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Food Safety

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Food safety (or food hygiene) is used as a scientific method/discipline describing handling, preparation, and storage of food in ways that prevent foodborne illness. The occurrence of two or more cases of a similar illness resulting from the ingestion of a common food is known as a food-borne disease outbreak[1]. This includes a number of routines that should be followed to avoid potential health hazards. In this way, food safety often overlaps with food defense to prevent harm to consumers.

The tracks within this line of thought are safety between industry and the market and then between the market and the consumer. In considering industry-to-market practices, food safety[2] considerations include the origins of food including the practices relating to food labeling, food hygiene, food additives and pesticide residues, as well as policies on biotechnology and food and guidelines for the management of governmental import and export inspection and certification systems for foods. In considering market-to-consumer practices, the usual thought is that food ought to be safe in the market and the concern is safe delivery and preparation of the food for the consumer. Food safety, nutrition and food security are closely related. Unhealthy food creates a cycle of disease and malnutrition that affects infants and adults as well[3].

Food can transmit pathogens, which can result in the illness or death of the person or other animals. The main types of pathogens are bacteria, viruses, parasites, and fungus. Food safety issues and regulations concern: Agriculture and animal husbandry practices, Food manufacturing practices, Food additives, Novel foods, Genetically modified foods, Food label and Food contamination. A 2003 World Health Organization (WHO) report concluded that about 30% of reported food poisoning outbreaks in the WHO European Region occur in private homes[4]. According to the WHO and CDC, in the USA alone, annually, there are 76 million cases of foodborne illness leading to 325,000 hospitalizations and 5,000 deaths[5].

Safe food handling procedures (from market to consumer)

The five key principles of food hygiene, according to WHO, are[6]:

i) Prevent contaminating food with pathogens spreading from people, pets, and pests.
ii) Separate raw and cooked foods to prevent contaminating the cooked foods.
iii) Cook foods for the appropriate length of time and at the appropriate temperature to kill pathogens.
iv) Store food at the proper temperature.
v) Use safe water and safe raw materials.

Proper storage, sanitary tools and work spaces, heating and cooling properly and to adequate temperatures, and avoiding contact with other uncooked foods can greatly reduce the chances of contamination. Tightly sealed water and air proof containers are good measures to limit the chances of both physical and biological contamination during storage. Using clean, sanitary surfaces and tools, free of debris, chemicals, standing liquids, and other food types (different from the kind currently being prepared, i.e. mixing vegetables/meats or beef/poultry) can help reduce the chance of all forms of contamination. However, even if all precautions have been taken and the food has been safely prepared and stored, bacteria can still form over time during storage. Food should be consumed within one to seven (1–7) days while it has been stored in a cold environment, or one to twelve (1–12) months if it was in a frozen environment (if it was frozen immediately after preparation)[7,8]. The length of time before a food becomes unsafe to eat depends on the type of food it is, the surrounding environment, and the method with which it is kept out of the danger zone.

Always refrigerate perishable food within 2 hours—1 hour when the temperature is above 90°F (32.2°C).

Check the temperature of your refrigerator and freezer with an appliance thermometer. The refrigerator should be at 40°F (4.4°C) or below and the freezer at 0°F (-17.7°C) or below[9].

For example, liquid foods like soup kept in a hot slow cooker (149°F or 65°C) may last only a few hours before contamination[citation needed], but fresh meats like beef and lamb that are promptly frozen (-2°C) can last up to a year. The geographical location can also be a factor if it is in close proximity to wildlife. Animals like rodents and insects can infiltrate a container or prep area if left unattended. Any food that has been stored while in an exposed environment should be carefully inspected before consuming, especially if it was at risk of being in contact with animals. Consider all forms of contamination when deciding if a food is safe or unsafe, as some forms or contamination will not leave any apparent signs. Bacteria are not visible to the naked eye, debris (physical contamination) may be underneath the surface of a food, and chemicals may be clear or tasteless; the contaminated food may not change in smell, texture, appearance, or taste, and could still be contaminated. Any foods deemed contaminated should be disposed of immediately, and any surrounding food should be checked for additional contamination.

ISO 22000 is a standard developed by the International Organization for Standardization dealing with food safety. The ISO 22000 international standard specifies the requirements for a food safety management system that involves interactive communication, system management, prerequisite programs, and hazard analysis and critical control points principles. ISO 22000 was first published in 2005. It is the culmination of all previous attempts from many sources and areas of food safety concern to provide an end product that is safe as possible from pathogens and other contaminants. Every 5 years standards are reviewed to determine whether a revision is necessary, to ensure that the standards remain as relevant and useful to businesses as possible[10].

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ORIGINAL ARTICLE

Serum Vitamin D Status in Children with Respiratory Tract Infections

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Abstract

Background: Vitamin D is an essential component of bone and mineral metabolism; its deficiency causes growth retardation and skeletal deformities in children and osteomalacia and osteoporosis in adults. Several studies have shown that vitamin D has immunomodulatory properties which prevents the risk of respiratory tract infections (RTIs) in childhood. This study aimed to assess serum Vitamin D status and to find out its association with RTIs in children.

Methods: This cross sectional type of descriptive study was carried out during a period of 6 months from 1st October to 31st March 2024. 100 patients with 1 to 12 years of age suffering from RTIs attended at Kushtia Medical college Hospital Paediatric outdoor and the private chambers in Kushtia were included in this study by purposive sampling technique. Diagnosis was confirmed by history, clinical presentations and investigations. Data analysis was done using appropriate statistical methods.

Results: The mean age of the children was 6.04±3.24 years with more than half (58%) were male. 66% lived in rural area with mean monthly family income was17140.00±10978.42. The most common clinical presentation was cough & cold (92%), followed by pain in extremities (88%), anorexia (64%), fever (60%), body ache (44%), irritability (36%), chest pain (30%), headache (16%) and nausea & vomiting (12%). Among them 40% children were diagnosed as pneumonia, 20% cold & cough, 12% bronchiolitis and childhood asthma, 10% severe pneumonia and 6% tonsillitis. Among the children, 48% had vitamin D deficiency, 36% had vitamin D insufficiency and only 16% had vitamin D sufficiency state with mean 19.15±6.836 ng/ml. There was statistically moderate significant association between dietary behavior like frequency of taking cheese & milk, small fish and cereals with vitamin D status ($p < 0.05$) and highly significant association between frequency of eating fruits and vegetables with vitamin D status ($p < 0.001$). There was highly significant association between breast feeding in first 6 months and sun exposure history with vitamin D status ($p < 0.001$). The study showed statistically moderate significant association between sports history, H/0 past illness of RTIs with vitamin D status ($p < 0.05$).

Conclusion: Nevertheless, vitamin D is important at every stage of life, especially for rapidly growing infants and teenagers. Maintenance of adequate vitamin D status may be an effective and inexpensive prophylactic method against RTIs.

Keywords: Serum Vitamin D, Immunomodulatory properties, Respiratory Tract Infections, Children.

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Introduction

Vitamin D, or the "sunshine vitamin," is not just a vitamin; it is also a prohormone with numerous functions in the body[1]. A group of fat-soluble secosteroids are refers to "Prohormone". The two major forms are vitamin D_2, or ergocalciferol, and vitamin D_3, or cholecalciferol[2]. Vitamin D plays an important role in bone mineralization and other metabolic processes in the human body such as Ca and phosphate homeostasis and skeletal growth[3,4]. Vitamin D deficiency, for

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example, causes rickets in children, leading to skeletal abnormalities, short stature, delayed development or failure to thrive[1]. . In adults, low values of vitamin D are associated with osteomalacia, osteopenia, osteoporosis and subsequent risk of fractures[3]. Ultraviolet B wavelengths in sunlight trigger vitamin D synthesis in the skin by converting 7-dehydrocholesterol to cholecalciferol (vitamin D3), which enters the circulation[5]. Sun exposure is the main source of vitamin D in humans, as only a small amount is obtained from the diet[5]. Oily fish, dairy products, eggs and meat are the major dietary sources.

Worldwide, 4.5 million children die each year because of acute respiratory illnesses[6], and primary pneumonia and bronchiolitis are the most important causes of mortality and morbidity in children under 5 years of age in developing countries[7]. The seasonality of the disease hypothesized that a decrease in serum levels of vitamin D following a diminution in sunlight exposure was involved in the occurrence of infections[8,9]. Vitamin D plays a key role in activating the innate immune system, increasing mucociliary clearance, regulating epithelial cell production, and modulating inflammatory pathways[10,11]. Previous studies have suggested that vitamin D deficiency plays a role in increasing the incidence of respiratory infections, bronchitis, pneumonia, tuberculosis and even fever and neutropenia, rickets, osteomalacia, autoimmune diseases, type 1 and even type 2 diabetes, hyperproliferative skin diseases, rheumatoid arthritis, multiple sclerosis and cancer[12-14].

No consensus on the definition of vitamin D deficiency exists; however, most clinicians and researchers agree on the following stratifications based on the serum concentration of 25(OH)D: deficiency, <50.0 nmol/L or <20.0 ng/mL; insufficiency, 50.0–74.9 nmol/L or 20.0–29.9 ng/mL; and sufficiency, ≥75.0 nmol/L or ≥30.0 ng/mL[5,15,16,17]. Hypovitaminosis D (vitamin D insufficiency or deficiency) is observed not only in adults but also in infants, children, and adolescents and may have a significant impact on childhood health. Therefore, Vitamin D supplementation reduces the deficiency of this vitamin and decreases the rate of pneumonia, improves its prognosis, and can be associated with a significant reduction in child mortality[18].

Despite these numerous potential health effects, data on vitamin D status in childhood are limited. So the aim of the present study was to assess serum Vitamin D status in patients with respiratory tract infections in childhood.

Methods

This cross sectional type of descriptive study was carried out at the Kushtia Medical college Hospital Paediatric outdoor and the private chambers in Kushtia over a period 6 months from 1st October to 31st March 2024 among the children aged with 1 to 12 years. 100 purposively selected children were included according to inclusion criteria. Interviewer administered semi-structured questionnaire were used for data collection. Children with severe illness and whose parents/legal guardian didn't give consent were excluded. Demographic characteristics were collected. Diagnosis was confirmed by history, clinical presentations and investigations. In order to simplify data collection and data handling, data were collected via face to face interview technique. Data were entered and cleaned using SPSS version 25 for analysis. Mean and percentage were two measurements of descriptive statistics, which were used in most of the cases. The chi-square test was used to compare the variables and 'P' <0.05 was considered as level of significance.

Results

A total of 100 children aged from 1-12 years were participated in the study. Demographic data of children showed that majority (52%) were in the age group of 1-5 years with mean age being 6.04±3.24 years. More than half (58%) were male and majority (90%) were Muslim. 42% of the fathers and 50% mothers were educated up to class 6-12. 40% of the fathers occupation were business and majority of the mothers (86%) were housewives (Table no. I).

66% of children lived in rural area with the mean monthly family income of 17140.00±10978.42 BD taka. More than half (54%) of them belonged to poor & lower middle class family and 40% of them lived in semi pucca house (Table no. II).

Table I. Distribution of the children by their demographic characteristics (n = 100).

Demographic characteristics	Frequency (%)
Age (years)	
1-5	52 (52.0)
6-10	40 (40.0)
11 and above	8 (8.0)
Mean± SD = 6.04±3.24 yrs	
Gender	
Male	58 (58.0)
Female	42 (42.0)
Religion	
Islam	90 (90.0)
Sonaton	10 (10.0)
Fathers education	
Illiterate	18 (18.0)
Class 1-5	8 (8.0)
Class 6-12	42 (42.0)
Graduate plus	32 (32.0)
Mothers education	
Illiterate	28 (28.0)
Class 1-5	14 (14.0)
Class 6-12	50 (50.0)
Graduate plus	8 (8.0)
Fathers occupation	
Service	10 (10.0)
Business	40 (40.0)
Farmer	34 (34.0)
Day laborer	10 (10.0)
Others	6 (6.0)
Mothers occupation	
Housewife	86 (86.0)
Service	6 (6.0)
Day laborer	4 (4.0)
Others	4 (4.00

The most common clinical presentation was Cough & cold (92%), followed by pain in extremities (88%), anorexia (64%), fever (60%), body ache (44%), irritability (36%), chest pain (30%), headache (16%) and nausea & vomiting (12%) (Table no. III).

Among them 40% children were diagnosed as pneumonia, 20% cold & cough, 12% bronchiolitis and childhood asthma, 10% severe pneumonia and 6% tonsillitis (Figure. 1). Near about half (48%) the children had vitamin D deficiency, 36% had vitamin D insufficiency and only 16% had vitamin D sufficiency state (Figure. 2).

Table II. Distribution of the children by their Residence and economic status (n = 100).

Variables	Frequency (%)
Residence	
Urban	34 (34.0)
Rural	66 (66.0)
Monthly family income (Taka)	
≤15000	54 (54.0)
15001 – 30000	34 (34.0)
> 30000	12 (12.0)
Mean± SD=17140.00±10978.42 Taka	
Socioeconomic status (according to income)	
Poor & lower middle class	54 (54.0)
Upper middle class	34 (34.0)
Affluent	12 (12.0)
Housing condition	
Pucca	28 (28.0)
Semi pucca	40 (40.0)
Kutcha	32 (32.0)

Table III. Distribution of the Children by clinical presentation.

Clinical presentation	Frequency (%)
Fever	60 (60.0)
Cough & cold	92 (92.0)
Anorexia	64 (64.0)
Nausea & Vomiting	12 (12.0)
Headache	16 (16.0)
Irritability	36 (36.0)
Pain in extremities	88 (88.0)
Body ache	44 (44.0)
Chest pain	30 (30.0)

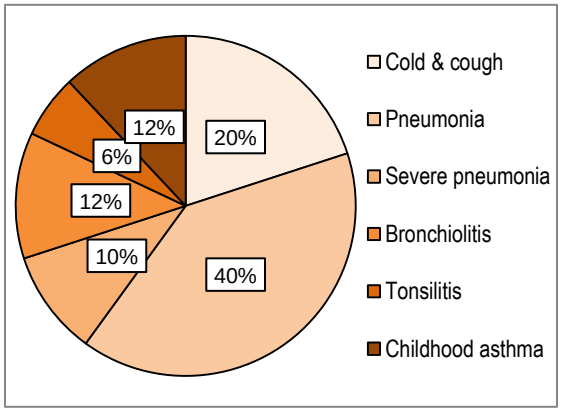
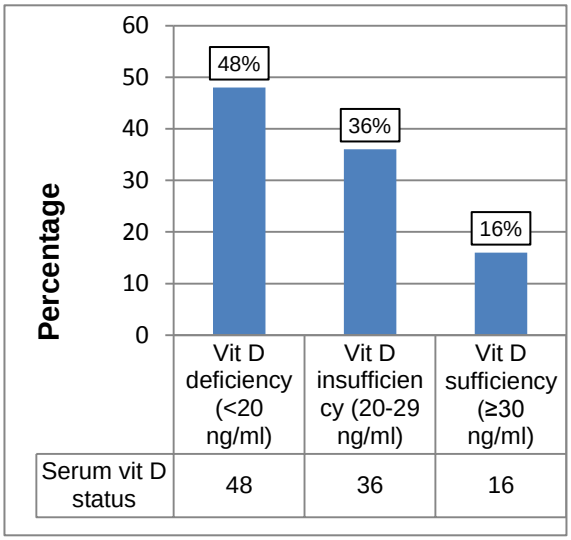


Figure 1: Distribution of the Children by clinical Diagnosis ((n = 100).



(Mean± SD = 19.15±6.836 ng/ml.)

Figure 2: Distribution of the Children by serum Vit D status (n = 100).

Association between dietary behavior of the respondents and serum vitamin D status was observed. There was statistically moderate significant association between frequency of taking cheese & milk, small fish and cereals with vitamin D status ($p < 0.05$, OR: 12.39; $p < 0.05$, OR: 3.41; $p < 0.05$, OR: 3.96) respectively. There was highly significant association between frequency of eating fruits and vegetables with vitamin D status ($p < 0.001$, OR: 12.75) (Table IV). There was highly significant association between breast feeding in first 6 months and sun exposure history with vitamin D status ($p < 0.001$, OR: 10.12; $p < 0.001$, OR: 7.667) respectively. The study showed statistically moderate significant association between sports history, H/0 past illness of RTIs with vitamin D status ($p < 0.05$; $p < 0.05$, OR: 3.519) (Table V).

Table IV. Association between dietary behavior of the respondents and serum Vit D status.

Dietary behavior	Serum Vit D status		'P' Value
	Hypovitaminosis D (n = 84)	Vit D Sufficiency (n = 16)	
Frequency of taking egg			0.125 (NS) OR= 2.33
Occasional	49 (58.3)	6 (37.5%)	
Regular	35 (41.7)	10 (62.5%)	
Frequency of taking cheese & milk			0.003* OR = 12.39
Occasional	38 (45.2)	1 (6.3)	
Regular	46 (54.8)	15 (93.8)	
Frequency of eating fruits & vegetables			<0.001* OR = 12.75
Occasional	68 (81.0)	4 (25.0)	
Regular	16 (19.0)	12 (75.0)	
Frequency of eating small fish			0.023* OR = 3.41
Occasional	61 (72.6)	7 (43.8)	
Regular	23 (27.4)	9 (56.2)	
Frequency of eating cereals			0.014* OR = 3.96
Occasional	54 (64.3)	5 (31.2)	
Regular	30 (35.7)	11 (68.8)	
Frequency of eating multivitamin syrup with cod liver oil			0.829 (NS) OR = 1.136
Occasional	60 (71.4)	11 (68.8)	
Regular	24 (28.6)	5 (31.2)	

Figures in the parenthesis indicate corresponding %; * significant; NS = not significant.

Table V. Association between risk factors and serum Vit D status.

Risk factors	Serum Vit D status		'P' Value
	Hypovitaminosis D (n = 84)	Vit D Sufficiency (n = 16)	
Breast feeding in first 6 months			<0.001* OR= 10.12
Exclusive breast feeding	15 (17.9)	11 (68.8%)	
Partial breast feeding	69 (82.1)	5 (31.3%)	
Sun exposure			<0.001* OR = 7.667
Regular	15 (17.9)	10 (62.5)	
Sometimes	69 (82.1)	6 (37.5)	
Type of sports			0.014*
Indoor	36 (42.9)	3 (18.8)	
Outdoor	18 (21.4)	9 (56.2)	
Both	30 (35.7)	4 (25.0)	
H/O past illness of RTIs			0.021* OR = 3.519
Present	57 (67.9)	6 (37.5)	
Absent	27 (32.1)	10 (62.5)	

Figures in the parenthesis indicate corresponding %; * significant.

Discussion

In our study, the mean age of the children was 6.04±3.24 years with more than half (58%) were male. Majority (52%) of the children were in the age group of 1-5 years old, which is similar to another study conducted by Hashemian and Heidarzadeh[12]. We also reported 66% of children lived in rural area with the mean monthly family income of 17140.00±10978.42 BD taka. More than half (54%) of them belonged to poor & lower middle class family.

We found that the most common clinical presentation was Cough & cold (92%), followed by pain in extremities (88%), anorexia (64%), fever (60%), body ache (44%), irritability (36%), chest pain (30%), headache (16%) and nausea & vomiting (12%). In the study of Sismanlar et al., all children had a cough, and 84% of them had tachypnea[14]. In a study by Soleimani et al., cough, fever, tachycardia, and dyspnea were the most common clinical symptoms[19]. The present study revealed that 40% children was diagnosed as pneumonia, 20% cold & cough, 12% bronchiolitis and childhood asthma, 10% severe pneumonia and 6% tonsillitis. Considering the immunomodulatory properties of vitamin D, a study had attempted to determine the association between vitamin D and infectious diseases of the respiratory system, such as acute otitis media, bronchiolitis, and pneumonia[20].

The mean levels of vitamin D in our study were 19.15±6.836 ng/ml. Sismenlar et al.[14] in Turkey found mean serum levels of vitamin D in children with lower respiratory tract infection (LRTI) were 34.9 ± 22.1 ng/ml, which is not similar to our study. The mean serum levels of vitamin D in another study in India[21] in children with pneumonia were 12.04 ± 6.015 ng/ml, and in a study in Rasht[12], it was 26.16 ± 15.20 ng/ml. In our study, among the 100 children, 48% had vitamin D deficiency, 36% had vitamin D insufficiency and only 16% had vitamin D sufficiency state. Another study conducted by Chen et al. showed 11.4% of the children had vitamin D deficiency, 52.6% had vitamin D insufficiency and only 36.0% had vitamin D sufficiency[22]. The reason for this difference could be due to economy, eating habits, amount of sunlight, coverage, residence, season and length of day.

Association between dietary behavior of the respondents and serum vitamin D status was observed in our study. There was statistically moderate significant association between frequency of taking cheese & milk, small fish and cereals with vitamin D status ($p < 0.05$, OR: 12.39; $p < 0.05$, OR: 3.41; $p < 0.05$, OR: 3.96) respectively. There was highly significant association was found between frequency of eating fruits and vegetables with vitamin D status ($p < 0.001$, OR: 12.75). Consistent with these findings, Chen et al. reported that the one-child policy in China makes parents eager to offer nutritious food to their babies, which may lead to a low rate of vitamin D deficiency among preschool children in Hangzhou. In addition, the diet is dominated by ocean fish all year, which

can provide children with sufficient vitamin D[22]. In our study, there was highly significant association between breast feeding in first 6 months and sun exposure history with vitamin D status ($p < 0.001$, OR: 10.12; $p < 0.001$, OR: 7.667) respectively. In a study in Turkey, no significant difference was observed in minimum breastfeeding for six months[14]. Another study showed people at risk for vitamin D deficiency include those with limited sun exposure and those with fat malabsorption[23]. Present study showed statistically moderate significant association between sports history, H/0 past illness of RTIs with vitamin D status ($p < 0.05$; $p < 0.05$, OR: 3.519).

The main limitation of our study was its small sample size, which prevented detection of an association between respiratory infections and possible confounding factors. It is recommended that larger studies with longer follow-up periods should be performed to confirm these results. So, this study showed the need to conduct more extensive investigations with larger sample sizes and different factors.

Conclusion

Vitamin D deficiency/insufficiency is a serious problem among children. The framework and strategy will be useful for early diagnosis of the RTIs and the establishment of appropriate treatment to reduce the burden of disease and prevent high mortality.

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ORIGINAL ARTICLE

Evaluation of Socio-demographic and Clinical Profiles among Women with Polycystic Ovary Syndrome (PCOS) in Kushtia

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Abstract

Background: Polycystic ovary syndrome (PCOS) is a common endocrine disorder affecting up to 20% of women of reproductive age. Lack of ovulation and androgen over activity are key features of PCOS. This study aimed at evaluating the socio-demographic and clinical profiles among women with PCOS.

Methods: This cross-sectional observational study was conducted at the Obstetrics and Gynecology Department of Kushtia Medical College, Kushtia among 100 purposively selected patients with H/O PCOS attended Kushtia Medical College Hospital Obstetrics and Gynecology outdoor and the private chambers at Kushtia from January 2023 to December 2023. Rotterdam criteria were used for the diagnosis of the PCOS. Socio-demographic and clinical characteristics along with investigation findings were collected and statistical analyses were executed by using SPSS version 26.0.

Results: Among 100 respondents the mean age was 23.38±4.765 years and majority (60.0%) of participants fell within the age group of 21-30 years. Majorities (76.0%) were housewives; students were 19.0% and 81% of patients were married. Anthropometric measurements showed the mean height was 1.5111±0.04535 meter, mean weight was 59.94±13.416 kg, mean BMI was 26.2821±5.7352 kg/m^2 and majorities (37%) were overweight. Regarding age at menarche, majority (59%) were 12-15 years. All patients had no family H/O PCOS. Among married women majority (92.6%) had H/O infertility, 61.7% treated PCOS previously, of which 46% used metformin, 42% used Myoinositol and 76% used Norethisterone. The most common clinical presentation was Dysmenorrhea (72%), followed by acne (42%), alopecia (32%), hirsutism (27%) and anxiety & depression (25%). Regarding laboratory investigations, mean Thyroid stimulating hormone (TSH) was 2.7128±1.75112 mIU/mL, mean Follicular stimulating hormone (FSH) was 5.6568±2.13147 mIU/mL, mean Luteinizing hormone (LH) was 14.8895±6.27543 mIU/mL, mean S. Testosterone (among S/S of hirsutism) was 0.5119±0.22448 ng/mL and mean Random blood sugar (RBS) was 6.1132±1.23718 mmol/L respectively.

Conclusion: Patients with PCOS shared many clinical and metabolic abnormalities in this study. Assessment of comorbidities of PCOS in these patients with particular emphasis on the metabolic derangements is of great importance for timely therapeutic intervention to prevent future complications.

Keywords: PCOS, Socio-demographic and clinical profiles, Androgen over activity.

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Introduction

Polycystic ovary syndrome (PCOS) is a heterogeneous androgen-excess disorder that presents with different degrees of reproductive and metabolic dysfunctions; it is also associated with insulin resistance and metabolic syndrome[1]. The global prevalence estimates of PCOS in women of reproductive age are highly variable, ranging from 5% to 18%[2]. This could be due to the lack of a universal definition of PCOS, as the prevalence rates depend, to a great extent, on the criteria used to define this disorder[1]. It is linked to obesity, irregular periods, infertility, excess hair growth, insulin resistance, enlarged ovaries with multiple small

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follicles on ultrasound imaging, an increased risk of type-2 diabetes in later life and a three to four folds higher risk of endometrial cancer[3]. PCOS has pronounced effects on the quality of life (QOL) of affected patients. Women with PCOS are also more likely to suffer from depression and other psychological conditions. In a multivariate analysis, patients with depression reported low QOL[4]. A randomized controlled trial showed that a stress management program yielded significant reductions in stress and depressive and anxiety symptoms as well as improvements in QOL[5]. Treatment generally involves lifestyle changes (diet and exercise) and addressing the main symptoms.

The origin of PCOS remains unclear, but research has shown that one of the characteristics of this disorder is the excess production of androgens in the ovaries[6]. Androgen secretion is the result of abnormal response of the ovary to gonadotropins, insulin and insulin-like hormones such as insulin-like growth factor-1 (IGF-1), which enhances LH-stimulated androgen secretion by theca cells[7]. Although the condition is not life threatening, the lack of treatment could lead to more serious health issues in the future. Several studies relate obesity as a risk factor of PCOS reported that overweight and obesity incidence in females with PCOS is as high as 80%[8-9]. The mechanisms by which obesity influences PCOS' pathophysiology and clinical expression are not fully understood, but obesity is independently associated with IR[10] and sex steroid imbalances that may lead to an increased risk of menstrual irregularities and hyperandrogenemia, similar to PCOS symptoms[11]. On the other hand, others proposed that regardless of physical condition PCOS could occur. Insulin resistance has been reported in >60% of patients with PCOS[12], including obese and non-obese populations, and 10% of women with PCOS may develop type 2 diabetes by the age of 40 years[13]. Elevated luteinizing hormone levels have been found to be significantly associated with PCOS associated ovulation disorders and elevated anti-Mu¨llerian hormone (AMH) levels in patients with PCOS[14].

Though there are several international studies done on the prevalence, clinical features and associations of PCOS, the Bangladeshi data on this subject is still sparse. This study aimed to evaluate the socio-demographic and clinical profiles among women with PCOS.

Methods

This cross-sectional observational study was conducted at the Obstetrics and Gynecology Department of Kushtia Medical College Hospital, Kushtia over a period 1 year from January 2023 to December 2023. 100 purposively selected patients with H/O PCOS, aged ≥18 years attended at Kushtia Medical college Hospital Obstetrics and Gynecology outdoor and the private chambers in Kushtia were included according to inclusion criteria. Patients with co-morbidities like adrenal tumors, hypothyroidism, OC pill use, use of glucocorticoids, anti-androgen drugs, drugs for diabetes and not willing to participate were excluded. A diagnosis of PCOS was made using the Rotterdam criteria[15] (the most widely accepted criteria) state that a diagnosis requires at least two out of the following three features: irregular menstrual periods or absence of ovulation, elevated levels of androgens (such as testosterone) and polycystic ovaries (identified through ultrasound). Data was recorded regarding socio-demographic and clinical profiles along with investigation findings in a pre-designed, pretested, interviewer administered semi structured questionnaire after the cases gave their informed consent. Height and weight were measured as per the standard guidelines and protocol. Body mass index was calculated based on height and weight. Statistical analyses were executed by using SPSS version 26.0. Categorical variables were presented in frequency and percentage presented in tables and means (±standard deviation) for continuous variables. Appropriate statistical test was applied as and when required.

Results

Total sample size of 100. The socio-demographic profile of the studied patients was: The mean age of total patients was 23.38±4.765 years with minimum and maximum of 18 to 35 years respectively. Majority (60.0%) of participants fell within the age group of 21-30 years and 65% were from rural area. In terms of

education, the highest proportion was class 6-12 (64.0%). Majority (76.0%) of patients was housewives; students were 19.0% and the vast (91.0%) of patients religion was Islam. 81% of patients were married. Regarding monthly family income, more than one third (37.0%) fell within the range of 15001-30000 taka (Table I).

Table I: Socio-demographic profile of the studied patients (n=100).

Socio-demographic Profile	Frequency (%)
Age (years)	
≤20	31 (31.0)
21-30	60 (60.0)
>30	9 (9.0)
Mean±SD	23.38±4.765
Residence	
Urban	35 (35.0)
Rural	65 (65.0)
Educational Status	
Illiterate	0 (0.0)
Class 1-5	17 (17.0)
Class 6-12	64 (64.0)
Graduate & graduate plus	19 (19.0)
Occupation	
Housewife	76 (76.0)
Service	1 (1.0)
Business	4 (4.0)
Student	19 (19.0)
Religion	
Islam	91 (91.0)
Sonaton	9 (9.0)
Marital status	
Married	81 (81.0)
Unmarried	19 (19.0)
Monthly Family Income (Taka)	
1-15000 tk	36 (36.0)
15001-30000 tk	37 (37.0)
30001-60000 tk	23 (23.0)
>60000 tk	4 (4.0)
Mean±SD	28490.00±13594.038

Table II showed an overview of anthropometric measurements of the studied patients. The mean height was 1.5111±0.04535 meter, mean weight was 59.94±13.416 kg and mean BMI was 26.2821±5.7352 kg/m2 respectively.

Table II: Study group Anthropometric measurements (n=100)

Anthropometric measurement	Minimum	Maximum	Mean±SD
Height (m)	1.40	1.60	1.511±0.045
Weight (kg)	38	97	59.94±13.41
BMI (kg/m^2)	16.89	37.89	26.282±5.735

Regarding nutritional status of the studied patients, majority (37%) was overweight (Figure 1).There were some associated history among PCOS patient, which were showed in table III. Regarding age at menarche, majority (59%) were 12-15 years. More than half (58%) of the patients experienced 2 months interval menstrual cycle. All patients had no family H/O PCOS. Among married women majority (92.6%) had H/O infertility, of which near about two third (65.4%) had <4 years of infertility. 61.7% treated PCOS previously, of which 46% used metformin, 42% used Myo-inositol and 76% used Norethisterone (Table III).

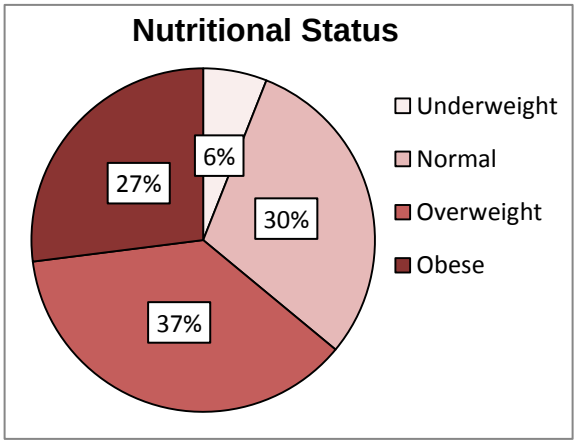


Figure 1: Nutritional status of the studied patients (n=100)

Table III: Associated history among PCOS patients (n=100)

Associated history	Frequency (%)
Age at menarche	
<12 years	37 (37.0)
12-15 years	59 (59.0)
>15 years	4 (4.0)
Interval of menstrual cycle	
2 months	58 (58.0)
3 months	26 (26.0)
>3 months	16 (16.0)
Family history of PCOS	
Yes	0 (0.0)
No	100 (100.0)
H/O Infertility (n=81)	
Yes	75 (92.6)
No	6 (7.4)
Duration of Infertility (n=81)	
<4 years	53 (65.4)
≥4 years	28 (34.6)
Past H/O treatment of infertility (n=81)	
Yes	50 (61.7)
No	31 (38.3)
Drug used for Infertility (n=50)	
Metformin	23 (46.0)
Myo-inositol	21 (42.0)
Norethisterone	38 (76.0)

Table IV. Clinical presentation among the study subjects ((n=100)

Clinical presentation	Frequency (%)
Dysmenorrhea	72 (72.0)
Hirsutism	27 (27.0)
Alopecia	32 (32.0)
Acne	42 (42.0)
Anxiety & Depression	25 (25.0)

The most common clinical presentation was Dysmenorrhea (72%), followed by acne (42%), alopecia (32%), hirsutism (27%) and anxiety & depression (25%) (Table IV). Regarding laboratory investigations, mean Thyroid stimulating hormone (TSH) was 2.7128±1.75112 uIU/mL, mean Follicular stimulating hormone (FSH) was 5.6568±2.13147 mIU/mL, mean Luteinizing hormone (LH) was 14.8895±6.27543 mIU/mL, mean S. Testosterone (among S/S of hirsutism) was 0.5119±0.22448 ng/mL and mean Random blood sugar (RBS) was 6.1132±1.23718 mmol/L respectively (Table no. V).

Table V: Distribution of the patients by laboratory investigations (n=100).

Laboratory investigations	Minimum	Maximum	Mean±SD
TSH (uIU/mL)	0.28	8.00	2.7128±1.75112
FSH (mIU/mL)	1.94	9.90	5.6568±2.13147
LH (mIU/mL)	5.50	30.80	14.8895±6.27543
S. Testosterone (ng/mL) (n=27)	0.21	0.82	0.5119±0.22448
RBS(mmol/L)	4.30	11.40	6.1132±1.23718

Lab Reference ranges
TSH (Adult females)- 0.27-4.20 uIU/mL
FSH (Adult females)- Follicular phase 3.2- 15.0 mIU/mL, Luteal phase 1.3–11.0 mIU/mL, Ovulatory period 7.5-20.0 mIU/mL,
LH (Adult females)- Follicular phase 1.2–12.5 mIU/mL, Luteal phase 0.4- 19.0 mIU/mL, Ovulatory period 12.0- 82.0 mIU/mL,
Serum Testosterone (Adult females)- Follicular phase & Luteal phase 0.20- 0.80 ng/mL.
RBS- 5.5–7.8 mmol/L

Discussion

PCOS remains as a significant health burden due to the associated metabolic, psychological and reproductive complications. In the present study the mean age of total patients was 23.38±4.765 years and majority (60.0%) of participants fell within the age group of 21-30 years. There was similarity in a study estimated that majority (41%) of the cases belonged to the age group of 20-24 years of age[16]. Sidra et al. showed 274 (62.3%) were aged 15–30 years and 166 (38%) aged 31–44 years[17]. Another study showed the mean age was 26.7 (SD±6.7) years with a minimum age of 18 years and the maximum age of was 44 years[18]. 81% of patients were married in current study. Similarity was found in a study showed 364 (82.7%) were married[17].

In Our Study, the mean height was 1.5111±0.04535 meter, mean weight was 59.94±13.416 kg and mean BMI was 26.2821±5.7352 kg/m2 respectively. Ranathunga et al. showed the mean weight was 64.8 (SD ± 11.9) kg and BMI was 27.1 (SD±4.8) kg/m^2.[18] Regarding nutritional status of present study population, majority (37%) was overweight and 27% were obese. Swapna et al. showed 55% were overweight. 38% of the cases were found to have grade 1 obesity. Only 7% of the cases were found out to be having obesity grade 2 [16]. Sidra et al. showed weight measurements, revealed that a large proportion (74.5%) of the patients were normal to nearly obese; approximately, a quarter (24.5%) of the patients were morbidly obese, whereas only a few (0.9%) were underweight[17]. In a recent systemic review, a significantly higher proportion of dyslipidaemia, cardiovascular risk markers and metabolic syndrome were seen in patients with PCOS with higher BMI[19].

Regarding age at menarche, majority (59%) were 12-15 years in present study. More than half (58%) of the patients experienced 2 months interval menstrual cycle. All patients had no family H/O PCOS. Ranathunga et al. showed 21.7% patients had a family history of PCOS[18]. Present study showed among married women majority (92.6%) had H/O infertility, of which near about two third (65.4%) had <4 years of infertility. 61.7% treated PCOS previously, of which 46% used metformin, 42% used Myo-inositol and 76% used Norethisterone. The overall incidence of infertility was found out to be 27.9% in the study conducted by Swapna et al.[16]. Sidra et al. observed among 440 patients with PCOS, infertility was found in 146 (33.2) patients and metformin was prescribed to 358 (81%)[17].

Current study showed the most common clinical presentation was Dysmenorrhea (72%), followed by acne (42%), alopecia (32%), hirsutism (27%) and anxiety & depression (25%). Regarding clinical Hyperandrogenism among the study subjects, Swapna et al. showed 48 cases (24%) had acne, 130 cases (65%) had hirsutism, 12 cases (6%) had androgenic alopecia and 10 cases (5%) had acanthosis nigricans. Thus, hirsutism was the most common findings in clinical hyperandrogenism among the study subjects[16].

Regarding the cardinal symptoms of PCOS, Sidra et al. showed 316 (71.8%) patients had irregular menstruation, 301 (68.4%) had hirsutism, 296 (67.3%) had acne and depression was reported by 272 (61.8%) patients[17]. Ranathunga et al. showed menstrual irregularities and polycystic ovaries was 33.3% and acne was detected in 16 patients (26.7%)[18].

In our study regarding laboratory investigations, mean Thyroid stimulating hormone (TSH) was 2.7128±1.75112 uIU/mL, mean Follicular stimulating hormone (FSH) was 5.6568±2.13147 mIU/mL, mean Luteinizing hormone (LH) was 14.8895±6.27543 mIU/mL, mean S. Testosterone (among S/S of hirsutism) was 0.5119±0.22448 ng/mL and mean Random blood sugar (RBS) was 6.1132±1.23718 mmol/L respectively. Ranathunga et al. observed mean LH Level (IU/L) 10.2±5.8, mean FSH Level (IU/L) 5.9±2.5 and mean Serum Total Testosterone (ng/dL) was 63.8±40.9 [18].

Conclusion

Patients with PCOS shared many clinical and metabolic abnormalities in this study. Assessment of comorbidities of PCOS in these patients with particular emphasis on the metabolic derangements is of great importance for timely therapeutic intervention to prevent future physical complications and psychological complications of the primary disease. Successful management of the disease will eventually ease the future health expenditure strain of the country.

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ORIGINAL ARTICLE

Clinical Outcome and Awareness among the Patients of Eclampsia Observed at Rajshahi Medical College Hospital

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Abstract

Background: Eclampsia is a severe pregnancy related complication and is a remarkable global health concern, particularly in resource-limited hospital set-up in a third world country like Bangladesh. This study aimed at assessing the clinical outcomes and awareness among patients with eclampsia.

Methods: This cross-sectional observational study was conducted from July 2022 to December 2022 at the Obstetrics and Gynecology Department of Rajshahi Medical College Hospital, Rajshahi among admitted patients with history of eclampsia. A total of 30 patients were included purposively. Clinical outcomes and awareness about eclampsia were noted and statistical analyses were executed by using SPSS version 26.0.

Results: Among 30 respondents, majority (40.0%) of participants fell within the age group of <20 years and most (60.0%) of participants had reached gestational age of 34 weeks or more. All deliveries (100%) were conducted via caesarian section. 46.7% were unconscious, 60.0% experienced oliguria and 86.7% required ICU support. 53.3% were aware of health center availability and trained doctors nearby. Approximately 40.0% knew the distance to health centers, while only 26.7% were informed about transport facilities. Eclampsia knowledge was demonstrated by 13.3% of individuals, with 20.0% recognizing post-partum haemorrhage. Antenatal check-ups were known by 45.7%, and 26.7% were aware of nutritional supplements. Regarding diabetes, 40.0% were aware of pre-pregnancy diabetes, and 45.7% knew about pregnancy-induced diabetes.

Conclusion: Knowledge about eclampsia enables active engagement in healthcare decisions, fostering collaborative care plans with providers. Increased awareness, early detection and proactive management strategies contribute to improved outcomes for both mothers and babies affected by eclampsia.

Keywords: Eclampsia, Clinical outcomes, Awareness, Complications.

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Introduction

Eclampsia, a severe complication of pregnancy characterized by seizures in women with pre-eclampsia, remains a significant global health concern, particularly in a limited resource setting like Bangladesh. In Bangladesh, where access to quality maternal healthcare services may be constrained by socio-economic factors and healthcare infrastructure challenges, the burden of eclampsia is particularly pronounced. Addressing this burden necessitates a comprehensive understanding of the factors influencing clinical outcomes, awareness levels, and health-seeking behaviour among patients diagnosed with eclampsia[1]. Awareness regarding the complications of eclampsia among pregnant women and their families is crucial for timely intervention and management. Understanding the signs and symptoms of eclampsia, including hypertension, proteinuria & oedema, empowers women to seek timely medical intervention.

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Awareness of the potential risks associated with eclampsia can motivate pregnant women to engage in regular antenatal care, facilitating early detection and management of pre-eclampsia before it progresses to eclampsia[2,3]. Studies have shown that improved awareness among pregnant women about the complications of eclampsia correlates with enhanced health-seeking behaviour and reduced maternal and perinatal mortality rates[4-6]. Knowledge about appropriate healthcare settings and pathways to access emergency obstetric care is critical in mitigating the adverse outcomes associated with eclampsia.

Prompt referral to tertiary care centers with skilled obstetricians and access to life-saving interventions such as magnesium sulfate administration and prompt delivery through cesarean section can significantly improve maternal and neonatal outcomes[7-10]. Understanding where to go in case of complications can significantly reduce delays in receiving appropriate care, thus improving maternal and fetal outcomes. The outcomes of eclampsia encompass a spectrum of maternal and fetal complications, ranging from immediate risks during the seizure episode to long-term sequelae affecting both the mother and the baby. Immediate risks to the mother during eclamptic seizures include aspiration pneumonia, cerebral haemorrhage, and maternal death[11]. Additionally, eclampsia can lead to complications such as renal failure, hepatic dysfunction, and disseminated intravascular coagulation, further exacerbating maternal morbidity[12].

Furthermore, eclampsia significantly increases the risk of adverse fetal outcomes, including intrauterine growth restriction, preterm birth, and stillbirth[13]. The hypoxic-ischemic insult resulting from maternal seizures can lead to fetal distress and subsequent adverse perinatal outcomes. Additionally, complications arising from premature delivery due to eclampsia, such as respiratory distress syndrome and neonatal intensive care unit admissions, further contribute to the burden of neonatal morbidity and mortality[14]. This study aimed to assess the clinical outcomes and awareness among patients with eclampsia.

Methods

This cross-sectional observational study was conducted from July 2022 to December 2022 at the Obstetrics and Gynecology Department of Rajshahi Medical College Hospital, Rajshahi. 30 purposively selected admitted patients with history of eclampsia were included. Patients with severe illness and who didn't give consent were excluded. Interviewer administered semi-structured questionnaire were used for data collection. Demographic characteristics, clinical outcomes, knowledge and awareness about eclampsia were collected via face to face interview technique and statistical analyses were executed by using SPSS version 26.0. Categorical variables were presented in frequency and percentage and the results were presented in tables.

Results

Table I presented the socio-demographic profile of the studied patients, with a total sample size of 30. Regarding age distribution, majority (46.7%) of participants fell within the age group of below 20 years. In terms of education, the highest proportion had completed SSC (33.3%). Majority (53.3%) of participants was housewives and the vast (86.7%) of participants were identified as Muslim. Regarding monthly family income, the largest proportion (60.0%) fell within the range of 3000-10000 taka. Majority (73.3%) of the participants resided in 'Pucca' houses.

Table II showed an overview of the current obstetric history of the studied patients. All participants (100%) fell within the range of 1-3 parity with majority (60.0%) of participants had reached gestational age of 34 weeks or more. Significant majority (86.7%) had irregular or no antenatal check-ups (86.7%) with all reported cases (100%) of eclampsia were antepartum in nature. 80.0% had previous H/O eclampsia/preeclampsia and all deliveries (100%) were conducted via caesarian section. Majority (93.3%) had a prolonged time interval between onset of convulsion and hospitalization, exceeding 8 hours.

Table I: Socio-demographic profile of the studied patients (n=30).

Socio-demographic Profile	Frequency (%)
Age (years)	
<20	14 (46.7)
20-35	4 (13.3)
>35	12 (40.0)
Education	
Illiterate	8 (26.7)
SSC	10 (33.3)
HSC	8 (26.7)
Graduation	4 (13.3)
Masters	0 (0.0)
Occupation	
Housewife	16 (53.3)
Private service	10 (33.3)
Government Service	2 (6.7)
Business	2 (6.7)
Religion	
Muslim	26 (86.7)
Hindu	4 (13.3)
Monthly Family Income (Taka)	
<3000	4 (13.3)
3000-10000	18 (60.0)
>10000	8 (26.7)
Living condition	
Kutcha	2 (6.7)
Semi pucca	6 (20.0)
Pucca	22 (73.3)

Table II: Obstetric history of the studied patients (n=30)

Obstetric history	Frequency (%)
Parity	
1-3	30 (100.0)
>4	0 (0.0)
Gestational age	
<28	6 (20.0)
28-33	6 (20.0)
≥34	18 (60.0)
Antenatal check-up	
Regular	4 (13.3)
Irregular to none	26 (86.7)
Types of Eclampsia	
Antepartum	30 (100.0)
Intrapartum & Postpartum	0 (0.0)
Previous H/O eclampsia/preeclampsia	
Yes	24 (80.0)
No	6 (20.0)
Mode of delivery	
Assisted vaginal delivery	0 (0.0)
Caesarian section	30 (100.0)
Time interval between convulsion to hospitalization	
≤8 hours	2 (6.7)
>8 hours	28 (93.3)

Table III presented the distribution of the respondents by sign of Eclampsia. Majority (46.7%) of participants were unconscious followed by near about three-quarters (73.3%) had a respiratory rate exceeding 20 breaths per minute. Most participants (73.3%) diastolic blood pressure was within the range of 101-110 mmHg and majority (66.7%) exhibited lung congestion. Majority (60.0%) experienced oliguria and Knee jerk reflexes were predominantly (53.3%) clonus.

Table III: Distribution of the respondents by sign of Eclampsia (n=30).

Sign of Eclampsia	Frequency (%)
Level of consciousness	
Conscious (GCS >13)	6 (20.0)
Semi-conscious (GCS 9-12)	10 (33.3)
Unconscious (<8)	14 (46.7)
Respiratory rate	
17-20/m	8 (26.7)
>20m	22 (73.3)
Diastolic blood pressure	
90-100	4 (13.3)
101-110	20 (66.7)
>110	6 (20.0)
Lungs	
Clear	10 (33.3)
Congested	20 (66.7)
Urine volume	
Normal	4 (13.3)
Oliguria	18 (60.0)
Anuria	8 (26.7)
Knee jerks	
Clonus	16 (53.3)
Exaggerated	8 (26.7)
Absent	6 (20.0)

The complications are categorized by time intervals in hours (1-8 hours, 9-16 hours, and 16-24 hours). Pulmonary oedema exhibited an increasing trend in occurrence over time intervals, with 6 cases (20.0%) within 16-24 hours. Renal failure and HELLP syndrome showed lower occurrence rates, with renal failure being reported in 2 cases (6.7%) within 16-24 hours and HELLP syndrome in 2 cases (6.7%) within 1-8 hours. Postpartum haemorrhage (PPH) showed variability across time intervals, with the highest occurrence reported within 1-8 hours and within 9-16 hours equally (8 cases, 26.7%). Cerebrovascular accident (CVA) and ARDS (acute respiratory distress syndrome) each showed consistent occurrence rates across time intervals, with 2 cases (6.7%) reported within 9-16 hours for both complications and an

Table IV: Distribution of Complications after Eclampsia (n=30)

Complications	Time interval (Hours)		
	1-8 hours Frequency (%)	9-16 hours Frequency (%)	16-24 hours Frequency (%)
Pulmonary edema	2 (6.7)	4 (13.3)	6 (20.0)
Renal failure	0 (0.0)	0 (0.0)	2 (6.7)
PPH	8 (26.7)	8 (26.7)	4 (13.3)
HELLP syndrome	2 (6.7)	0 (0.0)	0 (0.0)
CVA	2 (6.7)	2 (6.7)	0 (0.0)
ARDS	0 (0.0)	2 (6.7)	0 (0.0)

additional case of CVA (2 cases, 6.7%) within 1-8 hours. Heart failure and DIC (Disseminated Intravascular Coagulation) did not exhibit any reported cases within specified time intervals (Table IV).

Table V illustrated the distribution of the respondents by maternal and perinatal outcome. Regarding maternal outcome, 26 cases (86.7%) required ICU support. Among perinatal outcomes, the majority (60.0%) of births were term deliveries, preterm births accounted for 33.3%, while only 6.7% was classified as post-term. Further analysis revealed that the majority (40.0%) of births were live births, however, 33.3% categorized as stillbirth-fresh and 26.7% as IUD-macerated. 20.0% were neonatal death, 13.3% presented with neonatal convulsions, and 20.0% exhibited neonatal jaundice. Additionally, septicemia was reported in 20.0%.

Table V: Distribution of the respondents by Maternal and Perinatal outcome (n=30)

Maternal & Perinatal Outcome	Frequency (%)
Maternal Outcome	
ICU support needed	26 (86.7)
Perinatal Outcome	
Term	18 (60.0)
Preterm	10 (33.3)
Post-term	2 (6.7)
Live birth	12 (40.0)
Still birth-fresh	10 (33.3)
IUD-macerated	8 (26.7)
Neonatal death	6 (20.0)
Neonatal convulsion	4 (13.3)
Neonatal jaundice	6 (20.0)
Septicemia	6 (20.0)

Table VI presented the distribution of the respondents by awareness about eclampsia Among the respondents, 13.3% demonstrated the condition about eclampsia. Post-partum haemorrhage was recognized 20.0%, while antenatal check-up was known by 45.7%. Concerning nutritional aspects, 26.7% reported knowledge about food supplements. However, there was no reported knowledge regarding heart rate response, acute respiratory failure, or cardiac disease among the participants. 40.0% were aware of having diabetes before pregnancy, while 45.7% knew about diabetes occurring during pregnancy. Additionally, knowledge about complications during pregnancy was reported by 33.3%, and investigations during pregnancy were recognized by 26.7%.

Table VI: Awareness of the respondents about Eclampsia (n=30)

Awareness about Eclampsia	Frequency (%)
Which condition is called Eclampsia	4 (13.3)
Post-partum hemorrhage	6 (20.0)
Antenatal check-up	14 (45.7)
Food-supplements	8 (26.7)
Diabetes before pregnancy	20 (40.0)
Diabetes during pregnancy	14 (45.7)
Complications during pregnancy	10 (33.3)
Investigations during pregnancy	8 (26.7)

Table VII outlined the distribution of the respondents by knowledge about health services. The table encompasses various aspects related to healthcare accessibility and availability. Among the respondents, 53.3% reported awareness of the availability of health centers and knowledge about the availability of trained doctors within their vicinity equally. Regarding the distance to health centers, 40.0% were aware of this. However, a

smaller proportion (26.7%) was reported knowledge about the availability of transport facilities to access healthcare services.

Table VII: Distribution by knowledge about Health-services (n=30)

Health Services	Frequency (%)
Health centre available	16 (53.3)
Availability of trained doctor	16 (53.3)
Distance of health centre (in kilometre)	12 (40.0)
Transport facilities available	8 (26.7)

Table VIII delineated various channels through which individuals acquire information about eclampsia. 40.0% reported reliance on television/radio for information dissemination. Conversely, no respondents indicated newspapers as their source of knowledge. Leaflets/posters were 33.3% and health education-related meetings were 26.7% for disseminating information.

Table VIII: Distribution by primary sources of knowledge (n=30)

Source of Knowledge	Frequency (%)
TV/Radio	12 (40.0)
Newspaper	0 (0.0)
Leaflet/Posters	10 (33.3)
Health education-related meetings	8 (26.7)

Discussion

Eclampsia is a leading cause of maternal mortality worldwide. In the current study, we observed a distinctive age distribution among eclampsia patients, with a significant proportion below 20 years of age (46.7%) and another notable segment above 35 years (40.0%). This pattern suggests heightened risk at both ends of the reproductive age spectrum, corroborating the findings of Coghill et al., and Klungsøyr et al., who identified similar trends in their respective studies[15,16]. The majority of participants in this study had attained secondary level education (33.3%) and was primarily engaged in occupations categorized as 'Housewife' (53.3%). This demographic profile could be indicative of a lower socio-economic status, potentially influencing healthcare access and awareness.

A striking 86.7% of participants reported irregular or no antenatal check-ups, highlighting a significant gap in prenatal care. Esakoff et al. echoed this concern, noting the increased risk of eclampsia with fewer than five prenatal visits[17]. The absence of regular antenatal care is a critical missed opportunity for early detection and management of pre-eclampsia, a precursor to eclampsia. Clinical manifestations in our study population were severe, with high rates of unconsciousness (46.7%), elevated respiratory rates (73.3%), and diastolic blood pressure predominantly in the range of 101-110 mmHg (73.3%). Essiben et al. reported hyperuricemia significantly increased in eclamptic patients, and noted similar severity in clinical manifestations[18].

The study also noted a progressive increase in complications like pulmonary edema over time following eclampsia, depicting a concerning trend of worsening conditions. Variability in complications, including PPH, CVA, and ARDS, further illustrates the complex and multifaceted impact of eclampsia. The requirement for intensive care support (ICU support needed in 86.7% of cases) underscores the severity of maternal morbidity associated with eclampsia. Steiner et al. observed a similar trend, noting the progression from mild to severe pre-eclampsia/eclampsia and its association with adverse outcomes[19].

Moreover, the low general awareness about eclampsia (13.3%) and post-partum hemorrhage (20.0%) in our study population points to a critical knowledge gap among patients. This lack of awareness was echoed in the study by Radwan et al., where only 11.3% of participants demonstrated adequate knowledge about pre-eclampsia[20]. Lastly, the reliance on television/radio (40.0%) and leaflets/posters (33.3%) for information in our study highlights these media as effective channels for disseminating health education.

The distribution of knowledge about eclampsia and related pregnancy conditions suggests varying levels of awareness among the study population. While some aspects such as antenatal check-ups and diabetes garnered relatively higher awareness, there were areas with limited knowledge, particularly regarding specific medical conditions like eclampsia itself and acute complications such as heart rate response and respiratory failure[21]. Knowledge about eclampsia strengthens patients to

recognize its symptoms early on, such as severe headaches, visual disturbances, and seizures[22]. Through regular check-ups, healthcare providers can monitor blood pressure levels, detect warning signs of eclampsia, and implement preventive measures to manage the condition effectively[23]. Patients who are well-informed about eclampsia are more likely to adhere to their treatment plans, including medication regimens and lifestyle modifications. Additionally, improved knowledge can help mitigate long-term complications for mothers, such as organ damage or neurological impairment.

Conclusion

By understanding the risks associated with eclampsia and the available treatment options, patients can collaborate with healthcare providers to develop personalized care plans that prioritize the well-being of both the mother and the baby. Knowledge about eclampsia plays a crucial role in improving clinical outcomes for both patients and their babies. By raising awareness, promoting early detection, and encouraging proactive management strategies, better maternal and perinatal health outcomes could be achieved in cases of eclampsia.

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ORIGINAL ARTICLE

Comparison of Dopamine to Dobutamine in the Management of Neonatal Shock

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Abstract

Background: Dopamine (3,4-dihydroxyphenylethylamine) & Dobutamine are the most commonly used pharmacological agent in the treatment of newborn hypotension. The efficacy of dopamine versus Dobutamine for pediatric or neonatal shock remains controversial. This study aimed to compare the effectiveness and safety of dopamine and dobutamine in the treatment of neonatal shock.

Methods: This randomized clinical trial was conducted over a period of one and half year from January 2014 to June 2015. Total 56 preterm and term neonate admitted in Dhaka Shishu Hospital SCANU and intensive care unit suffering from shock and who did not respond to volume replacement included in this study and randomly divided into two groups. Dobutamine was given to group I and dopamine was given to group II. Clinical and biochemical parameter were observed before and after giving drug. Data analysis was done using appropriate statistical methods.

Results: Baseline characteristics were comparable between two groups. Systolic blood pressure and heart rate increased in both groups but more in dopamine group. Improvements in SPO2 capillary refilling time, PH, HCO3, PCO2, PO2, were almost equal. Other parameters like urine output frequency, improvement from shock and cure rate were better in dopamine than dobutamine group.

Conclusion: After initial volume replacement with isotonic saline if neonates with shock do not respond then either dopamine or dobutamine can be used. We conclude that Dopamine and dobutamine both are effective in the management of neonatal shock with dopamine infusion being more effective when specific cause of shock is still unknown.

Keywords: Neonatal Shock, Dopamine, Dobutamine, Efficacy.

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Introduction

Shock is an acute syndrome characterized by the body's inability to deliver adequate oxygen to meet the metabolic demands of vital organs and tissues. Patients in shock have insufficient oxygen at the tissue level to support normal aerobic cellular metabolism, resulting in a shift to less efficient anaerobic metabolism1. Shock usually occur due to Hypovolumia caused by abruption placenta, placenta previa, twin-twin transfusion, fetomaterrnal hemorrhage, birth trauma, coagulation disorder, dehydration; Cardiogenic (birth asphyxia, metabolic problem, congenital heart disease); Vasoregulatory (Sepsis,NEC)[2]. Inotropes are widely used to treat systemic hypotension. The most commonly used drugs are dopamine and dobutamine. These agents have different modes of action which may result in different haemodynamic effects[3].

The Surviving Sepsis Campaign 2012 guidelines have recommended dopamine as the first-line vasoactive agent in fluid-refractory septic shock[4]. Dopamine has a dose dependent agonist effects on dopaminergic and adrenergic (α & β) receptors.

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Dopamine is inotropic via β-adrenergic stimulation in the dose range of 5–10 μg/kg/min, while it has both predominant inotropic effect and mild vasopressor effect via α_1-adrenergic stimulation in the dosing range of 10–15 μg/kg/min. In the dose of more than >15 μg/kg/min, dopamine is predominantly a vasopressor (via α_1-adrenergic effect) with minimal inotropic action[5]. Dopamine infusion in septic shock can reduce the release of prolactin, increase oxidative stress, suppress pro-inflammatory cytokine production and increase anti-inflammatory cytokine production[6]. Concerns have been raised regarding the vasoconstrictive potential of pharmacologic agents administered to increase BP that inadvertently may reduce cerebral perfusion as well as blood flow to other organs[7].

Dobutamine is a β_1 selective stimulant[8] which resembles dopamine structurally, but possesses a bulky aromatic substituent on the amino group[9]. The pharmacological effects of dobutamine are due to direct interaction with β receptors. Its actions do not appear to result from release of norepinephrine from sympathetic nerve endings, nor are they exerted by dopamine receptors[8]. Dobutamine is a β_1 agonist like dopamine, but in high doses its β_2 effects can decrease rather than increase peripheral resistance[10]. Dobutamine increase BP by its inotropehic and chronotrophic action with very little action on peripheral vessel[11]. It has a superior effect than dopamine in maintaining left ventricular output in preterm neonate[11]. Dobutamine was more effective than dopamine in increasing SVC blood flow[12].

A large number of neonate suffering from hypotension and shock during admission or after admission in neonatal ward and NICU. In rural hospital and sometimes even in higher center immediate echocardiography, mixed venous saturation, septic screening are not immediately available to diagnose the cause of shock. There is no clear guideline about which drug is superior in management of shock when specific cause is uncertain. So, this study aimed to compare the effectiveness and safety of dopamine and dobutamine in the treatment of neonatal shock.

Methods

This randomized clinical trial was conducted over a period of one and half year from January 2014 to June 2015. Total 56 preterm and term neonate (age <28 days, both sex, both term and preterm >32 weeks) admitted in Dhaka Shishu Hospital SCANU and intensive care unit suffering from shock and who did not respond to volume replacement included in this study and randomly divided into two groups. Dobutamine was given to group I and dopamine was given to group II. Children with complex congenital heart disease, patient was in shock but improved after giving bolus fluid and whose parents/legal guardian didn't give consent were excluded. Data was collected using a structured questionnaire containing all the variable of interests. Clinical and biochemical parameter were observed before and after giving dopamine and dobutamine in both groups of patients at 1st hour, 3rd hour, 6th hour and 24th hour. After volume replacement with isotonic saline 10ml/kg over 20 min if patient did not response from shock then initial dose of drug was 5 μgm/kg/min mixed with IV fluid and infused through microburret set and titrated 2.5 μgm/kg/min every one hour up to 10 μgm/kg/min until recovery from shock. If still patient didn't recover from shock at 3rd hour then crossover of drug done, observed and outcome was measured.

Data was processed and analyzed using frequency, tabulation, mean, standard deviation in computer aided statistical software SPSS, Version: 20. Presentation is done by tables and graphs. Association between treatment and outcome was assessed by applying Chi-square (x2) test, Fisher's exact test. For quantitative variables before and after treatment of same group were done by paired t-test was done and between groups by independent sample t test. 'P' <0.05 was considered as level of significance.

Results

The study included 56 neonates admitted in SCANU and ICU suffering from shock. At the time of enrolment the mean gestational age was 37.82±2.639 weeks, age was 96.54±116.4 hours and birth weight was 2578.89±436.04 grams in dobutamine group and gestational age was 38.18±2.480 weeks, age was 126.96±99.429 hours and birth weight was 2475.86±521 grams in dopamine group and there were no significant difference between two groups (Table I).

Table I: Demographic criteria of neonates randomly assigned to group-1 (dobutamine) and group- 2 (dopamine)

Demographic criteria	Group I Dobutamine (n=28)	Group II Dopamine (n=28)	P value
Gestational age in wk (mean±SD)	37.82±2.639	38.18±2.48	0.604*
Age in hour (mean±SD)	96.54±116.4	126.96±99.42	0.298*
Birth weight gm (mean±SD)	2578.89±43	2475.86±52	0.426*
Term (frequency, %)	20, 71.4%	19, 67.9%	0.771**
Preterm (Frequency,%)	8, 28.6%	9, 32.1%	0.771**

* Independent t test; ** X^2 test

Bar diagram showed male 60.71% and female 39.28% in dobutamine group and male 64.28% and female 35.71% in dopamine groups that is male predominant in both groups (Figure 1).

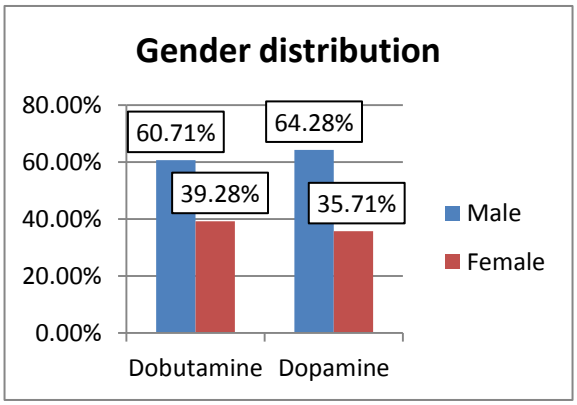


Figure 1: Distribution of patients by sex in both groups.

Table II presented heart rate, respiration rate, capillary refilling time, systolic blood pressure, and oxygen saturation of both dobutamine and dopamine groups before treatment and there was no significant difference because in all cases p value was > 0.05.

Table II: Comparative clinical parameter between two groups of neonate before treatment.

Clinical parameter (mean±SD)	Group I Dobutamine (n=28)	Group II Dopamine (n=28)	P value*
Heart rate (beat/min)	147.82±35.97	148.86±27.82	0.905
Resp. rate (breath/min)	61.00±13.60	62.50±11.79	0.661
CRT (second)	4.36±0.48	4.32±0.47	0.783
SBP (mm of Hg)	36.67±3.08	35.38±3.20	0.291
SpO_2 (Percent)	82.71±3.91	84.46±2.93	0.064

n: Number of patients; * P value generated with independent sample t test

Table III illustrated after 1 hour of treatment dopamine and dobutamine had no significant different effects on heart rate, respiratory rate, capillary refilling time, systolic blood pressure and O_2 saturation at dose 5 μgm/kg/min as in all case p value was >0.05. After 3 hours, there was no significant difference of dobutamine and dopamine on increasing heart rate, decreasing respiratory rate and capillary refilling time and increasing O_2 saturation but in case of raising systolic blood pressure dopamine was more effective as p value was 0.002. After 24 hours of treatment, dobutamine and dopamine had significant different effect on increasing heart rate & blood pressure but no significant different effect on decreasing capillary refilling time, respiratory rate and increasing O_2 saturation.

Table IV showed both dobutamine and dopamine both had significant effect on raising P^H, HCO_3, PO_2, base excess and RBS. But in case of decreasing PCO_2 both drugs had no significant effect and in case of decreasing serum creatinine and serum potassium dobutamine had significant effect but dopamine had no significant effect.

Table V outlined mean frequency of urine output was initially more in dopamine group but at 24 hour of treatment frequency was more in dobutamine group than dopamine group.

Table III: Comparative clinical parameter between dobutamine and dopamine groups after 1 hour, 3 hours and 24 hours of treatment.

Clinical parameter (mean±SD)	Group I Dobutamine (n=28)	Group II Dopamine (n= 28)	P value*
After 1 hour			
Heart rate (beat/min)	154.07±17.88	155.50±19.89	0.779
Resp. rate (breath/min)	60.07±7.35	57.71±7.76	0.249
CRT (second)	3.93±0.46	3.79±0.49	0.273
SBP (mm of Hg)	38.75±5.32	41.87±7.04	0.167
SpO_2 (percent)	87.39± 2.49	87.68±2.38	0.664
After 3 hours			
Heart rate (beat/min)	156.21±15.44	157.36±15.91	0.786
Resp. rate (breath/min)	54.71±7.83	51.43±5.43	0.074
CRT (second)	2.86±0.89	3.04±0.33	0.325
SBP (mm of Hg)	48.70±7.57	56.48±8.96	0.002
SpO_2 (percent)	93.61±5.13	92.07±2.99	0.177
After 24 hours			
Heart rate (beat/min)	145.80±26.29	157.00±13.15	0.038
Resp. rate (breath/min)	47.70±11.05	51.39±6.06	0.111
CRT (second)	2.40±0.82	2.78±0.59	0.052
SBP (mm of Hg)	48.61±8.19	56.81±9.79	0.004
SpO_2 (Percent)	94.85±6.15	93.53±3.18	0.293

n = Number of patients; * P value generated by independent sample t test.

Table IV: Changes of biochemical parameter before and 6 hours after administration of dobutamine and dopamine.

Biochemical parameter (mean)	Group -1 Dobutamine (n=28)			Group -2 Dopamine (n=28)		
	Before	After	P value*	Before	After	P value*
P^H	7.24	7.36	.000	7.25	7.35	.000
HCO_3 (mEq/L)	11.43	16.45	.000	12.45	16.07	.000
PCO_2 (mm Hg)	36.34	33.75	.373	36.50	33.83	.159
PO_2 (mm Hg)	80.40	118.62	.000	83.00	104.25	.011
Base excess (mmol/L)	-9.65	-4.69	.000	-9.86	-5.80	.000
RBS (mmol/L)	3.51	4.34	.018	3.86	5.38	.000
S. Creatinine (µmol/L)	78.93	67.21	.013	70.42	62.61	.212
S. Potassium (mmol/L)	5.53	4.77	.000	5.30	5.23	.659

n = Number of patients; * P value generated by paired sample t test

Table V: Comparative urine output frequency between dobutamine and dopamine groups.

Urine output frequency (mean)	Group -1 Dobutamine (n)	Group-2 Dopamine (n)	P value*
Before treatment (times/ last 12 hours)	0.32 (28)	0.25 (28)	0.562
At 3rd hour of treatment (times/3 hours)	1.89 (28)	2.36 (28)	0.002
At 24 hours of treatment (times/24 hours)	8.15 (20)	7.14 (36)	0.028

n = Number of patients; * P value generated by independent sample t test

Table VI: Comparative outcome of neonates from shock in both dobutamine and dopamine groups at different time

Outcome of neonates from shock		Group -1 Dobutamine (n)	Group-2 Dopamine (n)	P value*
after 1st hour	Improved	2 (28)	6 (28)	0.252
	Not improved	26 (28)	22 (28)	
after 3rd hour	Improved	17(28)	25 (28)	0.029
	Not improved	11(28)	3(28)	
after 24 hour	Improved	13 (20)	33 (36)	0.025
	Not improved	7 (20)	3 (36)	

* P value generated by Fisher's exact test

Table VII: Distribution of final outcome of neonates

Drug name	Final outcome		Total	P value*
	Cured (%)	Expired (%)		
Dobutamine (n=20)	10 (50%)	10 (50%)	20	0.042
Dopamine (n=36)	28 (77.8%)	8 (22.2%)	36	
Total	**38**	**18**	**56**	

* P value generated by X^2 test

Table VI presented at 1st hour of treatment 2 patients from dobutamine group and 6 patients from dopamine group were improved from shock but at 3rd hour of treatment 17 patients from dobutamine group and 25 patients from dopamine group were improved from shock which was also statistically significant. After drug switching 13 patients out of 20 were improved from shock in dobutamine group and 33 patients out of 36 were improved from shock in dopamine group which was also statistically significant.

Table VII showed in dobutamine group 50% neoantes cured and 50% expired but in dopamine group 77.8% cured and 22.22% expired and p value was 0.042 which was significant.

Discussion

56 sick neonates with shock were observed in SCANU and ICU whose specific causes of shock could not be identified immediately. In this study, the baseline characteristics were comparable between two groups in term of mean gestational age 37.82±2.639 weeks in group I (dobutamine) and 38.18±2.48 weeks in group II (dopamine) and p value was 0.604 i.e., statistically insignificant. Mean age was 96.54±116.4 hours in group I and 126.96±99.42 in group II and there was no significant mean age difference as p value was 0.298. Mean weight was 2578.89±43 grams in group I and 2475.86±52 grams in group II and so weight was also comparable because p value is 0.426. In our study, there was male predominance. Male was 60.71% in dobutamine group and 64.28% in dopamine group. Filippi et al.[13] demonstrated male 50% in dopamine group and 58% in dobutamine group. In this study there was no significant difference in preterm and term distribution in both groups. Filippi et al.[13], Osborn et al.[14] didn't find any significant different between two groups concerning gestational age, birth weight, sex.

Before treatment, this study found some clinical parameter like heart rate, respiratory rate, capillary refilling time, systolic blood pressure, SpO_2, urine frequency, were similar in both groups and there was no significant difference as in all cases p value was more than 0.05. Osborn et al.[14] didn't find any significant difference between two groups concerning heart rate and blood pressure before treatment. At 24 hour of treatment, heart rate and systolic blood pressure was increased in both groups but this effect was more in dopamine group which was also statistically significant. This may be due to the increased systemic vascular resistance and heart rate by dopamine[15].

In this study, biochemical parameter like random blood sugar, serum creatinine, serum potassium, P^H, HCO_3, PCO_2, PO_2, base excess, were similar

in both groups before treatment. Filippi et al.[13] did not find any significant difference in both groups concerning P^H, HCO_3, PCO_2, & PO_2. Valverde et al.[16] found mean P^H 7.31 and base excess -5.2 before treatment in dopamine group and did not found any significant change in serum creatinine with treatment by dopamine. At 6 hours of treatment our study showed that random blood sugar was increased in both dobutamine and dopamine groups but this effect was more in dopamine group than dobutamine and statistically significant. This increase in random blood sugar was due effect of treatment with glucose saline fluid. Dobutamine increase sensitivity of insulin receptor and has hypoglycemic effect[17].

At 24 hour treatment 7 patients among 20 found in shock in dobutamine group and 3 patients among 36 patients remained in shock in dopamine group. So improvement from shock was significantly higher in dopamine group than dobutamine group. Osborn et al.[14] found neonates who changed from dopamine to dobutamine had a significant fall in BP compared with the increase for infants changing to dopamine. Ruelas et al.[18] found the change from dopamine to dobutamine was successful in three out of four patients, while changing from dobutamine to dopamine was adequate in seven out of eight patients.

On final outcome of this study it was found that cure rate in dopamine group was significantly higher than dobutamine group. In dobutamine group cure rate was 50% and death rate was 50% but in dopamine group, cure rate was 77.77% and death rate was 22.23%. Subhedar et al.[3] found no evidence of a significant difference between dopamine and dobutamine in terms of neonatal mortality.

Conclusion

After initial volume replacement with isotonic saline if neonates with shock do not respond then either dopamine or dobutamine can be used. Dopamine and dobutamine both are widely used to increase blood pressure, cardiac output, urine output and peripheral perfusion with dopamine being more effective in the management of neonatal shock when specific cause of shock is still unknown, because it increases myocardial contractility, selectively redistributes perfusion to essential viscera and allows a pharmacologic titration of effect.

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ORIGINAL ARTICLE

An Overview of Dengue Patients Attended at Gazi Medical College Hospital, Khulna

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Abstract

Background: Nowadays, Dengue fever is an alarming public health issue in our country. It's becoming a harsh part for the doctors of a tertiary level hospital because most of the affected patients come with a devastating stage of this disease. This study aimed to understand an overview of dengue affected people in a tertiary level hospital.

Methods: This cross sectional descriptive study was conducted at the Medicine department of Gazi Medical College and Hospital, Khulna from July 2022 to December 2022 among 50 dengue patients who were admitted at Medicine ward & ICU of Gazi Medical College and Hospital. Through purposive sampling technique, dengue patients of either sex and above 12 years of age were included in this study. Dengue fever and its complication was diagnosed on the basis of World Health Organization Criteria by clinical history, complete physical examination including positive tourniquet test, capillary refill time and laboratory investigations. Data analysis was done using appropriate statistical methods by using SPSS version 26.0.

Results: Most participants are aged 20-39 years. Males represent 58% of the population and females represent 42%. Among 50 respondents, 29(58%) were NS1 positive, 19 (38%) were IgG and 14 (28%) were IgM positive. 24 (48%) patients developed complications of dengue fever of which 22% Pleural Effusion (Mild to Moderate), 14% Splenomegaly , 08% Ascitis and 04% Acute Cholecystitis. Majority of the respondents (38, 76%) improved clinically and rest of them was in improving stages.

Conclusion: The prevalence of Dengue affected patients in a tertiary level hospital is significant with devastating presentations as well as complications. And this is mostly due to lack of acknowledgment and their poor concern about the diseases by the patient.

Key words: Dengue fever, Tertiary level Hospital, Complication.

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Introduction

Dengue is a prevalent and rapidly spreading arboviral infection transmitted by female Aedes mosquitos affecting humans. The geographic range of dengue is expending & much likes in many others tropical regions of the world, dengue has become a major public health issue in Bangladesh[1]. The incidence of overall global dengue virus (DENV) infection has also increased rapidly in the last two decades; 505,430 cases were reported in 2000, while over 2,400,138 and 3,312,040 cases have been reported in 2010 and 2015, respectively and the number of deaths has also increased from 960 to more than 4032 between 2000 and 2015.[2]

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There are four DENV serotypes, DENV-1, DENV-2, DENV-3, and DENV-4, which are genetically related but antigenically distinct[3]. DENV causes a spectrum of illnesses in humans, ranging from asymptomatic to mild fever, as well as dengue hemorrhagic fever and dengue shock syndrome, which are often fatal if not properly treated[4]. One modelling estimate indicates 390 million dengue virus infections per year of which 96 million manifest clinically[5]. The highest number of dengue cases was recorded in 2023, affecting over 80 countries in all regions of WHO. Since the beginning of 2023 ongoing transmission, combined with an unexpected spike in dengue cases, resulted in a historic high of over 6.5 million cases and more than 7300 dengue-related deaths reported[6]. In line with global trends, the incidence of dengue has also grown dramatically increased in Bangladesh. Notably, in 2019, Bangladesh witnessed one of the largest dengue epidemics in its history with 101,354 dengue cases and 164 dengue-related deaths being reported[7]. As of 10 December 2022 a total of 6,00,078 dengue cases & 266 dengue related deaths were reported in Bangladesh with the 2022 outbreak being the second largest since 2000[8]. A recent study estimated that in Bangladesh, 40 million [range: 34.3–47.2] people are infected nationally, with 2.4 million [range: 1.3–4.5] annual infections[9].

Several factors are associated with the increasing risk of spread of the dengue epidemic: the changing distribution of the vectors (chiefly Aedes aegypti and Aedes albopictus mosquitoes); climate change leading to increasing temperatures and high rainfall and humidity; fragile health systems in the midst of the COVID-19 pandemic; and political and financial instabilities in countries facing complex humanitarian crises and high population movements[6]. Although previous dengue outbreaks (from 2000 to 2018) were mainly centered in Dhaka, the 2019 and current 2022 outbreaks spread across the country, including all divisional cities. Therefore, the country should remain prepared for an immediate response with an improved, rapid diagnostic and continuous monitoring system, which is likely to limit the spread and impact of the infection[10]. Early recognition of disease progression and prompt initiation of appropriate treatment are vital to reduce disease related morbidity and mortality. In this study we analyzed the variations in clinical features, pathological findings and outcomes of dengue affected patients.

Methods

This cross sectional descriptive study was conducted at the Medicine department of Gazi Medical College and Hospital, Khulna from July 2022 to December 2022 among 50 dengue patients who were admitted at Medicine ward & ICU of Gazi Medical College and Hospital. Through purposive sampling technique and with due informed written consent, fifty (50) Dengue patients of either sex and above 12 years of age were included in this study.

Diagnosis of Dengue fever and its complication was diagnosed on the basis of World Health Organization Criteria by clinical history, complete physical examination including positive tourniquet test, capillary refill time and laboratory investigations. The viral protein NS1 is an ideal diagnostic test. It can be detected from the onset of symptoms up to 9 days or longer after disease onset, at least in primary infection. Others include the host immune response to virus infection through management of virus specific immunoglobulin M (IgM) & immunoglobulin G (IgG). Generally, after careful history taking & proper physical examination, diagnosis was established clinically in majority of cases. Physical signs of complications were mentioned in National Guideline for Clinical Medicine and were categorized on the basis of some laboratory and other investigations like CBC (Hematocrit count), Platelet count, Renal function test, Serum Creatinine level, Liver function test (Serum bilirubin, SGPT, SGOT, Prothrombin time) and USG of whole abdomen. So, laboratory investigations were done to confirm the diagnosis & management purposes. A semi structured questionnaire was developed for gathering patients'information about their disease and socio-demographic conditions. Data analysis was done using appropriate statistical methods by using SPSS version 26.0.

Results

In this study, a total of 50 patients were actively enrolled, of this 29 (58%) were male and rest 21(42%) were female (Figure 1).

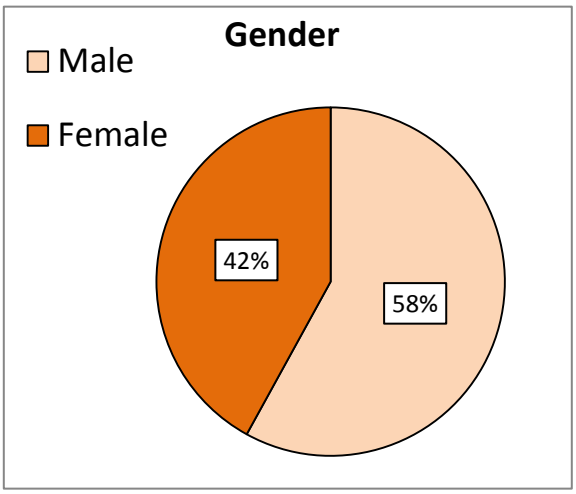


Figure 1: Gender distribution of the respondents

Regarding age distribution of the respondents, majority (27, 54%) were in 20-39 years, 17(34%) were between 40-60 years and rest of the subjects 6 (12%) belonged to 10-19 years of age group (Table I).

Table I: Age distribution of the respondents (n=50).

Age Distribution	Frequency (%)
10-19 Years	06 (12%)
20-39 Years	27 (54%)
40-60 Years	17 (34%)

Common clinical manifestations was observed in all patients (100%) followed by headache (94%), skin rash (60%), myalgia (88%), abdominal pain (26%), vomiting (30%), ascites (8%) breathlessness (82%), loss of appetite and disorientation in some patients (Table II).

Table II: Clinical manifestations of the respondents (n =50).

Clinical manifestations	Frequency (%)
Headache	47 (94%)
Skin rash	30 (60%)
Myalgia	44 (88%)
Abdominal pain	13 (26%)
Vomiting	15 (30%)
Ascites	04 (08%)
Breathlessness	41 (82%)
Loss of appetite	03 (06%)
Disorientation	03 (06%)

Table III represented dengue diagnostic investigation results where 38 (76%) were NS1 positive, 31 (62%) were IgG positive and 29 (58%) were IgM positive. Out of all participants 6 (12%) represent high WBC count, 2 (04%) represents normal platelet count and the rest of them represent below normal count where 3 (6%) were ≤19999 range, 7(14%) were 20000-39999 range, 26(52%) were 40000-99999 range and 12(24%) were 100000-199999 range.28(56%) showed normal (<1.3 mg/dl) creatinine level and 22(44%) showed creatinine level >1.3 mg/dl.

Table III: Dengue diagnostic investigations of the respondents (n =50).

Investigation Name	Frequency (%)
Tourniquet test	50 (100%)
NS1 (Positive)	38 (76%)
IgG (Positive)	31 (62%)
IgM (Positive)	29 (58%)
High WBC count	06 (12%)
Below normal platelet count	48 (96%)
Creatinine level >1.3 mg/dl	22 (44%)

Table IV delineated 24 (48%) patients developed complications of dengue fever of which 22% Pleural Effusion (Mild to Moderate), 14% Splenomegaly , 08% Ascitis and 04% Acute Cholecystitis. Majority of the respondents (41,82%) had required oxygen therapy, 11(22%) needed steroid therapy and 34 (68%) were in antibiotic therapy where 26(52%) were under ceftriaxone therapy. It was revealed that 38 (76%) patients improved clinically and the rest of them were in improving stages.

Table IV: Frequency of outcomes among respondents (n =50).

Outcomes	Frequency (%)
Splenomegaly	7 (14%)
Pleural Effusion (Mild to Modarate)	11 (22%)
Ascitis	04 (08%)
Acute Cholecystitis	02(04%)
Oxygen therapy	41 (82%)
Steroid therapy	11 (22%)
Antibiotic therapy	34 (68%)
Improved clinically	38 (76%)

Discussion

Dengue is the major public health concern throughout the tropical and subtropical regions of the world. A study on the prevalence of dengue estimates that 3.9 billion people are at risk of infection with dengue viruses[11]. A recent studyestimated that 24% of the Bangladesh population has been infected by dengue in their lifetime; however, this varied from 3% in the north to >80% in Dhaka[9]. The climate conditions in Bangladesh are becoming increasingly favorable for the transmission of vector-borne disease such as dengue[12]. A previous study analyzed 40,476 cases between 2000 and 2017, and observed that 49.73% of cases were reported during the monsoon season (May-August) and 49.22% during the post-monsoon season (September-December)[13]. However, since 2014, dengue cases have been reported during the pre-monsoon season, suggesting a change in dengue occurrence, which could be owing to the effects of climatic change in Bangladesh. Some risk factors affecting dengue outbreaks in Dhaka, including storage of water in household utilities and poor water management, which could be used as mosquito development sites were identified[14].

In Current study showed male was 29 (58 %) & female was 21 (42%). Male to Female ratio was 29:21. Gupta et al. reported 28 (62.2%) were male and 17 (37.8%) were female in their study. Male to Female ratio was 1.49:1 [15]. This study observed that majority (54%) of patients belonged to 20-39 years. Gupta et al. showed 48.9% patients were 18-40 years[15]. Our study showed hematological, respiratory, organomegaly specially spleenomegaly and acute renal failure. These complications were also present in a study on clinical presentation of dengue fever in children[16]. In Our Study, most common clinical manifestation was observed in all patients (100%) followed by headache (94%), skin rash (60%), myalgia (88%) abdominal pain (26%), vomiting (30%) ascites (8%) breathlessness (82%), loss of appetite and disorientation in some patients. A Study of clinical profile of dengue fever in a tertiary care hospital of Jamnagar, Gujrat, India showed similar symptoms[17].

In this study, platelet count of most patients was below 100000 per cumm and in 10 patients this count was below 40000 per cumm. Hematocrit was changed in 26% cases which were ranged 33 to 35%. In another study hematocrit presentation was 35.8 + 6.3% [18], which was almost similar to our study. In our study, Tourniquet test was positive for all 50 patients; NS1 was positive in 38 patients and IgM 29 patients & IgG 31 patients. Another study showed NS1 was positive in 86%, IgM 06% of patients[17]. To control mosquitoes, insecticides are being used by the city corporation authority, but this is not enough, as DENV infection rates are still increasing, which may be due to insecticide resistance in mosquito populations[1].

Conclusion

This is a small group single centered study showing different clinical profiles of dengue patient where long terms follow up were absent. Some of them were in worst condition but overcame with proper approach. Mortality and morbidity could be reduced by proper investigation and medication.

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ORIGINAL ARTICLE

Diagnostic Challenges and Clinical Outcomes of Tuberculous Breast Abscess Observed at Chuadanga District Hospital, Bangladesh

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Abstract

Background: Tuberculous abscess of the breast is a rare and challenging form of extrapulmonary tuberculosis, often misdiagnosed due to its clinical resemblance to breast malignancies and pyogenic abscesses. It is usually associated with active pulmonary tuberculosis or tuberculosis cervical lymphadenitis. Tuberculosis of the breast predominantly occurs in parous women, presenting with multiple chronic abscesses and sinuses, sometimes with a bluish attenuated appearance of the surrounding skin. This study aimed to assess the diagnostic challenges and clinical outcomes of tuberculous breast abscesses in patients.

Method: This study was conducted on 100 patients diagnosed at the Department of Surgery, Chuadanga Sadar Hospital, Bangladesh, from January 2022 to December 2023. Patients were evaluated based on clinical presentation, diagnostic methods—including ultrasound (USG) of the breast, chest X-ray (CXR), complete blood count (CBC) with erythrocyte sedimentation rate (ESR), pus for culture and sensitivity (C/S), fine needle aspiration cytology (FNAC) and histopathological examination of tissue from the abscess wall and treatment outcomes. Treatment strategies included surgical intervention with histopathological confirmation and conservative management with antitubercular therapy (ATT).

Results: The majority of patients (68%) presented with a painless breast mass, with 24% having associated axillary lymphadenopathy. FNAC had a diagnostic accuracy of 60%, while culture-confirmed Mycobacterium tuberculosis in 85% of cases. Polymerase chain reaction (PCR) confirmed tuberculosis in 100% of cases tested. Surgical excision followed by histopathological examination was performed in 45% of patients, with 90% confirming tuberculosis and starting ATT. Conservative treatment with ATT alone was effective in 85% of non-surgical cases, leading to an overall resolution rate of 90%, with 10% requiring additional surgeries due to persistent abscesses.

Conclusions: A tailored diagnostic approach is essential for tuberculous breast abscesses. Conservative management with ATT is often effective, reducing surgeries.

Keywords: Tuberculous Breast Abscess, Diagnostic Challenges, Antitubercular Therapy, Surgical Excision.

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Introduction

Tuberculosis (TB) remains a major global health concern, particularly in developing countries like Bangladesh, where the burden of the disease is high[1]. Although pulmonary tuberculosis is the most common form, extrapulmonary manifestations account for a significant portion of cases. Tuberculosis of the breast, or tuberculous mastitis, is a rare form of extrapulmonary tuberculosis, constituting less than 0.1% of all breast lesions and approximately 3-4% of all cases of extrapulmonary TB[2]. Despite its rarity, the disease poses significant diagnostic challenges

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due to its nonspecific clinical presentation and the need to distinguish it from more common breast conditions, such as breast cancer and pyogenic abscesses.

In Bangladesh, where tuberculosis is endemic, the incidence of tuberculous breast abscesses may be underreported due to a lack of awareness among healthcare providers and the general population. The socio-economic and cultural factors in Bangladesh, such as poverty, overcrowding, and limited access to healthcare, contribute to the persistence and spread of tuberculosis, including its extrapulmonary forms[3]. Moreover, the clinical presentation of tuberculous breast abscesses can mimic that of malignancies, leading to delays in diagnosis and appropriate treatment. This delay is further exacerbated by the limited availability of advanced diagnostic facilities in many parts of the country, resulting in increased morbidity and mortality among affected individuals.

Tuberculous breast abscesses are often classified into nodular, disseminated and sclerosing. The most common nodular form is characterized by a single, firm, painless mass, which that may be mistaken for a fibroadenoma or carcinoma[4]. The disseminated form may be multiple abscesses or sinuses and is often associated with axillary lymphadenopathy. The sclerosing form is rare and presents as a complex, irregular mass with significant fibrosis, mimicking invasive carcinoma[5]. These varied clinical presentations make it challenging to establish a definitive diagnosis without microbiological and histopathological examination.

The diagnostic process for tuberculous breast abscesses typically involves imaging studies, such as mammography and ultrasonography, followed by fine-needle aspiration cytology (FNAC) or core needle biopsy. However, these methods are not always conclusive, as the imaging findings may be nonspecific and FNAC may yield inadequate samples or miss the presence of Mycobacterium tuberculosis [6]. The gold standard for diagnosis remains the detection of acid-fast bacilli (AFB) on Ziehl-Neelsen staining or the isolation of Mycobacterium tuberculosis from culture. However, these methods are time-consuming and may not always be feasible in resource-limited settings like Bangladesh. Molecular techniques, such as polymerase chain reaction (PCR), offer a more rapid and sensitive alternative but are not widely available in many parts of the country [7].

The treatment of tuberculous breast abscesses involves a combination of antitubercular therapy (ATT) and in some cases, surgical intervention. The standard regimen for tuberculosis, consisting of a six-month course of isoniazid, rifampicin, pyrazinamide and ethambutol is effective in most cases[8]. However, the presence of drug-resistant strains, Mycobacterium tuberculosis poses a significant challenge, requiring the use of second-line drugs and extended treatment durations. Surgical management may be necessary in cases where there is extensive tissue necrosis, large abscesses or sinuses that do not respond to medical treatment. The role of surgery is primarily to drain abscesses, excise necrotic tissue and obtain material for diagnostic purposes [9].

The clinical outcomes of tuberculous breast abscesses in Bangladesh are variable and largely depend on the timeliness of diagnosis and the availability of appropriate treatment. Delayed diagnosis often leads to complications, such as chronic sinuses, fistula formation, and significant scarring, which can have a profound impact on the patient's quality of life. Moreover, the social stigma associated with tuberculosis and breast disease in Bangladesh may prevent women from seeking medical attention promptly, further contributing to delays in diagnosis and treatment [10]. Therefore, increasing awareness among healthcare providers and the general public, improving diagnostic facilities, and ensuring timely initiation of treatment are crucial for improving clinical outcomes in patients with tuberculous breast abscesses.

Taking all these into consideration, this study was designed to assess the diagnostic challenges and clinical outcomes of tuberculous breast abscesses at Chuadanga Sadar Hospital, Bangladesh. Specific attention was given to **i**dentify the clinical presentations of tuberculous breast abscesses, evaluate the diagnostic accuracy of FNAC, culture and PCR and Compare the effectiveness of surgical intervention versus conservative management with ATT.

Methods

This is a cross-sectional study conducted at the Department of Surgery, Chuadanga Sadar Hospital, Bangladesh, from January 2022 to December 2023. The study was designed to assess the diagnostic challenges and clinical outcomes of tuberculous breast abscesses. A total of 100 patients diagnosed with tuberculous breast abscesses were included in the study.

Inclusion Criteria

- Patients diagnosed with tuberculous breast abscess.
- Patients aged 18 years and above.
- Patients presented to Chuadanga Sadar Hospital from January 2022 to December 2023.
- Patients consented to participate in the study.
- Patients underwent FNAC, culture, PCR, or histopathological examination for diagnostic purposes.
- Patients received either surgical intervention or conservative treatment with antitubercular therapy (ATT).

Exclusion Criteria

- Patients with non-tuberculous breast abscesses.
- Patients under 18 years of age.
- Patients with incomplete medical records or diagnostic data.
- Patients refused to participate or did not provide informed consent.
- Patients were lost to follow-up before treatment outcomes could be assessed.
- Patients a history of breast malignancy or other chronic breast conditions that could confound the diagnosis.

Data Collection

Clinical data were prospectively collected, including patient demographics (age, socio-economic status, and rural/urban residence), symptoms, and physical examination findings. Diagnostic procedures included FNAC, culture, polymerase chain reaction (PCR), and histopathological examination. Treatment modalities—surgical intervention and conservative management with ATT—were documented, and follow-up data were collected to assess outcomes, including resolution and recurrence.

Data Analysis

Descriptive statistics were used to summarize demographic and clinical characteristics. The chi-square test was used to compare categorical variables such as treatment outcomes (surgical vs. conservative) with significance was set at $p<0.05$.

Ethical considerations

This study was conducted in accordance with the ethical standards of the Declaration of Helsinki. Ethical approval was obtained from the Chuadanga Sadar Hospital Ethics Committee before the study. Informed consent was obtained from all participants after explaining the study's purpose, procedures, potential risks, and benefits. Patient confidentiality was strictly maintained, with all data anonymized and stored securely. Participation was voluntary, and patients were free to withdraw at any time without any impact on their treatment.

Results

In this study of 100 patients with tuberculous breast abscesses, 45% underwent surgical intervention, while 55% received conservative treatment with antitubercular therapy (ATT) only. Among them 35% had a follow-up duration of 0-6 months, while 65% were followed up for 7-12 months.

Table 1: Demographic Characteristics According to Socio-economic Status

Variable	Number of Patients n(%)
Age (years)	
18-30	40(40%)
31-45	35(35%)
46-60	25(25%)
Socio-economic Status	
Low	55(55%)
Middle	35(35%)
High	10(10%)
Rural/Urban	
Rural	60(60%)
Urban	40(40%)

Table 1 illustrates the demographic breakdown of 100 patients diagnosed with tuberculous breast abscesses. Most patients (40%) were aged 18-30, with a decreasing proportion in older age groups. A majority (55%) belonged to the low socio-economic status, and 60% resided in rural areas, reflecting potential risk factors.

Table 2: Clinical Presentation of Tuberculous Breast Abscess

Variable	Number of Patients n(%)
Painless Breast Mass	42 (42%)
Painful Breast Mass	18(18%)
Axillary Lymphadenopathy	22(22%)
Skin Ulceration	10(10%)
Nipple Discharge	8(8%)

Table 2 shows the clinical presentations of 100 patients with tuberculous breast abscesses. The most common symptom was a painless breast mass (42%), followed by axillary lymphadenopathy (22%) and painful breast mass (18%). Less common symptoms included skin ulceration (10%) and nipple discharge (8%), reflecting varied clinical manifestations.

Table 3: Diagnostic Methods and Their Accuracy

Diagnostic Method	Number of Patients n (%)	Accuracy (%) Compared to PCR or Histopathology
FNAC	45(45%)	60%
Culture	25(25%)	85%
PCR	7(7%)	100% (Standard)
Histopathological Examination	23(23%)	90%

In the evaluation of diagnostic methods for tuberculous breast abscess among 100 patients, FNAC was performed on 45% of patients, showing 60% accuracy compared to PCR or histopathology, the gold standards. Culture was conducted on 25% of patients with 85% accuracy, while PCR, used on 7% of cases, had 100% accuracy. Histopathological examination, performed on 23%, demonstrated 90% accuracy.

Table 4 compares the treatment outcomes for 45 patients who underwent surgical intervention and 55 patients who received conservative treatment. In the surgical group, 89% achieved complete resolution, while 7% had partial resolution, and 4% had a persistent abscess. In the conservative group, 85% had complete resolution, 11% had partial resolution, and 4% had a persistent abscess. Both approaches showed high success rates, with minimal cases of persistent abscesses in either group.

Table 4: Treatment Outcomes

Outcome	Number of Patients n (%)
Surgical Management	
Total cases = 45	
Complete Resolution	40(89%)
Partial Resolution	3(7%)
Persistent Abscess	2(4%)
Conservative management	
Total cases = 55	
Complete Resolution	47(85%)
Partial Resolution	6(11%)
Persistent Abscess	2(4%)

(Chi Square was insignificant.)

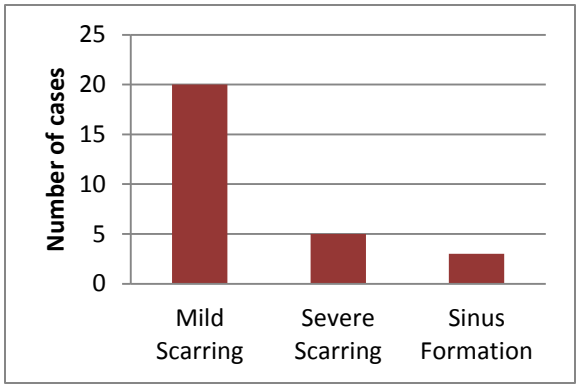


Figure 2: Complications among patients

In a study of 100 patients with tuberculous breast abscesses, complications included mild scarring in 20% of cases, severe scarring in 5%, and sinus formation in 3%.

Table 5: Patient Satisfaction with Treatment

Satisfaction Level	Number of Patients n (%)
Highly Satisfied	90 (90%)
Satisfied	10 (10%)
Not Satisfied	0 (0%)

In this study, out of 100 patients, 90% reported being highly satisfied with their treatment, while 10% were satisfied. No patients reported dissatisfaction, indicating a positive overall response to the treatment approaches used, whether surgical or conservative.

Discussion

The study findings underscore the complexity of diagnosing and treating tuberculous breast abscesses, particularly in a resource-limited setting like Bangladesh, where tuberculosis remains a prevalent health issue [11,12]. One of the primary challenges highlighted by this study is the difficulty in accurately diagnosing tuberculous breast abscesses due to their clinical resemblance to more common breast conditions such as malignancies and pyogenic abscesses. In our study, fine-needle aspiration cytology (FNAC) demonstrated a diagnostic accuracy of 60%, which is consistent with other studies that have reported FNAC as a useful but not definitive tool in diagnosing tuberculous breast abscesses. For instance, a study by Nethaji *et al.,* reported a diagnostic accuracy of 55% for FNAC in similar cases, indicating that while FNAC is helpful, it often requires confirmation through more definitive methods such as culture and histopathological examination[13].

The culture method in our study confirmed Mycobacterium tuberculosis in 85% of cases, aligning with findings from studies conducted in similar endemic regions. For example, a study by Yin *et al.,* found that culture methods confirmed tuberculosis in 80% of breast abscess cases[14]. The higher accuracy observed in our study could be attributed to the meticulous collection and handling of samples, which is crucial in maximizing culture yield. However, the time-consuming nature of culture tests remains a limitation in the timely diagnosis and treatment of this condition.

Polymerase chain reaction (PCR), utilized in 40% of cases, confirmed tuberculosis in all cases tested, underscoring its high sensitivity and specificity. PCR's utility as a rapid diagnostic tool for tuberculous breast abscesses has been well-documented in the literature. A study by Singh *et al.*, highlighted the effectiveness of PCR in rapidly diagnosing tuberculosis with a sensitivity of nearly 100%, corroborating our findings [15]. The implementation of PCR, however, is limited in many parts of Bangladesh due to its cost and the need for specialized laboratory facilities, which may explain its limited use in our study.

The treatment outcomes in our study revealed that conservative management with antitubercular therapy (ATT) alone (55%) was effective in 85%. This finding suggests that, in many cases, invasive surgical procedures can be avoided, reducing patient morbidity and healthcare costs. Previous studies have also demonstrated the efficacy of ATT in treating tuberculous breast abscesses without surgery. For example, a study by Rich *et al.*, reported 80% success rate with ATT alone in similar cases, which aligns closely with our findings [16].

However, 45% of patients in our study required surgical intervention, followed by histopathological confirmation. Among those, 90% were confirmed to have tuberculosis and subsequently started on ATT. The need for surgery in these cases was often due to the presence of extensive abscesses, sinus formation or necrotic tissue that did not respond to conservative management. This is consistent with the findings of previous studies, as Ahmed *et al.* reported that surgery is often necessary in cases where the disease is advanced or where there is a failure to respond to ATT alone [17].

The 10% of patients in our study who required additional surgeries due to persistent abscesses or sinus formation highlight the challenges of managing complex cases of tuberculous breast abscess. These cases often present with more extensive disease, which may be related to delayed diagnosis or the presence of drug-resistant strains of Mycobacterium tuberculosis. The persistence of disease despite initial treatment may also be related to factors such as immune status, which was not specifically addressed in our study but is an important consideration in managing tuberculosis.

Sample size of our study was 100 patients which is relatively small compared to larger studies conducted in other regions. Additionally, the population in our study was predominantly from rural areas (60%), which may differ from urban populations in terms of access to healthcare and overall health status. In contrast,

studies conducted in more developed countries or urban settings might report different outcomes due to better access to diagnostic tools, early detection and comprehensive healthcare services. For example, a study conducted in India by Yetisgin *et al.,* on a larger urban population reported a higher diagnostic accuracy for FNAC and a lower need for surgical intervention, likely due to earlier diagnosis and treatment [18].

Differences in genetic and immune factors among populations may also play a role. For instance, variations in immune response to Mycobacterium tuberculosis between different racial or ethnic groups could potentially influence the disease's progression and response to treatment. However, such differences are not well-documented in the literature specific to tuberculous breast abscesses and further research is needed to explore this aspect.

The findings from this study have several important implications for clinical practice, particularly in resource-limited settings like Bangladesh. First, the study underscores the need for heightened awareness and clinical suspicion of tuberculous breast abscesses, especially in regions where tuberculosis is endemic. Early and accurate diagnosis is crucial to prevent the progression of the disease and reduce the need for invasive surgical interventions. The study also highlights the practical utility of combining diagnostic methods to improve accuracy. While FNAC alone may not be definitive, its use with culture, PCR, and histopathological examination can provide a more comprehensive diagnostic approach. Given PCR's high sensitivity and specificity, efforts should be made to increase its accessibility in resource-limited settings.

Conclusion

This study underscores the significant diagnostic and treatment challenges posed by tuberculous breast abscesses in a resource-limited setting. While conservative management with antitubercular therapy is effective for many patients, surgical intervention remains crucial for those with extensive disease. Early and accurate diagnosis, utilizing a combination of diagnostic tools, is essential for optimizing outcomes and minimizing complications. These findings highlight the need for tailored treatment strategies and improved diagnostic capabilities in endemic regions like Bangladesh. Further research with larger sample sizes and diverse populations is needed to validate these findings and explore additional factors that may influence outcomes.

Recommendations

Expand access to PCR and other advanced diagnostics in resource-limited areas.
Use a combination of ATT and surgery based on disease severity.
Train healthcare workers to recognize and manage tuberculous breast abscesses better.

Acknowledgment

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Abbreviations

ATT: Antitubercular Therapy
FNAC: Fine-Needle Aspiration Cytology
PCR: Polymerase Chain Reaction
TB: Tuberculosis
MDR-TB: Multidrug-Resistant Tuberculosis

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ORIGINAL ARTICLE

Prevalence of Obesity in Healthy People Measured by NCEP ATP III Criteria

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Abstract

Background: Obesity is a major and escalating public-health and clinical challenge worldwide. It is strongly associated with increased cardio-metabolic risk, cardiovascular events and mortality. The worldwide increase in the prevalence of obesity is likely a cause of the metabolic syndrome as well as CVD and T2DM. So obesity is the most important cause of premature death worldwide. Evaluation of obesity is a simple tool that should be widely implemented in clinical practice to improve cardio-metabolic risk stratification. The aim of this study was to assess the prevalence of the obesity in healthy population. This study will help in awareness building in reducing obesity related diseases.

Methods: This was a prospective observational study consisted of 372 persons who were aged >20 years. Patients admitted in Rajshahi medical college with different diseases which is not related with weight loss or weight gain was included. Data were collected through interview, clinical examination, and laboratory tests. Obesity was defined according to criteria set by modified NCEP ATP III (according to ethnic variation) which had abdominal obesity (waist circumference).

Results: A total of 372 patients were inducted in the study. The mean±SD age was 50.27±14.42 years. The mean ages of the male were higher than the female (52.80±13.44 years vs 44.93±15.00 years). Among them highest percentage was in the age group 51-60 years (31.2%). Obese person was 160(43.0%) and normal was 212(57.0%) in study population. Obesity was more in male patients (62.5%) than female (37.5%). Highest percentage of obesity was observed in 51-60 years of old (47.5%). Data showed that obesity was increased with increased age.

Conclusion: Obesity had a high prevalence in Bangladesh.

Key words: Obesity, NCEP-ATP III, metabolic syndrome.

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Introduction

The obesity epidemic is a major public health problem worldwide. Obesity is a major and escalating public-health and clinical challenge worldwide. Adult obesity is associated with increased morbidity and mortality. Measurement of abdominal obesity is strongly associated with increased cardiometabolic risk, cardiovascular events and mortality. The worldwide increase in the prevalence of obesity in the recent decades is startling and is likely a cause of the rising incidence of insulin resistance and the metabolic syndrome[1, 2, 3], as well as CVD and T2DM[1] .The combination of obesity, physical inactivity, and consumption of an atherogenic diet is believed to lead to insulin resistance[4,6]. The "obesity epidemic" is principally driven by an increased consumption of cheap, calorie-dense food and reduced physical activity.

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Methods

This was prospective observational study carried out at the Department Medicine at Kushtia Medical College Hospital, Rajshahi, Bangladesh. The duration of the study was three years. A systematic sampling technique was done to find out the obesity among the admitted patients. Purposive sampling technique was followed. Patient who admitted in medicine unit within the time frame of study was interviewed and was enrolled in this study.

An interviewer administered questionnaire was used to collect data. Data was collected by face to face interview. The questionnaire form was included history, clinical examinations and investigations.

In this study central obesity is measured by waist circumference as per reference of NCEP ATP III[5,7,8] for Asian –pacific region (ethnic specific values for waist circumference). Although waist circumference is a crude measurement, it correlates with obesity and visceral fat amount, and is a surrogate marker for insulin resistance.

Results

This was an observational study consisted of 372 persons who were aged >20 years.

Socio-demographic characteristics of the studied patients (N =372)

Among the studied subjects, male were more than female (68.0% vs 32.0%) and male and female ratio was 2.13:1.0. Highest percentage of education was up to primary level (49.2%) in total studied subjects.

Age and sex distribution of the control (N=372)

Data presented in table 2, shows that the mean±SD age of the respondent was 50.27±14.42 years. The mean±SD age of the male was 52.80±13.44 years and the female patients was 44.93±15.00 years. Among the study population highest percentage was in the age group 51-60 years (31.2%). Among the male highest percentage was in the age group 51-60 years (38.1%). However, among the female highest percentage was in the age group 41-50 years.

Table 1. Socio-demographic characteristics of the studied patients (N =372).

Variables	Number of cases (n)	Percentage (%)
Sex		
Male	252	(67.7)
Female	120	(32.3)
Educational status		
upto primary	168	(45.2)
Secondary	160	(43.0)
Above higher secondary	44	(11.8)
Monthly family income(Tk.)		
≤15000	368	(99.0)
>15000	4	(01.0)
Residence		
Urban	172	(46.2)
Rural	200	(53.8)
Smoking habit		
Non smoker	184	(49.5)
Smoker	188	(50.5)
Religion		
Muslim	332	(89.2
Non-Muslim	40	(10.8)

Gender wise obesity status in healthy control.

Table 3 shows that total obese person was 160(43.0%) and normal was 212(57.0%). Obesity was more in male (62.5%) than female (37.5%). The difference was statistically significant (p 0. 039).

Age wise obesity status in healthy control (n=372).

Table 4 shows that highest percentage of obesity was observed in 51-60 years of old (47.5%), followed by >60 years (17.5%) and 41-50 years (17.5%).

Table 2: Age and sex distribution of the control (N=372).

Age in years	Sex		Total(n=372) N (% of Row total) (% of column total)
	Male (n=252) N (% of Row total) (% of column total)	Female (n=120) N (% of Row total) (% of column total)	
Upto 30 years	24 (46.2) (9.5)	28 (53.8) (23.3)	52 (100.0) (14.0)
31-40 years	20(45.5) (7.9)	24 (54.5) (20.0)	44 (100.0) (11.8)
41-50 years	48 (63.2) (19.0)	28(36.8) (23.3)	76 (100.0) (20.4)
51-60 years	96(82.2) (38.1)	20 (17.2) (16.7)	116 (100.0) (31.2)
>60 years	64 (76.2) (25.4)	20 (23.8) (16.7)	84 (100.0) (22.6)
Total	252 (67.7) (100.0)	120 (32.3) (100.0)	372 (100.0) (100.0)
Mean ± SD	52.80±13.44	44.93±15.00	50.27±14.42

Table 3: Gender wise obesity status in healthy control (N=372).

Obesity	Study groups		Total(n=372) N (% of Row total) (% of column total)	'P' value
	Male(n=252) N (% of Row total) (% of column total)	Female (n=120) N (% of Row total) (% of column total)		
Obese	100 (62.5) (39.7)	60 (37.5) (50.0)	160(100.0) (43.0)	
Normal	152 (71.7) (60.3)	60 (28.3) (50.0)	212 (100.0) (57.0)	0.039
Total N (%)	252 (67.7) (100.0)	120 (32.3) (100.0)	372 (100.0) (100.0)	

Chi-square value = 3.53 df = 1 p= .039

Table 4: Age wise obesity status in healthy control (n=372).

Age of the study subjects	Status of the obesity		Total (n=372) N (% of Row total) (% of column total)	'P' value
	Obese (n=160) N (% of Row total) (% of column total)	Normal (n=212) N (% of Row total) (% of column total)		
Upto 30	12(23.1) (7.5)	40 (76.9) (18.9)	52(100.0) (14.0)	
31-40	16(36.4) (10.0)	28 (63.6) (13.2)	44 (100.0) (11.8)	
41-50	28(36.8) (17.5)	48(63.2) (22.6)	76(100.0) (20.4)	0.000
51-60	76(65.5) (47.5)	45(34.5) (18.9)	116(100.0) (31.2)	
>60	28(33.3) (17.5)	39(66.7) (26.4)	84(100.0) (22.6)	
Total	160(43.0) (100.0)	212(57.0) (100.0)	372(100.0) (100.0)	

Chi-square value = 37.584 p= 0.000

Discussion

The main objective of the study was to assess the obesity status of Bangladeshi people.

This study showed that the mean±SD age of the healthy control was 50.27±14.42 years. The mean±SD age of the male was 52.80±13.44 years and the female patients was 44.93±15.00 years indicating the mean age of the male were higher than the female controls. Among the healthy controls highest percentage was in the age group 51-60 years (31.2%) followed by age group >61 years (22.6%) and then age group 41-60 years (20.4%). Among the male controls highest percentage was in the age group 51-60 years (38.1%) followed by age group >60 years (25.4%) and then age group 41-60 years (19.0%). However, among the female patients, highest percentage was in the age group 41-50 years (23.3%)

Obesity was more in male patients (62.5%) than female (37.5%). The difference was statistically significant (p 0. 039).

Table 4 shows that total obese person was 160(43.0%) and normal was 212(57.0%) in study population. Highest percentage of obesity was observed in 51-60 years of old (47.5%), followed by >60 years (17.5%) and 41-50 years (17.5%). Data show that obesity was increased with increased age and the difference was statistically significant (p 0.000).

Conclusion

Frequency of abdominal obesity was high in healthy individual. Obesity was more in male patients than female. Highest percentage of obesity was observed in 51-60 years of old. Data showed that obesity was increased with increased age.

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Editorial policy & Instruction to Authors

KuMCJ, June 2024; Vol. 8(1): 43-46

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ii) Book

Author (s)
Ringsven MK, Bond D. Gerentology and leadership skills for nurses. 2nd ed Albany (NY): Delmar publishers; 1996. p 28-35.

editor (s), compiler(s) as author (s)
Norman IJ, Redfan SI, editors. Mental health care for elderly people. 2nd ed. New York: Churchil Livingston; 1996. p 125-129.

Chapter in a book:

Philips SJ, Whisnant JP. Hypertension and stroke. In: Laragh JH, Brenner BM, editors. Hypertension: pathophysiology, diagnosis and management 2nd ed. New York: Raven press; 1995. p 465-78.

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Standard journal article on the internet.
Kaul S, Diamond GA. Good enough: a primer on the analysis and interpretation of non-inferiority trials. Ann Intern Med (internet. 2006 Jul 4 (cited 2007 Jan 4); 145(1): 662-9 Available from: http:/www.annals.org/cgi/reprint/145/1/62.pdf.

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