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Editorial

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A Snapshot of Dengue

M A Rouf[1*]

In the year 1779 - *'Aedes aegypti'* mosquito borne disease - "Dengue" was first officially reported. The origins of the word "Dengue" are not clear, but one theory is that it is derived from the Swahili phrase "Ka-dinga peop" (Cramp-like Seizure) which describes the disease as being caused by an evil spirit. The Swahili word "Dengue" (Fastidious or careful) describing the gait of a person suffering dengue fever or alternatively, the Spanish word may derive from the Swahili.[1]

Dengue is an acute viral infection with potential fatal complications, transmitted by the bite of a female Aedes mosquito (*Aedes aegypti* and *Aedes albopictus*) carrying dengue virus.

The virus belongs to the Flaviviridae family and has four separate but closely related serotypes :

i. DENV-1

ii. DENV-2

iii. DENV-3

iv. DENV-4.

Whilst there are four types of the dengue virus, it is still possible to be re-infected as the immune system only becomes immune to one serotype at a time.[2]

Over 7.6 million dengue cases have been reported to WHO as of 30th April 2024, including 3.4 million confirmed cases, over 16000 severe cases and over 3000 deaths. While a substantial increase in dengue cases has been reported globally in the last five years.

In 2024 Bangladesh, Nepal and Thailand have reported a higher number of cases compared to the same period of 2023. From January to April 2024, the Case Fatality Rate (CFR) varied from 0% in Nepal to 1.09% in Bangladesh.[3]

Bangladesh, a country in South Asia, has a lower seroprevalence of dengue than other nations in Southeast Asia but conditions are changing quickly. The country is in tropical and subtropical zones and presents a favorable environment for the dengue vector and its accelerated spread.[4,5]

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Since the onset of 2023, Bangladesh has faced a significant escalation in the dengue outbreak, with a distressing 321,179 hospitalizations and 1,705 fatalities recorded from January to December. Bangladesh experienced the highest number of dengue cases and fatalities in the last five years. From July 2023, Bangladesh saw a sharp rise in dengue infected cases (43,854 cases) and the highest number of dengue cases were recorded (79,598 cases) in September 2023. The highest death toll was also recorded (396 people) in September 2023.[6]

In addition, men were found to be more susceptible to infection as they have increased incidence rates which may be attributed to increased frequency of travel and exposure to external environments.[7] Mortality levels, however, do not relate to infection rates as more women die from the mosquito-borne viral disease.[8]

Symptoms of Dengue Fever (DF) often include a high fever, along with chills or a feeling of being hot and shivery. Additionally, individuals may experience intense pain behind the eyes, muscle and joint aches, nausea and a widespread rash. Other common signs are an enlarged liver (Hepatomegaly) abdominal discomfort and reduced urine output (Oliguria). Furthermore, many patients, especially those who eventually passed away, showed signs of impaired awareness when admitted to the hospital.[9]

DF can vary from having no symptoms or being mild and self-resolving to becoming severe, marked by plasma leakage, known as Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS). DSS occurs when the immune system overreacts to the virus, leading to serious complications. The mortality rate for individuals with DSS is nearly 50 times higher than for those without it.[10]

Several studies have noted that adolescents with dengue infection often experience excessive menstrual bleeding.[11,12] In pregnancy, dengue is associated with preterm birth and low birth weight.[13]

Additional obstetrical complications include premature labor, especially when infection occurs in the third trimester, a higher risk of miscarriage, hemorrhaging, and possible congenital abnormalities in the newborn.[14-18] One cohort study revealed that dengue raises the risk of maternal death by three times, while

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Dengue Hemorrhagic Fever (DHF) increases this risk by 450 times compared to pregnant women without dengue infection.[19]

While mosquitoes are the primary vector for transmitting dengue between humans, maternal transmission to infants can also occur. Additionally, the virus can be sexually transmitted for a short time after acute Dengue Fever (DF) and is known to cause temporary changes in sperm.[20]

It is well known that dengue infection affects the body's central nervous system and may result in psychological manifestations.[21-24] Several studies have revealed DF to be significantly associated with depression, anxiety and distress these are more prevalent in females and infected children who demonstrated irritable mood, visual hallucination, agitation and aggressiveness.[25-31] Moreover, transient myocardial depression is not uncommon in DSS patients and may affect their clinical severity and level of fluid overload.[32]

There is no specific cure for the disease, treatment focuses on alleviating the symptoms until the immune system can fight off the infection. It is recommended to use paracetamol to reduce pain and fever. However, nonsteroidal anti-inflammatory drugs like ibuprofen and aspirin should be avoided, as they may increase the risk of bleeding in people with dengue. Staying hydrated is crucial, especially if vomiting or diarrhea is present. In cases of severe dengue (DHF) signs such as persistent vomiting, vomiting blood, difficulty breathing, cold and clammy skin, a rapid but weak pulse or drowsiness and loss of consciousness require immediate medical attention.[33]

Currently, five different dengue vaccines are being investigated:

i) A live attenuated vaccine
ii) Inactivated vaccine
iii) A recombinant subunit vaccine
iv) A viral vector vaccine
v) A DNA vaccine.[34]

The vaccines primarily work by enhancing immune responses against the E protein and non-structural protein 1 of the DENV.[35] Dengvaxia, a live-attenuated dengue vaccine is approved by the U.S. Food and Drug Administration and recommended for use.[36]

Without a suitable cure for dengue, contact between people and vector is key to preventing infections. Several environmental, chemical, biological and genetic approaches are also being used or developed to control mosquito populations and prevent dengue infections. In addition, early detection and access to appropriate healthcare for case management reduces mortality, as can rapid detection of dengue cases with warning signs and timely referrals of severe cases to tertiary healthcare facilities. Case surveillance should continue to be enhanced in all affected countries and globally. Where feasible, resources should be allocated for the strengthening of case referral mechanisms and for the confirmation and serotyping of the dengue viruses.

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Original Article

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Socio-Demographic Characteristics of Hypertensive Patients on Medication in Rajshahi Metropolitan City

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ABSTRACT

Background: Hypertension is one of the major non-communicable diseases in the world, which significantly contributes to the burden of Cardiovascular Diseases (CVDs) stroke, kidney failure, disability and premature death. The prevalence of hypertension varies across regions and country income groups. Information on the pattern and trends in blood pressure in different group of populations is important for health professionals to direct health planning, health resourcing, and public health interventions. In the present study, attempt was done to determine the socio-demographic characteristics of hypertensive patients on medication in Rajshahi Metropolitan City of Bangladesh.

Materials and methods: This descriptive type cross sectional study was conducted in the Department of Pharmacology in collaboration with Medicine Unit of Rajshahi Medical College Hospital from July 2016 to June 2017 in order to evaluate the demographic characteristics of hypertensive patients on medication. A total number 0f 196 hypertensive patients of both sexes of different ages were collected from medicine outdoor of RMCH and different chamber of practicing professor of medicine in Rajshahi City.

Results: Average age was 41-50 years of 59.7% (Male) and 40.3% (Female). Maximum 90 (45.9%) were service holder followed by house-wife 45 (23.0%). Most (62.8%) of the patients were belong to middle socioeconomic condition.

Conclusion: Higher proportion of hypertensive patients on medication of Rajshahi Metropolitan City were male, 4th decade of age group, service holder and from middle income group.

KEY WORDS
Hypertension; Medication; Rajshahi; Socio-demographic characteristics.

INTRODUCTION

Bangladesh has been experiencing an epidemiologic transition from communicable diseases to Non-Communicable Diseases (NCDs).[1] Hypertension is one of the major non-communicable diseases in the world, which significantly contributes to the burden of Cardiovascular Diseases (CVDs) stroke, kidney failure, disability and premature death.[2,3] An estimated 1.28 billion adults aged 30–79 years worldwide have hypertension, most (Two-thirds) living in Low- and Middle-Income Countries (LMICs). The prevalence of hypertension varies across regions and country income groups.[3] The reasons for these disparities in hypertension prevalence across regions are not fully understood but are likely influenced by differences in the prevalence of risk factors for hypertension, including diet, lack of physical activity and obesity.[4,5] These disparities in hypertension prevalence trends suggest that health care systems in LMICs could be facing a rapidly increasing burden of hypertension and blood pressure-related cardiovascular diseases, in some cases in addition to a substantial burden of infectious diseases.[6]

According to the World Health Organization (WHO), about 17 million deaths occur worldwide due to CVDs, of which hypertension alone accounts for 9.4 million deaths and 80 % of the CVD-related deaths occurred in the developing countries.[7-9] With the projection of a 30% increase in worldwide prevalence of this condition by the year 2025 and for its pivotal role in the rising global burden of disease and disability, hypertension has become one of the most challenging concerns for world public health.[4,10,11]

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In recent years, rapid urbanization, increased life expectancy, unhealthy diet and lifestyle changes have led to an increase in the rate of CVD including hypertension in Bangladesh.[12] The prevalence of hypertension is high and rising in Bangladesh.[13] A substantial proportion of the population with hypertension remains undiagnosed and not treated properly due to lack of access to health care and high treatment costs.[14] Although Bangladesh successfully combatted against major communicable diseases, this altered pattern of diseases throws a paramount challenge to the health care system of Bangladesh.[13] Information on the pattern and trends in blood pressure in different group of population is important for health professionals to direct health planning, health resourcing and public health interventions.[15] In the present study, attempt was done to determine the socio-demographic characteristics of hypertensive patients on medication in Rajshahi Metropolitan City of Bangladesh.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted in Department of Pharmacology and Therapeutics in collaboration with the Department of Medicine, Rajshahi Medical College during the period of July 2016 to June 2017. Ethical approval was taken from Ethical Review Committee (ERC) Rajshahi Medical College. Patients with hypertension receiving antihypertensive drugs for at least three months were the studied population. Purposive sampling technique was applied to select each study subject. Sample size was 196.

Inclusion criteria:

- All hypertensive patients above 20 years.
- Both sexes.
- Duration of therapy three months and more.

Exclusion criteria:

- Patients having diabetes mellitus, chronic kidney disease, nephrotic syndrome, chronic liver disease, hypothyroidism along with hypertension
- Pregnant women.

Patient attending in Medicine OPD of Rajshahi Medical College Hospital during the study period who were suffering from hypertension and fulfilling the criteria of the study were enrolled as study population. Patient data sheet with questionnaire was used as data collection tool. After taking informed consent, complete history taking and physical examination were done and recorded in the preformed data sheet. Data were analyzed by using statistical package of social sciences software program for windows.

RESULTS

Table I shows that out 196 maximum 81(41.3%) were in their 4th decade of life and 66 (33.7%) in their 3rd decade. Minimum 8(4.1%) were in age group >60 years. Mean age of the patients was 44 years with standard deviation of 9 years.

Table I Distribution of patients by age

Age (Years)	Frequency	Percent (%)
<30	15	7.7
31-40	66	33.7
41-50	81	41.3
51-60	26	13.3
>60	8	4.1

Figure 1 showed that out of 196 respondents maximum 117 (59.7%) were male followed by female 79 (40.3%).

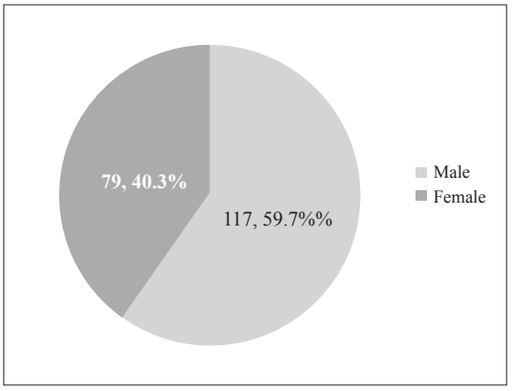

Figure 1 Distribution of patients by sex

Figure 2 shows that out of 196 respondents maximum 90 (45.9%) were service holder followed by house wife 45 (23.0%) minimum were farmer 21(10.7%) Businessman 40 (20.4%).

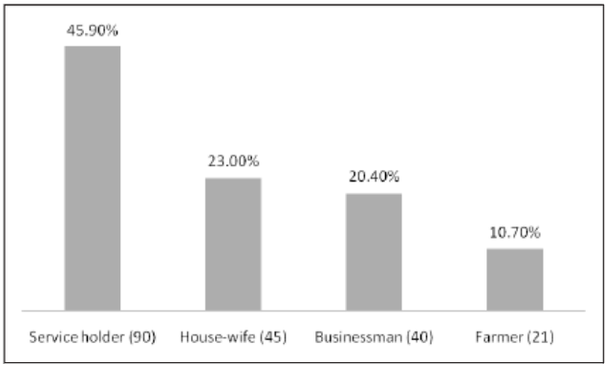

Figure 2 Distribution of patients by occupation (n=196)

Figure 3 showed that out of 196 Maximum 123 (62.8%) were middle socioeconomic group followed by upper group 62 (31.6%) and minimum were in lower group 11 (5.6%).

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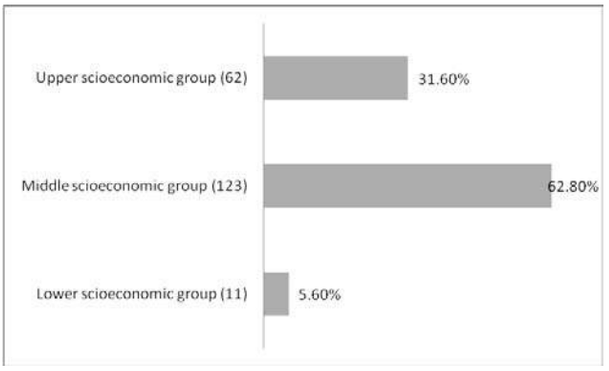

Figure 3 Distribution of patients by socioeconomic condition (N=196)

DISCUSSION

The study revealed that the mean age of the patients was 44 years with standard deviation of 9 years which was contrary to one study conducted in rural population of Bangladesh where mean age was 59.97 with standard deviation of 11 years.[15] Peak incidence of hypertensive patients was found at 41-50 years which is consistent with the study conducted by Goyel & Sarwat.[16] But different observations were found by studies conducted in Bangladesh.[14,15] One national cross-sectional survey revealed study participants with older age (60–69 years) had higher percentage of hypertention.[14] On the other hand, an earlier study conducted on rural population found higher proportion patients were from age group 51-60 years.[15] Majority (59.7%) of patients were male and that was concurrent to studies conducted in Canada and France but contrary to studies conducted in Bangladesh and China.[14,17-20] Patients stratified by socioeconomic status showed that middle class formed the main bulk (62.8%) and service being the main occupation (45.9%) which bears consistency with findings of Ghooschi et al.[21] One study conducted in Bangladesh found half of the respondents were housewives which was contrary to current study.[15] This was may be due to the fact that study was done on rural population whether current study was conducted on urban population. Higher wealth status has higher percentage of having hypertension was observed in one earlier large scale study of Bangladesh and this is different from our study.[14]

LIMITATION

This was a small scale study, conducted on limited number of patients living in one metropolitan city of Bangladesh and data was collected from one tertiary care teaching hospital.

CONCLUSION

Prevalence of hypertension is increasing day by day in Bangladesh. Higher proportion of hypertensive patients on medication of Rajshahi metropolitan city were male, 4th decade of age group, service holder and from middle income group. Better understanding of sociodemographic characteristics of patients will help to design appropriate intervention for screening, treatment and follow up strategies.

RECOMMENDATION

Large scale, multi centered, nationwide survey is needed to find conclusive data on hypertensive patients living in metropolitan areas.

DISCLOSURE

All the authors declared no competing interest.

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Original Article

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Association of the Dominant Hand Grip Strength with the Hand Dimension of Adult Female Tea Garden Workers of Bangladesh

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ABSTRACT

Background: The anthropometry assessment of hand is important to assess hand grip strength. Workers require more hand grip strength to perform their daily work efficiently because hand grip strength determines the overall physical health and muscle function of the hand. Female laborers are an important source of work on tea plantations and many industries. This study aimed to investigate the association of the dominant handg rip strength with the hand arthrometry.

Materials and methods: This cross-sectional descriptive type of study was conducted in the Department of Anatomy, Sylhet MAG Osmani Medical College, Sylhet, from January 2022 to December 2022. For this study total of 100 female tea state workers were recruited. Women from 20-50 years of age involved in tea leave plucking activity were purposively selected. Right hand length, hand width, palm length, wrist circumference and wrist width of subjects were measured using the digital slide caliper by direct physical procedure and dominant hand grip strength was measured using a digital hand grip dynamometer. Data were presented as Mean±SD and percentage. For the correlation regression analysis was done.

Results: The mean dominant right hand grip strength was 25.82±2.76 kg. Regression analysis of dominant hand grip strength with handlength, handwidth, palm length, wrist circumference and wrist width of study subjects showed significant positive relationship of hand grip strength with hand length (r=0.586, p=0.000 and r=0.585, p=0.007) hand width (r=0.613, p=0.000 and r=0.582, p=0.007) palm length (r=0.557, p=0.000 and r=0.530, p=0.007) and wrist width (r=0.456, p=0.000 and r=0.448, p=0.000). But there is no relationship of hand grip strength with wrist circumference (r=0.153, p=0.127 andr=0.165, p=0.101)

Conclusion: All anthropometric measurements of hand dimensions are positively correlated with the dominant hand grip strength except wrist circumference, of female tea garden workers in Bangladesh. Besides, to get desired success in work of a female laborer, it is important to see the hand anthropometry and hand grip strength, because, better hand grip strength lead to better performance in work.

KEY WORDS

Anthropometry; Dominant hand grip strength; Tea garden workers; Upper limb.

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INTRODUCTION

The study of measurement of any parts in the human body whatever it is living, dead or skeleton material, is termed anthropometric measurement of human body.[1] This non invasive method is required for indirect assessment of body composition. To calculate body mass, total body fat, and subcutaneous fat that is beneath the skin, many formulae can be used with girths and skin folds as input.[2] Grip strength is a significant indicator of general strength, dexterity, muscular-endurance and overall health.[3] Hand grip test is anoninvasive test that results from maximum voluntary force, the powerful flexion involving several muscles of hand and forearm. The overall body strength of a person can be determined by this test.[4] It is necessary for base ball, climbing, golf, hockey, paddling, swimming, tennis, weight lifting and wrestling, among other activities where grabbing and force application is crucial for performance.[5]

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Tea plantation is an agro based labor industry providing working opportunities to millions of workers. People working in tea gardens have more workload and need more physical strength. Surveys on tea garden workers ofour country reveals poor socioeconomic conditions with hard working environment that affects their physical structure and strength.[6] To perform daily work, female tea garden worker requires more hand grip strength than normal sedentary workers. Long period of standing and activity involved in plucking and weeding affect the general health of such workers.[7] Therefore, it is important to investigate the relationship between hand dimensions and dominant hand grip strength.

For identification of basic and specialized motor skills, the relationship between anthropometry and hand grip strength was observed by several studies.[4,8,9] Researchers found a strong correlation between handgrip strength with hand span.[9] However, due to variations in socio-cultural elements, Bangladeshis may not be able to adhere to standards of the dominant hand grip strength of different ethnic groups and western countries. Thus, such study was designed to give quantitative baseline data on dominant hand grip strength and to determine the relationship between dominanth and grip strength and hand dimensions in Bangladeshi women of tea garden workers.

MATERIALS AND METHODS

This cross-sectional descriptive study was conducted in the Department of Anatomy, Sylhet MAG Osmani Medical College, Sylhet, from January 2022 to December 2022. Female tea garden workers of the different teagardens of Sylhet, Bangladesh, were the study population. Before commencing the procedure of data collection, ethical permission was taken from the Ethical Review Committee of Sylhet MAG Osmani Medical College, Sylhet. Convenient sampling method was used for data collection. Data is collected by predesigned data collection sheet. Right-handed female tea garden workers, age 20-50 years were included for the study purpose. Person with congenital limb defects, history of trauma in upper limb and history of any chronic disease such as connective tissue disorder, musculoskeletal, neurological, endocrine, respiratory disorder were excluded from the study. In this study, 100 right-handed female teagarden workers are selected purposively. Study variables were hand length, hand width, palm length, wrist circumference and wrist width of both side of the subjects. Measuring tape and Verniercaliper were used for measurement of hand dimensions. Hand grip strength of dominant hand was measured by Camry digital hand dynamometer. Data were processed and analyzed by using Statistical Package for Social Sciences (SPSS) version 23. Regression analysis was done to determine the relationship of dominant hand grip strength with hand dimensions. $p < 0.05$ was considered as statistically significant. The data was presented in the table sand charts.

Image 1 Measurement of hand grip strength by using Camry Digital Hand Dynamometer

Image 2 Measurement of Palm length by using Digital Slide Caliper

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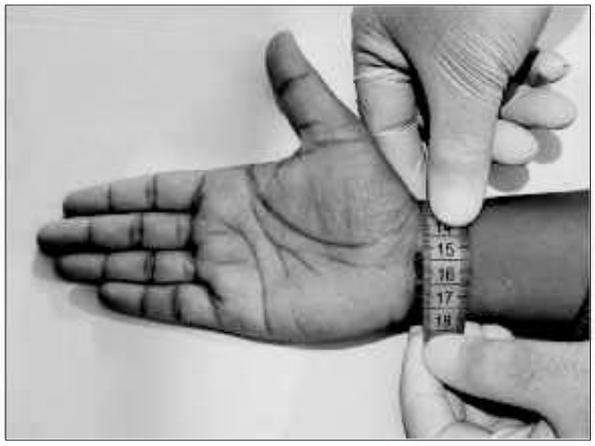

Image 3 Measurement of wrist circumference by using measuring tape

Image 4 Measurement of wrist width by using Digital Slide Caliper

RESULTS

The meanage of the subjects was 35.09±9.78 years and mean working experience of the workers were 15.47±8.75 years (Figure 1). The mean hand length was 16.29±1.24 cm in right side, mean hand width was 7.16±0.55 in right side, mean palm length was 9.24±0.71 cm in right side, mean wrist circumference was 13.30±17.60 cm in right side and mean wrist width were 4.85±0.23 cm in right side (Table I).The mean dominant right hand grip strength was 25.82±2.76 kg (Figure 2).

Regression analysis of dominant right hand grip strength with hand length, hand width, palm length, wrist circumference and wrist width of study subjects showed significant positive relationship of hand grip strength with hand length (r=0.586, p=0.000 and r=0.585, p=0.007) hand width (r=0.613, p=0.000 and r=0.582, p=0.007) palm length (r=0.557, p=0.000 and r=0.530, p=0.007) and wrist width (r=0.456, p=0.000 and r=0.448, p=0.000). But there is no relationship of hand grip strength with wrist circumference (r=0.153, p=0.127 and r=0.165, p=0.101) (Table II).

Figure 1 Age and working experience of the study subjects (n=100)

Table I Hand length, hand width, palm length, wrist circumference and wrist width (n=100)

Variables	Side	Range Minimum	Maximum	Mean±SD
Hand length (cm)	Right	14.10	18.80	16.29±1.24
Hand width (cm)	Right	6.10	7.80	7.16±0.55
Palm length (cm)	Right	6.90	10.70	9.24±0.71
Wrist circumference (cm)	Right	13.30	17.60	14.76±1.59
Wrist width (cm)	Right	4.50	5.30	4.85±0.23

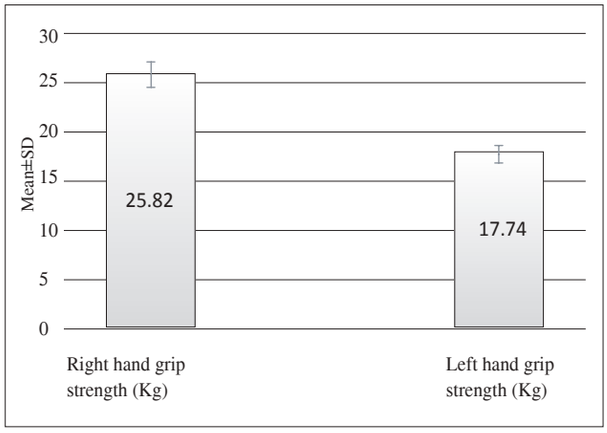

Figure 2 Right and left hand grip strength of study subjects (n=100)

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Table II Multiple regression analysis of dominant hand grip strength with hand length, hand width, palm length, wrist circumference and wrist width (n=100)

Variables	Side	Constant	B	Correlation with hand grip r	p value
Hand length	Right	9.508	0.263	0.586^{s}	0.000***
Hand width	Right	3.980	0.123	0.613^{s}	0.000***
Palm length	Right	5.535	0.144	0.557^{s}	0.000***
Wrist	Right	17.051	0.089	0.153^{s}	0.127^{ns}
Wrist width	Right	3.849	0.039	0.456^{s}	0.000***

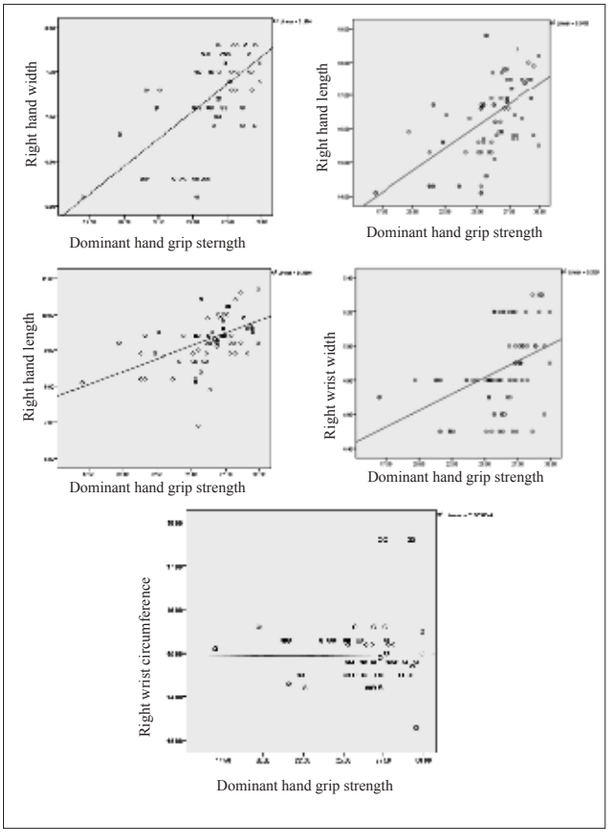

Figure 3 Relationship between dominant hand grip strength and hand dimensions of the subjects (n=100)

DISCUSSION

Hand grip strength is recognized as an objective indicator of the health of the upper extremity's functioning system. How a person interacts with his work station depends on his anthropometry.[10] Poor socioeconomic condition and a demanding working environment have an impact on our country's tea garden workers physical structure and strength.[6] In present study, we recruited 100 female tea garden workers to observe their right hand anthropometry, hand grip strength and correlate them.

The mean age of the subjects was 35.09±9.78 years. Uzun et al. involved university students of Turkey, whose mean age was 19.37±1.48 years.[11] El-Sais and Mohammad, found a significant positive correlation between hand grip strength with the age of the study subjects.[12] Although, the present study did not compare the hand grip strength with the age of the workers.

In our findings, the dominant right hand grip strength was 25.82±2.76 kg. Our research's findings agreed with those of the other studies.[13,14,15] Razzaque et al. found grip strength on the right side of 21-25 years subjects was 24.40±2.24 kg, 26-30 years subjects was 25.41±3.05 kg and 31-35 years subjects were 27.66±2.83 kg. On the left side, 21-25 years subjects had hand grip strength of 20.88±1.45kg, 26-30 years subjects had 21.05±2.02 kg and 31-35 years subjects had 21.46±1.61 kg.[14]

In the present study, the hand length of the right side was 16.29±1.24 cm. These findings are consistent with Waghmare, Gaikwad and Herekar, Molla and Noman, Amin and Arif.[16,17,13] On the other hand, Fallahi and Jadidian, found hand length of athletes was 21.24±1.47 cm and non-athletes were 20.38±0.86 cm. There was a significant positive correlation (p=0.000) between the hand grip strength with hand length observed in the present study.[4] Singh, Koley and Sandhu and Awotidebe et al. also observed a positive correlation between hand grip strength and hand length.[18,15]

When we measured the hand width, we found 7.16±0.55 cm on the right side.These findings are consistent with those of the other studies.[11,13] There was a significant positive correlation (p=0.000) between the hand grip strength with hand width was observed in the present study. Shahida, Zawiahand Case, as well as Akther, Amin and Arif also observed a positive correlation between hand width the hand grip strength.[19,13.]

According to our study, the palm length on the right side of the subjects was 9.24±0.71 cm, and the left side was9.13±0.71 cm. Uzun et al. and Akther, Amin and Arif 2021 observed similar findings.[11,13] There was a significant positive correlation (p=0.000) between the hand grip strength with palm length observed in the present study. Awotidebe et al. and Akther, Aminand Arif, also observed a similar correlation.[15,13]

In the present study, the wrist circumference of the workers on the right side was 14.76±1.59 cm. Our findings are different from those of the other studies. Arslan et al. found wrist circumference was 17.01±1.08 cm in carpal tunnel syndrome patients and 16.50±2.11cm in normal persons. They compared both findings, and the results were significant ($p<0.05$).[20]

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Awotidebe et al. found wrist circumference of 150 diabetic patients on the right side was 16.55±1.81cm and on left side was 16.64±1.74 cm.[15] No significant correlation was observed between the hand grip strength with wrist circumference (p=0.127 and p=0.101). But Awotidebe et al. and Shahida, Zawiah and Case, observed a positive correlation between hand grip strength with wrist circumference.[15,19.]

In the present study wrist width of the workers was 4.85±0.23 cm on the right side. The finding is similar to Uzun et al. and Akther, Amin and Arif.[11,13] There was a significant positive correlation (p=0.000) between the handgrip strength with wrist width observed in the present study. Akther, Amin and Arif also observed a similar correlation in their study.[13.]

LIMITATION

Sample size was small and male tea garden workers are excluded in this study so present study was not represents all tea garden workers. Sample was collected from different tea garden around Sylhet city so is not represent all tea garden workers of Bangladesh.

CONCLUSION

The dominant right handgrip strength was positively associated with the hand length, hand breadth, hand span, palmlength, palm breadth except wrist circumference in present research.

RECOMMENDATION

Furthermore, to get desired success in work of a female tea tea garden workers , it is important to see the body measurements (BMI) and hand grip strength. Because, better hand grip strength lead to better performance in work.

DISCLOSURE

All the authors declared no competing interest.

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Original Article

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Study of Changes in Serum TG and HDL-C Levels during Postmenopausal Period of Women in Bangladesh

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ABSTRACT

Background: Menopause has an effect on lipid profile which leads to increased risk of development of coronary heart disease, obesity and other risk factors. The aim of this study was to investigate the association of serum triglyceride and HDL cholesterol in postmenopausal women in Bangladesh.

Materials and methods: A cross-sectional observational study was carried out in the Department of Biochemistry, Mymensingh Medical College, Mymensingh, from January 2015 to December 2015. This study included 50 postmenopausal women as case compared with 50 apparently healthy premenopausal women as control. Estimation ofserum triglyceride and HDLcholesterol were measured.

Results: The mean value of serum triglyceride and HDL- cholesterol were 134.85 ±26.24mg/dl and 35.29 ±3.86 mg/dl respectively in group B (Case) and 176.81±18.36 mg/dl and 44.17±4.94mg/dl respectively in group A (Control). The levels of serum triglyceride and HDL- cholesterol were significantly increased.

Conclusion: The present study may facilitate the clinicians and gynecologists to update their knowledge in regard to lipid profile of women associated with menopause.

KEY WORDS

HDL cholesterol; Postmenopausal women; Total cholesterol.

INTRODUCTION

Menopause is defined as the cessation of menstruation for a period of longer than one year. It begins with changes in ovarian function and gradual decrease in the production of estrogen and other hormones.[1] During menopause, women face various physiological, psychological and biochemical changes. The adverse effects of menopause are attributed to a decrease in the estrogen level, which leads to alterations in body mass index, insulin levels and also to increase the risk of hypertension, cardiovascular diseases, osteoporosis, diabetes mellitus, cancer and other degenerative changes in postmenopausal females.[2] Lack of the protection of estrogen has been the major reason. However, several physiological changes which develop during menopause may also influence the risk of cardiovascular disease, such as ageing, increased obesity or android pattern of body fat distribution, decreasing resting metabolic rate and physical activity.[3] The hormonal changes associated with menopause i.e low plasma levels of estrogen and marked increase in luteinizing and follicle stimulating hormone levels exert a significant effect on the metabolism of plasma lipids and lipoproteins.[4] Lipid profile abnormalities in the menopausal women are common health hazard all over the world. There is derangement of lipoproteins profile independent of age.[5] Menopausal women have higher plasma levels of Total Cholesterol (TC) Low Density Lipoprotein Cholesterol (LDLC) Very Low-Density Lipoprotein Cholesterol (VLDL-C) and Triglyceride (TG) when compared with premenopausal women.[6] Ovarian estrogen seems to be inversely related to the development of cardiovascular disease and elevated serum lipid levels.[7] A stronger relationship was found between cardiovascular disease morbidity, mortality and surgical menopausal women.[8] Some researchers reported that the rate of metabolic syndrome (Hypertension, hyperglycemia and dyslipidemia) was higher in surgical menopausal women than that of natural menopausal women.[9] It has also been suggested that estrogen level drops abruptly in women with bilateral oophorectomy whereas gradually in natural menopausal women.[10] Hysterectomy alone cannot

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increase risk of cardiovascular disease, but hysterectomy may lead to subsequent ovarian failure.[11] After the age of 50 years, the risk of myocardial infarction increasesamong the oophorectomized women, compared with women who retain their ovaries.[12] However, after natural menopause, ovaries continue to produce significant number of androgens, which are converted to estrogen peripherally.[13] Remnants of TG-rich lipoproteins i.e. VLDL remnants and chylomicron remnants, are atherogenic particles that are being increasingly considered to be cardiovascular risk factors. Estrogen can reduce remnant concentrations by increased elimination through hepatic LDL receptors. Estrogen increases HDL cholesterol by several mechanisms, which mainly includes increased hepatic production of apolipoprotein A and decreased hepatic elimination of HDL2-cholesterol by reducing activity of hepatic lipase. Since during menopausal period estrogen level is low, all these actions are hampered resulting in increased TC and LDL-C level and decreased HDL-C level.[14] Some investigators observed that hysterectomy with bilateral oophorectomized women had higher level of TG and TC than those of natural menopausal women.[15] Recently it has also been observed that HDL-C level was significantly lower and VLDL-C level was significantly higher in surgically menopausal women than those of natural menopausal women.[16] High levels of LDL and low levels of HDL are strongly associated with the risk of CAD.[17] Menopause causes decrease of HDL concentration and changes in HDL structure as well. The concentration of HDL2 decreases while concentration of HDL3 increases. HDL concentration is in inverse proportion with abdominal fat level.[5] In this study, estimation of serum triglyceride and HDL cholesterol of postmenopausal women and to compare with the apparently healthy premenopausal women has been made.

MATERIALS AND METHODS

This cross-sectionalstudy was carried out in the Department of Biochemistry, Mymensingh Medical College and the subjects were collected from the Outpatient Department (OPD) Mymensingh Medical College Hospital, Mymensingh during the period of January 2015 to December 2015 with a view to compare serum Total C and LDL- C level between postmenopausal and healthy subjects. In this study 50 cases of postmenopausal and another 50 premenopausal women were selected as control.Informed written consent was taken before taking any interview. Fasting Total-C and LDL-Cwerecollected for biochemical analysis. Relevant information was recorded in a pre-formed data collection sheet designed for the study. All statistical analysis was done by using Statistical Package for Social Science (SPSS) using version 20. Results were calculated as mean ± SD (Standard Deviation). Statistical significance of difference between two groups were evaluated by using unpaired `t`test and 95% confidence limit was taken as level of significance.

RESULTS

A total of 100 subjects were included in the present study. Subjects were classified into group A (Control) and group B (Case). Group B comprising of (n = 50) postmenopausal women aged between 45-55 years served as case. Group A comprising of (n = 50) apparently healthy women aged between 30-40years served as control. In group B (Case) the mean value serum triglyceride and HDL cholesterol were 134.85 ±26.24 mg/dl and 35.29 ±3.86mg/dl respectively. In group A (Control) the mean ± SD of serum triglyceride and HDL-cholesterol were 176.81±18.36mg/dl and 44.17±4.94mg/dl. There were significant difference (p <0.001) in case of serum HDL –cholesterol between group A and group B. But there was no significant difference (p <0.733) in case of triacylglycerol between the two groups

Table I Serum total cholesterol and LDL cholesterol of the subjects

Biochemical variables	Group A (Control) Mean ±SD	Group B (Case) Mean ±SD	p value
Triacylglycerol (mg/dl)	136.53±27.53	134.85±26.24	< 0.733ns
HDL Cholesterol(mg/dl)	44.17±4.94	35.39±3.86	<0.001**

p value less than 0.05 taken as level of significance.
SD= Standard Deviation
** = Highly significant.

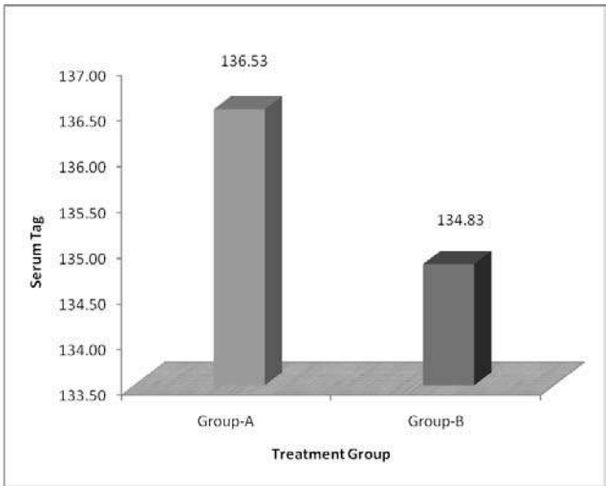

Figure 1 Mean ±SD of triacylglycerol of the subjects

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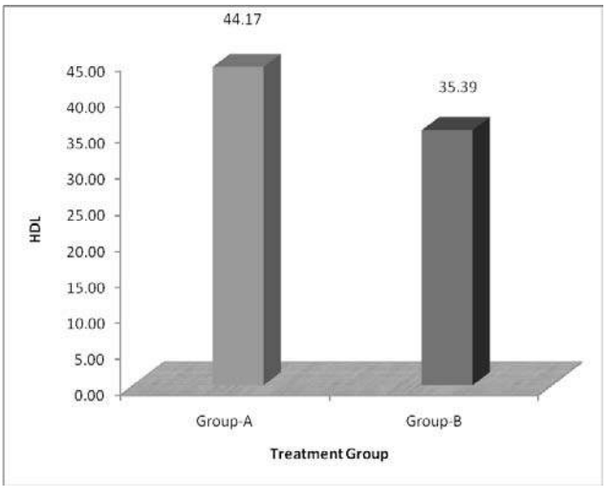

Figure 2 Mean±SD of HDL-cholesterol of the subjects

DISCUSSION

The present study was done to observe the various changes of serum TG and HDL-cholesterol levels in postmenopausal women compared with premenopausal women. Related medical history and clinical information of the subjects were taken by questionnaires from all the individuals included in this study.Fifty apparently healthy premenopausal women aged between 30-40 years were selected as group A (Control) and fifty postmenopausal women aged between 45-55 years were selected as group B (Case) in this study.This study showed no significant difference in triacylglycerol level between control and case groups. This is supported by other studies done by.[18,5] On the other hand, who also demonstrated higher triacylglycerol in menopausal transition and postmenopausal women in comparison to that of premenopausal women, which is against our result.[2] The finding of in menopause, supplementation with calcium/vitamin D increased mean serum 25-OHD_3 concentrations 38% and higher concentrations of the metabolite were associated with lower LDL-cholesterol and triglyceride levels, as well as higher HDL-cholesterol levels which were against our result.[19] In our study, we also found significantly decreased HDL–cholesterol in postmenopausal women which is in concurrence with those reported by.[7] Estrogen increased HDL-cholesterol by several mechanisms, which mainly includes increased hepatic production of apolipoprotein A and decreased hepatic elimination of HDL2-cholesterol by reducing activity of hepatic lipase.[14] Since during menopausal period estrogen level is low, all these actions are hampered resulting in decreased level of HDL- cholesterol.

LIMITATION

This study is conducted at the Department of Biochemistry Mymensingh Medical College over one year duration. As both the duration and sample size are minium, so further study is needed to find out the actual picture regarding this issue.

CONCLUSION

Menopause has an effect on serum triglyceride and HDL-cholesterol which leads to increased risk of development of coronary heart disease, obesity and other risk factors. The available knowledge of menopause and its effect on human can alleviate the risk factor of coronary heart disease and other cardiovascular alteration. The present study may facilitate the clinicians and gynecologists to update their knowledge in regard to TG and HDL-cholesterol of women associated with menopause.

RECOMMENDATION

Multicentre with large sample size study is to recommended to find out the overall scenario regarding the issue is Bangladesh.

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DISCLOSURE

All the authors declared no competing interest.

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Original Article

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Death due to Road Traffic Accident at Dhaka Medical College Hospital : A Two Years Based Cross Sectional Study

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ABSTRACT

Background: There has been a terrifying rise in road traffic accidents in the whole world and especially in Bangladesh over the past few years and has become a national problem. Everyday a considerable number of person die in road traffic accident with the higher rate of fatality. The objective of the study was to find out the majority of dead bodies in terms of gender, their age group, the types of vehicle involved and types of injuries of the dead bodies caused by the road traffic accidents .

Materials and methods: A cross-sectional study, data consisted of 345 cases of road traffic accident (Out of total 3569 cases) were collected from a predesigned format of autopsy reports, hospital notes and inquest reports all performed at Dhaka Medical College Hospital (DMCH) Morgue during the year of January 2022 to December 2023. The data received were carefully recorded later, analyzed by computer and organized in tables and pie charts.

Results: Out of 345 cases of road traffic accident, 291 cases were male (84.40%). Among these cases, the majority of age group for dead bodies were between 31 to 40 years (28%) followed by 41 to 50 years (15%), 0 to 10 years (14%). Majority of the vehicles where the accident occured was by bus (38%) followed by motorbikes (17%). 11% of the accidents were occurred by trucks. The main types of injuries occurred from the road traffic accident found as multiple abrasion and bruises (100%) followed by laceration (90%), fracture skull bone (82%), injury to other abdominal viscera (79%) and various injury to brain (78%).

Conclusion: According to this study all the dead bodies had multiple abrasion and bruises all over the body.

KEY WORDS

Accidental death; Injury pattern; PM examination; Road traffic accident.

INTRODUCTION

One of the most common non communicable epidemic of the world are accidents, which are a major cause for morbidity and mortality. This is the price we pay for the progress in technology.[1] As there is an increase in urbanization and modernization, there is an increase in motorization also.[2]

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The term accident has been defined as an occurrence in the sequence of events which usually produces unintended injury, death or property damage.[3] An injury is any harm whatever illegally caused to a person in body, mind, reputation or property.[4] Injury can lead to death in association with any form of transport, but the most common are with road, rail and air transport systems.[5]

A road traffic injury is a fatal or non fatal injury incurred as a result of a collision on a public road involving at least one moving vehicle. Children, pedestrian, cyclist and the elderly are the most vulnerable of road users.[6] Amongst of all, Road Traffic Accidents (RTA) claims the largest toll of human life and tend to be the most serious problem. Almost 12 million people die all over the world due to RTA.[7]

MATERIALS AND METHODS

A cross-sectional study, data consisted of 345 cases of Road Traffic Accident (RTA) collected from total autopsy reports of 3569 cases, all performed at Dhaka Medical College Hospital (DMCH) morgue during the year of January 2022 to December 2023. The records of all death resulting from Road Traffic Accident (RTA) were collected from a predesigned format of autopsy reports, hospital cases notes and

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inquest reports. The data received were carefully recorded later, analyzed by computer and organized in tables and pie charts.

RESULTS

The data was collected from the study of 345 cases of Road Traffic Accident out of total Cases of 3569 in Dhaka Medical College Hospital (DMCH) morgue from the year of January 2022 to December 2023.

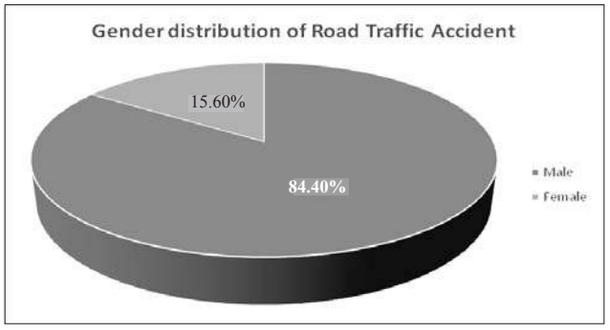

Figure 1 The gender distribution Road Traffic Accident (RTA)

As per Figure 1 the majority of the gender of the road traffic accident was male (84.40%) followed by female (15.60%).

Table II Distribution of age group of Road Traffic Accident

Age group (In years)	Number of victims	Percentage (%)
0 to 10	48	14%
11 to 20	31	9%
21 to 30	45	13%
31 to 40	97	28%
41 to 50	52	15%
51 to 60	38	11%
61 and above	34	10%

As per Table II, the age group of road traffic accident lies between 31-40 years (28%) followed by 41-50 years (15%), 0-10 years (14%), 21-30 years (13%) and 51-60 years (11%).

Table I Types of vehicles affected from Road Traffic Accident

Types of Vehicle	Number of victims	Percentage (%)
Bus	131	38%
Motorbikes	59	17%
Truck	38	11%
Microbus	31	9%
Covered van	28	8%
Pick up	24	7%
Minibus	24	7%
Private cars	7	2%
Others	3	1%

From Table II, we can see that, majority of the dead bodies had their accidents by bus (38%) followed by motorbikes (17%). 11% of the road traffic accidents were caused by trucks.

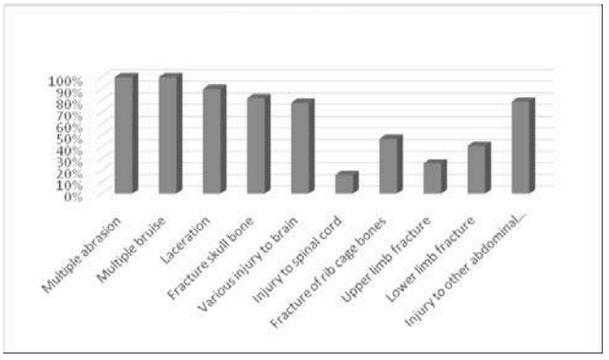

Figure 2 Types of injuries

From Figure 2 above, we can see that the main types of injuries occurred from the road traffic accident found as mautiple abrasion and bruises (100%) followed by laceration (90%), fracture skull bone (82%), injury to other abdominal viscera (79%) and various injury to brain (78%).

DISCUSSION

Road Traffic Accidents (RTA) are responsible for the greatest number of injuries and fatalities worldwide by killing around 1.2 million people each year and injuring another 50 million. These victims occupy 30-70% of orthopedic beds in hospitals of developing countries.[8]

Bangladesh is a South Asian developing country. Here poverty and unemployment push the people towards urban areas. This rapid and unplanned urbanization associated with incompetent traffic system, unplanned roads and highways, violation of traffic laws by the drivers and pedestrians, over- crowding, unlicensed rickshaws, reckless driving etc are responsible for this highest figure of road traffic accidents. The essential factors involved in RTA's include the person, the machine and the road.[9]

In this study male and female ratio observed among the dead bodies was 84 : 16. This ratio is in conformity with previous studies in other coutries.[10-12] In this country, males are predominantly the earning member of the family. More over they are at higher risk of injuries than women because of their greater exposure to traffic and more risky behaviour like hanging on the side of bus or rush to get in a running bus.[13-15]

Most accidents in this country take place in the highways and caused by buses. Aggressive driving, impatience, lack of attention and drinking alcohol (In case of drivers) prior to driving are responsible for this.[16-17]

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Highest incident of RTA was observed among the age group 31 to 40 (28%), followed by 41-50 years (15%), less than 10 years (14%) and 21 to 30 years (13%). This coincides with the other study reports, which explain that more than one-half of all road traffic deaths globally occur among people ages 15 to 44 years; their most productive earning years.[18] Similar age distribution of RTA victims has also been reported in other studies from developing countries.[19-21] Comparatively lower proportion of age group below 10 years and above 60 years could be explained by the fact that children are usually taken care of by elders during travel and lesser mobility of geriatric people. But the effect of head injury is disproportionately severe in elderly and they require more neurosurgical care.[22]

Persons involved vehicular accidents sustain a large varieties of injury, which often assume definite pattern in the case of a pedestrian, a driver or a passenger. According to the dynamics of pedestrian accident, legs were involved in 85%, head between 50-80%, followed by arms, pelvis, chest and abdomen. Injuries of neck and spine are relatively infrequent in overall time. Motorcycle and pedestrian accidents occur in vulnerable individuals lacking the relative physical protection afforded by cars and buses. These accidents result in major multiple injuries in the patients.[23]

All the dead bodies in the study had multiple abrasion and bruises all over their body. Laceration were present in 90% cases. 78% victims had injury to brain, 82% had fracture of different skull bones, 77% had injury to liver and spleen. 36% cases had fracture of pelvic bones, 49% had fracture femur, 41% had rupture of kidneys. These pattern of injuries coincides with other studies before.[24-25]

LIMITATION

Records and documents of the some dead bodies could not collected properly.

CONCLUSION

Road Traffic Accident (RTA) is probably the largest share holder amongst all traffic accidents. It is considered to claim the largest toll of human lives and is one of the major problem of the world. Starting from mid-range aged adults to children, pedestrians and the elderly are among the most vulnerable of road users. We must have to take necessary action and care for these accidents to overcome these. By doing proper implementation of traffic law, making proper and efficient planning of roads including land use and arranging shorter safer routes to the citizens will bring their exposure to highways. We must also teach and encourage people to use seat belts, checking the fitness of the vehicles properly, and most importantly making the public awareness. By doing these type of preventive actions we can reduce this economical burden and protect the people of our country.

RECOMMENDATION

To combat this issue through close co-ordination and collaboration, using a holistic and integrated approach, across several sectors and disciplines.

DISCLOSURE

All the authors declared no competing interest.

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Original Article

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Evaluation of Fasting Serum Lipid Profiles in Seborrheic Dermatitis Patients

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ABSTRACT

Background: While the exact mechanisms underlying the development of Seborrheic Dermatitis (SD) remain poorly understood, it is clear that the complex interaction between Malassezia, keratinocytes and the immune response to altered skin lipid composition plays a crucial role in its pathogenesis. This study sought to assess the connection between lipid profile abnormalities and SD, as the inflammation observed in both conditions may provide an explanation for their association, particularly in the context of metabolic syndrome and dyslipidemia.

Materials and methods: This cross-sectional observational study was conducted at Khwaja Yunus Ali Medical College (KYAMC) Enayetpur, Sirajgonj over a span of 12 months from June 2022 to June 2023. A total of 50 patients with seborrheic dermatitis were recruited in the present study. A structured data collection format comprised of items concentrating on socio-demographic characteristics, level of SD, severity of SD and lipid profile were used. Statistical analysis of the gathered data was performed using the Statistical Package for the Social Sciences (SPSS), version 25.

Results: In this study, the average age of patients was 37.46 years, with a range spanning from 17 to 62 years. Out of the 50 cases examined, 31 were female, and 19 were male. The majority of cases (44%) were classified as moderate, followed by 26% as mild, 24% as severe, and 6% as very severe. It was noted that the prevalence of severe disease was higher in cases with more advanced stages. The mean levels of fasting total cholesterol (217.82 mg/dl vs. 112.74 mg/dl), LDL (122.14 mg/dl vs. 84.19 mg/dl), and triglycerides (169.81 mg/dl vs. 102.17 mg/dl) were higher in cases with elevated severity levels compared to those with normal severity levels. Conversely, the HDL level (37.89 mg/dl vs. 30.62 mg/dl) in patients with high severity was lower than in those with normal severity. Among all groups, very severe cases exhibited the highest levels of fasting total cholesterol (237.85 mg/dl), LDL (128.94 mg/dl), VLDL (39.99 mg/dl), and triglycerides (200.77 mg/dl), while having the lowest HDL level (27.96 mg/dl). Importantly, serum triglyceride levels, the LDL/HDL ratio, and the total cholesterol/HDL ratio were found to be significantly associated with the severity of the disease.

Conclusion: The lipid profile exhibits a statistically significant correlation with the degree and seriousness of Seborrheic Dermatitis (SD). As a result, we suggest conducting a comprehensive observational study to elucidate the causal connection between serum lipid abnormalities and SD.

KEY WORDS

Dermatitis; Lipid profile; Seborrheic.

INTRODUCTION

Seborrheic Dermatitis (SD) is a common, chronic inflammatory skin condition. It typically occurs as an internal form of dermatitis and is often observed in individuals with overactive sebaceous glands.[1,2] The distribution of seborrheic dermatitis is more characteristic than its appearance, with adults being more commonly affected. While it primarily affects the scalp and face, other seborrheic areas like the paranasal region, infra-labial folds, mid-chest, mid-back, and periumbilical areas can also be involved. This condition's complexity is evident in the use of various terms to describe it, including sebopsoriasis, seborrheic dermatitis, seborrheic eczema, dandruff and pityriasis capitis.[1,2,3]

Despite being a recognized clinical condition for many years, significant controversy persists concerning the causes and development of seborrheic dermatitis. The pathogenesis of this condition involves several factors, including fungal colonization on the skin surface, sebaceous secretions, individual susceptibility, and the interplay among these elements.[1,2] The primary factors considered responsible for its onset are the overgrowth of the yeast Malassezia furfur, genetic predisposition,

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and immunodeficiency. However, the connection between Malassezia furfur, a common skin commensal and seborrheic dermatitis remains uncertain. There are two contrasting viewpoints regarding Malassezia furfur: some argue that it directly causes seborrheic dermatitis due to its response to antifungal treatments, while others suggest it may be incidental to a primary inflammatory skin condition, leading to increased cell turnover, scaling, and inflammation.[1,4]

Seborrheic Dermatitis (SD) is a common, chronic skin condition characterized by the presence of scaly, reddish-brown patches, primarily occurring in regions rich in oil-producing glands. Typically, it affects areas like the face, scalp, upper chest, and back. Dandruff represents a milder variant of this condition, primarily impacting the scalp without inflammation.[5,6,7] Among the general adult population, the prevalence of clinically significant SD is approximately 3%. However, this rate is higher in individuals with immunodeficiency disorders and neurological conditions such as Parkinson's disease. While the disease can affect healthy individuals, its occurrence is notably elevated, ranging from 34% to 83%, in immunocompromised patients, such as those with HIV and individuals with neurological disorders.[2,3] The occurrence of mild scaling, as seen in dandruff, is estimated at around 15% to 20%, although some reports suggest it may affect up to 50% of the population.[5,6]

The presence of red, scaly patches on exposed areas like the face and ears, accompanied by itching and dandruff, along with the chronic and recurrent nature of Seborrheic Dermatitis (SD), can significantly impact self-esteem and overall quality of life. SD is more prevalent in men and tends to be more severe in regions with cold, dry climates and during periods of increased stress.[4,5,7]The incidence of SD is notably higher within three specific age groups: from 2 weeks to 12 months (infanthood), from 13 to 19 years (Adolescence) and between 30 and 60 years (Adulthood). Among adults, the highest incidence of SD occurs during the third and fourth decades of life.[3,4,8]

The severity of Seborrheic Dermatitis (SD) can be categorized into three levels - mild, moderate, and severe - depending on the degree of scaling and inflammation. In terms of clinical features, it is characterized by the presence of oily yellow scales on erythematous (Reddened) patches.[5] In adolescents and adults, the manifestations of SD can vary, ranging from mildly erythematous patches with fine scaling in the seborrheic areas of the skin to crusted erythematous plaques. In individuals with immunodeficiency disorders, particularly those with potentially life-threatening generalized exfoliative dermatitis, the condition can manifest in more extensive and severe ways.[9,10]

The sebaceous glands are exocrine glands comprised of both immature and mature sebum-producing epithelial cells. These cells eventually transform into holocrine glands, releasing their secretions onto the surface of the skin.[5,6,7] Human sebum is composed of various components, including triglycerides (30%-50%), fatty acids (15%-30%), wax esters (26%-30%), squalene (12%-20%), esters of cholesterol (3%-6%), and free cholesterol (1.5%-2.5%).[2,3,5] Sebocytes, similar to adipocytes, are epithelial cells that produce sebum. However, sebocytes produce lipids through holocrine secretion, while adipocytes produce lipids for storage, primarily as energy reserves in subcutaneous, visceral, or epididymal white adipose tissues. Both keratinocytes and sebocytes are capable of synthesizing lipids, and they can also actively uptake lipids from the circulation. For instance, essential fatty acids are present in significant quantities in both types of skin cells.[1,5,11]

As treatments for seborrheic dermatitis, like topical or oral antifungals and topical corticosteroids, offer only temporary relief, it becomes crucial to identify lifestyle factors that can be modified to alleviate the impact of this condition.[12] Consequently, the primary objective of this study was to investigate the connection between lipid profiles and seborrheic dermatitis.

MATERIALS AND METHODS

This cross-sectional observational research was carried out at KYAMC, Enayetpur, Sirajgonj, spanning a period of 12 months from June 2022 to June 2023. All patients admitted during this study duration were enrolled. The study encompassed a total of 50 patients diagnosed with seborrheic dermatitis. The independent variables included socio-demographic factors such as gender, age, disease duration, and the level and severity of the condition. Meanwhile, the dependent variables comprised the lipid profile, encompassing measurements of total cholesterol, LDL-C, VLDL-C, triglycerides, and HDL-C. A structured data collection format was employed, which included items focusing on socio-demographic attributes, disease duration, the level and severity of Seborrheic Dermatitis (SD) and the lipid profile. Retrospectively, medical records of patients with SD were examined. Experienced physicians in the hospital were responsible for collecting the data. To ensure data quality, the data collectors were briefed about the study's objectives and the data collection format before the data collection process began. Any unclear or ambiguous questions

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were addressed and modified based on the preliminary results prior to the actual data collection. Stringent supervision was carried out throughout the data collection process to maintain data quality. The completed data collection formats were thoroughly reviewed for completeness and consistency to ensure data quality. Additionally, data entry underwent careful scrutiny and cross-verification, with any uncertainties being resolved appropriately. The gathered data was subjected to statistical analysis using the Statistical Package for the Social Sciences (SPSS), version 25.

RESULTS

The study encompassed a total of 50 patients diagnosed with seborrheic dermatitis. Their average age was 37.46 years, with an age range from 17 to 62 years. Among the 50 cases, 31 were female, and 19 were male (Table I). In terms of the severity of the condition, 31 cases were categorized as high-level, while 19 were classified as normal level (Table II). The distribution of severity among these cases showed that the majority (44%) had a moderate condition, followed by 26% with mild, 24% with severe, and 6% with very severe seborrheic dermatitis (Table III). Notably, the data indicated a higher occurrence of severe disease in cases classified as high level, as demonstrated in Table IV. The analysis of lipid profiles revealed that the mean levels of fasting total cholesterol (217.82±34.34 mg/dl vs. 112.74±20.36 mg/dl), LDL (122.14±21.81 mg/dl vs. 84.19±13.18 mg/dl) and triglycerides (169.81±29.46 mg/dl vs. 102.17 mg/dl) were higher in the high-level cases compared to the normal-level cases. Conversely, the HDL level (37.89±9.59 mg/dl vs. 30.62 mg/dl) in the high-level patients was lower than in those with normal seborrheic dermatitis (Table V). Moreover, the very severe cases exhibited the highest levels of fasting total cholesterol (237.85±23.9 mg/dl), LDL (128.94±9.52 mg/dl), VLDL (39.99±5.1 mg/dl) and triglycerides (200.77±34.68 mg/dl), while displaying the lowest HDL level (27.96±6.64 mg/dl) when compared to all the other groups (Table VI).

Table I Socioeconomic characteristics of the study subject (n=50)

Characteristics	Frequency	Percentage (%)
Age in years		
≤ 20	4	8.0
21-30	8	16.0
31-40	19	38.0
41-50	12	24.0
51-60	6	12.0
>60	1	2.0
Mean±SD	37.46±11.21	
Sex		
Male	19	38.0
Female	31	62.0

Table II Level of seborrheic dermatitis condition (n=50)

Severity	Frequency	Percentage (%)
Normal	19	38.0
High	31	62.0

Table III Severity of seborrheic dermatitis condition (n=50)

Degree	Frequency	Percentage (%)
Mild	13	26.0
Moderate	22	44.0
Severe	12	24.0
Very severe	3	6.0

Table IV Association of severity of disease and level of disease (n=50)

Severity of disease	Level of disease				p value
	Normal level (n=19)		High level (n=31)		
	No	%	No	%	
Mild	11	57.9	2	6.4	0.001
Moderate	7	36.8	15	48.4	
Severe	1	5.3	11	35.5	
Very severe	0	00	3	9.7	

Table V Association of level of disease and lipid profile (n=50)

Lipid profile	Normal level (n=19) Mean±SD	High level (n=31) Mean±SD	p value
Total cholesterol	112.74±20.36	217.82±34.34	0.001
LDL	84.19±13.28	122.18±21.81	0.001
VLDL	21.36±4.69	33.17±8.65	0.001
Triglycerides	103.21±19.85	169.81±29.46	0.001
HDL	37.89±9.59	30.62±7.57	0.001

Table VI Association of severity of disease and lipid profile (n=50)

Lipid profile	Severity of disease			
	Mild (n=13) Mean±SD	Moderate (n=22) Mean±SD	Severe (n=12) Mean±SD	Very severe (n=3) Mean±SD
Total cholesterol	135.85±29.35	180.91±28.37	214.81±33.42	237.85±23.79
LDL	91.74±16.52	108.85±20.56	123.86±22.34	127.94±9.52
VLDL	21.98±5.32	28.86±6.54	31.92±6.89	39.99±5.71
Triglycerides	112.41±15.74	145.78±21.59	162.86±28.37	200.77±34.68
HDL	35.93±8.86	32.74±8.63	32.53±10.69	27.96±6.64

DISCUSSION

Seborrheic Dermatitis (SD) and dandruff represent two chronic skin conditions that fall along a spectrum, with dandruff being the milder variant primarily affecting

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the scalp without inflammation. Although the intricate interaction among Malassezia, keratinocytes, and the immune response to altered skin lipid composition plays a pivotal role in the pathogenesis of Seborrheic Dermatitis, the causal relationship remains elusive. Consequently, the underlying pathophysiology remains inadequately comprehended. The primary objective of this study was to investigate the connection between serum lipid profiles and SD.[1,3,5,13]

Seborrheic Dermatitis (SD) and dandruff are both chronic skin conditions located at opposite ends of the same spectrum, with dandruff representing a milder form of the condition that primarily affects the scalp and lacks inflammation. Despite the complex interplay between Malassezia, keratinocytes and the immune response against altered skin lipid composition playing a crucial role in the development of Seborrheic Dermatitis, the specific causal relationship has yet to be fully elucidated. Consequently, the underlying pathophysiology remains poorly understood. The primary objective of this study was to investigate the connection between serum lipid profiles and Seborrheic Dermatitis.[5,13,14]

Seborrheic Dermatitis (SD) and dandruff are two chronic skin conditions situated at opposite ends of a spectrum, with dandruff representing a milder variation primarily affecting the scalp without any signs of inflammation.[15] Despite the intricate interplay involving Malassezia, keratinocytes, and the immune response against altered lipid composition in the skin, which plays a pivotal role in the development of Seborrheic Dermatitis, the exact causal relationship remains unclear. Consequently, the underlying pathophysiology remains inadequately comprehended.[5,13,14] The primary aim of this study was to investigate the correlation between serum lipid profiles and Seborrheic Dermatitis.

In the present study, the average age of the patients was 37.4 years, with 31 of them being female. The majority of cases (44%) were categorized as moderate, followed by 26% as mild, 24% as severe, and 6% as very severe. Among the cases with high severity levels, 44% were moderate, 24% were severe, and 6% were very severe. These findings are consistent with previous studies.[5,9,11] The results of this study align with the general incidence of Seborrheic Dermatitis (SD) which tends to peak within three age groups: infancy (2 weeks to 12 months) adolescence (13 to 19 years) and adulthood (30 to 60 years).[16,17] Ordinarily, androgens are known to play a significant role in regulating the function of sebaceous glands, contributing to a higher prevalence of SD in men.[1,5,9] However, in this study, there were more female cases than expected. This higher prevalence among females may be attributed to increased use of cosmetics.

In the current study, the mean fasting total cholesterol, LDL, and triglyceride levels were notably higher in the high-level cases compared to the normal-level cases, with values of 217.82 mg/dl versus 112.74 mg/dl, 122.18 mg/dl versus 84.19 mg/dl, and 169.81 mg/dl versus 103.21 mg/dl, respectively. Conversely, the HDL level was lower in high-level patients, at 30.62 mg/dl compared to 37.9 mg/dl in normal patients. The very severe cases exhibited the highest levels of fasting total cholesterol (237.85 mg/dl), LDL (127.94 mg/dl), VLDL (39.99 mg/dl) and triglycerides (200.77 mg/dl), while demonstrating the lowest HDL level (27.96 mg/dl) when compared to all other groups. It is worth noting that age was found to be a significant factor ($p<0.001$), and these findings are consistent with previous studies.[5] They reported that the mean fasting total cholesterol (219.72 mg/dl vs. 114.83 mg/dl), LDL (123.92 mg/dl vs. 85.08 mg/dl) and triglycerides (170.38 mg/dl vs. 102.17 mg/dl) levels were higher in high-level cases compared to normal-level cases. Furthermore, the HDL level was lower in high-level patients (31.06 mg/dl) compared to normal patients (38.94 mg/dl). Similar to our study, the very severe cases in their research showed the highest fasting total cholesterol (238.63 mg/dl), LDL (128.63 mg/dl), VLDL (40.28 mg/dl), and triglycerides (201.38 mg/dl) levels, along with the lowest HDL level (28.75 mg/dl) compared to all other groups.

In a different study conducted by Patil et al. it was reported that among all the lipid profile parameters, serum triglycerides, the LDL/HDL ratio, and the total cholesterol/HDL ratio displayed statistical significance, with p-values of 0.04, 0.03, and 0.004, respectively.[1] Consequently, our study indicates a potential association between serum lipid levels and the severity of seborrheic dermatitis. Particularly, the significant differences in serum triglyceride levels across the mild, moderate, and severe groups suggest that dietary fat intake may also play a role in the pathogenesis of the disease.

LIMITATIONS

It's important to note that the short duration of the study and the relatively limited sample size were the primary limitations of this investigation. Additionally, the study's scope was restricted as patients from the infant age group were not included, primarily due to the setting being a tertiary care teaching hospital where patients would typically seek care at the Pediatric Outpatient Department.

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CONCLUSION

In this investigation, the majority of patients with SD were female and presented with moderate to very severe cases of the condition. The mean levels of fasting total cholesterol, LDL-C, and triglycerides were notably higher in high-level cases compared to those with normal-level cases. Additionally, the mean HDL-C level in high-level patients was lower than that in individuals with normal-level cases. Notably, the most severe cases exhibited the highest levels of fasting total cholesterol, LDL-C, VLDL-C, and triglycerides, while displaying the lowest HDL-C level in comparison to all other groups.

RECOMMENDATION

Additional research with larger sample sizes and extended study durations would be beneficial to validate these results.

DISCLOSURE

Both the authors declared no competing interest.

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Original Article

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Cytomorphological Study of Palpable Breast Lump in a Tertiary Care Hospital

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ABSTRACT

Background: The incidence and mortality of breast cancer in Bangladesh are increasing at alarming rate and already reached anunexpected level. Fine Needle Aspiration Cytology (FNAC) is an inexpensive, simple and highly accurate means of diagnosing both benign and malignant breast lesions. The objective of this study was to observed the various cytomorphological patterns of breast lumps among the indivisiual attending the Department of Pathology at Enam Medical College Hospital, Savar.

Materials and methods: This was a retrospective study conducted from lst January 2018 to Decembar 2018. 100 patients presenting with breast lump who were advised for FNAC were included in this study. FNAC was performed and the smears were also categorized into neoplastic and non-neoplastic lesions and neoplastic lesions were further categorized into benign and malignant lesions. Numbers of benign and malignant lesions in various age groups were also observed.

Results: Out of 100 cases neoplastic lesions accounted for 70 cases. Among neoplastic lesion ductal carcinoma was the most common malignant lesions 50 cases. All malignant lesions were observed in older age between 4l-50 years.

Conclusion: From this study it can be concluded that FNAC is a simple and reliable method for diagnosis of both benign and malignant lesions of breast. Though it cannot categorize the lesion in some cases but it can rule out malignancy in most of the cases. Sometimes further histopathological study is needed to confirm the accuracy of FNAC in the diagnosis of breast lesion.

KEY WORDS

Breast lump; Ductal carcinoma; Fibroadenoma; FNAC.

INTRODUCTION

The incidence of breast cancer is increasing in alarming rate. It has been estimated in SouthAsia like Bangladesh, India, Pakistan, Nepal, Myanmar and Tibet etc. 76,000 women die of breast cancer in a year.[1] Although there is nonational cancer registry in Bangladesh but it was estimated that 30,000 women died for breast cancer. It is holding 2nd position in the world among 100 different types of cancer. Bangladesh stays at top rank for breast cancer in South Asian countries.[2] Again in Unite States Breast cancer is the leading cause of morbidity and mortality among women, and the second most common cause of cancer death.[3] Increase in number of breast cancer cases are related to late marriage, birth of childin the later age, shorter period of breast feeding and null parity or low parity. Clinically, the diseases of breast usually present with lump in breast or nipple discharge. Mass in breast, whether benign or malignant is a cause anxiety to the patient and her family members. FNAC of breast lumps is an important part of triple assessment (Clinical examination, imaging and FNAC). Avariety of inflammatory lesions can be seen in breast. Some of them are as a result of infectious agents while others do not have well understood etiology. Tuberculosis of the breast occurs very rarely. It is documented that only 3-4.5% tuberculosis has been observed in developing countries like India.[4] Due to increasing awareness there has been a recent increase in the number of Fine Needle Aspiration Cytology (FNAC) of breast. Triple test has good sensitivity and specificity in the evaluation of breast lumps.[5] The primary goal of aspiration cytology is to separate from benign to malignant lesions. Benign lesions of the breast lump include inflammatory lesions, epithelial and stromal proliferative lesions and

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neoplasms. The incidence of benign breast diseases begins to rise in the second decade and peaks in the fourth and fifth decade of life.[6] Among the benign lesion proliferative breast disease without atypia and with atypia confers mild and moderate risk respectively, whereas cancinoma in situ is associated with substantial risk if untreated.[7] Other diagnostic tool includes core needle biopsy. There are different preoperative diagnostic modalities for breast pathology. FNAC issensitive, simple, cost effective, less traumatic and rapid method. FNAC may beused for palpable or non palpable benign or malignant breast lesions. Palpable lesions may be either solid or cystic and non-palpable lesions are detected by radio imaging study.[4] Like other South Asian countries, breast cancer is the most common malignancy among women in Bangladesh.[8] Unlike women in high-income countries, more women in South Asian countries (Including Bangladesh) are diagnosed with breast cancer before menopause.[9] A very few study has been conducted regarding FNAC in Bangladesh. The objective of this study was to find out the various cytomorphological patterns of breast lumps among the individual attending the Department of Pathology at Enam Medical College and Hospital, Savar.

MATERIALS AND METHODS

This retrospective study was conducted Enam Medical College Hospital, Savar from January 2018 to december 2018. The study was conducted after approval from the ethical review committee of Enam Medical College. For this total 100 patients presenting with breast lump who were advised for FNAC were included in this study. FNAC was performed with 21 gauge needle asper the standard guideline. Five smear were made and stained with Papstain asper the standard guidelines. Smears were also categorized into neoplastic and non-neoplastic lesions and neoplastic lesions were further categorized into benign and malignant lesions.

Number of benign and malignant lesions invarious age groups was also observed. All data were inserted into SPSS 17 software and were analysed.

RESULTS

The most common age group affected in our study was 31- 40 years. Table I show detailed age distribution of neoplastic and non -neoplastic lesions among 100 cases. Among 100 cases 70 cases were neoplastic and 30 cases were non-neoplastic. Among the nelolastic lesion most of the cases were malignant 50and 20 cases were benign. Most of the malignant lesion was in41-50 years agegroup. Among non-neoplastic lesion most of the cases were in the age group 31-40 years.

Table I Distribution of Neoplastic and Non neoplastic cases according to age (n=100)

Age (Years)	Non-neoplastic lesions (n=30)	Neoplastic lesion (n=70)	
		Benign	Malignant
0-10	0	0	0
11-20	1	1	0
21-30	10	15	7
31-40	13	4	14
41-50	6	0	16
51-60	0	0	8
61-70	0	0	4
71-80	0	0	1
Total(n=100)	30	20	50

Among the clinical features 100% cases presented with the breast lump. Among neoplastic cases most of the malignant 42% cases presented with hard lump and 23% cases presented with mobile lump. Among neoplastic lesion 15 cases presented with nipple retraction and 5 cases presented with axillary lymphadenopathy. Among non-neoplastic lesion most of the cases 35% presented with mobile lump, 22% cases presented with pain, 8% cases presented with nipple discharge. Table II showed detailed signs and symptoms of 100 cases.

Table II Distribution of neoplastic and non-neoplastic lesion according to sign and symptom in 100 cases

Sign and symptom	Non-neoplastic	Neoplastic
Lump	30	70
Pain	22	8
Hard lump	0	42
Mobilelump	35	23
Nipple discharge	8	0
Nipple retraction	0	15
Fever	8	5
Axillary lympadenopathy	0	5

According to FNAC category different neoplastic and non-neoplastic lesion were identityfied. Non-neoplastic lesions accounted for (30%) and neoplastic lesions consisted of (70%). The prevalence of various non-neoplastic and neoplastic categories is shown in Table III and Table IV respectively. Non-neoplastic cases observed in this study were chronic non-specific mastitis (n=3) chronic granulomatous mastitis (n=4) fat necrosis (n=1) mammary duct ectasia (n=1) fibrocystic change (n=6) proliferative breast lesion without atypia (n=10) proliferative breast lesion with atypia (n=5). Among non-neoplastic lesion most 33.33% cases was proliferative breast lesion without atypia.

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Table III Distribution of FNAC pattern among non-neoplastic lesion (n=30)

FNAC diagnosis	No of cases	Percentage (%)
Chronic nonspecific mastitis	3	10%
Chronic Granulomatous mastitis	4	13.33%
Fat necrosis	1	3.3%
Mammary duct ectasia	1	3.3%
Fibrocystic change	6	20%
Proliferative breast lesion without atypia	10	33.33%
Proliferative breast lesion with atypia	5	16.67%
Total	30	100%

Similarly the neoplastic cases observed in this study were fibroadenoma (n=20) ductal carcinoma (n=45) ductal carcinoma with lymphnode metastasis (n=5). Among neoplastic lesion the most common lesion was ductal carcinoma, 50 (71.43%).

Table IV Distribution of FNAC diagonosis among neoplastic lesion (n=70)

FNAC diagnosis	No of case	Percentage (%)
Fibroadenoma	20	28.57%
Ductal carcinoma	45	64.29%
Ductal carcinoma with lymph node metastsis	5	7.14%
Total	70	100%

DISCUSSION

Lump in the breast can be benign and malignant. Different studies have shown that the most common lesions are benign and needs only reassurance.[10,11] Therefore early diagnosis of breast lesions and categorization into different groups of breast pathology is important. This can be helpful in accurate management of breast cancer patients. Thereby, to prevent patient discomfort and anxiety.[12] Breast lump is a common clinical presentation for which a cytological study is often sought. It is a necessary diagnostic tool and adjunct to the clinical examination. Cytological (FNAC) study has further many advantages including easiness, cost effectiveness and accuracy.[13,14] In our study breast lump as a clinical presentation was found in 100 cases. Similar observations were made by other authers.[11,15,16] In our study most (70%) of the breast lumps were neoplastic in origin which was similar to the other study.[14] In present study among benign lesion fibroadenoma is the commonest benign lesion. Majority of the patients of fibroadenoma in our study were in the 2nd and 3rd decade of their life. This result was consistent with others who observed that fibroadenoma occurs before the age of 25. Inflammatory lesions in our study were 15. Several studies also found similar findings.[17] Chronic granulomatous mastitis in our study were 4 which was in accordance with other studies.[17,18] Ductal carcinoma was the most common type of malignant breast lesion (50/70 cases, 71.43%) which was also found by others.[11,19] Many study also reported that ductal carcinoma is the commonest breast malignancy and found in the age group of 41-60 years of age.[11,16,19] The present study shows similar findings, the ductal carcinoma being the most common breast malignancy in the age group of 41-50 year of age. Regarding clinical features all the patients presented with lump in the breast. Among neoplastic lesion most 42 cases presented with hard lump and 15 cases presented with nipple retraction. Nipple discharge was observed in 8 cases of chronic nonspecific mastitis and mammary duct ectasia. Axillary lymphadenopathy was observed in 5 patients who were subsequently diagnosed as ductal carcinoma with lymphnode metastasis on FNAC. Similar findings were correlate by others.[15] This study has highlighted the several potential benefits of the breast FNAC. Due to its feasibility, FNAC has become the first diagnostic tool in the investigation of a breast lump. Success of FNAC is contingent upon several important contributing factors like aspirator's experience, skillful cytological interpretation and a rational analysis based upon correlation of cytological and clinical information of the patient.

LIMITATION

As the study was conducted in only one institution, results might not represent the whole community.

CONCLUSION

From this study it can be concluded that FNAC is a simple and reliable method for diagnosis of both benign and malignant lesions of breast. Though it cannot categorize the lesion in some cases but it can rule out rnalignancy in most of the cases. Sometimes further histopathological study is needed to confirm the accuracy of FNAC in the diagnosis of breast lesion.

RECOMMENDATION

More study should be conducted with large sample size with longer follow up to find out the actual scenario regarding this issue of the country.

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DISCLOSURE

All the authors declared no competing interest.

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Original Article

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Effects of Temperature on the Procedural Times and Gross Morphology of Selected Goat Muscular Organ (Tongue) in Silicone (S10) Plastination

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ABSTRACT

Background: Using plastinated specimens for studying gross anatomy in modern times is encouraged due to availability of plastination procedures. Both cold and room temperature plastination procedures produce good quality specimens however room temperature ensures low cost at short time. So the present study was aimed at determining relative efficacy of room temperature method compared to cold temperature method regarding silicone (S10) plastination of selected goat muscular organ- tongues in terms of the procedural times (Dehydration time, forced impregnation time, gas-curing time) and gross morphological changes.

Materials and methods: This experimental study was carried out in the Department of Anatomy, Bangabandhu Sheikh Mujib Medical University, Dhaka, from 2016 to 2017. A total of twenty four (24) goat muscular organ-tongues were collected for both groups. After fixation, all steps of plastination of two groups were done at room temperature and cold temperature respectively. The dehydration time forced impregnation time and gas-curing time were recorded in two temperature groups. The percentages of gross shrinkages by specific distances and by volume were calculated for different stages of plastination in two groups. Hypothesis testing was done for detecting any differences in these variables in room temperature group from cold temperature group by Mann-Whitney U test.

Results: Dehydration and gas-curing time was shorter in room temperature group (18 days) than in cold temperature group (26 days). However, forced impregnation time was same for both groups (21 days) and gas-curing time was further shorter (13 days) in room temperature group than in cold temperature group (17 days). During three stages of plastination- dehydration, impregnation and curing, in muscular organ-tongues, most of the median values of percentages of shrinkage by distance between two points showed a tendency of lower value at room temperature groupthan cold temperature group. Regarding shrinkage by volume, most of them showed a similar trend withlittle statistical significance was found in some values.

Conclusion: Considering potentials of room temperature method as cost-effective substitute of cold temperature method of S10 plastination and further studies are recommended using larger samples.

KEY WORDS

Cold Temperature; Morphology; Plastination; Procedural times.

INTRODUCTION

Anatomy is one of the integral basic subjects of medical science. The viscera and other specimens and cadavers need preservation because after death, biological tissues decomposition is occurred by autolysis or putrefaction.[1] Anatomy museums and in or dissection halls, specimens are usually preserved in jars containing formalin. Whole body embalming is also done with formalin. Fomalinated specimens are wet and cannot be handled without gloves. Students, dissection assistants and taxidermists involved in handling or maintaining these preserved specimens dislike formalin wet specimens due to their wetness and pungent odor. Keeping these in mind, many countries of the world are currently using the modern method for viscera/dead body preservation known which as "Plastination" for teaching learning purpose developed by Dr. Gunther von hagen in Heildelberg, Germany, in 1977.[2] It is a method for preserving dead bodies and specimens in a permanent way without any health hazard like carcinogenicity and contact dermatitis.[3] In this process,

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water and lipids in biological tissues are replaced by curable polymers. Thus, anatomical specimens are preserved by impregnation with these polymers which is subsequently hardened.[4] By this technique it is possible for us to treat every part of the body and tissues to preserve it for educational purposes.[5] A study mentioned that plastination preserves biological tissues with completely visible surface and high durability.[6]
Researchers have observed the effects of temperature on dehydration time and forced impregnation time.[7] Some have observed effects of dehydration medium on dehydration time and shrinkage of specimens.[8] Still others have compared forced impregnation and curing times.[9] The S10 procedure at cold temperature developed by Gunther von Hagen has been popular among many workers. Still, room temperature methods have been preferred by others. As Bangladesh is a tropical monsoon country and temperature ranges from 5°C to 22°C so room temperature procedure would be beneficial for us considering itsshort duration and cost effectiveness.[10] Though cold temperature plastination method is said to produce good quality specimens but it requires temperature between -18°C to –21°C which can be achieved by refrigerator. If good quality plastinates can be produced at room temperature, then cost will be reduced to some extent because maintenance of cold temperature is expensive. Dehydration at room temperature avoids buying of an explosion proof deep freezer or rebuilding a commercial freezer for safety by removing motor and compressor.[11] Assessing the effects of temperature on selected goat muscular organ-tongue have not been used before in Bangladesh climate. So this study aimed to determine the relative efficacy of room temperature method compared to cold temperature method of silicone (S10) plastination of selected muscular goat organ-tongues in terms of the procedural times (Dehydration time, forced impregnation time and gas-curing time) and gross morphological changes.

MATERIALS AND METHODS

This was an experimental study carried out in the Department of Anatomy, Bangabandhu Sheikh Mujib Medical University, Dhaka, during the period of September 2016 to August 2017. After collection, washing and numbering of specimens were done. In the present study, two groups of organs were used (Room temperature group and cold temperature group). Twelve (12) muscular organs (Tongues) were taken for each temperature group. Besides, experimental studies similar to the present one has used sample sizes like six (6) hearts for a cold temperature group and six (6) for a room temperature group.[9] As in the present study, muscular organs (Tongues) for each temperature group were either kept whole (6 tongues) or were sectioned longitudinally (3 tongues) into two (2) pieces each or transversely (3 tongues) into three (3) pieces each, the total numbers of tongue specimens of different types (Whole, longitudinally sectioned and transversely sectioned) for the two groups were 12, 12 and 18 respectively. But for the present study, as the animals had already been sacrificed for human consumption, there was no question of wastage of animal resource. It was very important to note that for the present study, both whole and sectioned organ pieces were considered as individual sampling units. Each of these units was numbered with a metallic tag.
Fixation of all specimens was done on 10% formalin solution for 7 days in a covered plastic bucket. Then rinsing them overnight to remove excess formalin. Prepared the specimens by taking necessary measurements for room temperature group (20 C to 28 C) and cold temperature group (-19 C to -23 C). Dehydration and defatting at room temperature (20 C to 28 C) were done. Precooling at 5 C for 12 hours for cold temperature group (-19 C to -23 C). Dehydration at cold temperature (-19 C to -23 C) and defatting at room temperature (20 C to 28 C) were done. Measurement was taken for both temperature groups. Then forced impregnation was done for both temperature groups and measurement was taken for both temperature groups. Gas-curing was done at room temperature for both temperature groups and again measurement was taken for both temperature groups.

RESULTS

It may be recalled that for each of the procedural times (Dehydration time, forced impregnation time and gas-curing time) there was only one value for all the organs of each group (Room temperature group and Cold temperature group) because all the organs were dehydrated/impregnated/cured for the same time duration. Therefore, no statistical test was done for these three variables to assess the difference (s) between the two temperature groups.

The dehydration time was shorter (18 days against 26 days), forced impregnation time was same (21 days) and gas-curing time was shorter (13 days against 17 days) for room temperature group compared with cold temperature group (Figure 1). The overall time for dehydration, impregnation and curing was therefore, shorter for room temperature group compared with cold temperature group (52 days against 64 days). The relative proportions of dehydration forced impregnation and gas-curing times in room temperature and cold temperature groups are shown in Figure 2.

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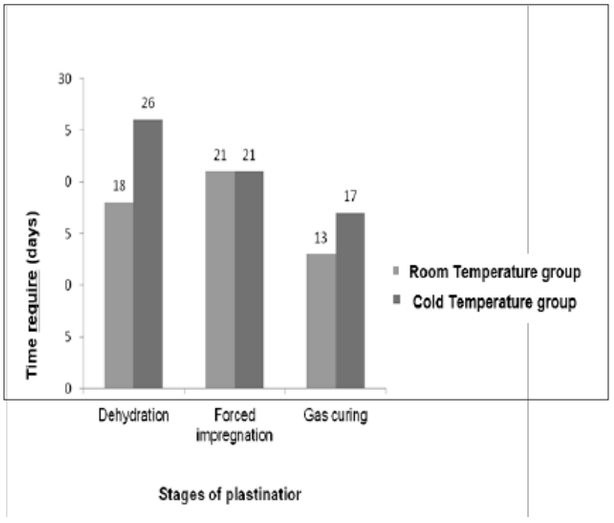

Figure 1 Procedural time i.e. dehydration time, forced impregnation time and gas-curing time in Room temperature group and Cold temperature group

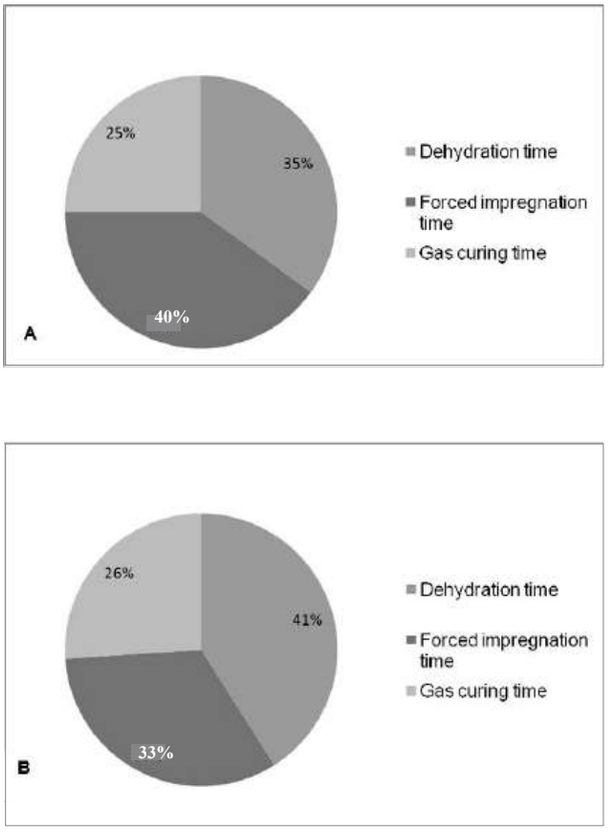

Figure 2 Relative proportions of dehydration forced impregnation and gas-curing times in room temperature and cold temperature groups

The medians of percentages of gross shrinkages along length and breadth muscular organ- tongues were lower in room temperature than in cold temperature group. However, along length and breadth, none of these differences between two temperature groups reached statistical significance. Considering thickness, the medians of percentages gross shrinkages of sectioned muscular organ (Tongue) were higher in room temperature group than in cold temperature group. However, none of these differences between two temperature groups reached statistical significance.

Although the median values of percentages of gross shrinkages along length of whole muscular (Tongue) were lower in room temperature group than in cold temperature group, but these differences between two temperature groups did not reach statistical significance (Table I). Along breadth of whole muscular organ (Tongue) was higher in room temperature group than in cold temperature group. None of these differences between the two temperature groups were statistically insignificant. Along the thickness, the medians of percentages of gross shrinkages of sectioned muscular organ (Tongue) were lower in room temperature group than in cold temperature group.

The medians of percentages of gross shrinkages along the length and breadth of whole muscular organ (Tongue) were significantly higher in room temperature group than in cold temperature, difference between two temperature groups did not reach statistical significance. But the medians of percentages of gross shrinkages along thickness of sectioned muscular organ (Tongue) were lower in room temperature group than in cold temperature group. The latter difference was statistically significant. The medians of percentages of gross shrinkages of whole muscular organ (Tongue) were lower in Room temperature group than in Cold temperature group but did not reach statistically significant. Details shown in Table 1.

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Table I Comparison between two temperature groups regarding percentage of gross shrinkage of selected goat muscular organ (Tongue) in different stages of plastination by specific distance

Stages of plastination	Percentage of gross shrinkage by specific distance along length Mean ±SD Median (25th and 75th percentile)		The value of U and significance	Percentage of gross shrinkage by specific distance along breadth Mean ±SD Median (25th and 75th percentile)		The value of U and significance
	Room temp.	Cold temp.		Room temp.	Cold temp.	
Dehydration	3.83 ± 0.37 3.81 (3.56 , 4.13)	4.68 ± 2.13 4.10 (2.73, 7.17)	17, NS	6.14± 1.11 5.99 (5.24, 7.16)	7.34 ± 0.96 7.50 (6.42, 8.07)	7, NS
Forced impregnation	7.09 ± 2.07 6.42 (5.70, 8.96)	8.48 ± 1.14 8.37 (7.39, 9.63)	9, NS	9.11 ± 1.29 9.65 (7.72, 11.22)	9.18 ± 2.41 9.07 (6.94, 10.13)	17.5, NS
Gas curing	3.84 ± .32 4.04 (3.03, 4.31)	1.81± .81 1.47 (1.32, 7.58)	0, S	9.18± 2.41 9.08 (6.94, 10.49)	8.81± 0.29 8.88 (8.5, 9.05)	12, NS
Overall	14.04 ± 2.02 13.66 (12.47, 15.43)	19.20 ± 2.24 19.69 (16.79, 20.86)	2, S	21.53 ± 4.51 19.74 (18.28, 25.68)	23.71 ± 2.83 23.64 (20.94, 26.17)	9, NS

n (number of whole organs for each type of organ for each temperature group): 6
S: Significant, NS: Non-significant.

Regarding percentage of gross shrinkage by volume, no significant difference was detected between the room temperature group and the cold temperature group either for different stages of plastination.During dehydration, the medians of percentages of gross shrinkages by volume of whole and sectioned muscular organ (Tongue) were lower in room temperature group than in cold temperature group. During gas-curing, the muscular organ (Tongue) showed higher medians of percentages of gross shrinkages by volume in the Room temperature group than in the Cold temperature group (Table 2).The percentage for the whole muscular organ (Tongue) was non-significantly higher in the Room temperature than in the Cold temperature group.

Table II Comparison between the two temperature groups regarding percentage of gross shrinkage of selected goat muscular organ- tongue in different stages of plastination by volume

Stage of plastination	n (no. of pieces)	Percentage of gross shrinkage by volume Mean ±SD Median (25th and 75th percentile) Room temperature	Cold temperature	The value of U and significance
Dehydration	Whole tongue-6	8.98 ± 4.07 7.47 (5.81, 13.35)	10.68 ± 1.81 10.66 (9.07, 12.38)	12, NS*
	Sectioned tongue-12	12.49 ± 5.41 11.11 (8.33, 21.43)	14.94 ± 8.00 13.33 (7.41, 14.29)	100, NS
Forced impregnation	Whole tongue-6	9.17± 3.41 8.10 (6.50, 11.66)	9.35 ± 1.52 8.92 (8.05, 10.72)	14, NS
	Sectioned tongue-12	14.86 ± 6.52 12.50 (10. 34, 20.00)	16.04 ± 5.20 16 (14.29, 20.00)	20.5, NS
Gas curing	Whole tongue-6	8.16 ± 0.83 8.16 (7.53, 14.19)	9.81± 6.48 7.82 (5.21, 8.84)	17, NS
	Sectioned tongue-12	8.30± 3.08 8.01(7.21, 42.86)	8.60± 6.99 5.57(4.55, 40)	102, NS
Overall	Whole tongue-6	25.29 ± 8.76 25.87(16.51, 33.70)	25.67± .95 25.75 (24.82, 26.45)	18, NS
Sectioned tongue-12	31.39 ± 10.31	25.67± .95 28.57(10.31, 42.86)	95, NS 25.75 (24.82, 26.45)	

* NS: Non-significant.

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DISCUSSION

The present study was done with a view to contributing to the utility of S10 plastination method by determining whether the low-cost room temperature plastination method can be considered better than cold temperature method regarding three procedural times and some morphological changes that may occur during each of three stages of plastination or during three stages combined.

Out of 16 median values of percentages of gross shrinkage by volume of whole and sectioned muscular organ (Tongue) during dehydration, forced impregnation, gas curing stages of plastination and overall changes, 8 were lower in the room temperature group than in the cold temperature group. In the present study, specimens were fixed in 10% formalin and measurements could not take at fresh stage, because dissection of twelve head to bring out tongue took more than 6 hours. Keeping specimens preserved during such a long time without fixative was a problem. Streber et al. used 10% buffered formalin to produce rat model in his study.[12]

In the present study, dehydration time was shorter (18 days against 26 days) for room temperature group compared with cold temperature group. Tianzhong et al. also observed that dehydration at room temperature was faster at room temperature than at cold temperature which was similar like ours. They took 21 to 35 days to dehydrate the heart, liver, muscle, trachea, brain, kidney and joints at room temperature and observed that the dehydration time for room temperature acetone dehydration was quicker than for cold temperature acetoneand took 5 days to dehydrate in 100% acetone bath at room temperature.[7] Chandel et al. took 3 weeks for dehydration in their study.[13] Raoof et al. used cold (-25°C) acetone to dehydrate bovine heart, camel liver, bovine uterus and kidney in DowTM Corcoran technique, here dehydration and defatting time was 30 days like Dejong et al. who plastinate human heart, lung and intestine and boa constrictor and jelly fish at Biodur cold temperature technique.[14,15] Sajjarengpong et al. dehydrated canine body sheet at -25°C acetone (100%) for 3 days.[16] Ezhilarasan et al. dehydrated a whole human body to plastinate at room temperature by 98-99% pure acetone for three months.[17] Brown, Reed et al. in their study used 1:10 volume 3 baths of 100% acetone to dehydrate bovine heart, bovine kidney and bovine liver, cat kidney, porcine kidney and heart at both room temperature and cold temperature and found that room temperature dehydration was quicker than cold temperature dehydration.[8] Ottone et al. took 14 days to dehydrate rat at room temperature with acetone (90%-100%).[2] Ahmed also worked with pig heart and goat liver for both cold and room temperature plastination. Her dehydration time was 26 days for cold temperature that was very similar to the present study. But her dehydration time was 21 days in room temperature.[18] Tiedemann et al. dehydrated the larynx, trachea, bladder and rectum with graded series of acetone that took 24 days.[19]

In the present study the forced impregnation time was same for both temperature groups. Tiedemann et al. mentioned that longer period of impregnation time was considered necessary to prevent major shrinkage which was dissimilar like ours.[19] Gordin mentioned that the impregnation time was 3 to 4 weeks in his study.[11] Ahmed took 22 days for forced impregnation at cold temperature procedure.[18] Like Akhter and Ahmed the forced impregnation process was continuous in the present study.[20]

In the present study, the gas curing time was thirteen (13) days for the Room temperature group and seventeen days (17) for the Cold temperature group. Akhter determined the gas-curing time and used Biodur S6, where the times of both temperature groups was very similar to those of the present study.[20]Ameko et al. mentioned that curing time required 14 days for room temperature plastination of fish. In another study Ameko et al. mentioned the same curing time was 2 weeks required for plastination of rat at room temperature.[21] Ottone et al. took 7 days to cure rat at room temperature.[2]

In the present study, graded series (80%, 90%, 95% and 100%) of acetone was used at 1:5 ratios as a dehydrating agent for dehydration of goat organs-tongue both at room temperature and at cold temperature. Akhter plastinated pig kidney as firmer organ and pig lung as softer organ at both room temperature and cold temperature. In her study she used four baths of acetone (83%, 95%, 100% and 100%) both at room temperature and at cold temperature at 1:5 ratios.[20] Ahmed also used four baths of acetone (83%, 95%, and 100%) for dehydration both at room temperature and cold temperature at 1:5 ratios.[18] Dejong mentioned that dehydration at -25°C decreases shrinkages because water in the specimen freezes and stabilized the form, structure and size of the specimen.[15] During dehydration in the present study, the mean percentages of gross shrinkages by specific distance were lower in the Room temperature group than in the Cold temperature group (Along the length, breath and the thickness) of the muscular organ (Tongue). But the differences between the two temperature groups were not statistically significant.

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Ahmed observed that the mean percentage of gross shrinkage by specific distance of pig heart was lower in the room temperature group than in the Cold temperature group, but this difference did not reach statistical significance.[18]

During impregnation in the present study, the mean percentages of gross shrinkages by specific distance (Along the length, breadth and thickness of the whole and sectioned muscular organs were lower in the room temperature group than in the cold temperature group. Ahmed also found lower values in the pig heart and goat liver in the room temperature group significantly so in the heart.[18] Akhter however, found lower means for the pig kidney and a higher mean for the pig lung in the room temperature group, none of these difference reaching the significant level.[20]Ameko et al. used a liquid silicone polymer bath consisting of 40% (w/v) silicone (ST 368 brand) in xylene in a Mikachi refrigerator for the forced impregnation process. The percentage of shrinkage was 0.93% for the heart, 1.22% for length of the ram's trachea was lower than the mean of the muscular organ (Tongue).[21]

During impregnation in the present study the mean percentages of gross shrinkage by volume of the whole and sectioned muscular (Tongue) were lower in the room temperature group than in the cold temperature group. However the differences between two temperature groups did not reach any statistical significant level. Ahmed observed a significantly lower value for the pig heart but a significantly higher value for the goat liver in the room temperature group.[18] During gas curing in the present study, the mean percentages of gross shrinkages by distance of the whole and sectioned muscular organs (Tongue) were higher in the room temperature group than in the cold temperature group, but only the muscular organ showed this significantly by length. Ahmed observed that the mean percentage of gross shrinkage by the distance of the pig heart and goat liver were lower in the Room temperature group than in the cold temperature group.[18] The difference was significant for the heart. Regarding the gas-curing stage of plastination in the present study, the mean percentages of gross shrinkage by volume of the whole and sectioned muscular organ (Tongue) were higher in the room temperature group than in the cold temperature group. None of these differences were statistically significant, however Ahmed found significantly lower percentages in the pig heart and goat liver in the room temperature group.[18]

LIMITATIONS

The following limitations were identified in the present study.

- The dehydration time, forced impregnation time and gas-curing time had to be measured only once for each group (Not measuring them separately for each: organ or its piece). Thus, no statistical analysis could be done regarding the time differences between the cold and room temperature procedures.
- No measurements could be taken for determining the effect of fixation because the dissection and preparation for measurements took much time, and the specimens could not be kept in normal saline such a long time, and had to be fixed.
- The sample size was small and this was mostly due to the limitations with the size of the containers that had to be used for different stages of plastination. Additionally, there was cost constraint. No formal sample size determination was done. A formal one would have increased the strength of the study. However, the adequacy of the size has been discussed in the Methods chapter.
- Randomization regarding group selection could not be done as the two temperature groups had to be plastinated in separate times. This was because there was only one set of instruments available.
- The measurements had to be done taking the organs out from the dehydrating and impregnating fluid. As the measurements took some time, exposure to air during the process of measurement might have some impact on the morphology of the specimens.
- For dehydration, previously used acetone, rather than fresh acetone, was utilised for the first bath (80% at 20^0 C), second bath (90% at 20^0 C) and third bath (95%) of the five acetone baths. However, such use of 'used acetone' is a usual trend in plastination.

CONCLUSION

Overview of the finding of the present study regarding comparisons of morphological changes between room temperature and cold temperature groups of muscular organ (Tongue). This overview looks at the changes in morphology of muscular organs in the two temperature groups. Both statistically significant as well as non-significant findings have been shown in term of median values. The percentage of shrinkage by distanceand by volume, the predominant tendency of all the organs was towards lower values in the room temperature group compared to the cold temperature group, the differences do not reach statistical significance.

RECOMMENDATION

The results of this study would help to deal with these issues so that room temperature silicone plastination method can be evaluated as a probable alternative for cold temperature method for producing good quality plastinates that can be used as important teaching-learning tools in medical, biological and veterinary sciences in Bangladesh and other less affluent countries.

DISCLOSURE

All the authors declared no competing interest.

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Original Article

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Changes of Endothelial Cell Count After Phacoemulsification: A Comparison Between Diabetic and Non-Diabetic Patients

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ABSTRACT

Background: Roughly 75% of blindness can be prevented due to cataracts, which are the leading cause of blindness. The main technique for treating cataracts that affects corneal Endothelium is phacoemulsification. The present study was aimed to compare change of endothelial cell count after phacoemulsification with Posterior Chamber Intraocular Lens (PCIOL) implantation in diabetic and non-diabetic patients.

Materials and methods: This prospective observational study was conducted during the period from March 2018 to February 2020, at the National Institute of Ophthalmology and Hospital in Dhaka, 104 patients who were purposefully selected and scheduled for phacoemulsification cataract surgery participated in a prospective observational study.

Results: A total 104 eyes of 104 patients were studied. Among them 51 patient was in Dibetic group A and 53 patient was in non diabetic group B. Maximum patients were from 54-63 years age group.The mean ages of the patient were 55.75 ±3.12 and in diabetic group A and 56.06 ±3.09 years in non diabetic group B. In Diabetic group 36(50.7%) patients were male while in non diabetic group 35(49.3%) patients were male.Endothelial cell count is decreased in diabetic group from [(2730.69 ±106.52 to 2582.14±108.74)=148.55±61.53] whereas in non diabetic group endothelial cell count decreased only 69.64±30.26(from2702.13±134.79 to 2632.49±132.83)

Conclusion: The endothelial cell count is significantly decreased in dibetic patients compared to non dibetic patients after phacoemulsification with PCIOL implantation.

KEY WORDS
Cataract; Diabetes mellitus; Endothelial cell count; Intraocular lens; Phacoemulsification.

INTRODUCTION

Cataract or opacification of the lens, accounts for around 75% of blindness and is the primary cause of preventable blindness, particularly in poor nations.[1] In the industrialized world, the most common technique for doing cataract surgery is phacoemulsification. This strategy is becoming more and more popular every day, even in underdeveloped nations.

Diabetes can cause diseases in a variety of tissues that make up the eye's structure.[2] According to reports, patients with diabetes have a five times higher risk of developing cataracts.[3] The frequency of diabetic cataracts has increased along with the prevalence of diabetes.

The endothelium's hexagonal cells have a limited capacity for mitosis and are in charge of actively eliminating water from the cornea, any disruption in endothelial homeostasis may have a significant impact on the cornea's clarity.[4] Numerous investigations have shown that diabetic people are more susceptible to intraocular surgical stress that can damage the cornea. This condition most likely results from long-term cellular metabolic alterations that mainly appear to impact the corneal endothelial cells' monolayer.[5]

The structure and function of the corneal endothelium and epithelium are altered by diabetes mellitus. It can result in endothelium polymegathism, epithelial

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polymorphism and morphological alterations in epithelial cells, as well as surface microvilli stunting. Diabetes patients have been shown to have larger corneas, higher endothelial polymegathism and pleomorphism, and variations in the mean cell area. Despite having a normal endothelial count, they may also have a poor endothelial reserve, which increases the endothelium's susceptibility to stress-related damage like ocular operations.[6]

One of the most popular surgical operations performed on the general public is cataract extraction and the annual number of cataract surgeries is rising.

The results of cataract surgery have improved due to recent technological developments. Numerous studies have documented the outcomes and problems of cataract surgery in individuals with diabetes, however the exact extent of improvement remains debatable.[7] Diabetes patients are more susceptible to problems following cataract surgery, including corneal decompensation and pseudophakic bullous keratopathy, as they lose almost five times as many endothelial cells in a single second compared to non-diabetics.[8]

When assessing the safety of surgical techniques, endothelial alterations and variations in central corneal thickness are essential indicators of surgical damage. In order to examine the changes in endothelial cell count in patients with and without diabetes following Phacoemulsification and Posterior Chamber Intraocular Lens (PCIOL) implantation, the current study was designed.

MATERIALS AND METHODS

This prospective observational study was carried out at the National Institute of Ophthalmology and Hospital in Dhaka, Bangladesh, between March 2018 and February 2020. The Institutional Review Board (IRB) of the National Institute of Ophthalmology and Hospital in Dhaka provided ethical clearance.

The study population consisted of patients who were scheduled for phacoemulsification cataract surgery at the National Institute of Ophthalmology and Hospital in Dhaka, Bangladesh.

In this study, 104 eyes from 104 patients slated for phacoemulsification cataract surgery at the National Institute of Ophthalmology and Hospital in Dhaka were examined. Two groups were assigned to the patients.

Group A: Included in this group were 51 diabetic patients. Group B: This group consisted of 53 patients who were not diabetics.

Every patient underwent a retinal evaluation with a slit lamp, and measurements of Intraocular Pressure (IOP) and best-corrected visual acuity were taken. A non-contact specular microscope was used to analyze the endothelial cell count (Cells mm^2) the variation in endothelial cell size (CV) and the percentage of hexagonal cells.

RESULTS

Table I Comparison of patients by age (n=104)

Age (In years)	Group A f (%)	Group B f (%)	p value
44-53	7 (13.7)	12 (22.6)	
54-63	44 (86.3)	40 (75.5)	0.610^{ns}
64 and above	0 (0.0)	1 (1.9)	
Total	51 (100.0)	53 (100.0)	
Mean ±SD	55.75 ±3.12	56.06 ±3.09	

ns= non-significant, p value obtained by unpaired t test.

The above table demonstrates that 40 (75.5%) of group B's patients were in the 54–63 age range, whereas 44 (86.3%) of group A's patients belonged to that age group. The patients in groups A and B had mean ages of 55.75 ±3.12 and 56.06 ±3.09 years, respectively. The results of the independent sample t test indicated that there was no statistically significant difference in age between the groups (p=0.610).

Table II Comparison of patients by endothelial cell count (n=104)

	Endothelial cell count (cells/ mm^2)		
	Preoperative	Postoperative	Difference
Group A (n=51)	2730.69 ±106.52	2582.14 ±108.74	148.55 ±61.53
Group B(n=53)	2702.13 ±134.79	2632.49 ±132.83	69.64 ±30.26
p value	0.235^{ns}	0.037^{s}	$<0.001^{s}$

ns= non-significant, s=significant, p value obtained by unpaired t test.

Above table shows that in group A, the mean preoperative endothelial cell count of the patients was 2730.69 ±106.52 cells/ mm^2 while in group B, the mean preoperative endothelial cell count of the patients was 2702.13 ±134.79 cells/ mm^2. Independent sample t test showed that there was no significant statistical difference between the groups regarding preoperative endothelial cell count (p=0.235). Postoperatively, in group A, the mean endothelial cell count of the patients was 2582.14 ±108.74 cells/ mm^2 while in group B, the mean endothelial cell count of the patients was 2632.49 ±132.49 cells/ mm^2. Independent sample t test showed that there was significant statistical difference between the groups regarding postoperative endothelial cell count (p=0.037). In group A, the mean difference between preoperative and postoperative endothelial cell count of the patients was 148.55 ±61.53 cells/ mm^2

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while in group B, the mean difference between preoperative and postoperative endothelial cell count of the patients was 69.64 ±30.26 cells/ mm^2. Independent sample t test showed that there was highly significant statistical difference between the groups regarding difference between preoperative and postoperative endothelial cell count ($p<0.001$).

Table III Comparison of patients by coefficient of variation (CV) (n=104)

	Coefficient of variation (CV)		
	Preoperative	Postoperative	Difference
Group A (n=51)	30.92 ±3.20	34.51 ±1.98	-3.59 ±3.51
Group B(n=53)	31.28 ±4.54	34.83 ±2.65	-3.55 ±5.08
p value	0.642^{ns}	0.489^{ns}	0.962^{ns}

ns= non-significant, p value obtained by unpaired t test.

Above table shows that in group A, the mean preoperative coefficient of variation (CV) of the patients was 30.92 ±3.20 while in group B, the mean preoperative CV of the patients was 31.28 ±4.54. Independent sample t test showed that there was no significant statistical difference between the groups regarding preoperative CV (p=0.642). Postoperatively, in group A, the mean CV of the patients was 34.51 ±1.98 while in group B, the mean CV of the patients was 34.83 ±2.65. Independent sample t test showed that there was no significant statistical difference between the groups regarding postoperative CV (p=0.489). In group A, the mean difference between preoperative and postoperative CV of the patients was -3.59 ±3.51 while in group B, the mean difference between preoperative and postoperative CV of the patients was -3.55 ±5.08. Independent sample t test showed that there was no significant statistical difference between the groups regarding difference between preoperative and postoperative CV.

Table IV Comparison of patients by hexagonal cell (n=104)

	Hexagonal cell(in percentage)		
	Preoperative	Postoperative	Difference
Group A (n=51)	66.76 ±2.14	52.49 ±1.85	14.27 ±2.36
Group B(n=53)	67.85 ±3.54	62.83 ±4.37	5.02 ±4.89
P value	0.061^{ns}	0.001^{s}	0.001^{s}

ns= non-significant, s=significant, p value obtained by unpaired t test.

Above table shows that in group A, the mean preoperative hexagonal cell percentage of the patients was 66.76 ±2.14 % while in group B, the mean was 67.85 ±3.54 %. Independent sample 't' test showed that there was no significant statistical difference between the groups regarding preoperative hexagonal cell percentage (p=0.061). Postoperatively, in group A, the mean hexagonal cell percentage of the patients was 52.49 ±1.85% while in group B, the mean was 62.83 ±4.37%. Independent sample 't' test showed that there was significant statistical difference between the groups regarding postoperative hexagonal cell percentage ($p<0.001$). In group A, the mean difference between preoperative and postoperative hexagonal cell percentage of the patients was 14.27 ±2.36%while in group B, the mean difference between preoperative and postoperative hexagonal cell percentage of the patients was 5.02 ±4.89. Independent sample t test showed that there was significant statistical difference between the groups regarding difference between preoperative and postoperative hexagonal cell percentage ($p<0.001$).

DISCUSSION

Changes in the structure and function of the corneal endothelium and epithelium are frequently observed in patients with diabetes mellitus. It has been observed that diabetic patients' corneas are thicker. Despite having a normal endothelial count, they may also have a poor endothelial reserve, which increases the endothelium's susceptibility to stress-related damage like ocular operations.[6] The goal of the current study was to assess the endothelial cell count and central corneal thickness in people with and without diabetes. In this prospective observational study, 104 patients who had phacoemulsification cataract surgery participated. These individuals were divided into two groups at random: 51 patients with diabetes and 53 patients without it.

According to the study's findings, the bulk of the patients in both groups were between the ages of 54 and 63. With regard to patient age, there was no discernible difference between the groups; the average patient age was over 55. In addition to examining the variations in corneal endothelium between patients with and without diabetes prior to and during phacoemulsification with intraocular lens implantation, Al-Sharkawy discovered that the patients' mean age was 59[9]. which was similar to the findings of the current investigation.

Males made up the majority of the study's patients. In their investigation, Jahangir et al. discovered a majority of men.[10]

Between the groups, there was no statistically significant variation in preoperative or postoperative BCVA. Regarding preoperative BCVA, Saliem similarly discovered no statistically significant difference between patients with diabetes and those

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without[5]. Hugod et al. discovered that both groups' postoperative visual acuity was comparable.[11] This suggests that patients with diabetes who had adequate glucose management did not have a decreased ability to see.

Numerous investigations have revealed anomalies in the cornea that may include increased endothelial permeability, decreased corneal cell density, and larger corneal thickness in diabetes patients. Diabetes is considered to produce alterations in the morphology and function of the diabetic cornea by inhibiting the activity of the corneal endothelium's Na+ – K+ ATPase.[12] .According to the current investigation, there was no statistically significant variation in the preoperative endothelial cell count between the groups. This could be because most diabetes patients had been under control of their blood sugar levels for less than ten years, and their glycemic status was under control. However, a notable difference was noted after surgery. In comparison to non-diabetic patients, the diabetes patients' mean difference between preoperative and postoperative endothelial cell counts was significantly higher, suggesting that the diabetic patients had experienced a greater degree of cell loss. Hugod et al. reported a similar outcome, noting that there was no preoperative difference between patients with diabetes and those without, but that there was a substantial difference after surgery.[11] This outcome was in line with Saliem and Sahu et al. findings.[5,13] But there were also differences in the outcomes. Al-Sharkawy discovered no differences in endothelial cell count between patients with diabetes and those without the disease, either before or after surgery.[9]

The reduction in cell density is indicative of the actual surgical trauma, while the morphological alteration is more directly linked to the healing process. A short-term increase in cell size and a fall in the percentage of hexagonal cells are indicative of the rapid response of the remaining cells to a loss of endothelial cells, which is to grow and slide in an attempt to cover the posterior corneal surface completely. Following a period of rearrangement, the CV and hexagonality go toward the preoperative status when the endothelium stabilizes. Diabetes causes a delay in or reduction in this healing process.[11]

The homogeneity of endothelial cell size is shown by the Coefficient of Variation (CV). Elevated values signify elevated pleomorphism levels. It shows that the endothelium's healing and repair mechanisms are active following an injury.[13] There was no discernible variance in the groups' Coefficient of Variation (CV). Results from several investigations varied. Hugod et al. discovered no discernible variation between the groups pre- and post-surgery.[11] Non-significant results were also reported by Saliem.[5] Al-Sharkawy discovered a substantial difference in CV after surgery, but no difference in preoperative risk between patients with and without diabetes.[9] According to Sahu et al. there was a notable difference in the amount of change exhibited by the diabetic group and the nondiabetic group.[13]

LIMITATIONS

While the study was being planned and carried out, certain limitations were noticed. The study had the following limitations:

- It was not possible to do a long-term follow-up.
- Purposive sampling was used to choose the population and study site, which could lead to selection bias.
- Because the study was limited to a single institution, its findings may not be representative of the general public.

CONCLUSION

It could be concluded that The endothelial cell count is significantly decreased in dibetic patients compared to non dibetic patients after phacoemulsification with PCIOL implantation.

RECOMMENDATIONS

The endothelium in diabetic patients is less capable of repairing itself after surgery and is more susceptible to surgical stress, even in the presence of normal corneal function and appropriate glycemic management. Patients with diabetes should take these findings into account when scheduling cataract surgery.

DISCLOSURE

All the authors declared no competing interest.

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Review Article

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The Influence of Yoga and Lifestyle Choices on Heart Disease

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ABSTRACT

Background: This article examines cardiovascular risk factors and introduces a comprehensive yoga-based intervention aimed at improving heart health. Research indicates that lifestyle modifications and yoga can have a beneficial effect on heart disease, stress, inflammation, vagal tone and overall physiological balance. The Cardiac Medical Yoga Lifestyle Change program, along with the five-point model for heart health (BREAD), offers heart patients a holistic approach to managing their condition and equips them with essential strategies and skills for lifestyle transformation.

Methodology : This review to published studies and articles by using PubMed and Google. Search strategy using appropriate key words and title.

Conclusion : The influence of Yoga based programs are cost-effective and complement conventional care, integrating smoothly into existing cardiac Rehab programs.

KEY WORDS
Cardiovascular disease; Lifestyle; Risk factor; Yoga.

INTRODUCTION

Sir William Osler (1849-1919) widely regarded as a pioneer of modern medicine, emphasized that "The good physician treats the disease, the great physician treats the patient who has the disease".[1] Osler advocated for lifestyle medicine and recognized the mind's role in disease onset and progression. This approach is particularly relevant for heart patients, as stress, personality and lifestyle significantly influence heart disease development and progression. Collaborative efforts between healthcare providers and patients to incorporate psychosocial and lifestyle interventions can lead to better treatment decisions, potentially reversing heart disease.

Key lifestyle risk factors for coronary heart disease include smoking, physical inactivity, obesity, poor diet, high blood pressure, high cholesterol, high blood sugar, diabetes and excessive alcohol consumption.[2,3] Additionally, behavioral and emotional traits such as social isolation, chronic stress, depression, anxiety and hostility can impact heart disease development and progression.[4] While medical treatments like medication and surgery are crucial for managing acute and chronic symptoms of Cardiovascular Disease (CVD) addressing lifestyle, behavioral, and psychosocial risk factors is equally important for heart patients.

Effective guidelines and strategies for reducing risk factors should consider both lifestyle factors and the autonomic nervous system's activation levels. The yogic concept of the gunas (qualities) parallels the autonomic nervous system's functions, as described by Porges' Polyvagal Theory (PVT).[5] Chronic over-activation of the rajasic quality (Sympathetic nervous system) or tamasic quality (Parasympathetic nervous system) disrupts homeostasis (Sattvic quality).[5] Over-activation of these systems can lead to the release of stress-related hormones and chemicals like cortisol and glucose. Coexisting risk factors such as smoking, stress, obesity, diabetes, dyslipidemia, and hypertension can trigger endothelial dysfunction and an inflammatory response, contributing to CVD.[6] Emotional and psychological stress can cause various coronary issues, including arrhythmias, myocardial ischemia and left ventricular contractile dysfunction. The American Heart Association endorses yoga for its benefits in lowering blood pressure, improving circulation, muscle tone, respiration and stress management.[7] Thus, the relationship between the yogic gunas and Polyvagal Theory highlights how yoga therapy can positively affect neurobiological processes, enhancing healing, self-regulation, and resilience through physical, psychological and behavioral improvements.[8] The influence of Yoga based intervention aimed at improving heart health.

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SEARCH STRATEGY

Available studies and abstract were identified through PubMed and Google Scholar (1990-2018). Key search topics were "The Influence of Yoga and Lifestyle Choices on Heart Disease" relevant articles from references lists of reviewed articles were also searched. The search term were the following key words used in combination : Cardiovascular disease; Life style; Risk factor; Yoga.

DISCUSSION

Risk Factors

Cardiovascular Disease (CVD) is a broad term encompassing various heart and circulatory system conditions, including coronary artery disease, stroke, heart attack and aortic disease. These conditions are influenced by risk factors, which can be divided into modifiable and non-modifiable categories. Modifiable risk factors involve lifestyle and behavioral choices that can be changed through diet, exercise, stress management and smoking cessation. Non-modifiable risk factors, such as family history, gender, age, and ethnicity, cannot be altered but can be managed. The likelihood of developing and worsening CVD increases with the number of risk factors present.[9] Adopting a healthy lifestyle and mitigating risk factors is essential in managing cardiovascular disease.

Non-Modifiable Risk Factors

Ethnicity and Race

Ethnicity and race significantly affect CVD risk due to factors like socioeconomic status and cultural differences in diet and lifestyle. In the U.S., even when socioeconomic factors area counted for, CVD rates differ between African Americans and Caucasian Americans. Nearly 50% of black adults have some form of cardiovascular disease, compared to about 33% of white adults. Researchers believe genetic factors might play a role, predisposing African Americans to higher blood pressure.[10] Black Americans have developed a physiological adaptation to salt sensitivity, originally beneficial in hot, dry climates like Africa. However, this salt sensitivity persists in later generations, making them more prone to sodium retention, which increases blood volume and pressure.[11] Black Americans also show higher rates of diabetes, hypercholesterolemia and hypertension, increasing their risk for diabetes and CVD.[11-13]

Family History

A family history of cardiovascular disease can indicate both genetic and lifestyle influences. If a father or brother develops CVD before age 55 or a mother or sister before age 65, this suggests a genetic predisposition.[14] Factors like family history of diabetes, high blood pressure and high cholesterol also contribute to CVD risk. While a genetic predisposition does not guarantee the development of CVD, individuals with such a history are advised to actively reduce their modifiable risk factors.

Age

Age is an independent and non-modifiable risk factor for CVD. The risk associated with aging is causal and often linked with other risk factors such as smoking, obesity and inactivity. Age-related structural changes in the arteries, including increased stiffness, contribute to higher blood pressure.[10] Aging also correlates with higher serum cholesterol levels, body mass index and diabetes prevalence. Approximately 80% of heart disease deaths occur in individuals over 65 years old.[10]

Gender Differences

There are notable gender differences in CVD prevalence and outcomes. A 2013 analysis in the U.S showed higher CVD-related female deaths compared to males. Women have higher rates of hospital discharges for heart failure and stroke, with CVD accounting for 35% of female deaths and 32% of male deaths.[15] Despite this, CVD is often perceived as more prevalent in men. Men have higher rates of living with and dying from Coronary Artery Disease (CAD) and more hospital discharges for CAD.[16] Women are generally protected from heart disease by sex hormones until menopause, after which their risk increases and aligns more closely with that of men.[16-19]

Modifiable Risk Factors

Cigarette/Tobacco Smoking

Smoking significantly harms the heart and circulatory system, making it a major risk factor for heart disease. According to the Centers for Disease Control and Prevention (CDC) smokers are 2-4 times more likely to suffer from stroke and heart disease.[20] Chemicals in tobacco, such as nicotine, cause vasoconstriction, increasing the demand for oxygen while reducing cellular oxygen supply. Nicotine also exacerbates endothelial dysfunction and systemic inflammation.[21,22] Additionally, second hand smoke elevates the risk of heart disease-related death by about 30%.[21] However, quitting smoking can significantly reduce the risk of heart disease, regardless of the duration and intensity of the smoking habit.

Quitting smoking is challenging, with only about 6% of smokers successfully quitting each year.[20] Negative effects of cessation include increased irritability,

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cravings and stress, which can lead to relapse[23] Yoga has shown promise in reducing these negative symptoms, with practices such as postures, breathing exercises and relaxation techniques helping to reduce stress and cigarette cravings, while also improving body awareness and well-being.[23]

Hypertension

Hypertension, often called the "Silent killer," can remain undetected for a long time. Normally, blood vessel walls are flexible and elastic, but constant high pressure can reduce elasticity and cause microscopic tears.[24] These tears can lead to fat and cholesterol deposits, narrowing the arteries and forcing the heart to work harder.[25] Contributing factors include obesity, high salt intake, excessive alcohol consumption, family history and physical inactivity. Sometimes, no clear cause is identifiable in individuals with hypertension. It is recommended to keep blood pressure below 120/80 mmHg.[26,27]

Cholesterol

Cholesterol is a fat (Or lipid) found in muscles, red blood cells and cell membranes. High levels of Low-Density Lipoprotein (LDL) or "Bad" cholesterol, are linked to various cardiovascular diseases. Excessive LDL leads to fatty deposits in artery walls, causing complications. LDL cholesterol, derived from dietary fats, is delivered to blood vessels and muscles where it can be deposited. While the liver produces some cholesterol, most cholesterol comes from saturated fats such as those in egg yolks, animal fats and oils. The liver can metabolize normal cholesterol levels but struggles with excess fat, leading to stored fat and cholesterol deposits in arteries. High LDL levels are often caused by unhealthy diets, smoking, physical inactivity, high alcohol intake and liver and kidney disease. To reduce LDL levels, it is recommended to exercise, eat a balanced diet and quit smoking.

High-Density Lipoprotein (HDL) or "Good" cholesterol, helps remove excess cholesterol from the body. Aerobic exercise, smoking cessation and a heart-healthy diet can positively affect HDL levels.[28] Smoking cessation, in particular, significantly improves HDL levels, especially in women.[29] Yoga has also been shown to significantly impact serum cholesterol levels, triglycerides and reduce LDL while increasing HDL.[30] A study by Shantakumari found yoga significantly reduced body weight, BMI, total cholesterol, triglycerides and LDL, while increasing HDL levels.[31]

Normal cholesterol levels range from 150-200 mg/dL.[32] Moderate risk is 200-240 mg/dL, while levels above 240 mg/dL pose a high risk for coronary artery disease.[33] Some experts emphasize the HDL to LDL ratio over total cholesterol levels, while others focus on maintaining total cholesterol below 200 mg/dL.[33] The American Heart Association recommends a daily fat intake of less than 25-30%.[33] The Ornish Diet, aimed at reversing coronary artery disease, suggests a 10% daily fat intake, replacing saturated fats with monounsaturated or polyunsaturated fats,and increasing complex carbohydrates.[33]

Medication may be recommended if lifestyle changes do not adequately lower cholesterol levels. Optimal levels are:

- Total Cholesterol: Less than 200 mg/dL
- LDL (bad) Cholesterol: Less than 100 mg/dL
- HDL (good) Cholesterol: At least 60 mg/dL
- Triglycerides: Less than 150 mg/dL.[34]

Lack of Exercise/Sedentary Lifestyle

A sedentary lifestyle is a known risk factor for heart disease. Conversely, regular exercise can reduce stress, high blood pressure, obesity and increase HDL levels.[35] Exercise significantly decreases CVD-related mortality and reduces the risk of myocardial infarction.[36] Benefits include strengthening the heart, enhancing its efficiency and reducing CVD risk.[37]

Aerobic exercise, which uses large muscle groups and increases heart rate to meet oxygen demands, is particularly beneficial. Even low-intensity aerobic activity can lower heart disease risk.[38] For maximum benefit, it is recommended to engage in aerobic exercise 3-4 times per week for 30-60 minutes. Examples include swimming, biking, running, and brisk walking.

Obesity

The incidence and prevalence of obesity among children and adults are rising rapidly in many countries. The World Health Organization notes that global obesity rates have nearly tripled since 1975. Obesity is a significant risk factor for various health issues, including type 2 diabetes, hypertension, certain cancers and cardiovascular diseases.[39] Research indicates that being over ten percent above one's ideal body weight increases strain on the heart and contributes to dyslipidemia, glucose intolerance, inflammation, hypertension and obstructive sleep apnea.[39]

Optimal waist circumference is recommended to be less than 40 inches for men (37-39 inches for Asian men) and less than 35 inches for women (31-35 inches for Asian women). Maintaining these standards can help lower blood pressure and improve cholesterol and blood sugar levels.[40]

Reducing obesity is crucial for heart health, and yoga has been shown to have positive effects on obesity levels. A study found that combining yoga with a diet of 1,900-2,000 Kcal/day significantly reduced measures

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of central obesity compared to a control group that received only nutritional advice.[41] This effect was most pronounced in individuals aged 30-45. Similarly, another study reported that a yoga-based program including postures, breathing, and relaxation, along with group support and nutrition information, improved quality of life and health. Within just ten days, this intervention reduced body weight, BMI, total body fat, blood pressure, total cholesterol, LDL, triglycerides, fasting glucose and waist-to-hip ratios.[42]

Diabetes

Diabetes occurs when the body cannot produce sufficient insulin or effectively use the insulin it produces. Insulin is essential for metabolizing glucose from food. Without proper insulin function, glucose accumulates in the blood, damaging the heart, kidneys, nerves and blood vessels[43] Damage to blood vessels, such as the endothelial lining of arteries, can lead to cholesterol deposits and the development of atherosclerotic plaque, increasing the risk of coronary artery disease.[44,45,43] Diabetic men have twice the risk, and diabetic women have three times the risk of developing coronary artery disease.[46] Diabetes is rising across all age groups, especially among African Americans and Hispanics.[43] Diabetes, the seventh leading cause of death in the U.S, affects 1 in 11 people, with another 86 million having prediabetes.[43]

Managing diabetes is critical due to its severe health impacts and common co-morbid conditions. Yoga has been shown to improve insulin sensitivity, glucose tolerance and lipid metabolism.[47] It also positively affects hypertension, obesity, hyperlipidemia, chronic kidney disease, cardiovascular disease and mood disorders associated with diabetes.[47-50] Active management of diet, weight, stress, exercise and medication is recommended to reduce risks of kidney disease, stroke and heart attack.

Stress

Chronic stress is increasingly recognized as a significant risk factor for cardiovascular disease, comparable to smoking, hypertension, diabetes and high lipid levels.[6] External stressors like low socioeconomic status, marital strife, job dissatisfaction and family caregiving contribute to cardiovascular disease.[51,52] Internal stressors related to personality and neurobiology also affect oxidative stress in the body.[51,53,54] Chronic stress activates the HPA axis, leading to inflammation and vascular responses that compromise the endothelial lining in coronary arteries.[6] This stress response increases blood pressure, respiration and heart rate.[55]

Research shows a significant association between resting metabolic activity in the amygdala and cardiovascular events. Amygdala activity mediates arterial inflammation, further influenced by upregulated bone marrow activity, highlighting a neuronal-haemopoietic-arterial axis.[6] Overactivation of the sympathetic nervous system results in elevated stress hormones, contributing to high blood pressure, increased heart and respiratory rates, reduced resilience, and impaired self-regulation.[56] Chronic cortisol activation disrupts sleep and can damage memory and emotional regulation.[56,57]

Severe stress can also overactivate the parasympathetic nervous system, leading to decreased output in vital systems, clinical depression, lethargy and lack of motivation.[5] Yoga aims to restore homeostasis through increased regulation of the ventral vagal complex, promoting a state of safety, homeostasis and social engagement.[58]

Alcohol and CVD

The relationship between alcohol and Cardiovascular Disease (CVD) is complex due to the influence of other lifestyle risk factors. High alcohol consumption can expose the heart to toxic agents, causing cardiomyopathy and vitamin deficiencies that damage heart muscle.[59,60] Excessive alcohol intake is linked to cardiomyopathy, stroke, irregular heartbeats and high blood pressure.[59,61,60]

Guidelines recommend low to moderate alcohol consumption: 1-2 drinks per day for men and 1 drink per day for women. One drink is defined as 1½ fluid ounces of 80-proof spirits, 1 fluid ounce of 100-proof spirits, 4 fluid ounces of wine or 12 fluid ounces of beer.[60]

The Effects of Yoga on Heart Disease and Lifestyle Factors

The American Heart Association endorses yoga for its benefits on circulation, muscle tone, respiratory function, heart rate and blood pressure levels.[62] Research consistently supports yoga's positive impact on Cardiovascular Disease (CVD) notably demonstrated by Dr. Dean Ornish's extensive studies on yoga-based interventions for reversing and preventing coronary heart disease.[63-66] Randomized control trials show that lifestyle changes including yoga can significantly reverse heart disease.[63,64]

Research Findings

One study revealed that after only 24 days of lifestyle changes and diet, the experimental group's Ejection Fraction (EF) levels increased, while the control group's EF levels declined. Additionally, the

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experimental group experienced a 91% reduction in angina, compared to a 165% increase in the control group, indicating improvements in endothelial function and microvascular ischemia.[63]

Another study showed that after one year, patients in the yoga-based intervention group saw a reduction in diameter stenosis from 16.9% to 16.5%, whereas the control group's stenosis progressed from 15.5% to 18.5%. After five years, the intervention group continued to show regression in diameter stenosis and experienced 2.5 times fewer cardiac events than the control group.[66,64]

A multi-site Cardiac Rehab study involving 2,974 participants demonstrated that after one year, significant improvements were observed in BMI, triglycerides, LDL cholesterol, total cholesterol, hemoglobin A1c, blood pressure, depression, hostility, exercise and functional capacity.[66]

Impact on Risk Factors and Inflammatory Markers

Risk factors like smoking, obesity, diabetes, stress and dyslipidemia negatively affect the endothelial lining in coronary arteries, contributing to CVD. Yoga has been shown to impact inflammatory biomarkers by enhancing parasympathetic nervous system activity and vagal tone, potentially interrupting the chronic HPA stress activation process and preventing inflammation.[67-71]

Yoga addresses physical, mental, emotional and spiritual dimensions, helping to restore homeostasis and reduce allostatic load, which refers to the chronic stress response that can have detrimental physiological and neuroendocrine effects. Stress, anxiety and depression are common in heart patients, and yoga provides strategies to manage these issues, disrupting the neurobiological stress response and reducing inflammation.[51,53,54,59]

Cardiac Medical Yoga: An Intervention for Heart Patients

The Cardiac Medical Yoga® program, developed by Cunningham in collaboration with cardiologists and cardiac rehab staff, is designed as a lifestyle intervention for heart patients and a teacher training program for healthcare workers. The program emphasizes reducing risk factors and stress by providing specific tools and strategies for increasing health, resiliency, and self-regulation. It includes a comprehensive assessment and recommendations for achieving heart-healthy goals.[72]

Classes, consults and retreats are held in relaxing environments where participants learn gentle yoga postures, deep relaxation, vagal toning, stretching, breathing, guided imagery, dietary tips and stress reduction techniques. Patients are encouraged to view the program as a complement to their existing treatment plans.

BREAD™: A Comprehensive Approach

The Cardiac Medical Yoga intervention uses the BREAD™ acronym to encapsulate its components:

i) Breathing Practices: Techniques like diaphragmatic breathing, deep breathing, calming breath, and alternative nostril breathing.

ii) Relaxation Strategies: Techniques such as Yoga Nidra, in-motion relaxation, and cognitive-behavioral methods to disrupt the stress response.

iii) Exercise/Yoga: Options for varying physical capacities, including Hospital Bed Yoga™, Limited Mobility Yoga™, chair yoga, and wall-assisted yoga.

iv) Attitudinal Exploration and Psychosocial Interventions: Addressing emotional and psychological aspects like anxiety, depression, stress, and grief, and providing support for setting heart-healthy goals and managing risk factors.

v) Dietary Tips: Guidance on healthy eating to support heart health.

Overall, the Cardiac Medical Yoga program offers a comprehensive approach to managing heart disease by addressing physical, mental, emotional, and spiritual health, aiming to reduce risk factors and improve overall well-being.

Dietary Tips

The Cardiac Medical Yoga program emphasizes dietary recommendations that align with guidance from a patient's physician or nutritionist, promoting a diet that is flavorful, nutritious, and natural. The role of the Cardiac Yoga Consultant or Teacher is to motivate, encourage and support patients in adhering to a heart-healthy diet. Compliance with dietary recommendations can be challenging for heart patients and tends to fluctuate significantly. The emotional and psychological support provided by the Cardiac Medical Yoga group is invaluable, boosting motivation and improving adherence to dietary guidelines and other risk management strategies.

Conclusion

The diagnosis of Cardiovascular Disease (CVD) often leads to significant emotional and cognitive distress, which can hinder efforts to manage CVD risk factors. The Cardiac Medical Yoga program offers essential support and education, helping patients increase emotional resilience, self-regulation and healing. Given the common co-morbidities of depression, anxiety and grief, heart patients benefit from support, tools and assistance during their recovery. Participation in yoga-based programs provides strategies and techniques for reducing risk factors and managing dysregulated

behaviors in a supportive environment, starting with small, manageable steps to build confidence.

Additionally, yoga-based programs are cost-effective and complement conventional care, integrating smoothly into existing Cardiac Rehab programs. With CVD being a leading cause of death worldwide and a significant contributor to rising healthcare costs, the ongoing implementation of effective, low-cost yoga-based programs is crucial.

DISCLOSURE

The author declared no competing interest.

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Case Report

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Congenital Cystic Adenomatoid Malformation : A Rare Disease, May be Missed While Focusing Only on the Common One

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ABSTRACT

Background: Congenital Cystic Adenomatoid Malformation (CCAM) is a fetal lung anomaly with varying sizes and compositions, often detected prenatally. CCAM accounts for 25% of congenital lung abnormalities and can lead to severe complications. Despite typically being diagnosed in the neonatal period, this report details a case where CCAM was identified late in a male infant, causing delayed intervention and complicating treatment. The report investigates the extent of delay in diagnosing Congenital Cystic Adenomatoid Malformation (CCAM) in antenatal and neonatal care settings.

Case Presentation: The study was conducted at the Department of Pediatrics Surgery in multicenter of Chittagong, Bangladesh (Mother and Child Care Hospital, Halishahar, Chattagram Maa Shishu-O-General Hospital, Chittagong Medical College Hospital) from October 2023 to January 2024.

Conclusion: The study recommends routine antenatal ultrasounds and emphasizes anomaly scans thoroughly for structural abnormality, not only for selective malformation.

KEY WORDS

Congenital; Cystic adenomatoid; Malformation.

INTRODUCTION

Congenital Cystic Adenomatoid Malformation (CCAM) is a non-malignant lung anomaly that manifests as a cyst or mass in the chest before birth.[1] Comprising abnormal lung tissue with impaired functionality, CCAM, also knownas Congenital Pulmonary Airway Malformation (CPAM) is the most prevalent type of fetal lung lesion.[2] It arises prenatally, varying in size and composition, presenting either as a fluid-filled or minor microcystic lesion.[3] Congenital lung malformations account for approximately 5-18.7% of all congenital anomalies, while fetal lung lesions are estimated to occur in around 1 in every 15,000 live births.[4] Prenatal diagnosis of CCAM occurs at 1 in 25,000-35,000 and its detection may extend into childhood or adulthood as an incidental finding after repeated infections.[5]

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Initially classified into three subtypes in 1977, CCAM was later redefined by Stocker in 2002, expanding the classification to five types under Congenital Pulmonary Airway Malformation (CPAM).[6,7] While 80% of lesions are identified in the neonatal period, there are documented cases in the adult population.[8] The diagnosis of CCAM can be established in utero through prenatal ultrasonography and postnatally via imaging radiography and MRI.[2,9] Due to the potentially life-threatening nature of some CCAMs, early and accurate diagnosis is crucial. While the majority of CCAM lesions are small and pose no threat during pregnancy, large lesions can lead to severe complications, such as fetal heart failure or maternal mirror syndrome, necessitating prompt intervention. This report details cases of CCAM diagnosed through delayed diagnosis.

CASE PRESENTATION

The study patient is a male infant born to non-consanguineous parents as preterm with low birth weight. On the seventh day of life, he exhibited symptoms such as difficulty breathing, poor feeding, and decreased activity. Following a diagnosis of early-onset neonatal sepsis, he was admitted to the Mother & Child Care Hospital (M&CCH) on October 2023. Despite three days of treatment, he was discharged with only slight improvement. At one month and 20 days old, the infant was readmitted to Maa-Shishu O General Hospital (MSOGH) with similar symptoms, and this time, he was diagnosed with very late-onset sepsis. An X-ray was performed (Figure 1) and he was discharged after six days of treatment.

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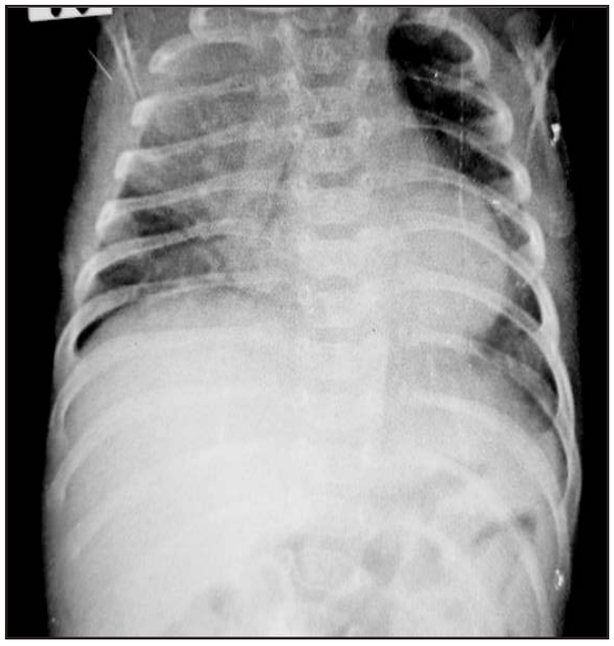

Figure 1 X-ray report at the age of 1 month-20 days

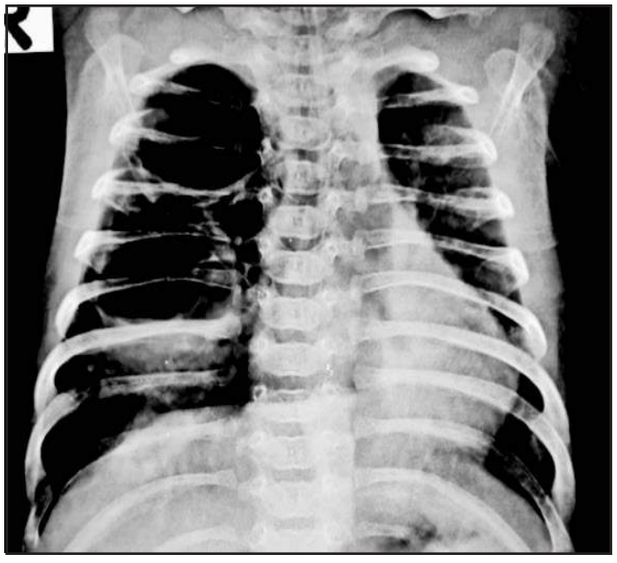

Figure 2 X-ray report at the age of 2 months

Notably, two prior hospitalizations failed to identify a final diagnosis. At the age of 2 months, the infant faced another admission to M&CCH, diagnosed with bronchopneumonia through an X-ray report. On the following day, he was referred to MSOGH with a diagnosis of right-side pneumothorax. A subsequent X-ray revealed an enlarged heart in T.D and multiple cystic structures in the right lung field (Figure 2).

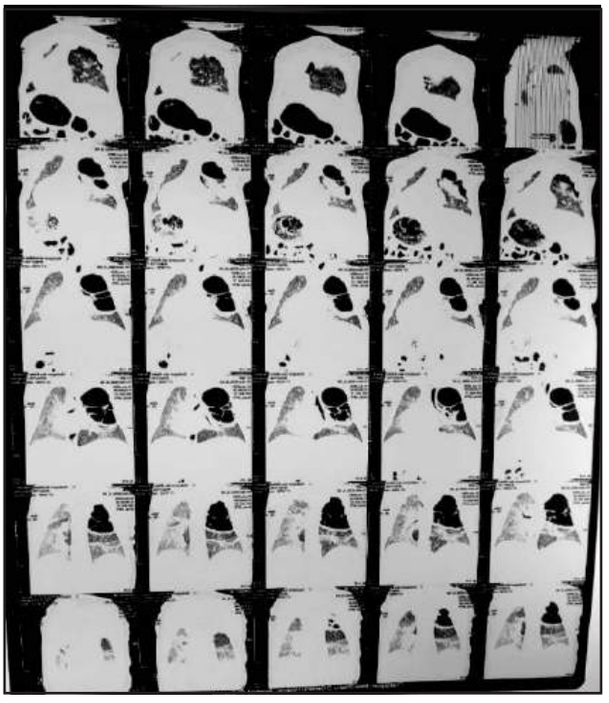

Figure 3 CT scan report age the age of 2 months-7 days

After seven days of treatment, he was referred to Chittagong Medical College Hospital (CMCH). At CMCH, a CT scan was performed at two months and seven days of age. The CT scan report highlighted irregularly increased attenuated areas with multifocal consolidation at multiple segments of both lungs with multiple thick fibrotic bands. Additionally, a sizeable emphysematous bulla with internal septation (Measuring about 41x30x47mm) was identified, involving a significant portion of the upper lobe of the right lung. These clinical features, X-ray and CT scan findings were suggestive of congenital cystic adenomatoid malformation (CCAM) (Figure 3). After seven days of treatment in the PICU, the infant showed a slight improvement and was proposed for Thoracotomy followed by Lobectomy. However, the parents declined the surgical option, and the infant was subsequently discharged. On follow-up, the condition of the infant was not improved.

DISCUSSION

CCAM is an uncommon congenital disorder characterized by postnatal respiratory distress.[11] Typically, this condition can be diagnosed during the prenatal period.[12] However, in the case of our patient, it remained unrecognized for over two months. Despite being hospitalized several times in different healthcare facilities and undergoing multiple X-rays during the

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treatment period, unfortunately, the diagnosis was missed. Diagnostic tools such as chest X-rays, Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) are commonly employed.[13] In our patient's case, unfortunately, the initial X-ray results were inconclusive, initially suggesting early sepsis and then late-onset sepsis and later indicating bronchopneumonia and pneumothorax. As the infant's condition gradually worsened, symptomatic treatments were administered.

Only at the age of 2 months and seven days was a CT scan performed for the first time. The findings from the CT scan, in conjunction with previous X-ray reports, confirmed the presence of Congenital Cystic Adenomatoid Malformation (CCAM) (Figure 3). Moreover, surgical intervention became imperative for proper treatment. The prognosis is also influenced by the Stocker type.[14] We have proposed a Thoracotomy followed by a Lobectomy to enhance the treatment outcome. However, his parents refused to surgery.

LIMITATION

The study's limitations include its retrospective nature, reliance on medical records for data collection, and potentially needing more nuanced clinical information. The absence of detailed analyses on imaging interpretations and diagnostic processes may obscure factors contributing to delayed CCAM diagnosis.

CONCLUSION

This case underscores the challenges in diagnosing Congenital Cystic Adenomatoid Malformation (CCAM) especially when presenting beyond the neonatal period. Despite multiple hospitalizations and diagnostic procedures, the condition remained elusive for over two months, leading to delayed intervention. The delayed diagnosis highlights the importance of considering CCAM as a differential diagnosis in infants with persistent respiratory symptoms. However, she underwent an ANC checkup and anomaly scan. Early and accurate identification is crucial for timely intervention, as evident in this case where surgical options were proposed. The reluctance of parents to pursue surgery emphasizes the need for comprehensive patient and family education to facilitate informed decision-making.

RECOMMENDATION

This study emphasizes the significance of vigilance in recognizing presentations of CCAM, which may be overlapped by the symptoms of common diseases. Finally, we recommend high-quality antenatal USG, which may help the diagnosis of CCA. Antenatally, the use of repeat USG with Doppler studies and fetal MRI is helpful for the accuracy of the diagnosis.

DISCLOSURE

All the authors declared no competing interest.

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