often lasts for a few days and can result in dehydration due to fluid loss. About 1.7 to 5 billion cases of diarrhoea occur per year. It is most common in developing countries, where young children get diarrhoea on average three times a year. Total deaths from diarrhoea are estimated at 1.26 million in 2013 – down from 2.58 million in 1990.<sup>1</sup>

In 2012, it was the second most common cause of deaths in children younger than five (0.76 million or 11%). Frequent episodes of diarrhoea are also a common cause of malnutrition and the most common cause in those younger than five years of age.<sup>2</sup>

Each episode deprives the child of the nutrition necessary for growth. As a result, diarrhoea is a major cause of

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Prof. Monowar Ahmad Tarafdar, Department of Community Medicine, ZH Sikder Women's Medical College, Dhaka. Email: babla762@yahoo.com malnutrition, and malnourished children are more likely to fall ill from diarrhoea. Diarrhoea can be treated with a solution of clean water, sugar and salt, and with zinc tablets.<sup>3</sup>

The leading cause of death from acute Diarrhoea is the loss of water and essential minerals, which can be compensated in most cases by an oral rehydration solution (ORS).<sup>4-6</sup>

ORS does not stop diarrhoea but replaces the lost fluids and essential salts, thus preventing or treating dehydration. Glucose in the ORS helps intestine absorb the fluid and salts more efficiently. ORS alone is an effective treatment in 90% of the diarrhoea patients. It is on the WHO lists of essential medicines.<sup>7</sup>

## **Materials and Methods**

This is a Descriptive type of cross sectional study conducted at Jaintapur Upazila health Complex and surrounding areas, Sylhet during the period of October 2017 to March 2018 with a sample size of 394 to study the status of knowledge, attitude and practice of mother on ORS in diarrhoea. The respondents were women having at least one child through purposive sampling technique using a pretested semi structured questionnaire and method was face to face interview. After cleaning, the data were analyzed with the help of SPSS software and presented accordingly.

## Results

After analysis data were presented through following table and charts:

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**Figure 1:** Distribution of the respondents by age group (n=394)

Figure-1 shows that 215(54.57%) respondents were within 18-27 years age group and 32(8.12%) were 48-57 years age group.



**Figure 2:** Distribution of the respondents by Religion (n=394)

Figure 2 shows that most 386(97.96%) of the respondents were Muslims

Table 1: Distribution of the respondents by level of education (n=394)

Level of education	Frequency	Percentage
Illiterate	146	37.1
Primary	148	37.6
Secondary	97	24.6
Bachelor and Above	3	0.7
Total	394	100

Table 1 shows that 148(37.6%) respondents were primary school pass and only 3(0.7%) had bachelor and above level degree.



**Figure 3:** Distribution of the respondents by occupation (n=394)

Figure 3 shows that 350(88.83%) respondents were housewife whereas only 2(0.50%) were service holder.

**Table 2:** Distribution of the respondents by number of the children in their family

No of the children	Frequency	Percentage
1-3	238	60.4
4-7	156	39.5
Total	394	100

Table 2 shows that among all the respondents 238(60.4%) had 1-3 child in their family

**Table 3:** Distribution of the respondents by their knowledge about methods of rehydration (n=394)

Knowledge about methods of rehydration	Frequency	Percentage
Rehydration salt	93	23.6
Anti-diarrheal drug	246	62.4
Glucose	6	1.5
Water	7	1.8
Don't know	42	10.7
Total	394	100

Table 3 shows that 246(62.4%) knew that ORS is an antidiarrheal drug, 93(23.6%) said it is rehydration salt.

**Table 4:** Distribution of the respondents by theirknowledge about diarrhea (n=394)

Knowledge about diarrhea	Frequency	Percentage
Loose stools >3/day	269	68.3
Loose stools <3/day	65	16.5
Don't know	60	15.2
Total	394	100

Table 4 shows that most 269(68.3%) of the respondents reported that diarrhoea means passage of loose stools >3 times/day, 65(16.5%) respondents reported passage of loose stools <3 times/day and 60(15.2%) don't know about it.

**Table 5:** Distribution of the respondents by knowledge of correct quantity of water for ORS preparation (n=394)

Knowledge of correct quantity of water for ORS preparation	Frequency	Percentage
1 liter	22	5.6
500 ml	368	93.4
Don't know	4	1
Total	394	100

Table 5 shows that 368(93.4%) knew the correct quantity of water (500 ml) for preparation of ORS.



**Figure 4:** Distribution of the respondents by their opinion about duration of ORS use for correction of dehydration (n=394)

Figure 4 shows that majority 350(88.8%) respondent know that ORS should be used till cure of diarrhea.



**Figure 5:** Distribution of the respondents by sources of water using for ORS preparation

Figure 5 shows that majority 285(72.33%) respondents used tube-well water for ORS preparation and 44(11.16%) use tap water.

**Table 6:** Distribution of the respondents by using water measuring tools for preparing ORS (n=394)

Tools for measuring water	Frequency	Percentage
Drinking glass	110	27.9
Drinking mug	136	34.5
<sup>1</sup> / <sub>2</sub> liter water bottle	148	37.6
Total	394	100

Table 6 shows that for measuring water about 110(27.9%) respondents used drinking glass, 136(34.5%) used drinking mug and 148(37.6%) used  $\frac{1}{2}$  liter water bottle.

 Table 7: Distribution of the respondents by knowledge about duration of using prepared ORS (n=394)

Time	Frequency	Percentage
6 hours	130	33
12 hours	151	38.3
24 hours	1	0.3
Don't know	112	28.4
Total	394	100

Table 7 shows that 38.3% of the respondents new the exact time (within 12 hours) for using ORS, followed by 6 hours (33%) and 28.4% did not know the exact time for using prepared ORS.

**Table 8:** Distribution of the respondents by practice of<br/>ORS during diarrhoea (n=394)

Characteristics	Frequency	Percentage						
Use handmade ORS when packed ORS is not available								
Yes	326	82.7						
No	68	17.3						
Measures taking when the child gets diarrhea								
Use drugs	17	4.30						
Use drugs and ORS	328	83.25						
Use only ORS	49	12.45						
Water used for preparing oral saline								
Boiled cooled water	65	16.5						
Tap water	44	11.2						
Tube well Water	285	72.3						
Duration of ORS use								
Till diarrhea is cured	350	88.8						
Only on the same day	44 11.2							
Have prepared ORS previously								
Yes	337	85.5						
No	57	14.5						

Table- 8 shows that 326(82.7%) used handmade ORS when packed ORS were not available, 17(4.3%) used drugs, 285(72.3%) use tube-well water and 57(14.5%) had no idea about handmade ORS

Characteristics	Frequency	Percentage	
Efficacy of ORS			
Good in diarrhea	376	95.5	
Useless	10	2.5	
No idea	8	2.0	
Continuation of ORS during diarrhea			
Do not stop ORS during diarrhea	339	86.0	
Stopped ORS if not improved	53	13.5	
No idea	2	0.5	
Consult doctor during diarrhea			
Consult doctor	200	50.8	
Give ORS at home	188	47.7	
Only wait	6	1.5	
Stopped ORS if there is vomiting			
Continue ORS during vomiting	231	58.6	
Stopped during vomiting	163	41.4	
Use of anti-diarrhoeal drugs			
Yes	284	72.1	
No	110	27.9	

**Table 9:** Distribution of the respondents by attituderegarding ORS during diarrhea (n=394)

Table 9 shows that 376 (95.5%) respondents reported that ORS is good in diarrhea. It also explored that 339(86.0%) did not stop ORS feeding during diarrhea, 200(50.8%) consult their doctor, It was also found that 231(58.6%) did not stop ORS feeding during vomiting and 284(72.1%) used anti-diarrhoeal drugs during diarrhea.

# Discussion

The study population included mothers were within the age group of 18-57 years, majority (54.57%) of them were among 18-27 years age group. More than half (60.4%) of the women had 1-3 children and 88.8% women were housewife. About 37.1% were illiterate and 37.6% studied up to primary level. Most (98%) of the respondents were Muslim. Almost similar findings were observed by Akhtaruzzaman M *et al* in 2015 at Mymensingh.<sup>8</sup>

The study reveals that, more than half (62.4%) of the respondents thought that ORS is anti diarrhoeal drug and only 23.6% respondents had correct knowledge that it is Rehydration salt. Around 85.5% of the respondents prepared packed ORS previously. Similar finding was observed in a study named 'Maternal knowledge, attitude and practices towards diarrhea and oral rehydration therapy in rural Maharashtra' where the results revealed that 90.7% of mothers were aware of ORS but only 60% of mothers practiced it.<sup>9</sup>

The study also shows that majority of the respondents 350(88.8%) used ORS till diarrhea is cured; remaining 11.2% used it only in the same day. It is also revealed that 93.4% knew that exact amount of water needed to prepare ORS. The result shows that 16.5% used boiled cooled water, 11.2% tap water and 72.3% used tube-well water to prepare packet ORS. Similar findings were observed in a study Malawi in the year 2015 by Essomba NE *et al.*<sup>10</sup>

When asked regarding duration of using the packet ORS, more than one third (38.3%) knew that the prepared ORS could be used for 12 hours, 33% used for 6 hours, and 28.4% don't know the exact duration. A very distinct different finding was observed by Muthulakshmi M. and Gopalakrishnan S. in Kancheepuram district, Tamil Nadu, India in the year 2017 where almost 87% of the mothers had a good practice of not storing the ORS for more than 24 hours.<sup>11</sup>

On the inquiry for the substances used other than ORS when it is not available, majority (82.7%) used handmade ORS, 4.3% used drugs and 13% didn't knew about it. Moreover, 58.6% did not stop ORS feeding during vomiting and 41.4% stopped it during vomiting. This result is consistent with the findings of the study conducted by Akrem Mohammad Al-Atrushi et al.<sup>12</sup>

# Conclusion

The knowledge and the use of ORS in diarrhoea by the study sample were insufficient. Awareness campaigns can be carried out in order to improve the use of this effective intervention for diarrhoea. The health workers should pay a regular visit to the rural community and knowledge, attitude as well as practice regarding the use of ORS should be improved by health education.

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# Health and Environmental Sustainability: Public Health Issues for Present and Future

Tarafdar MA

# **Executive summary**

AThe medical definition of environmental causes of diseases would be all those factors that are not genetic. Environmental factors include all those factors those affect human health mediated by social conditions and individual choice or environment. 'Sustainable' includes the environmental issues and 'development' includes the economic issues. Climate change alters or disrupts natural systems, making it possible for vector, water, and food-borne diseases to spread or emerge. Climate change can affect the incidence of diseases associated with air pollutants and aeroallergens. Clean air is considered to be a basic requirement of human health and well-being. Poverty increases vulnerability to climate-sensitive health outcomes directly by reducing the capacity to adapt to changing conditions. For countries in the early stages of development the major environmental hazards to health are associated with widespread poverty and severe lack of public infrastructure, such as access to drinking water, sanitation, and lack of health care as well as emerging problems of industrial pollution and also urban waste based pollution. A healthy population is a prerequisite for a productive and creative society, which in turn is needed to sustain national development. Social determinants affect the environmental conditions of an individual and may contribute to the fact that specific individuals or population groups more often experience less adequate or potentially harmful environmental conditions; may directly affect exposure beyond and in addition to the exposure. Enhancing environmental sustainability, through reducing carbon emissions, curtailing waste, and managing resources efficiently, will deliver healthy outcome, and provide broader social and economic benefits.

Keywords: Environment, Sustainability, Public Health.

## Introduction

The strict medical definition of environmental causes of diseases would be all those factors that are not genetic. This is the classic dichotomy between "nature" and "nurture," in which environmental factors include all those that affect the organism after conception regardless of whether they are mediated by social conditions and individual choice or through environmental media. Even mutation, natural selection, and other mechanisms of evolution have changed the genetic composition of humanity according to environmental conditions existing in the past.<sup>1</sup>

The term sustainable development, as originally conceived by the 1987 World Commission on Environment and Development (the "Brundtland Commission"), was meant to entail "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs". It was coined as part of an effort to bring "environmental" issues into the mainstream of development, recognizing that in order to address the escalating problems related to the environment, the root causes which lay in the broader development process and the global economic system needed to be addressed.<sup>2</sup>

As originally articulated, 'sustainable' captures the environmental issues (assumed to centre on the needs of *future* generations), while 'development' captured the

#### Correspondence to:

economic/poverty issues (assumed to centre on the needs of the *present* generation). The concept has since been broadened, in recognition of the non-environmental aspects of sustainability, and the non-economic aspects of development.<sup>3</sup>

Climate change can affect health directly and indirectly. Directly, extreme weather events (floods, droughts, windstorms, fires, and heat waves) can affect the health of people and cause significant economic impacts. Indirectly, climate change can alter or disrupt natural systems, making it possible for vector, water, and food-borne diseases to spread or emerge in areas where they had been limited or not existed, or for such diseases to disappear by making areas less hospitable to the vector or pathogen. Climate change can also affect the incidence of diseases associated with air pollutants and aeroallergens. The cause-and-effect chain from climate change to changing patterns of health outcomes is complex and includes factors such as initial health status, financial resources, effectiveness of public health programs, and access to medical care. Therefore, the severity of future impacts will be determined by changes in climate as well as by concurrent changes in non-climatic factors and by adaptations implemented to reduce negative impacts.4

There is increasing recognition that environment and health impacts require economic assessment in order to receive adequate consideration in policy. Studies confirm that approximately one-quarter of the global disease burden, and more than one-third of the burden among children, is due to modifiable environmental factors.

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Preventing disease through healthy environments: Towards an estimate of the environmental burden of disease.<sup>5</sup>

Clean air is considered to be a basic requirement of human health and well-being. However, air pollution continues to pose a significant threat to health worldwide. According to a WHO assessment of the burden of disease due to air pollution, more than two million premature deaths each year can be attributed to the effects of urban outdoor air pollution and indoor air pollution (caused by the burning of solid fuels). More than half of this disease burden is borne by the populations of developing countries.<sup>6</sup>

Climate variability records suggest ambient temperature change will affect domestic water supply from surface water source. Therefore, it seems reasonable to speculate that global scale climate variability may influence water supply in river basins around the world. River basin managers seek tools to address climate variability.<sup>7</sup>

Poverty, which was identified as a risk factor, increases vulnerability to climate-sensitive health outcomes directly by reducing the capacity to adapt to changing conditions and is often positively correlated with increasing susceptibility to climate-sensitive health outcomes. Because the conditions associated with being poor may change over time, the future risk associated with being poor also may change. The degree of risk associated with being poor so changes in the number of people living in poverty and their associated standard of living, both of which are uncertain.<sup>8</sup>

Table	1:	Mecha	anism	hv	which	above	average	and	helow	average	rainfall	can	affect	health
Table	1.	WICCH	am5m	Uy	wmen	abbvc	average	anu	UCIOW	average	rannan	Can	ancei	ncann

Event	Туре	Description	Potential health impact	
Heavy precipitation event	Meteorological	Extreme event	Increased mosquito abundance or decreased (if breeding sites are washed out)	
Flood	Hydrological	River/stream over tops its banks	Changes in mosquito abundance, contamination of surface water	
Flood	Social	Property or crops damage	Changes in mosquito abundance, contamination of surface water with faecal matter and rat urine (leptospirosis)	
Flood	Catastrophic flood/ disaster	Flood leading to >10 killed, and/or government call for external assistance	Changes in mosquito abundance, contamination of surface water with faecal matter and rat urine and increased risk of respiratory and diarrhoeal disease deaths, drowning, injuries, health effects associated with population displacement, loss of food supply and psychosocial impacts.	
Drought	Meteorological	Evaporation exceeds water absorption, soil moisture decreases.	Changes in vector abundance if vectors breed in dried up river beds, for example	
	Agricultural	Drier than normal conditions leading to decreased crop production	Depends on socio-economic factors, i.e. other sources of food available and the means to aquire them.	
	Social	Reduction in food supply or income, reduction in water supply and quality.	Food shortage, illness, malnutrition, increased risk of infection.	
	Food shortage/famine/ drought disaster	Food shortage leading to deaths >10 killed, and/or government call for external assistance.	Deaths (starvation), malnutrition (increases risk of infection) health impacts associated with population displacement. <sup>9</sup>	

Climate is a key determinant of health. Climate constrains the range of infectious diseases, while weather affects the timing and intensity of outbreaks. A long-term warming trend is encouraging the geographic expansion of several important infections, while extreme weather events are spawning 'clusters' of disease outbreaks and sparking a series of 'surprises'. Ecological changes and economic inequities strongly influence disease patterns. But a warming and unstable climate is playing an everincreasing role in driving the global emergence, resurgence and redistribution of infectious diseases.<sup>10</sup>

However, huge economic development and population growth result in continuing environmental degradation. Intensification of agriculture, industrialization and increasing energy use are the most severe driving forces of environmental health problems. For countries in the early stages of development the major environmental hazards to health are associated with widespread poverty and severe lack of public infrastructure, such as access to drinking water, sanitation, and lack of health care as well as emerging problems of industrial pollution and also urban waste based pollution.<sup>11</sup>

Since many of the key determinants of health and disease provide insights into the fundamental problems in health transition, whilst an epidemiological transition enhances our concepts of diseases that are continuously evolving in diverse ways with many scientific investigations and findings supported, refined and unfolded our progressive understandings in the influence of the eco-environments on human health. Consequently, ecological reasoning as a developing theme in the sciences and arts, which must apply to epidemiology for an appreciation of complexity in the enhancement of public health thinking that human and ecosystems health is interdependent.<sup>12</sup>

The emergence of the concept of sustainable development as a guiding principle for policy formulation, the adoption at the UN Conference on Environment and Development (UNCED) in 1992 of Agenda 21, and subsequent adoption of the Programme for the Further Implementation of Agenda 21, have been important stimuli at international, national and local levels, for innovative programmes of action to address current environment, health and development problems. The Rio Declaration, for example, states that, "Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature." Further, Chapter 6 of Agenda 21 emphasizes the fundamental commitment within sustainable development to "protecting and promoting human health".<sup>3</sup>

Today, one-half of the world's population is exposed to malaria on a daily basis. Deforestation, drug and pesticide resistance and inadequate public health measures have all contributed to a recent resurgence. Warming and extreme weather add new stresses. Dynamic models project that the warming accompanying the doubling of atmospheric CO2 will increase the transmission capacity of mosquitoes some 100-fold in temperate zones, and that the area capable of sustaining transmission will grow from that containing 45% of the world's population to 60%.<sup>10</sup>

Since environmental health aims to protect not only present but also future generations, is very much in line with the concept of sustainable development, which is defined by the Brundtland Report as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". This link between environmental health and sustainable development needs to be emphasized, and national and global policies in these areas should be complementary and mutually beneficial. A healthy population is a prerequisite for a productive and creative society, which in turn is needed to sustain national development. Uncontrolled and unsustainable development that overexploits the natural environment and its resources, however, is a major cause of environmental health problems.<sup>13</sup>

The prevalence of human diseases and is increasing rapidly worldwide, as is the number of deaths from diseases. The ecology of increased disease is exceedingly complex because of the diversity of infectious organisms and the effects of environmental degradation on the prevalence of disease. The rapid expansion of human populations is a major factor in the rise of human diseases: Humans living in crowded, urban areas are in an ecosystem that is ideal for the resurgence and rapid spread of old diseases as well as for the development and spread of new diseases. The unprecedented increase in air, water, and soil pollutants, including organic and chemical wastes, further stresses humans and increases disease prevalence. In particular, widespread malnutrition enhances the susceptibility of humans to infectious pathogens and other diseases. Global climate changes enhance the development of some disease vectors, increase the susceptibility of food crops to some pests and intensify food shortages and malnutrition. A concurrent problem is the rapid expansion in the number of "environmental refugees", living in poverty and desperate for food, flee their home areas in a search for survival. Their malnutrition, stress, and dislocation foster the resurgence of old diseases and the development of new ones.<sup>14</sup>

Several concurrent crises have either sprung up or accelerated during the last decade: crises in climate, biodiversity, fuel, food, water, and of late in the financial system and the economy as a whole. Accelerating climate-changing emissions indicate a mounting threat of runaway climate change, with potentially disastrous human consequences.<sup>15</sup> Socio-economic status (SES) plays a role in the susceptibility of a population to air pollution; people with a lower SES appeared to have an increased risk of death from respiratory causes, particularly COPD. Compared with the general population, infants and young children appeared to be more susceptible.<sup>16</sup>

Social determinants affect the environmental conditions of

an individual and may contribute to the fact that specific individuals or population groups more often experience less adequate or potentially harmful environmental conditions; may directly affect exposure beyond and in addition to the exposure. Given the same exposure, (socially) disadvantaged groups could show more severe health effects.<sup>17</sup>

Protecting and creating healthy environments is a critical component of sustainable development. Environmental health can be integrated into sustainable development by Improving environmental quality for the poorest populations with the greatest burden of environmental diseases, by reducing exposures to air pollution in homes and villages from biomass burning, and providing clean water and sanitation, identifying efforts to address environmental problems that can also provide health benefits. For example, creating environments that encourage biking and walking for transportation reduces greenhouse gas and toxic air pollution emissions (environmental benefit) and increases physical activity (health benefit) and above all recognizing that some policies, practices, and technologies designed to promote sustainability and economic development may have unintended adverse environmental health effects, and attempting to prevent or mitigate these before they are implemented.<sup>18</sup>

Achieving environmental sustainability in health care is essential to improve the way health system functions.

Enhancing environmental sustainability, through reducing carbon emissions, curtailing waste, and managing resources efficiently, will deliver better outcomes for patients, and provide broader social and economic benefits.<sup>19</sup>

The environmental health community can make three key contributions to achieving sustainable development objectives: 1) supporting efforts to reduce modifiable environmental exposures that continue to perpetuate poverty in low- and middle-income countries (LMICs);2) characterizing the environmental impacts of existing industries, technologies, and land-use patterns that are harmful to human health and 3) foreseeing potential unintended health effects of "green" technologies, industries, and occupations that will evolve out of efforts to promote sustainability.<sup>20</sup>

# Conclusion

Environmental factors affect directly and indirectly on human health, that needs to be addressed. More ever industrial pollution and effective urban waste management can be considered & pre-requisite for a sustainable productive population in creating healthy society. Thus it will promote quality of life including economic benifits in par

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# Gastroduodenal Intussusception of a Gastrointestinal Stromal Tumour

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## Abstract

Gatruduodenal Intussception is a very rare clinical entity reported in the literature. This is a rare case in a 8 year old boy who presented with features of recurrent fever, vomiting and Jaundice. A gastroduodenal intussusception of a large gastric stromal tumour, which presented with intermittent abdominal pain and gastric outlet obstruction. Pre-operative diagnosis was made on abdominal ultrasound and confirmed at laparotomy and histopathological examination.

Keywords: Intussusception, Laparotomy, Gastrointestinal stromal tumour (GIST).

# Introduction

An intussusception occurs when one portion of the gut invaginates into an immediately adjacent segment; almost invariably, it is the proximal into the distal. The condition is encountered most commonly in children, with a peak incidence between 5 and 10 months of age. Children with intussusception associated with a pathological lead point such as Meckel's diverticulum, polyp, duplication, Henoch–Schönlein purpura. After the age of 2 years, a pathological lead point is found in at least one-third of affected children. Adult cases are invariably associated with a lead point, which is usually a polyp, a submucosal lipoma or other tumour<sup>1</sup>.

In most children, the intussusception is ileocolic. In adults, colocolic intussusception is more common. The degree of ischaemia is dependent on the tightness of the invagination, which is usually greatest as it passes through the ileocaecal valve<sup>1</sup>.

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Dr. Md. Mazedur Rahman, Associate professor, Department of Surgery President Abdul Hamid Medical College, Kishoreganj. Email: drmazedb20@gmail.com Anterograde gastroduodenal intussusception is the rarest form of adult intussusception accounting for less than 10% of all intussusception cases in adults<sup>2</sup>. This rare presentation has been documented to be caused by pedunculated polyps<sup>3</sup>, Menetrier's disease<sup>4</sup>, hamartomas<sup>5</sup>, gastrointestinal stromal tumors<sup>6</sup>, and other gastric tumors. It is thought that luminal lesions act as a lead point for the anterograde prolapse of the gastric wall into the proximal duodenum<sup>7</sup>.

# Clinical presentation of the case

A male patient of 8 years old admitted into Prime Medical College Hospital, Rangpur on 05.05.2015 with the history of intermittent fever for 1 year, recurrent upper abdominal pain for 8 months, vomiting and jaundice for 8 months. Fever was 101-102° F and stay for 4-5 days, then reduced spontaneously and also by medication. Patients attendance give the history of upper abdominal pain with vomiting. Pain was colicky in nature increase after taking meal associated with vomiting. Vomiting projectile in nature, vomitus contain undigested food materials, copious amount, nonbilius and not mixed with blood. The patient also had jaundice which gradually increasing, associated with pale stool and weight loss. Clinical examination patient mildly anaemic, deep jaundiced, malnourished, upper abdomen distended an ill-defined mass present in epigastric region which is non tender and slightly moves with respiration, mild ascitis present, and normal bowel sound.

On investigation- CBC: WBC 23000/cumm, neutrophil 88%, Hb% 8.2gm/dl, serum bilirubin 3.7mg/dl, alkaline phosphatase 344 IU/l, USG show elongated bowel mass in upper and mid part of abdomen, most likely intussusceptions of small gut. Biliary tree dilated most likely due to kinking or narrowing of distal Common Bile Duct (CBD) of intussusceptions (Fig 1). The patient was managed as intussusceptions of small gut.

## **Management** approach

The patient attendance was counseled about the disease condition and was decided for laparotomy. Laparotomy done through upper right paramedian incision. Clear serous fluid comes on opening the abdomen. Duodenum and

proximal jejunum found hugely distended but distal jejunum and ileum found collapsed. Firm mobile mass feel within the duodenum and jejunum (Fig 2). On pressure from distal to proximal the mass was reduced and the mass then feel within the stomach. The stomach was open through anterior wall. A pedunculated mass found which was arised from the body of stomach along the greater curvature (Fig 3) with a base of about 6.5 cm. No gastric or celiac lymph nodes were enlarged. Wedge resection of the mass along with anterior & posterior wall of stomach and primary anastomosis made, specimen sent for histopathological examination. The postoperative course was uneventful and the patient was able to resume oral intake after 5<sup>th</sup> post operative day. Histologically, the resected tumor was composed of smooth muscle cells and fibroblast, arranged in interlacing bundles and fascicles i. e. benign gastrointestinal stromal tumour (GIST).



**Fig 1:** Ultrasonography finding of narrowing of distal Common Bile Duct (CBD) of intussusceptions



Fig 2: Mobile mass in abdomen



Fig 3: Pedunculated mass arise from body of the stomach

## Discussion

In gastroduodenal intussusception, a pedunculated benign gastric tumor is usually known to become the lead point<sup>8</sup>. Polyps constitute 40% and intramural smooth muscle tumors 40% <sup>9</sup>. In Japan, 143 cases of gastroduodenal intussusception caused by gastric tumors were reviewed <sup>10</sup>. About 67% of the tumors were epithelial tumors, such as an early gastric cancer and benign polyp. Intramural tumors, which were less common than epithelial tumors, comprised 25% of tumors. The tumors included 97 in the gastric antrum (68%), 36 in the gastric body (25%), and 10 in the gastric fundus (7%). While gastroduodenal intussusception is a rare clinical entity, tumors in the gastric body are less commonly associated with intussusception.

There were eight patients reported with ball valve syndrome secondary to a GIST in the gastric fundus and body. Seven patients were Japanese. The average age was 77 years (44–93), and 7/8 was women. The average maximum diameter of the tumors was 57 mm (32–87). Endoscopic reduction succeeded preoperatively in three tumors. Three tumors were resected laparoscopically, and the remaining five were resected at open surgery<sup>11</sup>.

GIST is a non-epithelial, mesenchymal tumor first described in 1983, and the majorities are gastric in origin<sup>12</sup>. <sup>13</sup>. The presentation of a GIST is usually nonspecific and depends on the size and location of the tumor. Small GISTs, 2 cm or less, are usually incidentally found during workup for other unrelated conditions because they are often asymptomatic. A gastric GIST causing duodenal obstruction is not common<sup>14</sup>. As described above, tumors located in the gastric fundus or body need to be submucosal and large to cause gastroduodenal intussusception. GISTs, which are not resected for any reason, often meet this condition. Therefore, we should pay attention to a possibility of this complication.

Surgical resection of GIST should be optimized to achieve a negative pathologic surgical margin while limiting the extent of gastric volume loss. A specific operative approach is selected based on the tumor size, location, and configuration. Since tumors in the gastric body which

cause gastroduodenal intussusception are usually large and show endophytic growth, an "exogastric resection" could significantly reduce the volume in the stomach. These tumors should be treated using an "intragastric" approach, with a gastrotomy in the anterior wall of the stomach and eversion of the mass, followed by a full thickness resection with a linear stapler or resection & anastomosis through the gastrotomy<sup>15, 16</sup>. The present patient was treated using open resection & anastomosis because of limitation of stapler use. In contrast, tumors reduced preoperatively can often be resected laparoscopically. The indications for laparoscopic resection should be considered carefully since these tumors are often larger than 5 cm. Current guidelines and consensus favor recommendations to maintain the principles for surgical resection without strictly limiting the indications for laparoscopic surgery based on size<sup>17</sup> However, five centimeters seem to be a practical reference.

# Conclusion

Gastroduodenal intussusception caused by GIST in the gastric body is a rare clinical entity. All patients previously reported presented with ball valve syndrome. Transgastric resection and anastomosis is possible. Many tumors were resected with an intragastric approach. The indications for laparoscopic surgery depend on the tumor size and whether endoscopic reduction is successful.

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