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Editorial

Original Articles

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Editorial

Importance of Iron in Our Healthy Life

*Rahim MA[1]

Iron is an essential micronutrient vital for human health, influencing numerous physiological functions across all age groups. Despite its critical role, iron deficiency remains a widespread global issue, particularly in developing countries like Bangladesh, where it continues to pose a major public health challenge. This editorial explores the importance of iron in human health, the implications of its deficiency, and strategies for ensuring adequate iron intake.

Role of Iron in the Body

Iron plays a pivotal role in the production of hemoglobin, a protein found in red blood cells that carries oxygen from the lungs to tissues and organs. Adequate iron levels are essential for the proper functioning of red blood cells, ensuring the body's tissues receive sufficient oxygen to perform their functions optimally. In addition to its role in oxygen transport, iron is involved in energy metabolism, immune function, and DNA synthesis.[1]

Iron deficiency, which occurs when the body's iron stores are insufficient to meet physiological needs, can lead to iron-deficiency anemia. This condition manifests as fatigue, weakness, and impaired physical and mental performance.[2] It is particularly prevalent among women of reproductive age, children, and pregnant women, making it an urgent issue in public health.

The daily requirement of iron varies according to age, sex, physiological status, and dietary patterns. Iron needs are higher during periods of rapid growth, pregnancy, and menstruation. Health authorities such as the World Health Organization (WHO) and the Institute of Medicine (IOM) have provided widely accepted recommendations.

Sources of Iron

There are two types of dietary iron: heme and non-heme iron. Heme iron, which is more easily absorbed, is found in animal products such as red meat, poultry, and fish. Non-heme iron, which is more abundant in plant-based foods, is found in legumes, green leafy vegetables, and fortified cereals. While non-heme iron is less efficiently absorbed, the presence of vitamin C in a meal can enhance its absorption.[12] Therefore, a diet rich in both heme and non-heme iron sources is essential for maintaining adequate iron levels.

Recommended Daily Iron Intake

Infants and Children
0–6 months: 0.27 mg/day
7–12 months: 11 mg/day
1–3 years: 7 mg/day
4–8 years: 10 mg/day
9–13 years: 8 mg/day

Adolescents
Boys (14–18 yrs): 11 mg/day
Girls (14–18 yrs): 15 mg/day

Adults
Men (19–50 yrs): 8 mg/day
Women (19–50 yrs): 18 mg/day

Older Adults (51+years)
Men: 8 mg/day
Women: 8 mg/day (post-menopausal)

Pregnancy & Lactation
Pregnant women: 27 mg/day (highest requirement due to fetal growth and increased blood volume)
Breastfeeding women: 9–10 mg/day.[3-8]

Requirements Differ:

Women of reproductive age lose iron through menstruation, increasing their daily need.

Pregnant women require iron for fetal development, placenta formation, and increased maternal blood volume.

Toddlers and adolescents have high iron needs because of rapid growth.

Older adults have lower needs unless they have chronic diseases or poor absorption.[3-8]

Impact of Iron Deficiency

Iron deficiency is the leading cause of anemia worldwide, affecting nearly 2 billion people.[9] For women, particularly those who are pregnant or menstruating, iron deficiency can lead to serious complications such as low birth weight, premature births, and impaired cognitive development in children.[10] In children, iron deficiency is associated with impaired growth, delayed development, and reduced cognitive performance.[5] In adults, it can result in decreased work productivity, reduced

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endurance, and overall health deterioration.

Moreover, iron is crucial for immune system function. Iron deficiency can impair the body's ability to mount an effective immune response, making individuals more susceptible to infections.[11] This is especially concerning in developing countries, where infections remain a significant cause of morbidity and mortality.

Public Health Strategies

Public health initiatives to combat iron deficiency include iron supplementation, fortification of staple foods, and nutritional education. The World Health Organization (WHO) recommends iron supplementation for pregnant women, as they have significantly increased iron needs.[13] In Bangladesh, where iron deficiency is prevalent, iron-fortified foods, such as fortified rice and flour, are being increasingly integrated into the diet. Furthermore, awareness campaigns can educate the public on the importance of consuming iron-rich foods and maintaining a balanced diet.[14-18]

Conclusion:

Iron is a micronutrient of paramount importance to human health, influencing oxygen transport, energy production, immune function, and overall well-being. Iron deficiency is a widespread issue that negatively affects growth, cognitive performance, and immune health, particularly in women and children. Effective public health strategies that include iron supplementation, fortification, and nutritional education can significantly reduce the burden of iron deficiency. Ensuring adequate iron intake is crucial for a healthier population, contributing to improved productivity, reduced healthcare costs, and better quality of life.

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Original Article

Somatotype of Bangladeshi Female Subjects with Type 2 Diabetes Mellitus

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Abstract:

Background: Now a days the world is suffering from most common medical as well as social problem is type 2 diabetes mellitus (T2DM). This metabolic disorder affects a constantly increasingly number of people worldwide. These T2DM patients may present with specific physical pattern. Anthropometrical measurement is a practical technique for determination of body physique of an individual and expressed as 3 number rating expressed as endomorphy, mesomorphy & ectomorphy which determines the somatotype of the individual.

Objective: To assess the somatotypic variation of female with type 2 diabetes mellitus by anthropometric technique.

Materials and methods: This cross-sectional, analytical study was conducted anthropometrically at Department of Anatomy of Rangpur Medical College from January 2021 to December 2021. 50 adult female patients suffering from T2DM for at least 1 year was selected as diabetic. Another 50 adult healthy female subjects without DM served as control of the study. Subjects with sign of any other chronic metabolic disorder was excluded from the study. Their age range was between 21-60 years. Subscapular, supraspinal and triceps skinfold thickness was measured for determination of endomorphic score. Humerus and femur breadth, mid arm and calf circumference was measured for determination of mesomorphic score. Height, weight was measured; BMI was calculated for determination of ectomorphic score. These scores were compared between diabetic and control group.

Results: Mean somatotype score of diabetics was endomorphy 10.36; mesomorphy 5.48; ectomorphy 3.16. Mean somatotype score of controls was endomorphy 5.17; mesomorphy 2.50; ectomorphy 0.11. All these scores (endo, meso & ectomorphic) were significantly higher in diabetics than controls. It was also observed that endomorphy was predominant in both control & diabetic female, where endomorphy was 84% in control and 96% in diabetics. Also mesomorphy was higher 12% in control and ectomorphy was similar and it was 2% in both control and diabetics. This explains the Bagladeshi females are endomorphic but in diabetics endomorphy tends to be higher. The differences in the ratings of the somatotype components were statistically significant ($p < 0.001$).

Conclusion: Though both group of females presented with higher endomorphic score, but in diabetics endomorphy tends to be higher. Similarly the findings of others studies in foreign countries presented markedly dominating endomorphy in diabetics. Higher endomorphic score could be regarded as a characteristic feature of Bangladeshi female which tends to be higher due to diabetes.

Key words: Type 2 diabetes mellitus, Somatotype, Females, Anthropometry, Endomorphy, Mesomorphy & ectomorphy

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Introduction:

Diabetes mellitus is a group of metabolic disorders sharing the common feature of hyperglycemia. Hyperglycemia in diabetes results from defects in insulin secretion, insulin action or most commonly both.[1] It is increasingly becoming a public health problem as the incidence of the disease is rapidly rising, resulting eventually in disability and shortening of lifespan of patients.

According to the estimation, year of 2013 about 220 million people was affected by the disease worldwide,[2] then by WHO global health days 2016, about 422 million people globally had diabetes,[3] by a cross-sectional study in 2019, about 463 million individuals affected by this chronic disease worldwide with most living in the developing

countries, and unfortunately, more than 80% of diabetes deaths occur in low and middle-income countries.[4] Currently estimates amount state that more than half of billion people are living with diabetes worldwide, affecting men, women, and children of all ages in every country and the number is projected to more than double to 1.3 billion people in the next 30 years.[5]

The prevalence of diabetes is increasing in Bangladesh in both urban and rural areas. A recent scoping review (1994-2013) revealed that the prevalence of type 2 diabetes mellitus varied from 4.5% to 35.0% in Bangladesh. The International Diabetes Federation estimated that about 7.1 million people with diabetes in Bangladesh and almost an equal number with undetected diabetes. The number is estimated to double by 2025.[3] The prevalence rate of diabetes among women increased significantly from 11.25% in 2011 to 13.81% in 2018 whereas this increment among men is not significant.[4] Obesity, high BMI, sedentary lifestyle, physical inactivity, cigarette smoking, consumption of alcohol are the major risk factors for development of diabetes mellitus.

Anthropometry is the technique of expressing quantitatively the form of the human body.[6] Somatotype is an effective technique for the study of anthropometric variations and body composition in subjects. The technique of somatotyping is a widely applied universal method of appraising body shape and structure. Somatotype was first invented by Sheldon et al[7] and later on revised by Carter and Heath.[8] According to Carter and Heath[9] "Somatotype calculation and analysis is a comprehensive, user-friendly noninvasive and non-laborious program that has excellent input-output calculation, analysis and display features, making it the program of choice for anyone doing somatotype calculations and analysis."[10]. Somatotype is expressed in a three-number rating representing endomorphy, mesomorphy and ectomorphy.[6]

Endomorphy is the relative obesity of the individual;& Mesomorphy is the musculo-skeletal robustness; whereas Ectomorphy is the relative linearity or slenderness of a physique.

The three basic components altogether determine body shape of each person. Each component is designated by a number. The mean somatotype is a figure, made up of three numbers which appraise the development of the three components. Scores under 2.5 are considered low, between 3 and 5 –average, between 5.5 and 7 – high and over 7.5 – very high.[9]

Though there are genetic prerequisites, the somatotype is affected by the environment as well as physical activity, nutritional habits, age, professional, medical and other variables such as endocrine and immunological status may account for the different morphological structures.[10]

There is little information in the world literature about the correlation between somatotype and predisposition to various disease. As diabetic subjects are usually obese with high BMI, somatotype estimation by anthropometric measurements of these subjects may help in early diagnosis of disease. In Bangladesh no such study is still done to find a correlation between somatotype and type 2 diabetes. Therefore, aim in the present study was to determine the somatotype component of females with type 2 diabetes.

Materials and methods:

This cross-sectional, analytical study was conducted anthropometrically at Department of Anatomy of Rangpur Medical College from January 2021 to December 2021. 50 cases of adult female patients suffering from T2DM for at least 1 year selected as diabetic and another 50 adult healthy female subjects without DM served as control of the study. The diabetic group was selected from Endocrinology Department of Rangpur Medical College Hospital and Diabetic Society and the control group was selected from stuff of Rangpur Medical College, Rangpur. Subjects with sign of any chronic metabolic disorder like coronary artery disease, renal disease, metabolic disorder, extreme obesity and any physical disability was excluded from the study. Before selecting the control subjects, blood glucose level of each was checked to confirm the absence of diabetes. Their age range was between 21-60 years. After full explanation, informed written consent was obtained from the subjects informing details of the purpose of the study.

The anthropometric examinations were carried out according to standard methods.[9] All measurements were taken on the right side of the body to avoid variation. According to reference each measurement was done three times and mean of these three were taken. Measurements were taken in office time from 9.00 am to 3.30 pm in day light. To avoid variations, same instruments were used throughout the study. During measurements of subjects female assistance was taken.

Following measurements were taken for determination of endomorphy, mesomorphy & ectomorphy respectively according to Carter and

Heath.[9] For determination of endomorphy triceps, subscapular, supraspinal skinfold thickness was measured. For determination of mesomorphy biepicondylar humerus and femur breadth and mid arm and calf (maximum) circumference was measured. For determination of ectomorphy, Body mass index (BMI) or Height- Weight Ratio (HWR) was calculated by measuring height and weight.

Somatotype was calculated according to the Heath-Carter Method, using the following equations.[9]

Endomorphy= $-0.7182+0.1451(x) - 0.00068 (x^2)+ 0.0000014(x^3)$

Where x= (triceps skinfold + subscapular skinfold + supraspinal skinfold) multiplied by (170.18/height in cm)

Mesomorphy= 0.858×humerus breadth+0.601× femur breadth+0.188×mid arm circumference+ 0.161×calf circumference – height×0.131 + 4.5

Ectomorphy

Three different equations are used to calculate ectomorphy according to height-weight r(HWR) or Body Mass Index (BMI)

If HWR is greater than or equal to 40.75 then

Ectomorphy= HWR×0.732 – 28.58

If HWR is less than 40.75 but greater than 38.25 then

Ectomorphy= HWR×0.463 – 17.63

If HWR is equal to or less than 38.25 then

Ectomorphy= 0.1

After collecting the data, results were prepared in term of range, mean values, standard deviations (SD), percentage value etc. as applicable for each parameter. All the values of measurement and calculation were compared between diabetic and control groups by students unpaired "t" test. In all the statistical analysis the significance level was set as $p \leq 0.05$ at 95% confidence interval. The statistical analysis was carried out using the statistical package for social sciences (SPSS version 26.0). Then tables were used to explain the result.

Results:

Table I shows the result of all the measurements in diabetic group and control group. It was observed that in endomorphy, subscapular, supraspinal and triceps skinfold thickness were significantly higher in diabetic group than control group; in case of mesomorphy, humerus breadth, femur breadth and mid arm and calf circumference were significantly higher in diabetic group than control group; again, in case of ectomorphy, height, weight and BMI were significantly higher in diabetic group than control group.

Table-I:.Comparison of endomorphic, mesomorphic & ectomorphic score between control and diabetic group (n=50 in each group)

Variables	Control	Diabetic	p value
For endomorphy			
Subscapular skinfold thickness (cm)	2.69±0.52 (2.02-4.40)	3.97±0.61 (2.34-5.44)	0.000
Supraspinal skinfold thickness (cm)	3.53±0.60 (2.19-5.90)	4.76±0.77 (3.18-6.66)	0.000
Triceps skinfold thickness(cm)	1.56±0.39 (1.01-3.33)	3.03±0.81 (1.01-4.61)	0.000
For mesomorphy			
Humerus breadth (cm)	6.29±1.01 (3.20-7.94)	7.45±0.67 (6.28-9.10)	0.000
Femur breadth (cm)	7.51±0.96 (3.25-9.70)	8.38±0.62 (6.72-9.97)	0.000
Mid arm circumference (cm)	26.27±2.18 (20.5-30.5)	30.27±2.38 (26.5-36.10)	0.000
Calf circumference (cm)	31.05±2.50 (25.10-37.10)	35.66±2.26 (31.50-40.50)	0.000
For ectomorphy			
Height (m)	1.50±0.05 (1.41-1.83)	1.56±0.09 (1.39-1.86)	0.021
Weight (kg)	49.96±4.93 (33-85)	66.68±8.16 (55-87)	0.000
BMI (kg/m2)	22.47 2.58 (15.58-28.14)	27.58 3.82 (16.81-38.03)	0.000

Results are shown as range and mean SDs

In table II and figure-1, remaining somatotypic score observed, all the three (endo, meso and ectomorphy) component are significantly higher in diabetics. And among them endomorphy was predominant in both control & diabetic. The differences between the somatotype components were highly significant ($p < 0.001$).

Table-II: Comparison of Somatotype score (endomorphy, mesomorphy and ectomorphy) between control and diabetic group (n=50 in each group)

Variables	Control	Diabetic	p value
Endomorphy	5.17±1.76 (0.25-1.13)	10.36±2.47 (0.53-1.55)	0.000
Mesomorphy	2.50±1.81 (0.18-5.72)	5.48±1.26 (2.97-7.92)	0.000
Ectomorphy	0.11±0.93 (0.10-0.76)	3.16±3.29 (0.10-12.03)	0.000

Results are shown as range and mean SDs

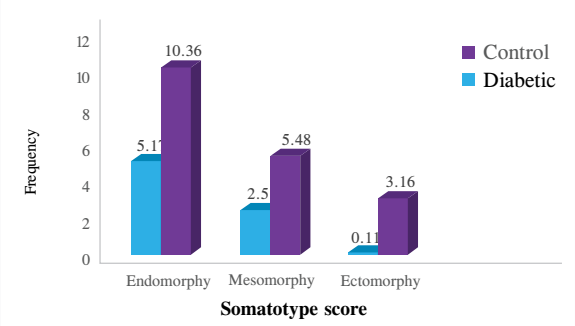

Figure-1: Bar diagram showing distribution of Somatotypic score between control and diabetic

In Table III percentage of endomorphy in diabetics present with 96% whereas in control endomorphy was 84% and mesomorphy 14% mesomorphic score in control and diabetic shows %. This explains the Bangladeshi females are endomorphic but in the diabetic females endomorphy tends to be predominant. The differences in the ratings of the somatotype components were highly statistically significant ($p < 0.001$).

Table-III: Percentage of endomorphic and mesomorphic score in control and diabetic group (n=50 in each group)

Groups	Endomorphy predominant	Mesomorphy predominant	Ectomorphy & predominant
Control	84%(42)	14%(7)	2%(1)
Diabetic	96%(48)	2%(1)	2%(1)

Results are shown as range and mean SDs

Discussion:

The human somatotype is expressed in three ratings representing endomorphy, mesomorphy, and ectomorophy.[7,9,11] Endomorphy reflects development of tissues with endodermal origin, relative domination of structures associated with digestion and assimilation, including fat deposition. Mesomorphy reflects development of human body structures with mesodermal origin, mostly bone and muscle systems. Ectomorphy reflects development of structures derived from ectoderm.[7,9,11] In the world literature little analysis of somatotype characteristics of female patients with type 2 diabetes mellitus is available. Studies using the Heath-Carter somatotyping method have been conducted in Italy.[12] Endomorphy is dominant - 6.8, followed by mesomorphy-5.6, and highly reduced ectomorphy-0.6. The findings correspond with overall obesity, high BMI, high risk of coronary and metabolic diseases. Studies of female patients with type 2 diabetes mellitus using the same somatotypic method have been conducted in India.[13] The findings (7.2-4.9-0.7) also show uppermost rating of endomorphy, followed by mesomorphy and highly reduced ectomorphy. Another studies of female patients with type 2 diabetes mellitus using the same somatotypic method have been conducted in Bulgaria.[2] The findings (6.59-6.09-1.57) it shows uppermost rating of endomorphy, followed by mesomorphy and highly reduced ectomorphy, where endomorphic score was higher in control female rather than diabetics.

In the present study in Bangladesh, somatotype of female patients with type 2 diabetes mellitus was performed by using the Heath-Carter method[8,9] and it shows endomorphy was with the highest rating, followed by mesomorphy and ectomorphy with the lowest rating similar the findings of highest endomorphy ratings in studies conducted in other countries. Unlike the findings in Bulgaria[2] where endomorphic score highest in control rather than diabetics, our results show that endomorphy is the dominant somatotype component in the Bangladeshi female. This can be regarded as a characteristic feature of Bangladeshi female. But in diabetic group endomorphy as well as mesomorphy tends to be higher may due to obesity, high BMI, sedentary habit, food habit of these subjects. These habits could be prevented by change in life style to overcome this life threating disease.

Conclusion:

The Bangladeshi female are predominantly endomorphic by nature but this tends to be higher due to diabetics. For development of Diabetes mellitus, endomorphism was the first and main key factor. Endomorphism was the beginning of all coronary, chronic and metabolic diseases. It was an alarming sign for a healthy individual and everyone must be aware of this condition.

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Original Article

The Effects of Satellite Television Channels on Bangladeshi Traditional Culture: Perceptions of the Community

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Abstract

Background: *In the globalized world of today, national borders do not define culture. Even if satellite channels have a lot of negative effects, not all of them are bad for our society.*

Objectives: *To assess the effects of satellite television channels on traditional culture of Bangladesh.*

Materials and methods: *A descriptive type of cross-sectional study was conducted among the adult population residing at Porihole Para village of Burichang Upazila under Comilla District from January 2025 to June 2025. Data were collected from 165 adult male and female participants. Data were collected by face-to-face interview with a semi-structured questionnaire.*

Results: *The mean age of the participants was 33.56±12.4 years and the highest frequency 51.5% was in the 31-45 years group. Out of all participants, 110 (66.7%) were female and a considerable number of participants 134 (81.2%) were married and in this study, we found 60 (36.4%) participants completed their secondary education. In our study, among all the participants, most of the participants 90(54.5%) stated that their most preferred channel was StarZalsa. The study findings also showed that among all the participants, 65(39.4%) of the participants believed that satellite television is more harmful than beneficial, 32(19.4%) stated that it is more beneficial than harmful and a significant number of participants 68(41.2%) mentioned that it is a threat to our culture.*

Conclusions: *In the end, it may be said that this investigation has discovered many important problems. We must understand that the young population is the future image of our country So, it is necessary to enlighten them about our cultural values. Therefore, society and the government must shield the population from these harmful effects, and people should also watch educational and good programs from which they can gain lessons and entertainment.*

Keywords: *Satellite channel, Perception, Western culture, Traditional cultures.*

Introduction:

Culture is a complex framework comprising all the skills and behaviors humans have developed as community members, such as knowledge, beliefs, art, law, and traditions.[1] It is the foundation of every nation and society. Every nation has a distinct culture. Bangladesh's culture is rich with historical influences and has a captivating appeal. It is a multicultural melting pot. Three major religions influence Bangladeshi culture. Islam, Hinduism, and Buddhism are the three. Bangladesh's traditional culture is completely represented in its language, dance, music, drama, literature, architecture, clothing designs, and paintings, among other mediums. Bangladeshi music is highly well-liked in the isolated region of the subcontinent among various cultures. Two well-known figures in classical instrumental music are Ustad Alauddin Khan and Ustad Ayet Ali Khan. The spiritual lyrics of Lalon Shah, Hason Raja, Romesh Shill, and numerous more unnamed lyricists are replete with folk song treasures. Additionally, folk songs such as Jari, Shari, Bhatiali, Murshidi, and others are incorporated into the soundtrack. The Bengalese tradition of Nazrul and Rabindra sangeet is highly

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valued.[2]

Now this is the globe of the twenty-first century, a century marked by constant transformation. The cultural revolution is among them.[3] In light of this, the emergence and popularity of satellite TV as a component of the Cultural Revolution is well-known to the general public, particularly in third-world nations like Bangladesh where the influx of foreign satellite channels has had a significant impact on the general population. One of the reasons behind this is countries like Bangladesh technologically lagged from first-world countries.[4]

The public, particularly in Bangladesh, is quite familiar with and fond of satellite TV's emergence and expansion as a component of the cultural revolution. Many individuals have access to more media sources these days, including mobile phones, TV, and radio. Most individuals, especially young children, find satellite TV to be the most conveniently accessible form of media when compared to other forms. Nowadays, it may give viewers whatever kind of information they require, be it for business, pleasure, or just interest.[5] With the advent of inexpensive televisions and cable connections, satellite television viewing is no longer limited to the upper middle class; it is now a regular household fixture for those in lower socioeconomic classes as well.[6] There are numerous international and local channels available to viewers, giving them the chance to watch a wide range of programming. These media outlets expose viewers to fresh knowledge about the outside world and alternative lifestyles, which may have an impact on cultural norms and individual attitudes and behaviors.[7]

TV can have hypnotizing qualities that attract both adults and children to watch it for an hour and enjoy hours of entertainment. The numerous violent television shows and movies that today's youth see have a negative influence. Some people sit at home and watch obscene movies, music videos, or television shows instead of improving themselves or engaging in worthwhile activities.[8] Several TV series have their focus on extramarital affairs, and many films and music videos are overflowing with violence and sexual content. In this sense, our youth are significantly diverted from our rich cultural history by satellite TV channels.[9]

A global measurement and data analytics company Nielsenstated that American female prefer to watch TV more than male.[10] Ruwandeepa investigated about the impact of Indian Tele-dramas on women's behavior in Sri Lanka. He found that Mother's attention towards their kids has been lessened by spending a long time watching TV which causes personality disorders in long term.[11] Many people in our nation, particularly women, have a strong devotion to Hindi and Indian Bangla serials. The youth and teenagers in our nation are more susceptible than adults.[5]

In India, Ahluwalia and Singh found in their study that on an average, children watch two hours of TV daily and most of them indulged in bedtime.[12] Gurleen and Sukhman in their study found that in India most of the adults watch about 3-5 hours of TV.[13]

Today, watching television has established itself into our daily lives. Without television, individuals are unable to ponder about their daily lives. Bangladeshi culture used to be extremely beautiful and well-known outside of its own nation. The jatra, flok, song, tribal dance, changeable song, etc., were notable cultural elements. However, since satellite television first appeared in Bangladesh in 1992, there has been a notable cultural shift.[14] Before that BTV was the dominant medium and it has been shown Bangladeshi cultural program. Now there are different regional channels of satellite TV particularly the Indian channels like Zee Bangla, Star Jalsha, ZeeTV, Star plus, Sony TV serials are impacting the cultural sphere of Bangladesh.[15]

The introduction of satellite television is one of the dimensions of this technological advancement which has a definite effect on the social and cultural area of Bangladesh. For these changes, human behavior is also changing and therefore, the study of changes in human behavior is becoming more important in the present business world. So the purpose of this study is to analyze the impact of Satellite Television on the traditional culture of Bangladesh.

Materials and Methods:

This was a cross-sectional study conducted to assess the Effect of Satellite Television Channels on the traditional culture of the adult population residing at Porihole Para village of Burichang Upazila under Comilla district Bangladesh, from January 2025 to June 2025. Permission for the study was taken from the Institutional Ethical Review Board (IERB) of EMC (EMC/IERB/2025/193-A). Data were collected from the participants through a pretested semi-structured questionnaire. Participants were interviewed face-to-face from March to April 2025. A total of 165 adult males and females aged 18 years and above were interviewed in this study according to their convenience. Data were collected from the residences of the participants by the researchers

themselves. Each participant was asked in the local language to mention his/her opinion on each question. The collected data were sorted, cleaned, kept up with precision and protected for factual examination by using SPSS v25 software. Descriptive analysis was carried out by calculating the mean and standard deviation for continuous variables and frequency and percentages for categorical variables**.** Participation was voluntary and confidentiality was maintained using an individual code number for each participant. They were assured that the information provided by them would be used only for the study and would not be shared with anyone other than the investigators and that their names would not be mentioned anywhere in the dissemination of the results.

Results:

Table-I: Socio-demographic characteristics of the participants (n=165)

Characteristics	Frequency (n=165)	Percentage	Mean±SD
Age group (in years)			
18-30	45	27.2	33.56±12.4
31-45	85	51.5	
46-60	20	12.1	
>61	15	9.2	
Sex			
Male	55	33.3	-
Female	110	66.7	
Religion			
Muslim	120	72.7	-
Sonaton (Hindu)	45	27.3	
Marital status			
Unmarried	27	16.4	-
Married	134	81.2	
Widow	04	2.4	
Monthly family income (in taka)			
<10000	31	18.8	-
10000- 20000	51	30.9	
21000-29000	42	25.5	
>30000	41	24.8	
Occupation			
Homemaker	100	60.6	-
Businessman	19	11.5	
Students	19	11.5	
Agriculture	10	6.1	
Service Holder	7	4.2	
Other	10	6.1	

Table I depicts the socio-demographic characteristics of the participants. A total of 165 were interviewed. Among the participants, 85(51.5%) were from the age group 31-45 years and a few 15(9.2%) were from the age group more than 61 years. Their mean age was 33.56±12.4 years. Out of all participants, nearly two-thirds110 (66.7%) were female. Many of the participants were Muslim 120 (72.7%). Most of the participants were married 134 (81.2%). Regarding occupation 100(60.6%) were homemakers, 19(11.5%) were respectively businessmen & students. A significant number of participants 51(30.9%) earn a monthly wage in between 10000-20000 tk.

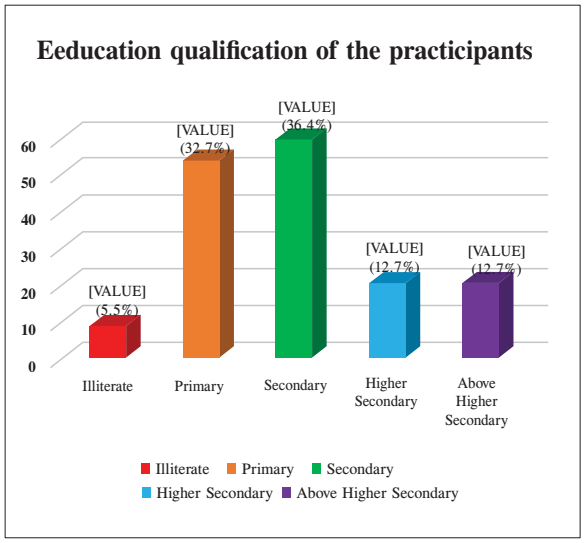

Fig-1: Distribution of the participants by their educational qualification (n=165)

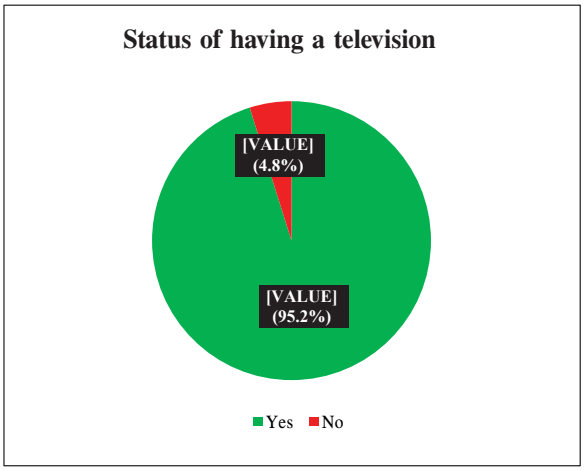

Fig-2: Distribution of the participants by their status of having a television (n=165)

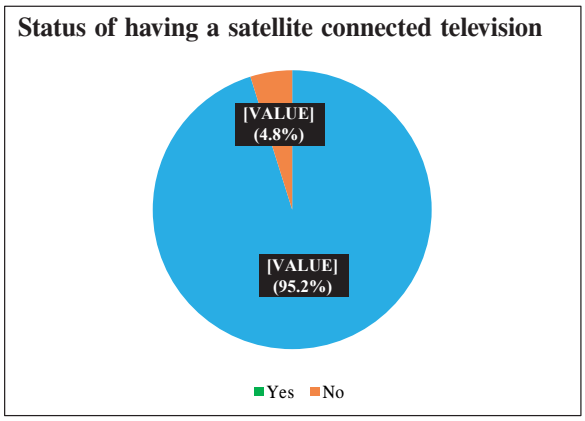

Fig-3: Distribution of the participants by their status of having a Satellite-connected television (n=165)

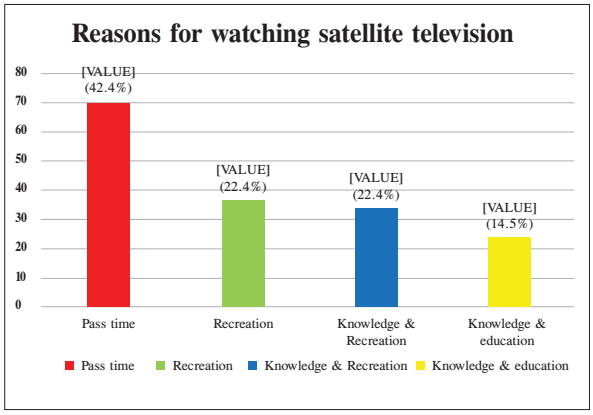

Fig-4: Distribution of the participants by reasons for watching satellite television (n=165)

Figure-1 shows the distribution of participants by educational qualification. Among the participants, 60(36.4%) completed their secondary level education, 54(32.7%) were primary education, 9 (5.5%) were illiterate and 21(12.7%) completed their higher secondary education.

Figure-2 shows the distribution of participants by their status of having a television. Most participants 157(95.2%) have owned a television and only 8(4.8%) have no television.

Figure-3 shows the distribution of participants by their status of having a satellite-connected television. The status of satellite connection of owned television 100% of them have a satellite connection

Figure-4 shows the distribution of participants by reason for watching satellite television. Most of the participants 70(42.2%) watch satellite television only to pass the time, followed by 37(22.4%) for recreation, 34(20.6%) for knowledge and recreation and only 24(14.5%) for knowledge and education.

Table II: Influence of satellite television on preferences for fast food (n=165)

Strength of influence	Frequency (n=165)	Percentage (%)
Strong	43	26.1
Moderate	46	27.9
Mild	33	20.0
No	43	26.0
Total	165	100.0

Table III: Influence of satellite television on interest in foreign music/ movie (n=165)

Strength of influence	Frequency (n=165)	Percentage (%)
=Strong	61	37.0
Moderate	37	22.4
Mild	41	24.8
No	26	15.8
Total	165	100.0

Table IV Influence of satellite television on instigating extramarital affairs (n=165)

Strength of influence	Frequency (n=165)	Percentage (%)
Strong	11	6.7
Moderate	13	7.9
Mild	21	12.7
No	120	72.7
Total	165	100.0

Table V: Most preferred channel of participants (n=165)

Strength of influence	Frequency (n=165)	Percentage (%)
Star Zalsa	90	54.5
Zee Bangla	15	9
ATN Bangla	14	8.5
Star Sports	9	6
Other	37	22
Total	165	100.0

Table II demonstrates the influence of Satellite Television on the preferences for fast food participants. From the findings of table, 43(26.1%) stated that they feel strong influence followed by 46(27.9%) who stated that they feel moderate influence, 43(20%) mild influence and 43(26.1%)

stated they felt no influence of Satellite Television on preference of fast food.

Table III displays the influence of Satellite Television on interest in foreign music/movies of participants. From the findings of table, it can be clearly seen that 61(37%) of the respondents stated that satellite television has strongly influenced their interest in foreign movies/songs, followed by 41(24.8%) who stated mild influence, 37(22.4%) moderate influence and only 26(15.8%) replied that satellite television does not influence foreign movie/songs.

Table IV interprets the influence of Satellite Television on instigating extramarital affairs. From the findings of table, most of the participants 120 (72.7%) stated that extramarital affairs were not influenced by satellite television, followed by 21(12.7%) who stated mild influence, 13(7.9%) with moderate influence and only 11(6.7%) stated that satellite television has a strong influence on extra marital affairs.

Table V interprets the most preferred channel of participants. From the findings of table, it can be clearly seen that most of the participants 90(54.5%) stated that their most preferred channel was StarZalsha, followed by 15(9%) Zee Bangla, 14(8.5%) ATN Bangla, 9(6%) Star Sports and 37(22%) stated the name of other 25 channels.

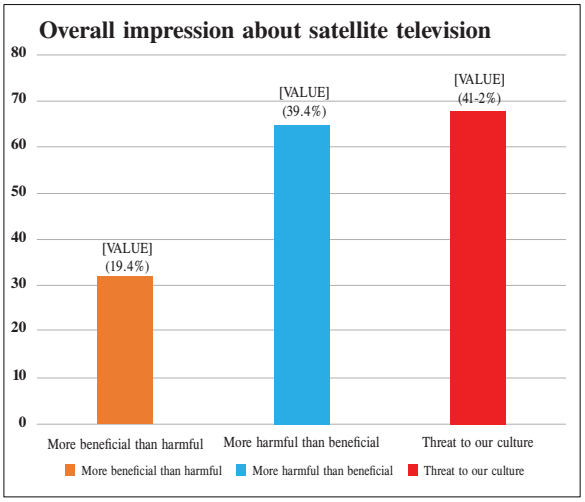

Fig-5: Distribution of the participants by an overall impression about satellite television. (n=165)

Figure-5 shows the distribution of the participants by an overall impression about satellite television. Among all participants, 65(39.4%) of the participants believed that satellite television is more harmful than beneficial, 32(19.4%) stated that it is more beneficial than harmful and a significant number of participants 68(41.2%) mentioned that it is a threat to our culture.

Discussion:

The present study was conducted among 165 adult populations residing at Porihole Para village of Burichang Upazila under Comilla district Bangladesh, focusing on 4 age groups 18-30 years, 31-45 years, 46-60 years and more than 61 years. In this study, we found that most of the participants 85(51.5%) are in adult age and belong to 31-45 ages. Similarly, another study reported, that almost half of the participants belong to 31-45 years age group.[16]

About 110(66.7%) of the participants in this study were female, making them the majority. The results of this study are consistent with those of another Bangladeshi study that also indicated that there were more female participants than male participants.[16]

Regarding the educational level of the participants, this study revealed that the highest 60(36.4%) participants completed their secondary level education. Similarly, another study in reported that most of the participants completed their higher secondary-level education.[17]

In terms of how satellite television affected the participants' choices for fast food, this study found that 46 people (27.9%) were somewhat impacted by satellite television, while 43(26.1%) participants were severely influenced. The younger generation's preference for fast food over traditional meals is strongly affected by satellite television.[18]

In the present study out of all participants, 54% of the participants replied that Star Zalsa is their most preferred channel. Similarly, another study revealed that the, recent time Indian drama serials are becoming very much popular in Bangladeshi communities. Our men and women and also our young generation are blindly affecting by Indian culture which is a tremendous alarming for our own culture.[19]

Among 165 participants, it was found that 61(37.0%) had strongly Influenced of satellite television on interest in foreign music/ movie. On the other hand, another study revealed that most of the youth select modern clothing and fashion and prefer western music and movies by influenced from satellite television.[20]

In the present study, out of all participants, 68(41.2%) participants mentioned that Satellite Television is a threat to our culture. Similarly, another study reported that Indian drama serials and Western culture movies provoke sexual behavior, instigate pre and extra-marital affairs, encourage

criminal activity and nurture conflict between family members. Bangladesh is a traditional country but its population is losing its local culture gradually due to these types of movie & drama serials, which is a high threat to our traditional culture.[21]

Conclusion:

Though satellite television is a wonderful blessing of modern science, there are still many hazards, which threaten our own traditional culture and economy. According to the study's findings, a significant number of all participants stated that satellite television poses a threat to our culture. It is recommended that to save our own culture we should reduce our dependency on Foreign Satellite Channels. We should concentrate on our local channels & Traditional cultures.

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Original Article

Brine Shrimp Toxicity Assay of Aqueous Extract of Vernonia Amygdalina (Bitter Leaf)

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Abstract

Background: *Uses of traditional medicines are now becoming rising over the world due to increase efficiency, easy accessibility of these drugs and the rising concerns about the side effects of modern drugs. Although antioxidant from natural sources are beneficial but it is necessary to assess their biosafety. Brine shrimp toxicity study is an excellent predictive tool for the toxic potential of plant extracts in human. Vernonia amygdalina (V.amygdalina) (Bitter leaf) is one of the important medicinal plant reported to have several health benefits.*

Objective: *To prepare the aqueous extract of leaves of V.amygdalina and to evalutate its toxicity through brine shrimp lethality assay.*

Materials & methods: *This quasi experimental study was carried out in the Department of Pharmacology and Therapeutics, Rajshahi Medical College, Rajshahi from January 2021 to December 2021. This study was conducted in two steps: Firstly, preparation of aqueous extract of V. amygdalina. Secondly, through brine shrimp (Artemia salina) lethality assay assessment of toxicity of aqueous extract of V. amygdalina .*

Results: *The results of the study showed that the plant aqueous extract showed the highest percentage of lethality to be 62±13.04 % at 1mg/ml and lowest percentage of lethality 30±10% at 0.0625 mg/ml. All values were expressed as mean±SD. Brine shrimp lethality assay revealed that LC_{50} of aqueous extract of V. amygdalina was 0.38 mg/ml which was less than 1000 μg/ml.*

Conclusion*: Hence it is concluded that aqueous extract of V. amygdalina showed mild toxicity.*

Keywords: Vernonia amygdalina, Aquous extract, Artemia salina, Brine shrimp lethality assay, $LC_{50.}$

Introduction:

Plants are not only used as a source of food of high nutritive value but also used in health care system for their high medicinal value.[1] Plants that are responsible for their pharmacological activities and are used for different medicinal purpose are known as medicinal plants. These plants are found as a source which have such chemical constituents of raw material and play an important role in the development of new drugs.[2] According to World Health Organization about 60 to 90 percent of the world's population of developing countries are dependent on medicinal plants either totally or partially for their basic health care needs.[3] Many drugs are developed from plant species which are used worldwide such as Vinblastine and Vincristine from *Catharanthus roseus,* Quinine and Quinidine from *Cinchona* species, Atropine from *Atropa belladonna,* Digoxin from *Digitalis lanata*, Morphine and codeine from *Papaver somniferum* and many others.[4]

Among the medicinal plants *Vernonia amygdalina* is one of the nutritionally and economically viable plants. *V.amygdalina* belongs to astereceae family is used in traditional and folkloric medicine for the

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treatment of various diseases in different parts of the world.[5] Due to impactation of bitter taste of leaves *V.amygdalina* commonly known as "bitter leaf". The bitter taste is due to anti-nutritional factors such as A-series saponins, alkaloids, tannins and glycosides.[6] But the bitterness can be reduced by boiling or by soaking in several changes of clean water.[7,8] All parts of the plant are pharmacologically useful. The leaves of *V.amygdalina* can be eaten as raw for stomach ache after washing with clean water. Several studies have reported that *V. amygdalina* posseses various types of pharmacological properties such as antioxidant, antidiabetic, antimicrobial, anti-inflammatory, anticancer, antifungal etc.[6]

Many plants which are curative may also be associated with harmful effects. But there is lack of scientific evidence of their safety profile though they are not entirely free of toxicity or side effects. Plant extracts may be toxic, carcinogenic and mutagenic. Some plant extracts could be a threat to the health due to potential side effect or harmful effect related to toxic principles or overdose. So it is necessary to know the biosafety of plant extract for a safe treatment with it.[9,10] Many drugs are therapeutic at one dose but may be toxic at another, so before applying them to the first human volunteer it is necessary to know their safety profiles. Toxicity studies are helpful to know the safety profile of a compound. In the drug development process, toxicity studies of new compound are essential before formulating and marketing them as drug. There are several different test methods for the preliminary assessment of toxicity of plant extracts. Among them the brine shrimp lethality assay is an excellent useful tool. This assay is used for assessment of toxicity of plant extracts, toxicity of heavy metals and metal ions, toxicity of nanoparticles, toxicity of cyanbacteria and algae and also for screening of marine natural products. There are several advantages of this assay such as simplicity, rapidness, inexpensiveness, low requirements, easy availability etc.[4,10,11] The shrimp lethality assay was proposed by Michael and co-workers in 1956, and later developed by Vanhaecker and his group in 1981. This is based on principle, whereby the kill of *Artemia salina* (the brine shrimp larva) following exposure to a various concentration of plant extracts, heavy metals etc. Due to presence of several pharmacological and biological activities a large number of medicinal plants are used in the health care system of Bangladesh but majority of them have not yet investigated for their biosafety.[10,12] Therefore present study was designed to prepare aqueous extract of *Vernonia amygdalina*. Brine shrimp lethality assay was also done to assess cytotoxic effect of *Vernonia amygdalina*.

Materials and Methods:

A quasi experimental study was conducted in the Department of Pharmacology and Therapeutics, Rajshahi Medical College, Rajshahi from January 2021 to December 2021. Prior study of the experiment, permission was taken from the Ethical Review Committee in the Rajshahi Medical College, Rajshahi. In brine shrimp toxicity assay five strength (1mg/ml- 0.0625mg/ml) of aqueous extract of bitter leaf were taken and for each strength 50 brine shrimp nauplii (5 petridish for each sample and 10 nauplii for each petridish) were taken.

Present investigation was focused on the preparation of aqueous extract leaves of *V.amygdalina*. Bitter leaf leaves were collected from the garden of Rajshahi Medical College. All glass wares and instruments (measuring cylinders, whatman No. 1 filter paper, deionized water, beakers, petri dishes, test tubes, micropipettes etc.) were purchased from local market. Deionized water was used throughout the experiment.

Preparation of aqueous extract of leaves of *V.amygdalina*:

Aqueous extract of *V.amygdalina* was prepared according to the method described by Okwuzu et al., 2017 with slight modification. 500gm of fresh leaves of *V.amygdalina* were collected from the garden of Rajshahi Medical College.[13] The leaves then washed with clean water to remove the dust and dirt. After that they were air-dried at room temperature by spreading them on a laboratory table for 7 days. Thereafter, they were grounded to course powder with blender. 50gm of powdered material was extracted with 500ml of deionized water. And kept it for 72 hours. The resultant formulation was then filtered with whatman No. 1 filter paper and evaporated to dryness with the aid of hot air oven at 40°C. The powerd form of leaves of bitter leaf was made. The working solution of extract was prepared by weighing out 200 mg of powdered form accurately and dissolved it in 200 ml of distilled water to give an effective concentration of 1mg/ml.

Figure-1: Preparation of aqueous extract of leaves of bitter leaf

Brine Shrimp Totoxicity Assay:

Brine shrimp (*Artemia salina*) cysts were purchased and maintained in the laboratory conditions and used for cytotoxicity assay. Briefly , Artemia salina cysts of 1 gm were aerated in 1 L capacity of glass jar containing 3.8% of saline water (3.8 gm commercial sea salt in 100ml of distilled water). pH of artificial sea water was maintained at around 8.5. The jar was aerated constantly for 48 hrs at room temperature (25+ ºC). After hatching, active free-floating young nauplii were collected from bright illumination and were used for the bioassay. Parallel control (without extract) was included for the experimental setup. Five test samples (1mg/ml, 0.5mg/ml, 0.25mg/ml, 0.125mg/ml, 0.0625mg/ml) were prepared. Ten nauplii were transferred to each petri dish (05 petridishes for each test sample) using pipette. Then 1ml of plant extract and artificial sea water were added to make the final volume 5ml. The experimental setup was allowed to remain 24 hrs. Artemia salina nauplii were devoid of food throughout the experiment. Survirors were counted aid of a magnifying glass after 24 hrs.

Percentage of mortality was calculated by the following formula:

$$\%:\text{mortality of } \frac{\text{Number nauplii Artemia dead of}}{\text{Initialnauplii Artemia live ofnumber}} \times 100$$

Data processing and analysis was done using SPSS (statistical package for social science) version 24. The results was calculated as mean±standard deviation (SD). LC_{50} for tested concentration of brine shrimp toxicity assay was determined using probit regression analysis.

Results:

Preparation of aqueous extract of leaves of *Vernonia amygdalina* (Bitter leaf):

Figure-2 showed different concentration of aqueous extract of leaves of *V.amgdalina* (bitter leaf). From left to right 1mg/ml, 0.5 mg/ml, 0.25mg/ml, 0.125 mg/ml, 0.0625 mg/ml of aqueous extract of bitter leaf respectively.

500gm of fresh leaves of bitter leaf were air dried after washing with clean water for 7 days. 200mg dry powder of bitter leaf was mixed with same amount of deionized water to prepare the effective concentration of 1mg/ml aqueous extract. After that serial dilution 0.5mg/ml, 0.25 mg/ml, 0.125mg/ml and 0.0625mg/ml of aqueous extract of bitter leaf were prepared. When gradual dilution of bitter leaf extract was prepared the colour of the solution was changed from dark yellow to pale.

Brine Shrimp toxicity assay:

The brine shrimp lethality assay was also performed to determine the toxicity of aqueous extract of leaves of *V.amygdalina*, which could also provide an indication of possible toxicity of the test materials. It was demonstrated that early developmental stages of *Artemia salina* was highly vulnerable to toxins.

Table-I showed percentage (%) of mortality of *Artemia salina* larveae in different concentration of aqueous extract of leaves of *V.amygdalina*. The toxicity was found to be directly proportional to the concentration of aqueous extract of bitter leaf. The results were found to be in such a way that in the control the mortality rate was about 0%. In case of aqueous extract of leaves of *V. amygdalina* the

Figure-2: Different concentration of aqueous extract of Vernonia amygdalina

mortality rate was found 30±10%, 38±8.37%, 46±8.94%, 52±16.43%, 62±13.04% respectively after 24 hour for the concentration of 0.0625mg/ml, 0.125 mg/ml, 0.25 mg/ml, 0.5 mg/ml, 1 mg/ml. The plant aqueous extract showed the highest percentage of lethality to be 62±13.04 % at 1mg/ml and lowest percentage of lethality 30±10% at 0.0625 mg/ml. All values were expressed as mean±SD.

Table-I: Percentage (%) of mortality of brine shrimp in different concentration of aqueous extract of V. amygdalina

Concentration of aqueous extract of V. amygdalina (mg/ml)	Percentage of mortality (%) (Mean±SD)
0.0625	30±10
0.125	38±8.37
0.25	46±8.94
0.5	52±16.43
1	62±13.04

Table-II showed LC_{50} of aqueous extract of bitter leaf was obtained at 0.38 mg/ml.

LC_{50} of aqueous extract of bitter leaf (The concentration at which 50% of brine shrimp were died) was calculated by using probit analysis.

Table-II: LC50 value of aqueous extract of V. amygdalina

Test sample	LC50-24h (mg/dl)	95% Confidence limit		Regression equation	χ^2 (df)
		Lower	Upper		
Aqueous extract of bitter leaf	0.38	0.22	0.94	Y=5.29±0.67	0.056(3)

{LC50=Median lethal concentration (The concentration at which 50% of brine shrimp died), χ^2= Chi-square, df=degree of freedom}

Figure-3 showed LC_{50} of aqueous extract of bitter leaf was obtained at 0.38 mg/ml.

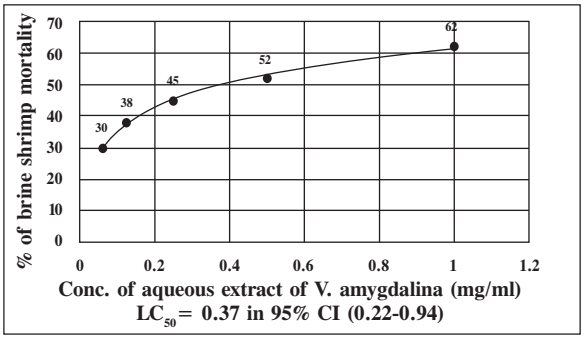

Figure-3: Graphical presentation of brine shrimp mortality with LC_{50} value of aqueous extract of Vernonia amygdalina

Discussion:

In the present study aqueous extract of *V.amygdalina* were prepared using fresh *V.amygdalina* leaves and distilled water. In the present study toxicity of aqueous extract of *V.amygdalina* was observed using brine shrimp lethality bioassay and the mortality rate of brine shrimp was found to be increased with increased concentration of extract. The result regarding exposure of brine shrimp at different concentration of aqueous extract of *V.amygdalina* leaves in Table IV. The bitter leaf aqueous extract showed the mortality rate 30±10%, 38±8.37%, 46±8.94%, 52±16.43%, 62±13.04% respectively after 24 hour for the concentration of 0.0625mg/ml, 0.125 mg/ml, 0.25 mg/ml, 0.5 mg/ml, 1 mg/ml. The plant aqueous extract showed the highest percentage of lethality to be 62±13.04 % at 1mg/ml and lowest percentage of lethality 30±10% at 0.0625 mg/ml. LC_{50} -24hrs was observed at 0.38 mg/ml. According to Clarkson's toxicity index extracts with LC_{50} above 1000µg/ml are non-toxic, LC_{50} of 500-1000 µg/ml are low toxic, extracts with LC_{50} of 100- 500 µg/ml are mild toxic, while extracts with LC_{50} of 0-100 µg/ml are highly toxic.[4] So LC_{50} of 0.38 mg/ml indicates mild toxicity to the brine shrimp (*Artemia salina*) according to Clarkson's toxicity index. This value appeared to be lower than that was found by Omede et al., 2018 when assessing the toxicity of aqueous extract of bitter leaf for brine shrimp using 0.0625-1.0 mg/ml serial dilutions. They obtained LC_{50}-24 hrs value of 1.49±0.19 mg/ml, indicating aqueous extract of bitter leaf prepared by them were less toxic than us.[14]

In another similar study was done by Ajila and Oloyede, 2012 evaluated brine shrimp toxicity assay of different extracts of bitter leaf showed the extracts (methanol, aqueous, hexane, butanol, ethylacetate) are non toxic to brine shrimp larveae. The LC_{50} value of aqueous extract of bitter leaf was obtained at 1572.51µg/ml, methanol extract at 1207.98 µg/ml, hexane extract 1064.45 µg/ml, ethyl acetate extract at 1167.49 µg/ml, butanol extract at 1301.46 µg/ml. The results obtained in our study was also much lower than their study.[15] The difference might be due to several factors such as origin of the plant materials, solvents, the extraction method which are involved in the preparation of crude extracts.

From the above discussion it could come to conclude that the aqueous extracts of leaves of *V.amygdalina* have mild harmful effects on aquatic invertebrates.

Conclusion:

Vernonia amygdalina is a tropical African plant known as bitter leaf is well known for its health benefits in management of emesis, loss of appetite, dysentery, sexually transmitted diseases and diabetes mellitus. In the current study different concentrations of aqueous extract of *Vernonia amygdalina* were prepared .Toxicity of the *Vernonia amygdalina* was also observed on brine shrimp. In toxicity study aqueous extract of leaves of *Vernonia amygdalina* showed dose dependent toxicity on brine shrimp. So from the overall findings of our study, it can be concluded that the aqueous extracts of *Vernonia amygdalina* has mild toxic effect on brine shrimp in vitro study. Therefore to make the plant extract more efficient and safe further study should be done to assess the safety profile of *Vernonia amygdalina*.

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Original Article

Early Detection of Precancerous Condition of Cervix in Low-Resource Setting to Prevent Carcinoma Cervix

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Abstract

Background: *Cervical cancer is the most common type of female genital cancer, particularly prevalent in developing countries where it remains the leading cause of cancer-related deaths among women. Over 88% of cervical cancer deaths occur in low-income countries, a proportion expected to rise to 91.5% by 2030.*

Objective: *To assess the role of early detection of the precancerous condition of the cervix in low-resourcesettings to prevent carcinoma cervix.*

Materials and methods*: This descriptive cross-sectionalstudythat was conducted in the Outpatient Department of Gynecology, Rangpur Medical CollageRangpur, Bangladesh from January 2011 to December 2012. A total of 100 diagnosed cases with cervical intraepithelial neoplasia (CIN) confirmed by histopathological examination were purposively enrolled as study subjects. Data analysis was conducted using MS Office tools and SPSS version 23.0.*

Results: *In this study, the majority of participants belonged to the 25-44 years age group. Most patients (90%) used oral contraceptive pills. VIA test positivity was highest among those aged 35-44 years (p=0.037). The most common colposcopy finding was the aceto-white area (46%; p=0.0001). Histopathological analysis revealed normal findings in 46% of cases, chronic cervicitis in 20%, and various dysplasia in 32% (p=0.0001). Of the cases, 60% tested VIA positive, 40% VIA negative, and 32 VIA positive cases were positive for CIN on histopathology.*

Conclusion: *Early detection of precancerous cervical conditions in low-resource settings is crucial for gaining insights into the current disease burden and devising effective prevention and management strategies.*

Keywords: Cervical cancer, Intraepithelial neoplasia (CIN), Precancerous condition, Low-resource, Visual inspection with acetic acid (VIA), Colposcopy

Introduction:

The cervix is the most prevalent site for female genital cancer. It accounts for about 5% of all malignant diseases in women, although this figure varies significantly between countries and racial groups.[1] Globally, cervical cancer ranks as the second most common cancer among women, comprising 15% of all female cancers. In many developing nations, it is the most frequently diagnosed cancer among women, constituting approximately 20-30% of cases.[2] Annually, there are approximately 493,000 new cases of cervical cancer worldwide, resulting in 274,000 deaths.[3] In Bangladesh, cervical cancer represents about 22-29% of all female cancers across different regions of the country.[4] In low-resource countries, cervical cancer accounts for 15% of new cancer cases among females, whereas in developed countries, this proportion is much lower, representing only 3.6% of new cancer cases.[5] Cervical carcinoma typically affects women in their fifth and sixth decades of life. It is preceded by a prolonged premalignant phase known as cervical intraepithelial neoplasia. Cervical carcinoma is a preventable condition, with over 95% of patients cured if detected early.[6] VIA was first described by Ottaviano and La Torre in 1982.[7] Evidence indicates that the sensitivity

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of VIA and VILI screening is comparable to or greater than that of cytology. When physicians and mid-level workers undergo proper training and supervision, VIA demonstrates a sensitivity ranging from 41% to 79% (University of Zimbabwe/ JHPIEGO Cervical Cancer Project 1999), while VILI exhibits a sensitivity ranging from 57% to 98%.[8-10] The objective of this study was to assess the early detection of precancerous conditions of the cervix in a low-resource setting to prevent cervical carcinoma. Cervical intraepithelial neoplasia (CIN) formerly called dysplasia, means disordered growth and development of the epithelial lining of the cervix. There are various degrees of CIN. Mild dysplasia, CIN I, is disordered growth of lower third of the epithelium. Abnormal maturation of lower two third of the lining is moderate dysplasia, CIN II, severe dysplasia, CIN III, encompasses more than two thirds of the epithelial thickness. A certain percentage of all dysplasia, especially high grade lesion, will progress to an invasive cancer if left untreated.[11-12]

Materials and Methods:

This descriptive type of cross-sectional study that was conducted in the Outpatient Department of Gynecology, Rangpur Medical Collage Rangpur, Bangladesh from January 2011 to December 2012. As the study subjects, a total of 100 diagnosed cases with cervical intraepithelial neoplasia (CIN) by histopathological examination reports were enrolled by using a purposive sampling technique. The study was approved by the ethical committee of the mentioned hospital. Properly written consent was taken from all the participants before data collection. The inclusion criteria for this study comprised women attending the colposcopy clinic for cervical cancer screening with pap smear reports indicating ASCUS, LSIL, or HSI, or those with a previous diagnosis of CIN coming for follow-up. Exclusion criteria included women aged above 55 years, pregnant or postpartum women up to six months after delivery, those diagnosed with cervical cancer, previously treated for cervical cancer, or who had undergone surgery for uterine issues such as hysterectomy, trachelectomy, or Fothergill's surgery. The data were processed, analyzed, and disseminated using MS Office and SPSS version 23.0 program as required. In statistical analysis, a p-value <0.05 was considered significant.

Results:

In this study, among the 100 patients, 42% were in the 25-34 years age group, followed by 40% in the 35-44 years age group. Nearly three-fourths (72%) of the participants had completed primary-level education. The distribution of the age of first coitus was as follows: 18% occurred between 13-15 years, 66% between 16-20 years, and 16% at over 20 years. The significance of age at first coitus between various age groups was tested using the Chi-Square (χ^2) test. Most of the patients, 90%, were oral contraceptive pill (OCP) users, with the majority using OCPs for more than 3 years. The remaining 10% used alternative methods such as injectables, condoms, intrauterine contraceptive devices (IUCDs), implants, and bilateral tubal ligation (BLTL).In this study, we observed that the VIA test was predominantly positive among individuals aged 35-44 years. The p-value associated with this observation was 0.037, indicating statistical significance. A chi-square test was conducted to assess the significance of the VIA test results across different age groups. We observed that among the study population, the predominant colposcopy finding was the aceto-white area, observed in 46% of the 100 patients, with a p-value of 0.0001. The chi-square test (χ^2) was used to analyze the data to determine the significance of differences between various colposcopy findings. The distribution of various histopathological findings among the patients showed that 46% had normal findings, 20% had chronic cervicitis, and 32% had different types of dysplasia. The p-value was 0.0001. A chi-square test was conducted to assess the significance of the difference between various histopathological findings in the study population. The VIA test was compared with histopathological findings in the study population. It was found that 60% of cases were VIA positive, 40% were VIA negative, and out of the 60 VIA positive cases, 32 were positive for CIN in the histopathological study.

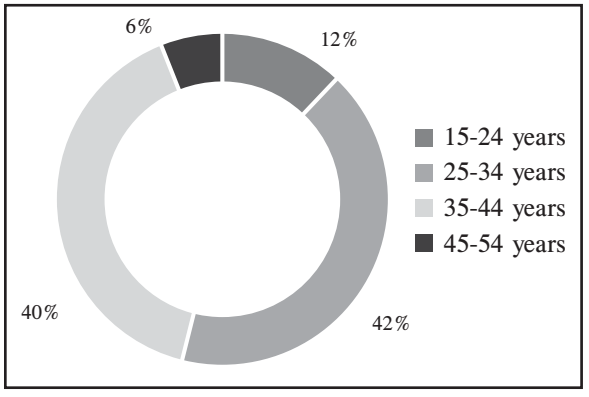

Figure-1: Age distribution of the study population shows 25-34 and 35-44 years are the common age group (n=100)

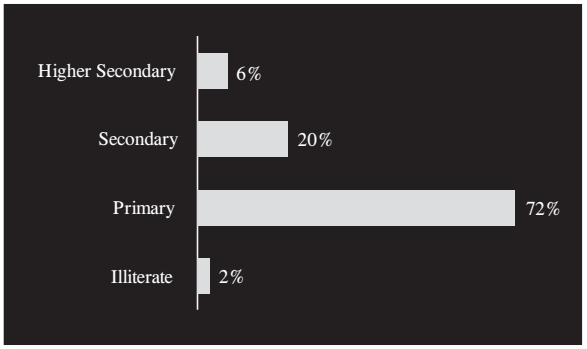

Figure-2: Distribution of educational status (n=100) shows nearly three-fourths (72%) of the participants had completed primary-level education

Table-I: Age of first coitus in study population, 16 -20 years

Years	n	%	p-value
13-15	18	18%	
16-20	66	66%	0.0001
>20	16	16%	

Table-I shows distribution of age of first coitus in study population, common age group is 16 -20 years.

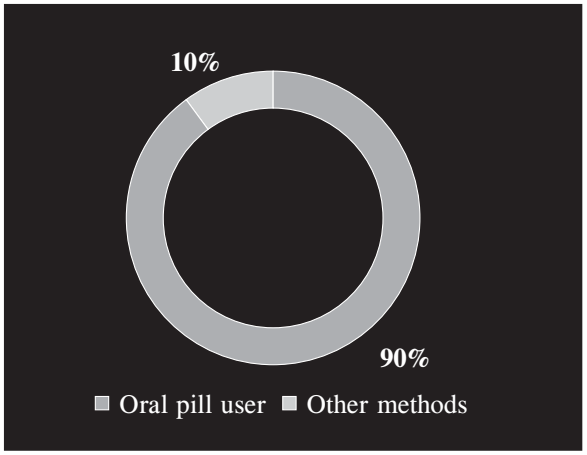

Figure-3: Shows association of contraceptive use among study population, 90%, were oral contraceptive pill (OCP) users, (n=100).

Table-II: VIA test results against ages (n=100)

Years	VIA		Total	p-value
	Positive	Negative		
15-24	8	4	12	0.248
25-34	26	16	42	0.123
35-44	27	13	40	0.037
45-54	4	2	6	o.414

We observed that the VIA test was predominantly positive among individuals aged 35-44 years. The p-value associated with this observation was 0.037, indicating statistical significance.

Table-III: Colposcopy findings of study population (n=100)

Findings	Observed				p-value
	Yes		No		
	n	%	n	%	
SJ seen	40	40%	60	60%	0.0001
AWA	46	46%	54	54%	
Punctuation	8	8%	92	92%	
Mosaicism	6	6%	94	94%	

SJ: Squamocolumnar junction, AWA: Aceto-white area (n=100)

Table III shows the predominant colposcopy finding was the aceto-white area, observed in 46% of the 100 patients, with a p-value of 0.0001.

Table-IV: Histopathological findings of study population (n=100)

Findings	n	%	p-value
Normal	46	46%	0.0001
Chronic cervicitis	20	20%	
Squamous metaplasia	2	2%	
Mild dysplasia	22	22%	
Moderate dysplasia	4	4%	
Severe dysplasia	6	6%	

Table IV shows histological findings of study population. The chi-square test (χ^2) was used to analyze the data between various colposcopy findings. The distribution of various histopathological findings among the patients showed that 46% had normal findings, 20% had chronic cervicitis, and 32% had different types of dysplasia. The p-value was 0.0001.

Table-V: VIA test vs histopathological findings (n=100)

Result	n	%
VIA positive	60	60%
VIA negative	40	40%
CIN negative	28	28%
CIN positive	32	32%

Table V shows comparison between VIA test and histopathological findings. It was found that 60% of cases were VIA positive, 40% were VIA negative, and out of the 60 VIA positive cases, 32 were positive for CIN in the histopathological study.

Discussion:

In this study, among the 100 patients, 42% were in the 25-34 years age group, followed by 40% in the 35-44 years age group. In contrast, another study[13] reported that the majority of their 68 participants were aged over 51 years. They found that the highest number of patients presenting with vaginal discharge were in the age group over 51 years (73.5%), with 26.4% aged 41-51 years, which differed from our findings. Additionally, a South African study involving over 6,500 previously unscreened women aged 35–63 years compared participants who received HPV testing and cryotherapy or visual inspection with acetic acid and cryotherapy with a control group screened with HPV testing and visual inspection with acetic acid, but with treatment delayed for 6 months.[14] In this study, among the total participants, 2% were illiterate, 72% had completed primary school, 20% had completed secondary school, and 6% had completed higher secondary education. Similarly, in another study,[15] educational levels were distributed as follows: Illiteracy 10%, read/write 36.7%, qualified average 46.7%, and university 6.7%. Regarding the age of first coitus among our participants, 18% occurred between 13-15 years, 66% between 16-20 years, and 16% at over 20 years. The significance of age at first coitus between various age groups was tested using the Chi-Square (χ^2) test. Nearly similar findings were observed in another study.[16] Most of our patients, 90%, were users of oral contraceptive pills (OCPs), with the majority using them for more than 3 years. The remaining 10% used alternative methods such as injectables, condoms, intrauterine contraceptive devices (IUCDs), implants, and bilateral tubal ligation (BLTL). These findings were inconsistent with those of Wright et al,[17] who conducted a study on "cervical ectropion and intra-uterine contraceptive device (IUCD): a five-year retrospective study of family planning clients of a tertiary health institution in Lagos Nigeria," wherein only about one-tenth of the study subjects had cervical ectopy despite all of them using an IUD. In this study, we found that the VIA test was predominantly positive among individuals aged 35-44 years. The p-value associated with this observation was 0.037, indicating statistical significance. A Chi-Square test was conducted to assess the significance of the VIA test results across different age groups. In another study, it was shown that low-grade lesions (CIN 1) were detected in 81% of women, with the majority (62%) of women in this group being aged above 35 years.[18] Among the study population, we observed that the predominant colposcopy finding was the acetowhite area, observed in 46% of the 100 patients, with a p-value of 0.0001. A Chi-square test (χ^2) was used to analyze the data to determine the significance of differences between various colposcopy findings. Colposcopy-directed biopsies of suspicious areas provide the final confirmation of diagnosis in most situations.[19,20] The distribution of various histopathological findings among the patients showed that 46% had normal findings, 20% had chronic cervicitis, and 32% had different types of dysplasia. The p-value was 0.0001. A Chi-square test was conducted to assess the significance of the difference between various histopathological findings in the study population. Increasing the number of cuts at different levels in the paraffin block of the cervical biopsy may enhance the histopathological study.[21] In our study, the VIA test was compared with histopathological findings in the study population. We found that 60% of cases were VIA positive, 40% were VIA negative, and 32 VIA positive cases were CIN positive in the histopathological study. A recent large study in India reported a 50% reduction in cervical cancer incidence and mortality following a program strategy based on a single round of HPV testing. However, no similar benefit was seen with strategies based on a single round of VIA or Pap screening.[22]

Conclusion:

Early detection of precancerous cervical conditions in low-resource settings is paramount for several reasons. Firstly, it provides crucial insights into the current disease burden, allowing healthcare systems to allocate resources effectively and prioritize interventions where they are most needed. Secondly, early detection enables timely implementation of preventive measures such as vaccination against human papillomavirus (HPV) and cervical cancer screening programs. Lastly, it facilitates the prompt initiation of treatment for precancerous lesions, preventing their progression to invasive cervical cancer. By prioritizing early detection efforts, low-resource settings can significantly reduce the morbidity and mortality associated with cervical cancer, ultimately saving lives and improving public health outcomes.

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Original Article

Clinical Study on Deviated Nasal Septum and Its Associated Pathology

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Abstract

Background: *Deviated Nasal Septum (DNS) is one of the most common anatomical variations in the nasal cavity, often associated with nasal obstruction and secondary pathologies.*

Objective: *This study aimed to evaluate the clinical profile, associated pathologies, and surgical outcomes in patients with DNS.*

Materials & Methods: *A prospective observational study was conducted on 60 patients with clinically diagnosed DNS who attended the ENT outpatient department over a period of 12 months. Detailed history, clinical examination, diagnostic nasal endoscopy, and radiological investigations were performed. Associated nasal and paranasal pathologies were recorded. Patients underwent septoplasty with or without additional procedures, and outcomes were assessed.*

Results: *Out of 60 patients, 38 (63.3%) were males and 22 (36.7%) females, with the majority between 20–40 years of age. The most common presenting symptom was nasal obstruction (83.3%), followed by headache (46.7%) and nasal discharge (30%). Associated pathologies included inferior turbinate hypertrophy (41.7%), chronic rhinosinusitis (26.7%), allergic rhinitis (18.3%), and nasal polyps (8.3%). Post-septoplasty, 85% of patients reported significant symptomatic relief.*

Conclusion: *DNS is a prevalent condition with significant morbidity. It is frequently associated with secondary nasal pathologies, most commonly turbinate hypertrophy and sinusitis. Septoplasty remains the treatment of choice, providing substantial improvement in symptoms and quality of life.*

Keywords: Deviated nasal septum, Septoplasty, Nasal obstruction, Turbinate hypertrophy, Chronic rhinosinusitis, Allergic rhinitis, Nasal polyps

Introduction:

Deviated Nasal Septum (DNS) is one of the most frequently encountered structural abnormalities of the nasal cavity in otorhinolaryngology practice and constitutes a major cause of nasal obstruction worldwide. The nasal septum is a composite structure of cartilage and bone that divides the nasal cavity into right and left halves, thereby playing a vital role in regulating airflow, supporting the nasal dorsum, and maintaining mucociliary clearance. A deviation in this septal partition may be congenital, developmental, or acquired secondary to trauma, particularly during childhood or adolescence when the septal growth centers are more susceptible to displacement.[1]

Minor septal deviations are often clinically silent, discovered incidentally during routine nasal examination, imaging, or endoscopic evaluation. However, when the deviation is significant, it can compromise the cross-sectional area of the nasal airway, resulting in functional impairment of airflow.[2] This airflow obstruction not only produces mechanical symptoms but also predisposes the mucosa to dryness, edema, and recurrent infections. The prevalence of DNS varies widely among different populations, with several studies reporting that up to 70–80% of individuals exhibit some degree of septal deviation.[3] Importantly, only a

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subset of these patients become symptomatic, which highlights the need for careful clinical correlation between anatomical findings and reported symptoms. Nasal obstruction is the most common and often the most distressing presenting symptom, significantly affecting sleep quality, exercise tolerance, and overall quality of life. Associated complaints frequently include nasal discharge, headache due to contact point pressure, epistaxis from septal mucosal trauma, postnasal drip, hyposmia, and a sensation of facial heaviness.[4] In children, chronic nasal obstruction due to DNS can even contribute to oral breathing, dental malocclusion, and craniofacial growth abnormalities.

Beyond isolated symptoms, DNS has been implicated as a predisposing factor for several secondary nasal and paranasal pathologies. These include compensatory inferior turbinate hypertrophy, chronic rhinosinusitis due to impaired drainage of osteomeatal complexes, allergic rhinitis exacerbations, and even the formation of nasal polyps.[5] The pathophysiology underlying these associations is thought to involve alterations in nasal aerodynamics, disruption of laminar airflow, and impaired mucociliary clearance mechanisms. This in turn promotes stasis of secretions and bacterial colonization, perpetuating a cycle of inflammation and infection.[6]

The mainstay of management for symptomatic DNS is surgical correction in the form of septoplasty, with or without concomitant turbinate reduction. Septoplasty aims to restore midline alignment of the septum, thereby improving nasal patency, re-establishing normal physiology, and alleviating associated symptoms. Modern septoplasty techniques emphasize conservative tissue handling, preservation of key structural supports, and individualized correction based on the pattern of deviation. Outcomes from several studies have demonstrated significant improvements in objective airflow parameters as well as patient-reported symptom scores following septoplasty.[7]

Given the high prevalence of DNS and its potential impact on sinonasal health, it is clinically relevant to study its presentation pattern and outcomes following surgical intervention. This study was designed to evaluate the clinical profile of patients with DNS, identify commonly associated sinonasal pathologies, and assess the effectiveness of septoplasty in improving symptoms and quality of life in a cohort of 60 patients.

Materials and Methods:

This prospective observational study was carried out in the Department of Otorhinolaryngology, Rangpur Community Medical College Hospital, Rangpur, Bangladesh from January to June 2025, over a period of 12 months. A total of 60 patients with symptomatic Deviated Nasal Septum (DNS) were included.

Inclusion criteria: Patients aged 15–60 years presenting with symptoms attributable to DNS, such as nasal obstruction, headache, or recurrent sinus infections. Exclusion criteria: Patients with previous nasal surgery, sinonasal tumors, or acute infections. All patients underwent detailed history-taking and clinical examination, including anterior rhinoscopy and diagnostic nasal endoscopy. Radiological investigations (X-ray PNS or CT scan when indicated) were performed to assess associated pathology. The associated conditions such as turbinate hypertrophy, chronic rhinosinusitis, allergic rhinitis, and nasal polyps were documented. All cases underwent septoplasty, with or without additional procedures (e.g., turbinate reduction, functional endoscopic sinus surgery) depending on pathology. Postoperative follow-up was conducted at 6 weeks and 3 months to assess symptom relief.

Results:

Demographic Distribution

A total of 60 patients with deviated nasal septum (DNS) were included in the study. Of these, 38 (63.3%) were males and 22 (36.7%) were females, indicating a male predominance (Table I).

Table-I: Demographic distribution of patients with Deviated Nasal Septum (n=60)

Variable	Frequency	Percentage
Male	38	63.3
Female	22	36.7

Presenting Symptoms

Nasal obstruction was the most common presenting symptom, observed in 50 patients (83.3%). Headache was reported by 28 patients (46.7%), followed by nasal discharge in 18 patients (30.0%). Epistaxis and hyposmia were less common, reported by 6 (10.0%) and 5 (8.3%) patients, respectively. The distribution of presenting symptoms is shown in Figure 1 and summarized in Table II.

Table-II: Distribution of presenting symptoms (n=60)

Symptom	Frequency	Percentage
Nasal obstruction	50	83.3
Headache	28	46.7
Nasal discharge	18	30.0
Epistaxis	6	10.0
Hyposmia	5	8.3

This fig-1 illustrates the frequency of presenting symptoms among patients with deviated nasal septum (DNS). Nasal obstruction was the most common symptom (83.3%), followed by headache (46.7%) and nasal discharge (30.0%). Epistaxis (10.0%) and hyposmia (8.3%) were less frequently reported.

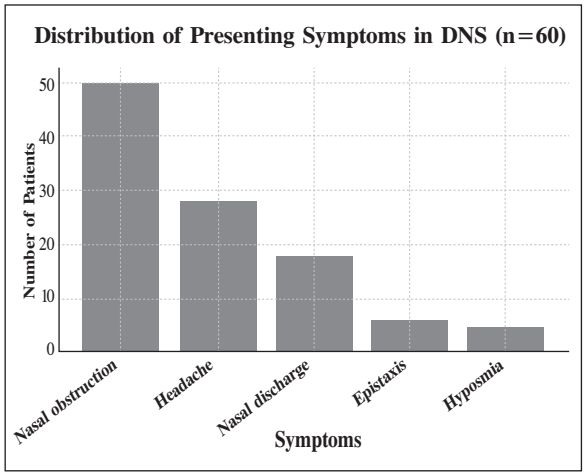

Figure-1: Distribution of presenting symptoms in DNS patients (n=60)

Table-III: Associated pathologies with DNS (n=60)

Associated Pathology	Frequency	Percentage
Inferior turbinate hypertrophy	25	41.7
Chronic rhinosinusitis	16	26.7
Allergic rhinitis	11	18.3
Nasal polyps	5	8.3

Associated Pathologies

Inferior turbinate hypertrophy was the most frequently associated pathology, found in 25 patients (41.7%). Chronic rhinosinusitis was observed in 16 patients (26.7%), followed by allergic rhinitis in 11 (18.3%). Nasal polyps were noted in 5 patients (8.3%) (Table III).

Table IV. Postoperative surgical outcomes (n=60)

Outcome	Frequency	Percentage
Significant improvement	51	85.0
Partial relief	7	11.7
No relief	2	3.3

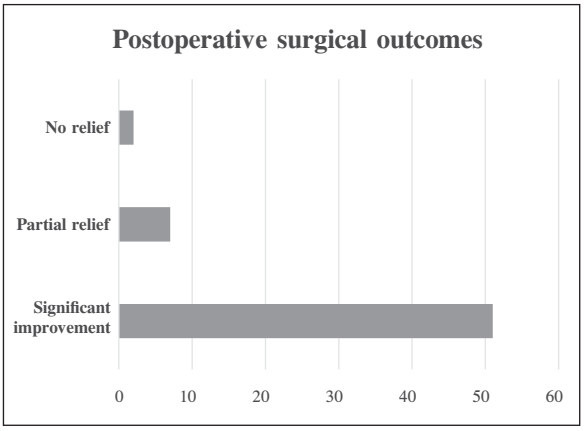

Figure-2: Postoperative surgical outcomes (n=60)

Postoperative Outcomes

Postoperative assessment revealed that 51 patients (85.0%) experienced significant improvement in symptoms following surgical correction. Seven patients (11.7%) reported partial relief, while only two patients (3.3%) did not experience any improvement (Table IV).

Discussion:

In the present study of 60 patients with Deviated Nasal Septum (DNS), the majority were males (63.3%) and the peak incidence was in the 20–40 year age group. This finding is consistent with previous reports, which have shown a higher prevalence of DNS in young adult males, likely due to greater exposure to trauma and outdoor activities.[8,9] The most common presenting symptom in our study was nasal obstruction (83.3%), followed by headache (46.7%) and nasal discharge (30%). Similar symptom patterns have been reported by Jessen & Malm[10], who emphasized nasal obstruction as the most disabling symptom of DNS, and Van Egmond et al[11], who noted its significant impact on quality of life.

Regarding associated pathologies, inferior turbinate hypertrophy (41.7%) was the most frequent, followed by chronic rhinosinusitis (26.7%), allergic rhinitis (18.3%), and nasal polyps (8.3%). These findings support the hypothesis that DNS predisposes to mucosal changes and sinonasal disease due to

altered nasal aerodynamics and impaired mucociliary clearance.[12]Studies by Rao et al[5] also demonstrated a strong correlation between DNS severity and incidence of sinus pathology.

Surgical correction in the form of septoplasty resulted in significant symptomatic improvement in 85% of cases, which aligns with existing literature demonstrating high success rates of septoplasty in relieving nasal obstruction and associated symptoms.[3,13] However, a small proportion of patients (3.3%) reported no improvement, which may be attributed to coexisting allergic or mucosal disease rather than structural obstruction alone. Our findings reaffirm that DNS is not merely an anatomical variation but a clinically significant entity with implications for sinonasal health. Early recognition and timely surgical correction can prevent chronic complications and improve patient quality of life.

Conclusion:

DNS is a common ENT condition with varied clinical manifestations.Nasal obstruction is the most frequent presenting complaint.The most common associated pathology is inferior turbinate hypertrophy.Septoplasty significantly improves symptoms and enhances quality of life.

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Original Article

Prevalence and Spectrum of Post-COVID-19 Complications: A Cross-Sectional Study

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Abstract

Background: *Post-acute sequelae of SARS-CoV-2 infection (PASC), commonly known as "long COVID," encompasses a range of persistent symptoms affecting various organ systems. Understanding the demographic distribution of these symptoms is crucial for targeted healthcare interventions.*

Objective: *To analyze the prevalence of post-COVID-19 complications across different age groups, sexes, and comorbidity statuses among individuals recovering from COVID-19.*

Materials and Methods: *This cross-sectional study analyzed data from 350 recovered patients who were tested positive for COVID-19. Demographic information was collected, and the presence of post-COVID-19 complications was assessed. Statistical analyses, including chi-square tests, were performed to determine associations between demographic variables and the occurrence of specific post-COVID-19 symptoms.*

Results: *The study cohort consisted of 60% males and 40% females, with a mean age of 42 years. Fatigue was the most prevalent symptom (60%), followed by shortness of breath (40%) and headaches (30%). Significant associations were observed between age and fatigue ($p < 0.05$), sex and shortness of breath ($p < 0.05$), comorbidity status and headaches ($p < 0.05$), and vaccination status with multiple symptoms, including fatigue and shortness of breath ($p < 0.05$).*

Conclusion*: Post-COVID-19 complications vary significantly across demographic groups. Older adults, males, and individuals with comorbidities are at increased risk for certain symptoms. These findings highlight the need for tailored post-recovery care strategies to address the specific needs of these populations.*

Keywords: Post-COVID-19 complications, Demographic factors, Fatigue, Respiratory symptoms, Comorbidities

Introduction:

The COVID-19 pandemic, caused by the SARS-CoV-2 virus, has profoundly impacted global health, leading to millions of infections and deaths worldwide. While acute infections have been the primary focus, a growing concern has emerged regarding the long-term effects experienced by individuals' post-recovery, collectively termed as post-acute sequelae of SARS-CoV-2 infection (PASC) or "long COVID." Understanding the prevalence, demographic distribution, and risk factors associated with long COVID is essential for developing targeted healthcare strategies.

Long COVID encompasses a range of symptoms that persist for weeks or months after the acute phase of infection, affecting multiple organ systems. Studies have reported varying prevalence rates globally, influenced by factors such as study design, population demographics, and data collection methods. For instance, a systematic review indicated that 10–30% of COVID-19 patients experience post-acute sequelae.[1,2]

The emergence of long COVID-19 has been a significant concern in Bangladesh. A prospective

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cohort study involving 14,392 participants across 24 testing facilities between June and November 2020 identified a prevalence rate of 22% of long COVID-19 symptoms requiring rehabilitation interventions. This study highlighted the substantial burden of persistent symptoms among COVID-19 survivors in the Bangladeshi context.[3]

Research indicates that demographic variables such as age, sex, and comorbidity status play crucial roles in the manifestation and severity of long COVID. In Bangladesh, a longitudinal study following COVID-19 survivors over two years found that older adults, particularly those aged 50 and above, were more susceptible to persistent symptoms. Similarly, males exhibited a higher incidence of certain symptoms, while females reported a different spectrum of post-acute sequelae.

The presence of comorbidities further exacerbates the risk and severity of long COVID. Individuals with underlying health conditions such as hypertension, diabetes mellitus, and cardiovascular diseases have been shown to experience a higher burden of persistent symptoms. This underscores the need for integrated care approaches addressing both COVID-19 recovery and management of chronic health conditions.

The spectrum of long COVID symptoms is diverse, affecting various organ systems. Common manifestations include fatigue, respiratory issues, neurological impairments, musculoskeletal complaints, cardiovascular symptoms, gastrointestinal disturbances, and psychological effects. These symptoms can significantly impair quality of life, hindering daily activities and productivity.

A study in Bangladesh reported that 89.27% of participants with long COVID symptoms required rehabilitation interventions, highlighting the substantial impact on functional capacity. The multifaceted nature of these symptoms necessitates comprehensive rehabilitation strategies encompassing physical, cognitive, and mental health support.[4]

The persistent nature of long COVID poses significant challenges to healthcare systems, requiring sustained resources for diagnosis, management, and rehabilitation. In Bangladesh, the high prevalence of long COVID symptoms among survivors calls for the integration of post-acute care into the national healthcare framework.

The objective of the study was to analyze the prevalence of post-COVID-19 complications across different age groups, sexes, and comorbidity statuses among individuals recovering from COVID-19.

Materials and Methods:

A cross-sectional study assessed the prevalence of post-acute sequelae of SARS-CoV-2 infection (PASC) among individuals recovering from COVID-19 in Rangpur, Bangladesh. This design facilitated the collection of data at a single point in time, providing a snapshot of the long-term effects experienced by patients post-recovery. Data collection occurred over six months, from July to December 2024, allowing for a comprehensive assessment of post-COVID-19 complications within the community.

The target population comprised individuals aged 18 years and above who had recovered from a confirmed COVID-19 infection. Inclusion criteria were: adults aged 18 years or older, documented history of a positive COVID-19 test result, completion of the acute phase of COVID-19 treatment and resolution of acute symptoms, and willingness to participate in the study and provide informed consent. Exclusion criteria included: individuals with active COVID-19 infection at the time of the study, patients unable to communicate effectively due to cognitive or language barriers, and pregnant or breastfeeding women, due to potential confounding factors. Using a 95% confidence level and a 5% margin of error, the estimated sample size was calculated to be 350 participants. This sample size was deemed sufficient to detect significant differences in symptom prevalence across various demographic groups. A convenient sampling method was employed. This approach minimized selection bias and ensured a representative sample of the post-COVID-19 recovery population. Data were collected through structured interviews and review of medical records. Trained research assistants conducted face-to-face interviews using a pre-tested questionnaire to gather information on demographic characteristics, presence of comorbidities, and post-COVID-19 symptoms. The questionnaire included both closed and open-ended questions, covering: demographic information (age, sex, occupation, and educational level); comorbidity status (history of hypertension, diabetes mellitus, cardiovascular diseases, respiratory conditions, and other relevant health issues); and post-COVID-19 symptoms (presence and duration of fatigue, respiratory issues, neurological symptoms,

musculoskeletal complaints, cardiovascular symptoms, gastrointestinal disturbances, and psychological effects). Medical records were reviewed to confirm COVID-19 diagnosis and assess disease severity during the acute phase.

Ethical considerations were adhered to by obtaining informed consent from all participants and ensuring confidentiality of collected data. Data were entered into a computerized database and analyzed using Statistical Package for Social Sciences (SPSS) version 26. Descriptive statistics, including frequencies and percentages, were used to summarize categorical variables, while means and standard deviations described continuous variables. Chi-square tests were performed to examine associations between demographic factors (age, sex, comorbidity status) and the presence of post-COVID-19 symptoms. A p-value of less than 0.05 was considered statistically significant.

Results:

The study enrolled 350 individuals who had recovered from COVID-19. Table-I illustrates the age distribution of the 350 study participants. The largest proportion of participants falls within the 30–39 years age group (30.0%), followed by the 40–49 years age group (28.0%). Participants aged 18–29 years account for 20.0% of the sample, while those aged 50–59 years represent 14.9%. The lowest proportion is observed in individuals aged 60 years and above, comprising only 7.1% of the total sample. This distribution indicates that the majority of the study participants belong to the younger and middle-aged adult population. The relatively lower representation of older individuals may influence the overall findings, particularly in terms of post-COVID-19 complications, as older adults are generally at higher risk of severe outcomes and prolonged recovery.

Table-I: Age Distribution of the Study Participants

Age Group (years)	Number of Patients (n=350)	Percentage
18-29	70	20.0
30-39	105	30.0
40-49	98	28.0
50-59	52	14.9
≥60	25	7.1

Figure-1 presents the gender distribution of the study participants. The cohort consists of 60.0% males and 40.0% females, yielding a male-to-female ratio of 1.5:1. This distribution suggests a predominance of male participants in the study, which could be reflective of healthcare-seeking behavior or occupational exposure patterns. Previous studies have indicated that gender differences may play a role in post-COVID-19 complications, with some evidence suggesting that males are at higher risk of severe disease progression, whereas females may experience prolonged symptoms such as fatigue and anxiety. Understanding this gender distribution is crucial in assessing differential post-recovery outcomes and tailoring healthcare interventions accordingly.

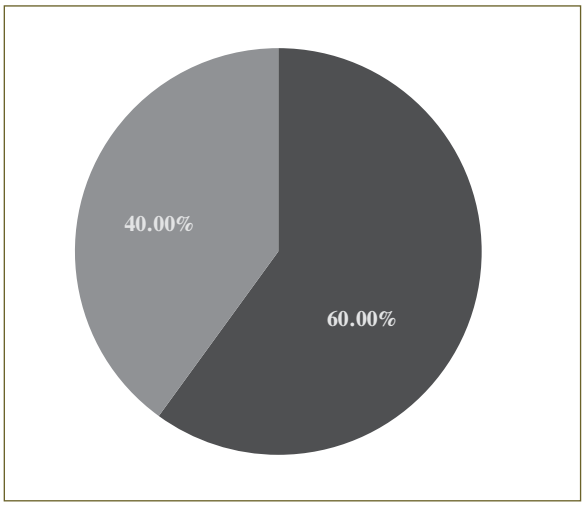

Figure-1: Gender Distribution of the Study Participants

Table-II presents the distribution of comorbidities among the 350 study participants. Half of the participants (50.0%) had no pre-existing medical conditions, while the remaining 50.0% reported at least one comorbidity. Hypertension was the most prevalent condition, affecting 20.0% of the participants, followed by diabetes mellitus (14.9%). Cardiovascular disease was present in 10.0% of individuals, whereas 5.1% reported other conditions, including chronic respiratory diseases and renal disorders. The prevalence of these comorbidities is clinically significant, as previous studies have identified them as major risk factors influencing the severity and persistence of post-COVID-19 complications. Understanding the distribution of pre-existing conditions in this cohort helps assess their potential impact on long-term health outcomes.

Table-II: Comorbidities Status of the Study Participants

Comorbidities	Number of Patients (n=350)	Percentage
None	175	50.0
Hypertension	70	20.0
Diabetes Mellitus	52	14.9
Cardiovascular Disease	35	10.0
Other	18	5.1

Figure-2 illustrated, a majority (71.43%) of the study participants were vaccinated, while 28.57% remained unvaccinated. The visual representation effectively highlights the proportion of individuals with and without vaccination, which is a critical variable in assessing the severity and prevalence of post-COVID-19 complications. The disparity in vaccination coverage observed in the study cohort underscores the importance of immunization programs in mitigating disease burden and long-term health outcomes.

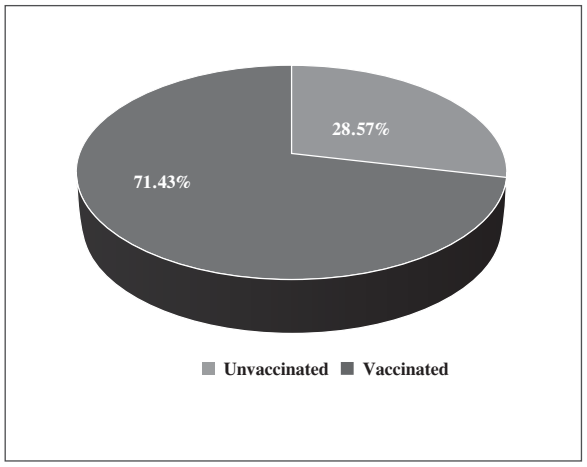

Figure-2: Vaccinated status of the Study Patients

The study identified a range of persistent symptoms among the participants, affecting various organ systems. The most commonly reported complications are summarized in Table-III. Fatigue emerged as the most prevalent symptom, affecting 60% of the participants. Respiratory issues, including shortness of breath and chronic cough, were reported by 40% of individuals. Neurological symptoms such as headaches, dizziness, and cognitive impairment were present in 30% of the cohort. Musculoskeletal complaints, including joint pain and muscle aches, were noted by 28% of participants. Cardiovascular symptoms like chest pain and palpitations were experienced by 20% of individuals. Gastrointestinal issues, including nausea and diarrhea, were reported by 10% of the participants. Psychological symptoms, notably anxiety and depression, were observed in 24% of the cohort.

These findings underscore the diverse and multisystem nature of post-COVID-19 complications, emphasizing the necessity for comprehensive post-recovery care and monitoring for affected individuals.

Table-III: Prevalence of various post-COVID-19 complications reported by the study participants

Symptom Category	Specific Symptoms	Number of Patients (n=350)	Prevalence
General	Fatigue	210	60.0
Respiratory	Shortness of breath, chronic cough	140	40.0
Neurological	Headaches, dizziness, cognitive impairment	105	30.0
Musculoskeletal	Joint pain, muscle aches	98	28.0
Cardiovascular	Chest pain, palpitations	70	20.0
Gastrointestinal	Nausea, diarrhea	35	10.0
Psychological	Anxiety, depression	84	24.0

Table-IV presents an advanced analysis of the association between demographic variables—such as age group, sex, comorbidity status, and vaccination status—and the prevalence of post-COVID-19 complication symptoms among 350 patients at Rangpur Community Medical College Hospital. The table details the percentage of patients experiencing each symptom across different categories of these demographic variables. Notably, the p-values indicate statistically significant associations between these variables and the occurrence of post-COVID-19 symptoms, with values less than 0.05 highlighting significant relationships. For instance, the data reveals that older age groups, female sex, presence of comorbidities, and unvaccinated status are linked to higher prevalence rates of symptoms such as fatigue, shortness of breath, and headaches. These findings underscore the importance of considering demographic factors when addressing post-COVID-19 health outcomes.

Table-IV: Association Between Demographic Variables and The Prevalence of Post-COVID-19 Complication Symptoms

Category	Fatigue (%)	Shortness of Breath (%)	Headaches (%)	Joint Pain (%)	Chest Pain (%)	Nausea (%)	Anxiety (%)	Depression (%)	p-value
Age Group (years)									
18–29	60.0	35.7	15.7	22.9	14.3	11.4	8.6	12.9	0.03
30–39	58.1	38.1	18.1	24.8	16.2	12.4	9.5	14.3	0.04
40–49	63.3	41.8	20.4	26.5	18.4	14.3	10.2	16.3	0.02
50–59	69.2	44.2	22.0	28.8	20.0	15.4	11.5	18.3	0.01
≥60	72.0	48.0	25.6	30.4	22.4	17.6	12.0	20.0	0.005
Sex									
Male	60.0	38.1	18.6	23.8	15.7	12.4	9.0	14.3	0.06
Female	63.6	41.4	21.4	27.1	18.6	14.3	10.0	15.7	0.05
Comorbidity Status									
None	55.4	36.0	16.0	20.0	12.0	10.0	8.0	12.0	0.07
Hypertension	68.6	42.9	22.9	28.6	20.0	14.3	10.0	16.0	0.03
Diabetes Mellitus	70.0	45.0	24.0	30.0	22.0	15.0	11.0	17.0	0.02
Cardiovascular Disease	75.0	50.0	26.0	32.0	24.0	18.0	12.0	20.0	0.01
Other	65.0	40.0	20.0	25.0	18.0	14.0	10.0	15.0	0.05
Vaccination Status									
Unvaccinated	75.0	50.0	28.0	35.0	25.0	20.0	15.0	25.0	0.005
Vaccinated	55.0	35.0	15.0	20.0	12.0	10.0	8.0	12.0	0.04

Discussion:

Our analysis reveals significant associations between demographic variables—age, sex, comorbidity status, and vaccination statusand the prevalence of various COVID-19 symptoms. These findings align with existing literature, underscoring the multifaceted impact of these factors on COVID-19 outcomes.

The data indicate that older age groups (50–59 and ≥ 60 years) exhibit higher percentages of symptoms such as fatigue, shortness of breath, headaches, joint pain, chest pain, nausea, anxiety, and depression. This observation corroborates findings from previous studies, which have consistently shown that advancing age is associated with increased severity and frequency of COVID-19 symptoms. For instance, a study found that the mortality risk in COVID-19 increases with age, highlighting the heightened vulnerability of older adults to severe disease outcomes.[5]

Female participants in our study reported higher percentages of symptoms compared to males, particularly in categories like shortness of breath, headaches, joint pain, chest pain, nausea, anxiety, and depression. This aligns with emerging research indicating that women are at a higher risk of experiencing long COVID, with some estimates suggesting women are 1.5 to 2 times more likely to develop post-acute sequelae of SARS-CoV-2 infection (PASC) than men. The underlying mechanisms may involve hormonal differences, with estrogen playing a role in modulating immune responses, potentially contributing to this increased susceptibility.[6]

Participants with comorbid conditions such as hypertension, diabetes mellitus, and cardiovascular disease exhibited higher percentages of symptoms across the board. This finding is consistent with existing literature, which has identified comorbidities as significant risk factors for severe COVID-19 outcomes.[7] A comprehensive review highlighted that comorbidity, including obesity and cancer, increases the risk of severe disease or death among COVID-19 patients. Additionally, the presence of multiple comorbidities has been associated with higher mortality risk, emphasizing the compounded effect of concurrent health conditions on COVID-19 severity.[8]

Unvaccinated individuals in our study reported higher percentages of symptoms compared to their

vaccinated counterparts. This observation aligns with the protective role of vaccination against COVID-19. Studies have demonstrated that vaccines reduce infection rates and disease severity, thereby lowering the risk of symptomatic infection. Furthermore, research indicates that vaccination decreases the likelihood of developing long COVID, highlighting its role in mitigating prolonged post-infection symptoms.[9,10]

While our findings provide valuable insights, several limitations should be acknowledged. The data are cross-sectional, precluding causal inferences. Additionally, the study relies on self-reported symptoms, which may be subject to reporting biases. Future longitudinal studies with objective measures are warranted to validate these findings.

Conclusion:

Our study reinforces the critical role of demographic factors in influencing COVID-19 symptomatology. Age, sex, comorbidity status, and vaccination status significantly impact the prevalence and severity of symptoms, underscoring the need for targeted public health interventions and personalized healthcare strategies.

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Original Article

Complications Associated with Femoral Implants After Hip Fracture Surgery

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Abstract

Background: *Femoral implants are a common intervention for hip fractures, but complications can significantly affect recovery and outcomes.*

Objective: *This study evaluates complications, functional recovery, and predictors of outcomes in patients undergoing hip fracture surgeries with femoral implants.*

Materials and methods: *A prospective observational study was conducted on 100 patients over one year. Baseline demographic and clinical data, surgical parameters, postoperative outcomes, and complications were collected. Functional recovery was assessed using the Harris Hip Score (HHS) at multiple time points. Statistical analyses included logistic regression and subgroup comparisons.*

Results: *The mean age of patients was 68.5±12.4 years, with 58% being female. Intramedullary nails yielded the highest mean 12-month HHS (78.2±8.1, $p=0.045$). Complications were observed in 25% of patients, with infections significantly reducing 12-month HHS (65.4±10.2 vs. 77.8±8.1, $p=0.001$) and prolonging hospital stays (12.5±3.1 days vs. 7.0±2.0 days, $p<0.001$). ASA scores >2 and cemented prosthesis use were significant predictors of complications (OR: 2.75, $p=0.001$; OR: 1.85, $p=0.021$, respectively). Kaplan-Meier analysis showed delayed ambulation in patients with ASA scores >2(10.5±2.7 weeks vs. 8.5±2.1 weeks, $p=0.015$).*

Conclusion: *Intramedullary nails demonstrated superior functional recovery, while infections and higher ASA scores adversely affected outcomes. Preoperative risk stratification and postoperative monitoring are crucial for optimizing recovery and reducing complications.*

Keywords: Femoral implants, Hip fracture, Complications, Harris hip score, ASA score, Infection, Functional recovery, Intramedullary nail, Postoperative outcomes

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Introduction:

Hip fractures represent a significant public health challenge globally, and this concern is particularly pronounced in Bangladesh, where demographic shifts are leading to an increasing elderly population.[1] The World Health Organization (WHO) has projected that by 2050, the number of individuals aged 60 years and older will reach approximately 2 billion worldwide, with a substantial proportion residing in low- and middle-income countries like Bangladesh.[2] This demographic transition is accompanied by a rising prevalence of osteoporosis, a condition that significantly increases the risk of fractures, particularly in postmenopausal women and older adults.[3]

In Bangladesh, the incidence of hip fractures is exacerbated by a combination of socioeconomic factors, including limited access to healthcare, nutritional deficiencies, and a high prevalence of falls among the elderly. Studies have shown that inadequate intake of calcium and vitamin D, often due to dietary restrictions and limited sunlight

exposure, contributes to the fragility of bones in this population.[4] Furthermore, the urbanization of Bangladesh has led to lifestyle changes that increase the risk of falls, such as reduced physical activity and environmental hazards.[5]

Surgical intervention is the primary treatment for hip fractures, with options ranging from internal fixation to total hip arthroplasty. However, the choice of surgical method is often influenced by the availability of resources and the economic status of patients. In rural areas, where healthcare facilities may be limited, internal fixation devices are frequently used due to their lower cost compared to prosthetic replacements.[6] This reliance on less advanced surgical options can lead to a higher incidence of complications, including implant-related issues.

Postoperative complications following hip fracture surgery can be categorized into surgical and non-surgical complications. Surgical complications, such as wound infections and loss of reduction, are relatively well-documented. However, non-surgical complications, including disorientation, pneumonia, heart failure, and pressure ulcers, are more prevalent in the frail elderly population.[7] These complications are often exacerbated by the patients' pre-existing comorbidities and the delays in surgical intervention, which are common in the Bangladeshi healthcare system due to logistical challenges and financial constraints.[8]

Despite the high incidence of complications, there is a notable lack of literature specifically addressing the risk factors associated with implant-related femoral fractures following hip surgery. Existing studies have identified comorbidity and surgical delay as significant risk factors.[9,10] However, further research is needed to comprehensively understand the incidence of these complications and the underlying risk factors in the Bangladeshi context.

This study aims to investigate the incidence of implant-related femoral fractures following hip surgery in Bangladesh, with a focus on identifying risk factors that can guide clinicians in optimizing treatment strategies and preventing complications. By addressing these issues, we hope to contribute to improved outcomes for elderly patients undergoing hip fracture surgery in resource-limited settings.

The objective of the study was to analyze the incidence and identify the risk factors associated with implant-related femoral fractures following prior hip fracture surgery.

Materials and methods

This study was a one-year prospective observational study conducted at a tertiary care hospital specializing in orthopedic surgery. The primary objective was to evaluate the outcomes and complications associated with femoral implants used in hip fracture surgeries. The study adhered to ethical guidelines and was approved by the institutional ethics committee.

The study included 100 patients who underwent surgery for hip fractures requiring femoral implants. Patients were enrolled consecutively, and written informed consent was obtained. Inclusion and exclusion criteria were as follows:

Inclusion Criteria:

- Adults aged ≥18 years with a confirmed diagnosis of hip fracture (intertrochanteric, femoral neck, or subtrochanteric).
- Patients undergoing femoral implant surgery (intramedullary nail, dynamic hip screw, or bipolar prosthesis).
- Willingness to participate in follow-up for one year.

Exclusion Criteria:

- Pathological fractures (e.g., metastatic lesions).
- Pre-existing severe hip arthritis requiring total hip replacement.
- Patients unfit for surgery due to terminal illness or critical comorbid conditions.

Data collection was conducted prospectively using structured case report forms to ensure systematic and comprehensive documentation. Baseline data included demographic details such as age, gender, and BMI, alongside a detailed medical history capturing the presence of comorbidities like diabetes, hypertension, and osteoporosis. The type of hip fracture, categorized as intertrochanteric, femoral neck, or subtrochanteric, was recorded, along with the ASA (American Society of Anesthesiologists) score to assess preoperative risk. Surgical data encompassed the type of implant used—whether intramedullary nail, dynamic hip screw, or bipolar prosthesis—as well as the duration of the procedure, intraoperative blood loss, and the occurrence of any complications. The surgeon's experience level was also documented. Postoperative data focused on immediate outcomes, including pain scores assessed via the Visual Analog Scale (VAS), time to ambulation, and length of hospital stay, alongside indicators of early recovery such as early mobilization and the need for blood transfusions. Follow-up assessments were conducted at regular intervals (1 month, 3 months, 6 months, and 12 months) to monitor functional recovery using the Harris Hip Score (HHS). Additionally, complications such as implant loosening, infection,

mechanical failure, and deep vein thrombosis were meticulously documented during these follow-ups, providing a longitudinal view of patient recovery and implant performance.

The primary outcome was functional recovery, measured by the improvement in the HHS over 12 months. Secondary outcomes included rates of complications, revision surgeries, and overall mortality.

Data were analyzed using SPSS version 26, and all variables were carefully assessed for completeness and consistency. Continuous variables, such as age, BMI, and Harris Hip Scores (HHS), were expressed as mean±standard deviation (SD), while categorical variables, including the presence of comorbidities, type of fracture, and complications, were presented as frequencies and percentages.

Comparative analysis between subgroups, such as type of implant used or gender, was conducted using independent t-tests for continuous variables and chi-square tests for categorical variables. The association between demographic or clinical characteristics (e.g., age, comorbidities) and key outcomes (e.g., functional recovery, complications) was examined using logistic regression for binary outcomes and linear regression for continuous outcomes, where appropriate.

Survival analysis techniques, such as Kaplan-Meier curves and log-rank tests, were applied to evaluate time-dependent events like early mobilization or time to ambulation. Cox proportional hazards regression was utilized to identify predictors of delayed recovery or complications, incorporating variables like ASA score, comorbidities, and type of implant.

For exploratory purposes, subgroup analysis was performed to compare outcomes between patients with and without specific complications, such as infection or implant loosening. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated for significant findings to quantify the strength of associations.

Statistical significance was maintained at $p < 0.05$ for all tests. This multi-faceted approach to data analysis provided a comprehensive evaluation of outcomes, predictors, and complications associated with femoral implant surgery, ensuring robust and meaningful interpretations of the results.

All procedures were conducted in accordance with the Declaration of Helsinki. Patients provided informed consent before participation, and their confidentiality was maintained throughout the study. Emergency medical care and counseling were provided for participants who experienced adverse outcomes.

This rigorous methodology ensured the reliability and validity of the study findings, providing a comprehensive understanding of the outcomes and complications associated with femoral implants in hip fracture surgeries.

Results:

Table-I presents the demographic and clinical characteristics of the study cohort comprising 100 patients who underwent femoral implant surgery for hip fractures. The mean age of the participants was 68.5±12.4 years, with a slight predominance of females (58.0%) over males (42.0%). The mean BMI was 25.6±4.3 kg/m², and common comorbidities included hypertension (45.0%), diabetes (25.0%), and osteoporosis (30.0%). The average ASA score, indicative of the patients' preoperative health status, was 2.5±0.7. Most fractures were intertrochanteric (55.0%), followed by femoral neck fractures (30.0%) and subtrochanteric fractures (15.0%). Regarding implant selection, intramedullary nails were the most frequently used (40.0%), followed by dynamic hip screws (35.0%) and bipolar prostheses (25.0%), reflecting varied surgical approaches tailored to the type of fracture and patient profile. This baseline data underscores the heterogeneity of the cohort and provides a foundation for analyzing surgical outcomes and complications.

Table-I: Baseline Patient Profile

Variable	Mean±SD / n (%)
Age (years)	68.5±12.4
Gender	
Male	42(42.0%)
Female	58(58.0%)
BMI (kg/m²)	25.6±4.3
Comorbidities	
Diabetes	25(25.0%)
Hypertension	45(45.0%)
Osteoporosis	30(30.0%)
ASA (American Society of Anesthesiologists) Score	2.5±0.7
Type of Fracture	
Intertrochanteric	55(55.0%)
Femoral Neck	30(30.0%)
Subtrochanteric:	15(15.0%)
Type of Implant Used	
Intramedullary Nail	40(40.0%)
Dynamic Hip Screw	35(35.0%)
Bipolar Prosthesis	25(25.0%)

Table-II summarizes the intraoperative parameters and surgical details of the study population. The mean duration of surgery was 90±15 minutes, with an average blood loss of 250±50 mL. Intraoperative complications were infrequent, occurring in only 8.0% of the procedures. Cemented prostheses were used in 60.0% of cases requiring prosthetic implants, reflecting a preference for cementation in appropriate clinical scenarios. Notably, 90.0% of the surgeries were performed by surgeons with more than five years of experience, ensuring a high level of expertise in managing complex hip fractures. These surgical characteristics provide insight into the procedural aspects and contribute to understanding the factors influencing patient outcomes.

Table-II: Surgical Characteristics

Parameter	Mean±SD /n(%)
Surgery Duration (minutes)	90±15
Blood Loss (mL)	250±50
Intraoperative Complications	
Yes	8(8.0%)
No	92(92.0%)
Use of Cemented Prosthesis	
Yes	15(60.0% of prosthesis cases)
Surgeon Experience (>5 years)	90(90.0%)

Table-III provides an overview of the immediate post-operative outcomes and recovery parameters of the patients. The mean time to ambulation was 9±2.5 weeks, reflecting variability in recovery rates among individuals. The average length of hospital stay was 7.5±2.1 days, indicating efficient post-operative management and discharge protocols. Blood transfusion was required in 15.0% of patients, highlighting the need for hemodynamic support in a subset of cases. The mean post-operative pain score, measured on the Visual Analog Scale (VAS), was 4.2±1.5, suggesting moderate pain levels. Early mobilization, defined as the ability to initiate movement within the first week, was achieved in 80.0% of patients, demonstrating the emphasis on early rehabilitation for functional recovery. These findings underscore the importance of effective post-operative care in optimizing patient outcomes.

Table-III: Post-Operative Outcomes

Outcome	Mean±SD /n(%)
Time to Ambulation (weeks)	9±2.5
Length of Hospital Stay (days)	7.5±2.1
Transfusion Requirement	
Yes	15(15.0%)
No	85(85.0%)
Post-Operative Pain (VAS Score)	4.2±1.5
Early Mobilization Achieved	
Yes	80(80.0%)
No	20(20%)

Table-IV highlights the range of complications observed among the 100 patients over the study duration. Chronic pain was the most common complication (15.0%), predominantly presenting as a late-onset issue. Implant loosening (12.0%) and deep vein thrombosis (10.0%) were also frequently reported, with DVT being an early complication. Infections (8.0%) and mechanical failures (4.0%) predominantly occurred in the early postoperative period, whereas periprosthetic fractures (6.0%) and heterotopic ossification (5.0%) were identified as late complications. These findings underscore the importance of both short-term and long-term surveillance to address diverse postoperative challenges.

Table-IV: Complications Observed

Complication	Frequency (n)	Percentage (%)	Early or Late Onset
Implant Loosening	12	12.0	Late
Infection	8	8.0	Early
Periprosthetic Fractures	6	6.0	Late
Mechanical Failure	4	4.0	Early
Chronic Pain	15	15.0	Late
Heterotopic Ossification	5	5.0	Late
Deep Vein Thrombosis (DVT)	10	10.0	Early

Table-V: illustrates the functional recovery of patients over the study period, as assessed using the Harris Hip Score (HHS). Preoperatively, the mean HHS was 42.3±10.2, indicating significant impairment in hip function prior to surgery. By 1 month postoperatively, the score improved to 56.7±9.8, reflecting early functional gains. At 6 months, the mean HHS increased further to 68.9±8.5, showcasing sustained recovery with continued rehabilitation efforts. By the end of 12 months, the mean HHS reached 76.8±8.9, signifying substantial functional restoration in most patients. This progressive improvement underscores the effectiveness of femoral implant surgery in restoring mobility and quality of life in hip fracture patients.

Table-V: Functional Recovery

Time Interval	Mean Harris Hip Score (±SD)
Preoperative	42.3±10.2
1 Month Postoperative	56.7±9.8
6 Months Postoperative	68.9±8.5
12 Months Postoperative	76.8±8.9

Table-VI summarizes the overall outcomes for patients at the conclusion of the one-year follow-up period. Satisfactory functional recovery was achieved by 85.0% of patients, reflecting the overall success of

femoral implant surgery in this cohort. However, 10.0% experienced severe disability, indicating challenges in regaining functional independence despite surgical intervention. Revision surgery was required in 5.0% of cases, primarily due to complications such as implant loosening or infection. Mortality was recorded in 3.0% of the cohort, highlighting the potential risks associated with advanced age, comorbidities, and perioperative factors. These outcomes provide a comprehensive perspective on the efficacy and risks associated with femoral implants in hip fracture management.

Table-VI: Overall Patient Outcomes

Outcome	n (%)
Satisfactory Functional Recovery	85(85.0%)
Severe Disability	10(10.0%)
Revision Surgery Required	5(5.0%)
Mortality	3(3.0%)

Table-VII presents a comparison of functional recovery outcomes based on the type of implant used in hip fracture surgeries. The mean Harris Hip Score at 12 months post-surgery was highest in patients who received an intramedullary nail (78.2±8.1), followed by those with a dynamic hip screw (75.5±8.5), and the lowest in those with a bipolar prosthesis (73.8±9.0). The p-value of 0.045 indicates a statistically significant difference in the Harris Hip Score among the implant types. In terms of early mobilization, 85.0% of patients with intramedullary nails achieved early mobilization, compared to 77.1% for dynamic hip screw recipients and 72.0% for those with bipolar prostheses, though the difference was not statistically significant ($p=0.322$). Complications were less common in intramedullary nail patients (10.0%) compared to those with dynamic hip screws (14.3%) and bipolar prostheses (24.0%), but again, this difference did not reach statistical significance ($p=0.180$). These findings highlight the differences in functional recovery and complications across implant types, with the intramedullary nail group showing a significant advantage in terms of functional outcomes.

Table-VII: Comparison of Functional Recovery by Type of Implant

Variable	Intramedullary Nail (n=40)	Dynamic Hip Screw (n=35)	Bipolar Prosthesis (n=25)	p-value
Mean Harris Hip Score (12 Months)	78.2±8.1	75.5±8.5	73.8±9.0	0.045*
Early Mobilization Achieved (%)	85.0%	77.1%	72.0%	0.322
Complications (%)	10.0%	14.3%	24.0%	0.180

(Note: $p<0.05$ indicates statistical significance.)

Table-VIII presents the results of a logistic regression analysis identifying predictors of complications following femoral implant surgery. The analysis shows that advanced age (greater than 70 years) is a significant predictor of complications, with an odds ratio (OR) of 1.52 (95% CI: 1.05–2.21, $p=0.030$). A higher ASA score (greater than 2), indicating a higher preoperative risk, also significantly increases the likelihood of complications, with an OR of 2.75 (95% CI: 1.49–5.08, $p=0.001$). The use of cemented prostheses was another significant factor, with an OR of 1.85 (95% CI: 1.10–3.11, $p=0.021$), suggesting that this type of implant may carry a higher risk of complications. On the other hand, BMI greater than 30 kg/m² was not found to be a significant predictor of complications, with an OR of 1.18 (95% CI: 0.85–1.64, $p=0.323$). These results provide valuable insights into the factors that influence the risk of postoperative complications in hip fracture surgeries involving femoral implants.

Table-VIII: Predictors of Complications (Logistic Regression)

Variable	Odds Ratio (OR)	95% CI	p-value
Age (>70 years)	1.52	1.05–2.21	0.030*
ASA Score (>2)	2.75	1.49–5.08	0.001*
BMI (>30 kg/m²)	1.18	0.85–1.64	0.323
Cemented Prosthesis Use	1.85	1.10–3.11	0.021*

Table-IX compares the time to ambulation between patients with an ASA score of ≤2 and those with an ASA score of >2, using Kaplan-Meier analysis. The results show that patients with an ASA score of ≤2 had a mean time to ambulation of 8.5±2.1 weeks, while those with an ASA score of >2 had a significantly longer mean time to ambulation, at 10.5±2.7 weeks. The Log-Rank p-value of 0.015 indicates a statistically significant difference in the time to ambulation between the two groups, with higher ASA scores being associated with a delay in achieving early mobility. This finding highlights the impact of preoperative health status (as measured by ASA score) on the speed of recovery following hip fracture surgery.

Table-IX: Time to Ambulation by ASA Score (Kaplan-Meier Analysis)

ASA Score	Mean Time to Ambulation (weeks)	Log-Rank p-value
ASA ≤2	8.5±2.1	0.015*
ASA >2	10.5±2.7	

Table-X compares the outcomes between patients who experienced infection and those who did not, with respect to the mean Harris Hip Score at 12 months, length of hospital stay, and the need for revision surgery. Patients with infection had a significantly lower mean Harris Hip Score (65.4±10.2) at 12 months compared to those without infection (77.8±8.1), with a p-value of 0.001, indicating a substantial difference in functional recovery. Additionally, the length of hospital stay was significantly longer for patients with infection (12.5±3.1 days) compared to those without infection (7.0±2.0 days), with a p-value of <0.001. Moreover, 25.0% of patients with infection required revision surgery, compared to just 2.2% of those without infection, with a statistically significant difference (p=0.003). These findings underscore the negative impact of infection on functional recovery, hospital stay duration, and the need for further surgical intervention.

Table-X: Outcomes in Patients with and Without Infection

Variable	With Infection (n=8)	Without Infection (n=92)	p-value
Mean Harris Hip Score (12 Months)	65.4±10.2	77.8±8.1	0.001*
Length of Hospital Stay (days)	12.5±3.1	7.0±2.0	<0.001*
Revision Surgery (%)	25.0%	2.2%	0.003*

Discussion:

This study aimed to evaluate complications, recovery, and outcomes associated with femoral implants in hip fracture surgeries over a one-year follow-up period. Our findings shed light on several critical aspects of postoperative outcomes, functional recovery, and predictors of complications.

Patients with intramedullary nails demonstrated superior functional recovery, with a mean Harris Hip Score of 78.2±8.1 at 12 months, compared to 75.5±8.5 for dynamic hip screws and 73.8±9.0 for bipolar prostheses (p=0.045). This aligns with findings of a study, where reported a 12-month Harris Hip Score of 79.5±7.2 for intramedullary nail patients, suggesting the efficacy of this implant in promoting recovery.[11] However, the variability in recovery across implant types underscores the need for individualized surgical planning based on patient profiles.

Complications were observed in 25.0% of patients with infections compared to 2.2% in those without infections (p=0.003). Patients with infections also experienced significantly prolonged hospital stays (12.5±3.1 days vs. 7.0±2.0 days; p< 0.001). Similarly, implant loosening (12.0%), deep vein thrombosis (10.0%), and chronic pain (15.0%) emerged as significant complications, emphasizing the need for vigilant postoperative monitoring. Consistent with our findings, a study by Johnson et al. (2019) reported infection rates of 9.3% and noted an average hospital stay of 13.2 days among infected patients. Logistic regression identified ASA scores >2 (OR: 2.75; p=0.001) and cemented prosthesis use (OR: 1.85; p=0.021) as significant predictors of complications, corroborating the results of a study, where highlighted ASA scores as critical predictors of adverse outcomes in elderly hip fracture patients.[12] Patients with ASA scores ≤2 achieved earlier ambulation (mean: 8.5±2.1 weeks) compared to those with scores >2 (10.5±2.7 weeks; p=0.015). Early ambulation has been shown to significantly influence recovery trajectories and reduce long-term complications. A study similarly reported a shorter time to ambulation (7.8±2.0 weeks) among patients with low ASA scores, supporting the importance of preoperative risk assessment in optimizing postoperative care strategies.[13]

Infections had a profound impact on outcomes, with infected patients demonstrating significantly lower Harris Hip Scores at 12 months (65.4±10.2 vs. 77.8±8.1; p=0.001) and higher rates of revision surgery (25.0% vs. 2.2%; p=0.003). This is consistent with the findingsof a study, where reported a 20.0% revision rate among infected patients and emphasized the importance of stringent infection control protocols.[14]

The prospective design of this study and the comprehensive follow-up ensured robust data collection and analysis. However, the single-center setting and moderate sample size (n=100) may limit the generalizability of our findings. Future studies with larger, multi-center cohorts are warranted to validate these results further.

Conclusion:

This study highlights the critical role of implant type, preoperative risk factors, and infection control in determining outcomes after femoral implant surgery. Intramedullary nails showed superior functional recovery, while higher ASA scores and infections were associated with poorer outcomes. These findings underscore the need for personalized care pathways and rigorous postoperative monitoring to optimize recovery and reduce complications.

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Original Article

Laparoscopic Cholecystectomy Under Spinal Anesthesia: A Feasibility Study

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Abstract:

Background: *Laparoscopic surgery is normally performed under general anesthesia, but many patients with major medical problems sometimes cannot tolerate such anesthesia, and regional anesthesia may be beneficial in such patients. Encouraged by such experience, we performed a feasibility study of segmental spinal anesthesia in healthy patients.*

Objective: *To evaluate efficacy, safety and cost benefit of conducting laparoscopic cholecystectomy under spinal anesthesia in comparison to general anesthesia.*

Materials and methods: *A prospective, randomized study conducted over a period of nine month at an urban, non-teaching hospitals. A 50 American Society of Anesthesiologists grade I or II patients undergoing elective laparoscopic cholecystectomy received a segmental (L1-L2 or L2-L3) spinal anesthetic using 3 ml of plain bupivacaine 0.5% (5mg) in addition to 25μg fentanyl. Other drugs were only given (systemically) to manage patient anxiety, pain, nausea, hypotension or pruritus. The patients were reviewed after 3 days, 7 days and 3 months at chamber or by telephone.*

Results: *The spinal anesthesia was performed in all patients. The block was effective for surgery in all 50 patients. A 6 experience some discomfort which was readily treated. None requiring conversion to general anesthesia. One patient requires extra- ephedrine for hypotension. One patient need atropine for bradycardia. Six patients need pentazocine for abdominal pain. six patients need antiemetics for nausea and vomiting. Recovery was uneventful and without sequelae, 41patients were discharged from hospital with in 24 hours only 09 patients (all not for surgical reasons) not being discharged home within 24 hours.*

Conclusion: *This study has shown that spinal anesthesia can be used successfully and effectively for laparoscopic surgery in healthy patients. However, the use of an anesthetic technique involving needle insertion into the vertebral canal above the level of termination of the spinal cord requires great caution and should be restricted in application until larger numbers of patients have been studied.*

Keywords: Laparoscopic cholecystectomy, Spinal anesthesia, General anesthesia.

Introduction:

Laparoscopic cholecystectomy is normally performed under general anesthesia, but regional technique, such as low thoracic epidural and lumber spinal[1,2] have been used, usually to manage patients with significant medical problems.

Thus, the aim has been the avoidance of general anesthesia rather than the provision of the benefits of regional, although Hamad and Ibrahim El-Khhattary concluded that spinal anesthesia does seem better matched to laparoscopic cholecystectomy, citing reduced sequelae as primary reson.

Encouraged by both that conclusion and our experience of segmental spinal anesthesia in a patient with end-stage respiratory disease[3] we decided to study the feasibility of a segmental technique for routine surgery.

Regional anesthesia (spinal/epidural/combined spinal epidural) has been reported as a sole technique for performing laparoscopic cholecystectomy as an alternative to general anesthesia. Initially it was reported only for cases who were otherwise high-risk candidates for general anesthesia[4] more recently it has been reported as a routine technique otherwise healthy patients also.[5,6] It was thought that

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laparoscopy cholecystectomy necessitates endotracheal intubation. This was to prevent aspiration, abdominal discomfort and hypercarbia which was expected secondary to induction of CO_2 pneumoperitoneum.[7] Recent studies demonstrate that laparoscopic cholecystectomy with low-pressure CO_2 pneumoperitoneum can indeed be safely performed under spinal anesthesia (SA).[8] In spite of the emerging evidence that laparoscopic cholecystectomy can be performed safely under regional anesthesia, it has not gained widespread acceptance. We designed a randomized controlled study to assess if spinal anesthesia, instead of general anesthesia, can be used as a routine in clinical practice.

Laparoscopic cholecystectomy was first introduced by Phillipe Mouret in 1987 and is now generally performed by many surgeons.[9,10] Unlike previous open surgery, this procedure requires only very little incisions and has benefits such as less pain and shorter hospital stay due to less tissue damage and swift return to everyday life due to fast recovery.[11] However, considerable difficulties in anesthetic management could be encountered since wide hemodynamic fluctuation may develop due to pneumoperitoneum and position changes.

Pneumoperitoneum induces systemic effects due to the absorption of CO_2, and in venous return due to the increase in intra-abdominal pressure.[12] Initially, absorption of CO_2 increases its elimination in the expired air, in the arterial, and venous blood.[12,13] This carboxemia induces metabolic and respiratory acidosis decreasing arterial and mixed venous pH and arterial PO_2.[13] Absorption of CO_2 affects negatively the respiratory function, which is not observed with inert gases such as helium and argon.[14] Minute ventilation, peak inspiratory pressure, pulmonary vascular resistance, alveolar concentration of CO_2, calculated physiological short circuit, central venous pressure, diastolic and systolic blood pressure, systemic vascular resistance, and cardiac index are all increased.

In recent years, advanced laparoscopic surgery has targeted older and high-risk patients for general anesthesia; in these patients, regional anesthesia offers several advantages with improved patient satisfaction.[15,16]

Materials and methods

Institutional ethical committee approval was obtained prior to the study. Written informed consent was taken from all the patients after explaining the procedure. Fifty patients schedule for elective laparoscopic cholecystectomy aged 18-70 years of 15 male and 35 females with American society of anesthesiologists (ASA) physical status I and II, BMI <30 kg/m², schedule for elective laparoscopic cholecystectomy were included in this study.

All patients were informed about spinal anesthesia in detail that any anxiety, discomfort, or pain during surgery would be dealt with intravenous medication. The patients were also informed about the probability of conversion to general anesthesia. All patients were kept nil per for 8 hrs for solid foods and 4 hrs for clear fluids. Intravenous access was obtained with 18G IV cannula on the right hand. Pre-anesthetic medication was standardized for all patients. Patients were received diazepam I/V, omeprazole I/V. A 500ml of Ringer's lactate was infused over 15 minutes. Pre-anesthetic values of heart rate, mean arterial pressure, respiratory rate and pulse oximetry were recorded. All patients were inserted urinary catheter. All patients were placed in sitting position. The subarachnoid space puncture was performed between the L1-L2 or L2-L3 inter-vertebral space. After confirming free and clear flow of CSF, 3 ml of hyperbaric 0.5% bupivacaine were injected. Afterwards, patients were placed in the supine position with a head-down position. After the surgeon confirmed anesthesia at T4 level by pin prick. Once the block level reached T4 dermatome level, the table position was normalized or slight head raised and left lateral position and surgeon was allowed to proceed with the surgery and nasal oxygen 4 liter/min started. If the mean arterial pressure dropped below 60 mm Hg, ephedrine 6 mg bolus was administered and if heart rate decreased to less than 50 beats per minute atropine 0.6 mmHg was administered. Patients who experienced intraoperative anxiety or discomfort IV ketamine was given. All patient's surgical procedure done smoothly none of require conversion of general anesthesia.

Uniform technique of laparoscopic cholecystectomy was used a standard four trocar technique. Carbon dioxide pneumoperitoneum was established by surgeon to a maximum pressure of 14 mmHg and the surgery was proceeded. Intra-operative cardiovascular and respiratory stability monitored. Any complication/side effects were noted and treated. Time of intra-thecal injection to anesthesia, duration of operation, total fluid volume needed, drugs used all were recorded.

Postoperatively pain was managed by intravenous injection tramadol/nalbuphine and when required paracetamol 1g intravenous infusion 8 hourly. Other post-operative events related to surgery or anesthesia

such as discomfort, headache, nausea, vomiting, back pain, shoulder pain was recorded. When patients were awake and comfortable blood pressure, pulse rate, respiratory rate, oxygen saturation were recorded. Arterial partial pressure of carbondioxide was determined in all patients before induction of anesthesia, half an hour after pneumoperitoneum and in the post-operative period. At the time of discharge patients were questioned about their degree of satisfaction with the anesthesia technique on a scale of very good, good, average and unsatisfied. Patients were routinely discharged to home with in 24 hours, unless some complication or warranted further stay. Mean anesthesia time, pneumoperitoneum time, and surgery time defined primary outcome measures.

Results:

Fifty typical cholecystectomy patients (table-1) were recruited in 09 months, the segmental spinal anesthesia technique being successful in all. None of the patient experience paresthesia during insertion of needle or anesthetic drugs. All the patients completed the study without any major complications or requiring change of anesthetic or surgical technique.

Table-I: Distribution of responders by age group

Age group	Number
18-30	12(24%)
31-40	15(30%)
41-50	6(12%)
51-60	9(18%)
61-70	8(16%)

Shows the age group distribution of the study population, majority of the cases 30% were of 31-40 years age group, 24% were with age of 18-30 years.

Table-II: Distribution by gender

Gender	Number
Male	15(30%)
Female	35(70%)

Shows that female predominance.

Table-III: Distribution by ASA grade

ASA grade	Number
ASA-I	44(88%)
ASA-II	06(12%)

Shows that most of them 44% are ASA-I

Table-IV: Distribution of segment where anesthesia given

Level	Number
L1-L2	36(72%)
L2-L3	14(28%)

Shows most of the patient 36% were given through L1-L2 level of spinal segment.

Table-V: Side effects

Parameter	Per-operative	Post-operative
Abdominal pain	06(12%)	14(28%)
Restlessness	01(2%)	-
Shoulder pain	07(14%)	16(32%)
Nausea/vomiting	1(2%)	06(12%)
Itching	-	1(2%)
Back pain	-	12(24%)
Respiratory rate	14-22	12-18
Pulse rate- Tachycardia	09	02
Blood presser- Hypotension	01	-

Table-V shows minimum side effect in both per-operative and post-operative period. Most common 32% patient were complained of shoulder pain.

Table-VI: Outcome

Outcome	Number
Adequate pneumoperitoneum	50(100%)
Adequate exposure of operative field	50(100%)
Duration of surgery	20-80 minutes
Interval spinal injection to end of the operation	30-90 minutes
Time to full block regression	4-6 hours
Intra-operative fluid volume	1-2.5L
Conversion to general anesthesia	No
Conversion to open surgery	No
Post-operative hospital stays.	16-48 hours

Table-VI shows 100% patients were under went surgery by spinal anesthesia and all were adequate pneumoperitoneum. Most of the patient discharge with 24 hours.

Discussion:

Regional anesthesia for laparoscopic cholecystectomy reduced the surgical stress response. In regional anesthesia, there is no airway

instrumentation and there is low incidence of deep vein thrombosis.[15] Despite that, regional anesthesia carries the possibility of inadequate ventilation due to extensive thoracic nerve block. The main inspiratory muscle, diaphragm, will unaffected because it is innervated from cervical level, and expiration is normally a passive phenomenon. However, forceful expiration and coughing will be affected because they are generated primarily by the muscle of the anterior abdominal wall which are innervated by the thoracic nerve.[16,17]

Use of relatively large dose of local anesthetics can produce distorus effects in patients with obstructive airway diseases, which depends on active expiration in maintaining lung ventilation. Thus, the degree of nerve block and muscle weakness should be minimized by using adequate dose of local anesthetics. Another concern is careful control of the pneumoperitoneal pressure during surgery to ensure adequate diaphragmatic excursion. Because pneumoperitoneum by CO2 insufflation can stimulate vagal nerve and cause bradycardia, CO2 must be insufflated slowly, and the maximum intra-abdominal pressure should be lowered than 14 mmHg. The negative effect of the pneumoperitoneum with CO2 on the respiratory function have been widely investigated.[18] Usually, CO2 is used for safety due to its high-water solubility and its high capacity of exchange in the lungs. The concentration of CO2 can be easily monitored by capnography and controlled by ventilation.[19]

Partial pressure of oxygen and carbondioxide remained within normal limits (no hypoxemia or retention of CO2) during the procedure, confirming that thoracic spinal anesthesia can be safe for laparoscopic cholecystectomy in patients without associated respiratory depression as the respiratory control mechanism is still intact and allows patients to adjust their minute ventilation.[20] Segmental spinal anesthesia was performed at L1-L2 or L2-L3 inter-vertebral space with 3mg of hyperbaric bupivacaine 0.5% and 20µg of fentanyl. A segmental sensory block, extending from T4 to S4 dermatomes, was obtained. No patients were experience paresthesia during needle insertion or injection of drugs. Surgery was performed smoothly and uneventfully.[21] It is possible that the low dose of bupivacaine used was a factor which minimized the degree of thoracic motor block. Generally minor and transient degree of lower limb motor block was more likely to have been due to minimal physical spread of solution to the lumbo-sacral nerve roots. Cardiovascular changes were also minimum, even though the local anesthetic, as judged by sensory block spread to affect most of the spinal cord segments responsible for sympathetic outflow. Again, the differential blocking effects of bupivacaine may have been relevant, but fluid therapy was liberal, the patients all remained conscious, so avoiding significant central depression of circulation or respiration.

Other side-effects were both infrequent and easily manage, the most surprising of those perhaps being the low incidence, and ease of treatment, of shoulder tip pain, a common problem after laparoscopic surgery. It occurred pre-operatively in 28% of patient, and post-operatively in 14%. The former figure is comparable with that from a report of laparoscopic surgery under epidural block, but both figures are at odds with the incidence (30-50%) reported after laparoscopic surgery under general anesthesia. Van Zundert[24] have provided preliminary evidence that segmental spinal spinal anesthesia can be an effective anesthetic technique for routine laparoscopic surgery; in a group of 20 healthy patients, side effects were minimum, and patient satisfaction score were high, although cardiovascular changes might be greater in older patients and those with intercurrent diseases. Gupta et a.[25] during their study about thoracic epidural anesthesia for elective laparoscopic cholecystectomy found that hemodynamic changes were minimal.

Abdominal discomfort and patient anxiety were also infrequent and easily managed, both responding well to small dose of standard drugs. Abdominal discomfort occurred in one patient due to longer time of surgery. The low incidence of all side-effect might relate to this being a group of patients who had been approached very carefully and who were, to some extent, self-selected and thus well motivated.

This study confirmed the superiority of spinal anesthesia in the control of pain un the immediate post-operative period when compared to general anesthesia, besides having a lower cost. Spinal anesthesia is associated not only to low mortality indices, but also a lower incidence of severe complications such as deep vein thrombosis, pulmonary embolism, pneumonia, respiratory depression, myocardial infarction and renal failure when compared to general anesthesia.[26] In another series, spinal anesthesia with a lower incidence of post-operative complains as well as shorter observation time.[27] Consequently, laparoscopic cholecystectomy under spinal anesthesia should be

an appropriate method.

Conclusion:

This small study has provided preliminary evidence that patients received segmental spinal anesthesia had shorter discharge time and better satisfaction. Laparoscopic cholecystectomy done under spinal anesthesia as a routine anesthesia of choice is feasible and safe. Spinal anesthesia can be recommended to be the anesthesia technique of choice for conducting laparoscopic cholecystectomy in hospital setups in developing countries where cost factor is a major factor.

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Original Article

Antimicrobial Susceptibility of Microorganisms Grown in Tracheal Aspirate Cultures in Intensive Care Unit

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Abstract:

Background: *Pneumonia is a major public health problem. In ICU, which leads to high morbidity and mortality of patients. In intensive care units (ICUs), the rate of antibiotics resistance and microorganisms grow in cultures may vary by time period. Antibiotic sensitivity must be known for one time diagnosis and appropriate meditation. It is the best way to know for a correct empirical treatment approach and save the lives of affected one.*

Objective: *To find out antimicrobial susceptibility of pathogenic microorganisms isolated from tracheal aspirate samples in the ICU.*

Materials and methods: *This descriptive cross-sectional study was carried out at Rangpur Community Medical College and Hospital, Bangladesh from June 2023 to November 2024. During this period, a total 200 of throat swab samples with suspected pneumonia, history of febrile illness and chest x-ray show consolidations, patchy opacities. The current antibio-therapy was continued until culture antibiogram results were obtained, while empirical antibiotic therapy was started considering the potential source in the case of suspected infection.*

Results: *Out of total 200 samples 95.5% showed bacterial growth. We have grouped our patients considering to different variables: by the sex of the patients, by the age of the patients. In our study we had 64.5% male and 35.5% female. Among the male patients 60% and among the female patients 35.5% shown bacterial growth. Considering the age groups: In the age group below 50 years only 22% of the patients shown culture positivity but in the patients age group 50 and above culture positivity rate each nearly 73.5%. We found 5 different pathogens grown in 200 samples. Klebsiella was the most common organism isolated 37%, followed by Acinetobacter 27%, other organisms grown includes Pseudomonas 14%, Escherichia coli 9%, Staphylococcus aureus 8.5%. Most frequent pathogens isolated in the 50 and above age group were Klebsiella 27%, Acinetobacter 21%, Pseudomonas 11%,Escherichia coli 7%, Staphylococcus aureus 7%. In below 50 age group the most frequent pathogens were Klebsiella 10%, Acinetobacter 6%, Pseudomonas 3%,Escherichia coli 2%, Staphylococcus aureus 1.5%.*

Conclusion: *Each hospital, using knowing its own microbiological flora and resistance pattern, can reduce mortality by instituting early and correct treatment. Microbiological data are crucial for a correct empirical treatment approach. We believe that starting empirical therapy with colistin when infections caused by Klebsiella, Escherichia Coli, Pseudomonas and Acinetobacter are suspected may be an appropriate initial therapy until culture antibiogram results become available. Stop selling antibiotic without registered physicians prescriptions all over the country. In this way, intensive antibiotic usage and subsequent high antibiotic resistance can be adequately controlled.*

Keywords: Intensive care unit, Drug resistance, Tracheal aspirate, Culture sensitivity, Antibiotic susceptibility, Empiricaltherapy, Microorganisms.

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Introduction:

Pneumonia is a major public health problem. In ICU, which leads to high morbidity and mortality of patients. In intensive care units (ICUs), the rate of antibiotics resistance and microorganisms grow in cultures may vary by time period. Antibiotic sensitivity must be known for one time diagnosis and appropriate meditation. It is the best way to know for a correct empirical treatment approach and save the lives of affected one. Nosocomial infections are defined as infections that are neither present at the time of hospital presentation nor in the incubation period at hospital admission.[1] A great majority of

nosocomial infections are seen in intensive care units (ICUs). Despite the advancements in medicine, nosocomial infections remain an important health problem worldwide.[2]

Pediatric intensive care units (PICU), where nosocomial infections are common, are a setting where broad-spectrum antibiotics are used because of the existence of resistant pathogens.[3]

In ICUs, invasive procedures such as mechanical ventilation, tracheostomy, and catheter placement, as well as the duration of ICU stay, are the main factors associated with infections caused by resistant pathogens.[3]

Pneumonia is the leading cause of death among children aged less than five years worldwide. Approximately 1.4 million of a total of 7.6 million deaths in the pediatric population in 2010 occurred due to pneumonia.[4] Pneumonia is one of the most common nosocomial infections. Clinical and radiological findings may not be necessarily sensitive or specific enough for diagnosing pneumonia. Thus, gram staining and culture studies of lower respiratory tract samples, such as endotracheal aspirate (ETA) obtained with a protected specimen brush and bronchoalveolar lavage (BAL), aid in diagnosis and management.[5] It is important to accurately detect the etiological agent and promptly start antimicrobial therapy. A delay of four to eight hours during treatment has been shown to increase mortality.[5,6] Hence, empirical antibiotic therapy is usually started by the clinician without waiting for laboratory findings.

Several differences regarding microorganisms, antibiotic resistance rates, and the distribution of antibiotherapy can be observed between hospitals or even at different time points in the same ICU. Factors detected in those units and antibiotic sensitivities should be determined at regular intervals, and treatment protocols should be updated according to the follow-up results.

Materials and methods:

This descriptive cross-sectional study was carried out at Rangpur Community Medical College and Hospital, Bangladesh from June 2023 to November 2024. During this period, a total 200 of throat swab samples with suspected pneumonia, history of febrile illness and chest x-ray show consolidations, patchy opacities. The current antibio-therapy was continued until culture antibiogram results were obtained, while empirical antibiotic therapy was started considering the potential source in the case of suspected infection.

Laboratory procedure: Deep tracheal aspirate or sputum samples (via closed system aspiration). The sputum is cultured after washing it with saline or treating it with a liquefying agent (sputolysin). One technique is that sputum is inoculated after 1 in 100 or 1 in 10000 dilutions. Sputum culture is done on blood agar media (incubated aerobically 37° c), chocolate agar media (incubated in CO_2 jar at 37°c) and Mac-con keys agar media (OXOID CO.UK) (incubated aerobically at 37° c). The plates are incubated for 24 hours. Bacterial isolates were identified by colony morphology, gram staining reaction. Bacterial test using catalase test, coagulase test, oxidase test, urease test (BBL™) and motility indole urea (MIU) (BBL™) for the standard procedure for bacterial identification.

Sputum swabs cultured plates without any signal within 72 hours of incubation were being reported as a negative result.

Antimicrobial susceptibility test was carried out by the 'Kirby-Bauer' disc diffusion method using Mueller Hinton agar media (MHA) according to clinical laboratory standards institute (CLSI) guidelines 2012 and antibiotic disc form OXOIDCO. Minimum distance of the disc was 24mm from centertocenter. Zone of inhibition was measured in milometers after 24 hours of incubation. Based on the zone of inhibition obtain the isolates were classified in to sensitivity and resistant pattern. The antibiotics tested were Amikacin, Amoxycillin, Amoxyclav, Azithromycin, Cefixime, Ceftazidime, Ceftriaxone, Ciprofloxacin, Linezolid, Polymixin B, Cotrimoxazole, Doxycycline, Piperacillin/ Trazobactam, Tetracycline, Gentamicin, Imipenem, Levofloxacin, Meropenem, Nalidixic acid, Colistin, Gatifloxacin, Ofloxacin, Teicoplanin, Vancomycin, Chloramphenicol.

Data analysis was performed using the SPSS windows version 16.0 software.

Results:

Out of total 200 samples 95.5% showed bacterial growth. We have grouped our patients considering to different variables: by the sex of the patients, by the age of the patients.

In our study we had 64.5% male and 35.5% female. Among the male patients 60% and among the female patients 35.5% shown bacterial growth.

Table-I: Culture positivity according to the sex of patients

Gender	Positive		Negative	
	Number	Percentage	Number	Percentage
Male	120	60	9	4.5
Female	71	35.5	-	-

Considering the age groups: In the age group below 50 years only 22% of the patients shown culture positivity but in the patients age group 50 and above culture positivity rate each nearly 73.5%

Table-II: Culture positive according to the age group of patients.

Age	Positive		Negative	
	Number	Percentage	Number	Percentage
Age Below 50	44	22	4	2
Age 50 and above	147	73.5	5	2.5

We found 5 different pathogens grown in 200 samples. Klebsiella was the most common organism isolated 37%, followed by Acinetobacter 27%, other organisms grown includes Pseudomonas 14%, Escherichia coli 9%, Staphylococcus aureus 8.5%. Most frequent pathogens isolated in the 50 and above age group were Klebsiella 27%, Acinetobacter 21%, Pseudomonas 11%, Escherichia coli 7%, Staphylococcus aureus 7%. In below 50 age group the most frequent pathogens were Klebsiella 10%, Acinetobacter 6%, Pseudomonas 3%, Escherichia coli 2%, Staphylococcus aureus 1.5%.

Table-III: Pathogens identified from the sample

Name of the bacteria	Age below 50		Age 50 and above	
	Number	Percentage	Number	Percentage
Klebsiella	20	10	54	27
Acinetobacter	12	6	42	21
Pseudomonas	6	3	22	11
Escherichia coli	4	2	14	7
Staphylococcus aureus	3	1.5	14	7

Table-IV shows that Klebsiella found 83.7% sensitive to Colistin and Polymixin B, 78.3% sensitive to Meropenem, 66.2% sensitive to Doxycycline, 33.7% sensitive to Amikacin and Chloramphenicol, 28% sensitive to Gentamicin, 21.6% sensitive to Gatifloxacin. This organism shows that 100% resistant to Azithromycin, Cefixime, Ceftazidime, Piperacillin/Trazobactam, Teicoplanin, Vancomycin & Linezolid. 94.5% resistant to Amoxycillin,

Table-IV: Antibiotics sensitivity of gram's negative bacilli (Klebsiella, Escherichia Coli)

Antibiotics	Klebsiella (n=74)				Escherichia Coli (n=18)			
	Positive		Negative		Positive		Negative	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Amikacin	25	33.7	49	66.2	10	55.5	8	44.4
Amoxycillin	4	5.4	70	94.5	-	-	18	100
Amoxyclav	8	10.81	66	89.1	5	27.7	13	72.2
Azithromycin	-	-	74	100	-	-	18	100
Cefixime	-	-	74	100	-	-	18	100
Ceftazidime	-	-	74	100	-	-	18	100
Ceftriaxone	4	5.4	70	94.5	3	16.6	15	83.3
Ciprofloxacin	4	5.4	70	94.5	5	27.7	13	72.2
Chloramphenicol	25	33.7	49	66.2	5	27.7	13	72.2
Polymixin B	62	83.7	12	16.2	15	83.3	3	16.6
Cotrimoxazole	8	10.8	66	89.1	8	40.4	14	77.7
Doxycycline	49	66.2	25	33.7	15	83.3	3	16.6
Piperacillin/Trazobactam	-	-	74	100	-	-	18	100
Tetracycline	8	10.8	70	89.1	10	55.5	8	44.4
Gentamicin	21	28.3	53	71.6	5	27.7	13	72.2
Imipenem	12	16.2	62	87.8	8	40.4	10	77.7
Levofloxacin	8	10.8	66	89.1	3	16.4	15	83.3
Meropenem	58	78.3	16	21.6	8	40.4	10	77.7
Nalidixic acid	4	5.4	70	94.5	3	16.4	15	83.3
Colistin	62	83.7	12	16.2	18	100	-	-
Gatifloxacin	16	21.6	58	78.3	5	27.7	13	72.2
Ofloxacin	4	5.4	70	94.5	3	16.4	15	83.3
Teicoplanin	-	-	74	100	-	-	18	100
Vancomycin	-	-	74	100	-	-	18	100
Linezolid	-	-	74	100	3	16.4	15	83.3

Ceftriaxone, Ciprofloxacin, Nalidixic acid & Ofloxacin. 89.1% resistant to Amoxyclav, Cotrimoxazole, Tetracycline & Levofloxacin. 87.8% resistant to Imipenem, 78.3% resistant to Gatifloxacin. 71.6% resistant to Gentamicin. 66.2% resistant to Amikacin & Chloramphenicol.

Escherichia Coli found 100% sensitive to Colistin. 83.3% sensitive to Polymixin B & Doxycycline. 55.5% sensitive to Amikacin & Tetracycline. 40.4% sensitive to Meropenem, Imipenem & Cotrimoxazole. 27.7% sensitive to Amoxyclav, Ciprofloxacin, Chloramphenicol, Gentamicin & Gatifloxacin.This organism shows that 100% resistant to Amoxycillin, Azithromycin, Cefixime, Ceftazidime, Piperacillin/Trazobactam, Teicoplanin & Vancomycin. 83.3% resistant to Ceftriaxone, Levofloxacin, Nalidixic acid, Ofloxacin & Linezolid. 77.7% resistant to Cotrimoxazole, Imipenem & Meropenem. 72% resistant to toAmoxyclav, Ciprofloxacin, Chloramphenicol, Gentamicin & Gatifloxacin. 44.4% resistant to Amikacin & Tetracycline. 16.6% resistant to Polymixin B & Doxycycline.

Table-V: Antibiotics sensitivity of gram's positive cocci (Staphylococcus aureus)

Antibiotic	Staphylococcus aureus (n=17)			
	Positive		Negative	
	Number	Percentage	Number	Percentage
Amikacin	6	35.2	11	64.7
Amoxycillin	2	11.6	15	88.8
Amoxyclav	-	-	17	100
Azithromycin	-	-	17	100
Cefixime	-	-	17	100
Ceftazidime	-	-	17	100
Ceftriaxone	2	11.6	15	88.8
Ciprofloxacin	-	-	17	100
Chloramphenicol	6	35.2	11	64.7
Polymixin B	6	35.2	11	64-7
Cotrimoxazole	6	35.2	11	64.7
Doxycycline	11	64.7	6	35.2
Piperacillin/Trazobactam	2	11.6	15	88.8
Tetracycline	8	47	9	52.9
Gentamicin	2	11.6	15	88.8
Imipenem	11	64.7	6	35.2
Levofloxacin	2	11.6	15	88.8
Meropenem	8	47	9	52.9
Nalidixic acid	-	-	17	100
Colistin	14	82.3	3	17.6
Gatifloxacin	2	11.6	15	88.8
Ofloxacin	-	-	17	100
Teicoplanin	15	88.2	2	11.7
Vancomycin	11	64.7	6	35.2
Linezolid	6	35.2	11	64.7

Table-VI: Antibiotics sensitivity of Acinetobacter, Pseudomonas

Antibiotics	Acinetobacter (n=54)				Pseudomonas (n=28)			
	Positive		Negative		Positive		Negative	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Amikacin	27	50	27	50	11	39.2	17	60.7
Amoxycillin	-	-	54	100	-	-	28	100
Amoxyclav	-	-	54	100	-	-	28	100
Azithromycin	-	-	54	100	-	-	28	100
Cefixime	-	-	54	100	-	-	28	100
Ceftazidime	-	-	54	100	-	-	28	100
Ceftriaxone	-	-	54	100	-	-	28	100
Ciprofloxacin	-	-	54	100	3	10.7	25	89.2
Chloramphenicol	3	5.5	51	94.4	3	10.7	25	89.2
Polymixin B	46	85.1	8	14.8	17	60.7	11	39.2
Cotrimoxazole	24	44.4	30	55.5	6	21.4	22	78.5
Doxycycline	11	20.3	43	79.6	17	60.7	11	39.2
Piperacillin/Trazobactam	3	5.5	51	94.4	3	10.7	25	89.2
Tetracycline	8	14.8	46	25.1	9	28.5	20	71.4
Gentamicin	21	38.8	33	61.1	17	60.7	11	39.2
Imipenem	30	55.5	24	44.4	17	60.7	11	39.2
Levofloxacin	-	-	54	100	6	21.4	22	78.5
Meropenem	30	55.5	24	44.4	17	60.7	11	39.2
Nalidixic acid	-	-	54	100	3	10.7	25	89.2
Colistin	46	85.1	8	14.8	28	100	28	100
Gatifloxacin	8	14.8	46	25.1	11	39.2	17	60.7
Ofloxacin	-	-	54	100	8	28.5	20	71.4
Teicoplanin	-	-	54	100	-	-	28	100
Vancomycin	3	5.5	51	94.4	-	-	28	100
Linezolid	3	5.5	51	94.4	-	-	28	100

Table-V shows that Staphylococcus aureus found 88.2% sensitive to Teicoplanin, 82.3% sensitive to Colistin, 66.7% sensitive to Doxycycline, Imipenem & Vancomycin. 47% sensitive to Tetracycline & Meropenem. 35.2% sensitive to Amikacin, Chloramphenicol, Polymixin B, Cotrimoxazole & Linezolid. This organism shows that 100% resistant to Amoxyclav, Azithromycin, Cefixime, Ceftazidime, Ciprofloxacin, Nalidixic acid & Ofloxacin. 88.8% resistant to Amoxycillin, Ceftriaxone, Piperacillin/Trazobactam, Gentamicin, Levofloxacin & Gatifloxacin. 64.7% resistant to Amikacin, Chloramphenicol, Polymixin B, Cotrimoxazole & Linezolid. 52.9% resistant to Tetracycline & Meropenem. 35.2% resistant to Doxycycline, Imipenem & Vancomycin. 17.6% resistant to Colistin, 11.7% resistant to Teicoplanin.

Table-VI Shows that Acinetobacter found 85.1% sensitive to Polymixin B &Colistin. 55.5% sensitive to Imipenem & Meropenem. 50% sensitive toAmikacin. 44.4% sensitive to Cotrimoxazole. 38.8% sensitive to Gentamicin, 20.3% sensitive to Doxycycline. 14.8% sensitive to Tetracycline & Gatifloxacin. This organism shows that 100% resistant to Amoxycillin, Amoxyclav, Azithromycin, Cefixime, Ceftazidime, Ceftriaxone, Ciprofloxacin, Levofloxacin, Nalidixic acid, Ofloxacin & Teicoplanin. 94.4% resistant to Chloramphenicol, Piperacillin/Trazobactam, Vancomycin & Linezolid. 79.6% resistant to Doxycycline. 61.1 % resistant to Gatifloxacin. 55.5% resistant to Cotrimoxazole. 44.4% resistant to Imipenem &Meropenem. 25.1% resistant to Tetracycline & Gatifloxacin.

Pseudomonas found 100% sensitive to Colistin. 60.7% sensitive to Polymixin B, Doxycycline, Gentamicin, Imipenem & Meropenem. 39.2% sensitive to Amikacin &Gatifloxacin. 28.5% sensitive to Tetracycline & Ofloxacin. 21.4% sensitive to Cotrimoxazole & Levofloxacin. 10.7% sensitive to Ciprofloxacin, Chloramphenicol, Piperacillin/Trazobactam & Nalidixic acid.This organism shows that 100% resistant toAmoxycillin, Amoxyclav, Azithromycin, Cefixime, Ceftazidime, Ceftriaxone, Teicoplanin, Vancomycin & Linezolid. 89.2% resistant to Ciprofloxacin, Chloramphenicol, Piperacillin/Trazobactam&Nalidixic acid. 78.5% resistant to Cotrimoxazole & Levofloxacin. 71% resistant to Tetracycline & Ofloxacin. 60.7% resistant to Amikacin & Gatifloxacin. 39.2% resistant to Polymixin B, Doxycycline, Gentamicin, Imipenem & Meropenem.

Figure-1: Sputum culture in agar media

Figure-2: 'Kirby-Bauer' disc diffusion method in Mueller Hinton agar media (MHA)

Discussion:

In this study, out of total 200 samples tested 95.5% showed bacterial growth. We found low culture positivity in the below 50 years group22 % than in 50 and above years grup73.5%, this different is statistically significant.

In our study klebsiella was the most common organism isolated 37%, followed by Acinetobacter 27%, other organisms grow includes Pseudomonas 14%, Escherichia coli 9%, Staphylococcus aureus 8.5%.

In our study Klebsiella is 83.7% sensitive to Colistin and Polymixin B, 78.3% sensitive to Meropenem, 66.2% sensitive to Doxycycline. 100% resistant to Azithromycin, Cefixime, Ceftazidime, Piperacillin/ Trazobactam, Teicoplanin, Vancomycin & Linezolid. 94.5% resistant to Amoxycillin, Ceftriaxone, Ciprofloxacin, Nalidixic acid & Ofloxacin. 89.1% resistant to Amoxyclav, Cotrimoxazole, Tetracycline & Levofloxacin. 87.8% resistant to Imipenem, 78.3% resistant to Gatifloxacin. 71.6% resistant to Gentamicin. 66.2% resistant to Amikacin & Chloramphenicol (table-IV).

We found Escherichia Coli 100% sensitive to Colistin. 83.3% sensitive to Polymixin B & Doxycycline. 55.5% sensitive to Amikacin & Tetracycline. 100% resistant to Amoxycillin, Azithromycin, Cefixime, Ceftazidime, Piperacillin/ Trazobactam, Teicoplanin & Vancomycin. 83.3% resistant to Ceftriaxone, Levofloxacin, Nalidixic acid, Ofloxacin &Linezolid. 77.7% resistant to Cotrimoxazole, Imipenem & Meropenem. 72% resistant to toAmoxyclav, Ciprofloxacin, Chloramphenicol, Gentamicin &Gatifloxacin (table-IV).

In our study Staphylococcus aureus found 88.2% sensitive to Teicoplanin, 82.3% sensitive to Colistin, 66.7% sensitive to Doxycycline, Imipenem & Vancomycin. 47% sensitive to Tetracycline & Meropenem. 100% resistant to Amoxyclav, Azithromycin, Cefixime, Ceftazidime, Ciprofloxacin, Nalidixic acid & Ofloxacin. 88.8% resistant to Amoxycillin, Ceftriaxone, Piperacillin/Trazobactam, Gentamicin, Levofloxacin & Gatifloxacin. 64.7% resistant to Amikacin, Chloramphenicol, Polymixin B, Cotrimoxazole & Linezolid. 52.9% resistant to Tetracycline & Meropenem (table-V).

In our study Acinetobacter found 85.1% sensitive to Polymixin B & Colistin. 55.5% sensitive to Imipenem & Meropenem. 50% sensitive toAmikacin. 44.4% sensitive to Cotrimoxazole. 100% resistant to Amoxycillin, Amoxyclav, Azithromycin, Cefixime, Ceftazidime, Ceftriaxone, Ciprofloxacin, Levofloxacin, Nalidixic acid, Ofloxacin& Teicoplanin. 94.4% resistant to Chloramphenicol, Piperacillin/ Trazobactam, Vancomycin & Linezolid. 79.6% resistant to Doxycycline. 61.1 % resistant to Gatifloxacin. 55.5% resistant to Cotrimoxazole. 44.4% resistant to Imipenem & Meropenem (table-VI).

Pseudomonas found 100% sensitive to Colistin. 60.7% sensitive to Polymixin B, Doxycycline, Gentamicin, Imipenem & Meropenem. 39.2% sensitive to Amikacin & Gatifloxacin. 100% resistant to Amoxycillin, Amoxyclav, Azithromycin, Cefixime, Ceftazidime, Ceftriaxone, Teicoplanin, Vancomycin & Linezolid. 89.2% resistant to Ciprofloxacin, Chloramphenicol, Piperacillin/ Trazobactam & Nalidixic acid. 78.5% resistant to Cotrimoxazole & Levofloxacin. 71% resistant to Tetracycline & Ofloxacin. 60.7% resistant to Amikacin & Gatifloxacin. Globally, 30% of all nosocomial infections are seen in ICUs. These infections are an important cause of mortality and morbidity.[9]

While gram-positive bacteria are reported in nosocomial infections in developed countries, gram-negative bacteria have been reported in developing countries.[14-16]

Hospitalization in ICUs forms a basis for infection due to invasive procedures breaking the natural barrier, which increases in number as the duration of ICU stay is prolonged.[17] Because resistant microorganisms found in the hospital flora are the causative microorganisms, healthcare-associated infections (HCAIs) are difficult to treat and typically require long-term treatment with broad-spectrum and expensive antimicrobials.[18] HCAIs cause prolonged hospitalization, increased healthcare costs, morbidity, mortality, and workforce and productivity losses.[18-21]

Similarly, a study conducted in Mexico reported that HCAIs caused an extra hospitalization duration of an average of 6.05 days, an extra cost of 8,326 dollars, and 20% higher mortality.[23] Lower respiratory tract infections are among the most common nosocomial infectious foci seen in ICUs.[12] Gram-negative, non-fermentative bacteria such as P. aeruginosa and A. baumannii, which are associated with high mortality and morbidity rates, are among the most common etiological agents causing these infections. According to the antimicrobial surveillance program (SENTRY), the gram-negative microorganisms that are most commonly isolated in ICUs include Escherichia coli, Klebsiella pneumoniae, P. aeruginosa, Enterobacter spp, Serratia spp,

Hemophilus influenza, A. baumannii, and Proteus mirabilis. In addition, two studies investigating microorganisms grown in tracheal aspirate cultures in ICUs in Turkey found that A. baumannii and P. aeruginosa were the most common microbiological agents.[13,15] Studies on the carbapenem resistance of A. baumannii isolates grown from the samples sent from Turkey as part of the SENTRY program found sensitivity rates of 80.4% and 71.7% for imipenem and meropenem, respectively, as of 2000. Özünel et al.[17] reported that imipenem resistance was 86% among Acinetobacter strains grown in ETA cultures between 2012 and 2013. Aydemir et al.[18] found a rate of 93.3% for imipenem resistance among Acinetobacter strains grown in ETA cultures between 2015 and 2016. S. aureus constituted 28% of all nosocomial and ventilator-associated pneumonia (VAP) agents in the SENTRY Antimicrobial Research Program. Aydemir et al.[18] found methicillin resistance in 30% of S. aureus strains.

According to our study findings, klebsiella 37%, Acinetobacter 27%, Pseudomonas 14%, Escherichia coli 9%, Staphylococcus aureus 8.5% were the most commonly isolated microorganisms. Gram negative bacteria are more sensitive to Colistin, Polymixin B, Tetracycline, Doxycycline&Meropenemgram positive bacteria are more sensitive to Teicoplanin, Vancomycin, Colistin, Doxycycline & Imipenem.

In the other side Macrolides, Cephalosporins, Quinolone, Broad spectrum penicillins, Oxazolidinones are the most resistant antibiotic in our study.

In the developing countries like Bangladesh, 'Polli Chikitsok'prescribe anti-microbial more than the actual need, all kinds of antibiotics are easily available over the country and anybody can buy antibiotic without physicians prescription are responsible for developing bacterial resistant.

Conclusion:

Each hospital, using knowing its own microbiological flora and resistance pattern, can reduce mortality by instituting early and correct treatment. Microbiological data are crucial for a correct empirical treatment approach. We believe that starting empirical therapy with colistin when infections caused by Klebsiella, Escherichia Coli, Pseudomonas and Acinetobacter are suspected may be an appropriate initial therapy until culture antibiogram results become available. Stop selling antibiotic without registered physicians prescriptions all over the country. In this way, intensive antibiotic usage and subsequent high antibiotic resistance can be adequately controlled.

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Manuscript Preparation and Submission: Guidelines for Authors

Uniform Requirements for Manuscripts Submitted to RCMC Journal following the guideline of "International Committee of Medical Journal Editors" updated April 2010.

General Principles:

The text of observational and experimental articles is usually (but not necessarily) divided into the following sections: Introduction, Methods, Results, and Discussion. This so-called "IMRAD" structure which is a direct reflection of the process of scientific discovery. Long articles may need subheadings within some sections (especially Results and Discussion) to clarify their content. Other types of articles, such as case reports, reviews, and editorials, probably need to be formatted differently. Authors need to work closely with editors in developing or using such new publication formats and should submit supplementary electronic material for peer review.

Preparation of manuscripts:

Type manuscripts double-spaced in all portions, including the title page, abstract, text, acknowledgments, references, individual tables, and legends. Leave 1-inch margin on all sides with number in every page so that it is possible for editors and reviewers to edit the text line by line and add comments and queries directly on the copy. As a general rule, articles should not exceed 4000 words. Over-length manuscripts will not be accepted for publication.

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The title page should have the following information:

1. Article title: Concise titles are easier to read than long, convoluted ones and should not exceeding 50 characters.
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Abstract

Structured abstracts are preferred for original research and systematic reviews. The abstract should provide the context or background for the study and should state the study's purpose, basic procedures (selection of study subjects or laboratory animals, observational and analytical methods), main findings (giving specific effect sizes and their statistical significance, if possible), principal conclusions, and funding sources in a running manner and not under separate headings with three to five key words for use as indexing terms. Do not cite references in the abstract. Be concise (250 words, maximum). Limit use of acronyms and abbreviations. Abbreviations must be defined at the first mention. Because abstracts are the only substantive portion of the article, and the only portion many readers read, authors need to be careful that they accurately reflect the content of the article.

The Text

The following are typical main headings: Introduction, Materials and Methods, Results, Discussion and Conclusion.

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1. **Standard journal article**
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   As an option, if a journal carries continuous pagination throughout a volume (as many medical journals do) the month and issue number may be omitted.
   Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002;347:284-7.
   b. **More than six authors:**
   Rose ME, Huerbin MB, Melick J, Marion DW, Palmer AM, Schiding JK, et al. Regulation of interstitial excitatory amino acid concentrations after cortical contusion injury. Brain Res. 2002;935(1-2):40-6.
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