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Content Page

INCREASED PEAK SYSTOLIC VELOCITY (PSV) OF PERIPHERAL ARTERY IS AN INDIRECT PARAMETER OF INCREASED ARTERIAL STIFFNESS IN COPD PATIENTS.

Magfura Pervin

Arterial stiffness means a loss of elasticity.[1] It may be define by a reduction in arterial distensibility which may quantify by measuring different parameters like pulse wave velocity.[2] Arterial stiffness can be assessed indirectly only by measuring peak systolic velocity (PSV) of blood flow of peripheral artery.[3]

Arterial stiffness is influenced by both structural and functional aspects of the conduit arteries and resistance beds. Atherosclerosis and calcification of the large arteries decrease vascular compliance and causes structural changes in the vessel wall that may explain as the cause of the increased arterial stiffness in COPD patients. COPD itself may result in premature aging of the vasculature.[4]

Peak systolic velocity (PSV) of blood flow remains the best single velocity parameter for detecting vascular stenosis by ultrasound through using vascular probe. PSV increases with the narrowing of an artery.[5] Mean velocity of blood flow in large arteries about 50.00 cm/sec. Factors influencing velocity of blood flow are cardiac output, cross sectional area of the blood vessel, viscosity of the blood.[6]

Patients with COPD have increased arterial stiffness due to chronic systemic inflammation. While a number of factors may influence arterial tone in these group of patients, it is possible that increased large artery stiffness is one of the major determinant of increased blood pressure and hence cardiovascular risk in patients with COPD.[7] About 50% death in COPD patients result from cardiovascular causes.[8]

Arterial stiffness is the principal cause of increasing systolic blood pressure.[9] It has been suggested that excessive neutrophil elastase activity in cigarette smokers and patients with COPD results in consumption of elastic fibers in the tunica media of large arteries leading to arterial stiffness.[10] Indeed, in most of the patients, COPD is the results of long-term heavy cigarette smoking.[11] Again, elastin may involve in the regulation of vascular smooth muscle cells. Changes in vascular smooth muscle cell may also contribute to arterial stiffness.[12] Another group of investigators also explained that in arteries where collagen increases in addition to degradation of elastin there is increase in arterial stiffness.[13] Moreover, elastolytic activity is increased both in emphysema and arteriosclerosis which may be partly genetically determined.[14] To sum up, it can be suggested that PSV measurement may be used as a diagnostic tool to detect early arterial stiffness that developed in COPD patients. As a consequence there may be reduction of the cardiovascular risk in this group of patients.

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OCCUPATIONAL HEALTH HAZARDS OF TEA GARDEN WORKERS OF SELECTED TEA GARDENS IN MOULVIBAZAR

Ahmad Zubair Mahdi[1], Mahibun Nahar[2], Asma Kabir[3], Faisal Mohammed Pasha[4]

ABSTRACT

Background: Occupational health aims at prevention of disease and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations. Bangladesh is an important tea producing country. The industry accounts for 3% of global tea production and employs more than 4 million people where 75% are women. **Objective:** This study was conducted to detect the common occupational health hazards of tea garden workers so that appropriate preventive measures can be recommended for safeguarding the health. **Methods:** A cross-sectional study design was applied in this study. Two tea gardens of Moulvi bazar were selected as a convenient sample. Those are: 1) Satgoan Tea estate and 2) Madhabpur Tea estate. **Results:** This study reveals that sanitation facilities of the respondents were very poor. Among the respondents, 15.1% had no sanitation facility and 68.6% used kacha latrine. The study also found that 39.4% respondents were substance abusers. Most of them have a long history of working in tea gardens. It varies from 1 to 50 years where average length of stay is 19.2 years. Nature of work distribution among male and female were different. Female were mainly involved in leaf plucking while males were mainly labors and pesticide sprayer. Among the respondents, 46.5% felt physical problem due to job. The workers who suffered from any physical problems were mainly heat due to sunburn (67.5%) followed by pain in different body parts (43%), cold due to rain (29.1%) and vertigo (13.2%). Among the respondents 38.4% suffered from any kind of mechanical hazards. Those are mainly cut injury (24.6%) and insect bite (20.3%). The relationship with mechanical hazards and sex of the respondents are significantly related. Female was more susceptible for mechanical hazards, and it is statistically significant ($P < 0.05$). Mechanical hazards also closely relate with the nature of work that respondents were doing. Mechanical hazards also had statistically significant ($p < 0.05$) correlation with the duration of work in the tea garden. According to the respondents, 39.4% suffered some kind of psychological hazards. Those were mainly stress (17.2%) and anxiety (17.8%). The relationship with psychological hazards

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Citatpon: Occupational Health Hazards of Tea Garden Workers of Selected Tea Tardens in Moulvi Bazar, TMMC Journal 2023; 8(2):43-52.

and sex of the respondents are significantly related. Female was more susceptible for psychological hazards, and it is statistically significant ($P<0.05$). A big portion of the respondents also suffered by biological hazard. Among the respondents, the main biological hazards are TB (33.6%) followed by chronic PUD (31.5%). **Conclusion:** According to the findings of this study, working environment, types of work, duration of work in the tea garden has a great impact on the health of the tea garden workers. For bright future of tea industries, the government of Bangladesh should take adequate preventive measures in tea industrial activities to ensure safe, sound and healthy environment.

Keywords: Occupational health, Occupational health hazards, Tea-garden workers.

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Introduction

Occupational health aims at prevention of disease and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations. The Joint ILO/WHO Committee on Occupational Health gave the following definition1 "Occupational Health should aim at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations, the prevention among workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological equipment, and, the adaptation of work to man and of each man to his job." One of the basic aims of occupational health is to provide a safe 'occupational environment' to safeguard the health of the workers and to step up industrial production. Occupation and health are closely related. The occupational environment of the worker cannot be separated from his domestic environment. Both are complementary to each other. Stress at work may disturb his domestic life just as stress at home may affect his work[2].

Bangladesh is an important tea producing country. Its tea industry dates back to British rule, when the East India Company initiated the tea trade in Chittagong in 18403. Today, the country has 162 commercial tea estates, including many of the world's largest working plantations. The industry accounts for 3% of global tea production and employs more than 4 million people where 75% are women[3].

Tea is the second largest export oriented cash crop of Bangladesh, following jute. Industry accounts for 1% of national GDP. Tea-producing districtsinclude Maulvibazar, Habiganj, Sylhet, Chittagong, Panchagarh, Brahmanbaria, Rangamati[4].

Once a major world exporter, Bangladesh is now a net importer of tea. The rise of the Bangladeshi middle class has increasingly driven the industry to focus on a lucrative domestic market. The sector is today dominated by Bangladeshi conglomerates, including M. M. Ispahani Limited, Kazi & Kazi, the Transcom Group, James Finlay Bangladesh, the Orion Group, the Abul Khair Group and Duncan Brothers Bangladesh Limited.

In 2009, Bangladesh recorded its highest production of tea, at 63.85 million kilograms[5]. The country has over 56,846 hectares of land under tea cultivation, up from 28,734 hectares in 1947. The government has begun to promote small-scale tea growers, particularly in the Chittagong Hill Tracts[1].

The tea is grown in the northern and eastern districts, the highlands, temperate climate, humidity and heavy rainfall within these districts provide a favorable ground to produce high-quality tea.

Tea is consumed in about 100 countries and Bangladesh has 172 commercial tea estates, including many of the world's largest working plantations. Ninety-one of Bangladesh's tea gardens are in Moulvibazar. So, most the tea of Bangladesh is produced from there. The present study will try to find out the occupational health hazards of tea garden workers of Srimangal, Moulvibazar.

Materials and Methods:

This cross-sectional descriptive type of study was conducted in two tea gardens of Moulvibazar, which were Satgoan Tea estate and Madhabpur Tea estate during the period from January to December 2017. 325 tea garden workers were selected purposively.

The data collection technique was an interview, specially structured interview while the tool used to collect data in this study was a questionnaire with some multiple response questions to fulfill the exploratory inquiry involved in the thesis topic. At first, a primary questionnaire was developed based on literature, understanding of the researcher. Secondly, pre-testing of the primary questionnaire on 10 people in the selected areas. This procedure was undertaken due to ascertain the flow of sequence of the questions, the suitability of the language, and comprehensiveness of the topic to address the objective of study. Finally, on the experience of pre-testing, the questionnaire was modified and finalized for data collection in the field.

Information from the individual questionnaire has been drawn up for analysis. Data analysis was performed through using statistical software SPSS.

Results:

Among the respondents, male and female ratio was almost equal. Most of them were from the age group 31-40 years. Around one-third (35.7%) had primary education, most (79.1%) were from nuclear family. Most of them were non-smokers (78.2%) & non-substance abusers (60.6%). [Table-1]

By nature of work, most of the participants were leaf pickers (41.5%), among them most were female (80%). 29.5% of them were laborers, most of them were male (55.8%). 7.4% were pesticide sprayer workers, all of them were male. 21.2% of people attended others works, male-female ratio was almost equal there. [Table-2]

According to types of physical problem faced by the respondents, the workers who suffered from any physical problems were mainly heat due to sunburn (67.5%) followed by pain in different body parts (43%), cold due to rain (29.1%) and vertigo (13.2%). [Figure 1]

Based on mechanical hazards, 65.2% respondents didn't face any mechanical hazards while 34.8% faced some kinds of mechanical hazards. The main mechanical hazards, the respondents were faced-cut injury (24.6%), insect bite (20.3%), fall from height (4.3%) and snake bite (2.8%) [Figure 2]

Regarding types of mechanical hazards by sex of the respondents, male workers are little higher sufferer (52.4%) in case if cut injury. Males were also more sufferer (65.9%) of falling from height. More than two-third female workers were suffering than male workers in snake bites (71.7%) & insect bites (70.3%) [Figure 3]

Based on psychological hazards faced by the respondents, 60.6% respondents didn't face any psychological hazards while 39.4% faced some kinds of psychological hazards. Themain psychological hazards respondents were faced-anxiety (17.8%), stress (17.2%) and panic (7.1%) [Figure 4]

By types of psychological hazards by sex of the respondents, females were suffered more all types of psychological hazards like stress (58.9%), panic (78.3%), and anxiety (60.3%) than male. [Figure 5]

In respect of association between psychological hazard and sex, most of the male (69%) don't suffer any psychological problem. On the contrary, majority of the female (48.2%) have some psychological problem. This difference of suffering from psychological hazard by sex of the respondents was found statistically significant ($p < 0.05$) [Table-3]

Based on types of biological hazards Among the respondents, the main biological hazards are TB (33.6%), followed by Chronic PUD (31.5%). Other hazards are Chronic RTI (16.8%), Skin disease (9.8%), Coronary disease (6.3%), Malaria (4.2%) etc. [Figure 6]

In respect of association between biological hazards and sex, around 56% of the participants don't suffer any biological problem. On the contrary, around 44% suffer from biological hazards. This difference of suffering from biological hazard by sex of the respondents was found statistically non-significant ($P > 0.05$) [Table-4]

Based on types of biological hazards by sex of the respondents, most of the males were suffering from TB (54.2%), chronic RTI (54.2%), malaria (66.7%), and chronic PUD (53.3%). On the other hand, most of the females were suffering from coronary disease (55.6%), DM (66.7%), and skin disease (78.6%) [Figure 7]

Table-1: Baseline characteristics of the participants (n=325)

Attributes	Findings
Gender	Male: 50.8%; Female: 49.2%
Age (Years)	≤30: 18.5%; 31-40: 30.8%; 41-50: 26.5%; 51-60: 20.9%; >60: 3.4%.
Education	Illiterate: 25.5%; Can sign only: 26.8%; Primary: 35.7%; Secondary: 10.2%
Marital status	Unmarried: 3.7%; Married: 94.2%
Type of family	Nuclear: 79.1%: Three Generation Family: 16.0%; Joined: 4.9%
Smoking habit	Non-smoker: 78.2%; Smoker: 21.8%
Substance abuse	Non-substance abusers: 60.6%; Substance abusers: 39.4%
Type of substance abuse	non-smoked tobacco: 96%; Alcohol:10.9%; Weed: 0.8%

Table-2: Nature of work of the respondents according to gender (n=325):

Nature of work	Gender	
	Male	Female
leaf picker (41.5%)	20.0%	80.0%
pesticide sprayer work (7.4%)	100%	0.0%
laborer work (29.5%)	55.8%	44.2%
Bungalow worker (0.3%)	100.0%	0.0%
others work (21.2%)	51.4%	48.6%

Figure 1: Types of physical problem faced by the respondents (n=325):

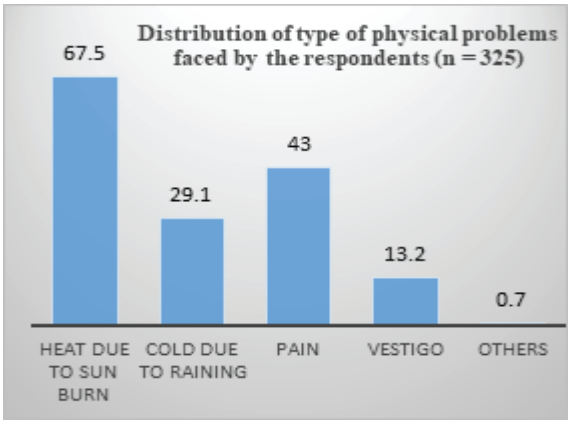


Figure 2: Mechanical hazards faced by the respondents (n=325):

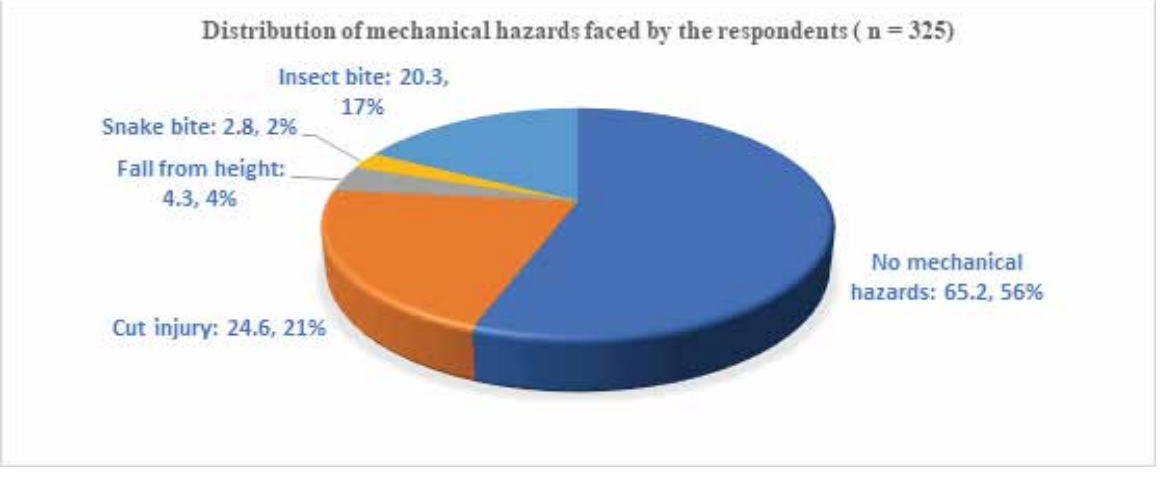


Figure 3: Types of mechanical hazards by sex of the respondents (n=325)

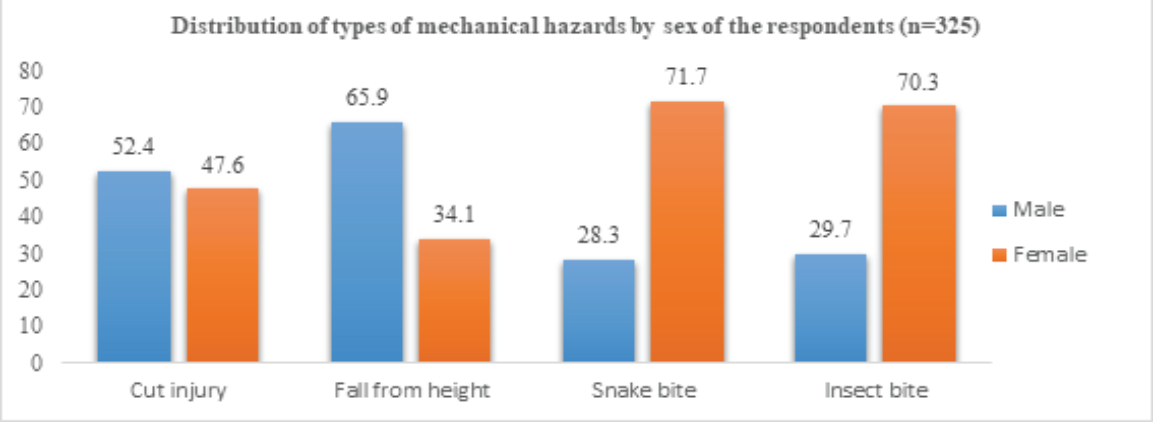


Figure 4: Psychological hazards faced by the respondents (n=325):

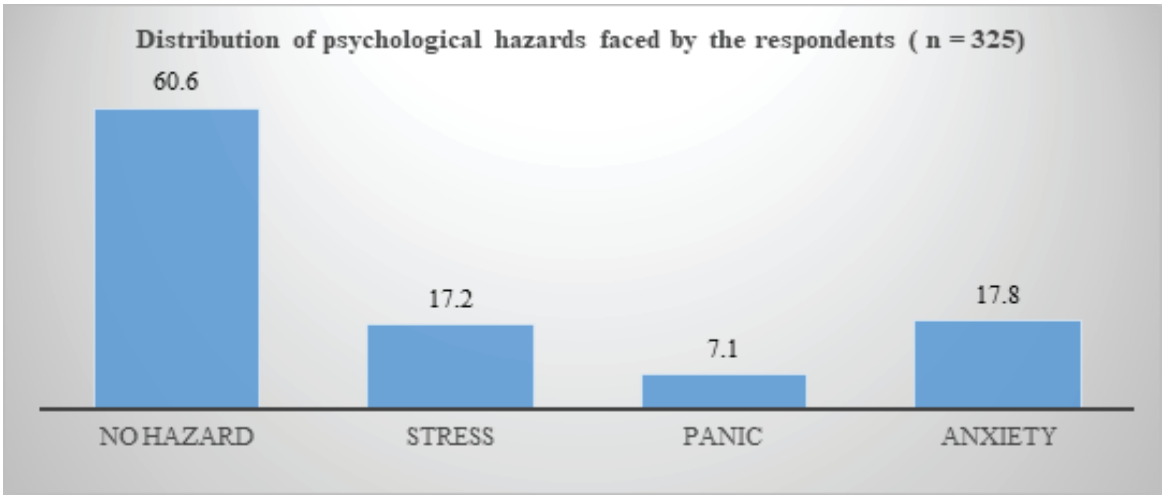


Figure 5: Types of psychological hazards by sex the respondents (n=325):

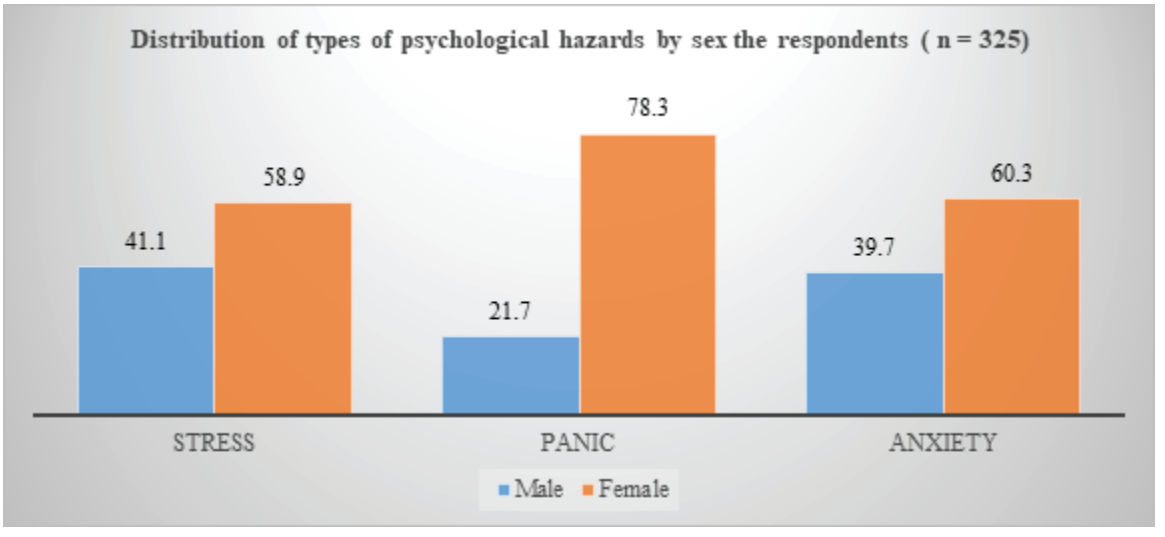


Table-3: Association between psychological hazard and sex:

Psychological hazards	Sex		Total
	Male	Female	
Don't suffer any psychological problem	114 (69%)	83 (51.8%)	197 (60.6%)
Suffer some psychological problem	51 (31%)	77 (48.2%)	128 (39.4%)
Total	165 (100%)	160 (100%)	325 (100%)

Figure 6: Types of biological hazards faced by the respondents (n=325):

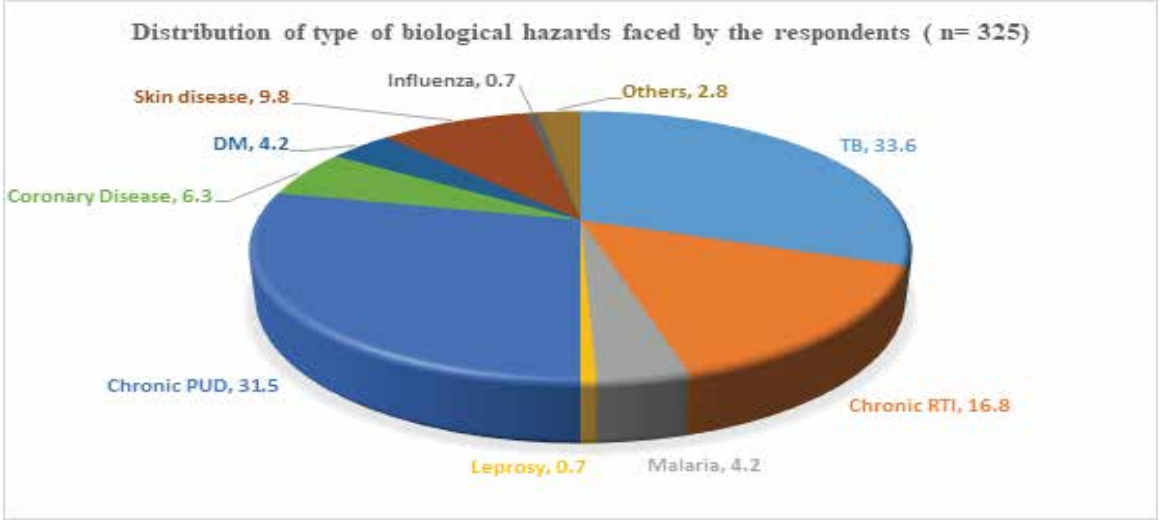
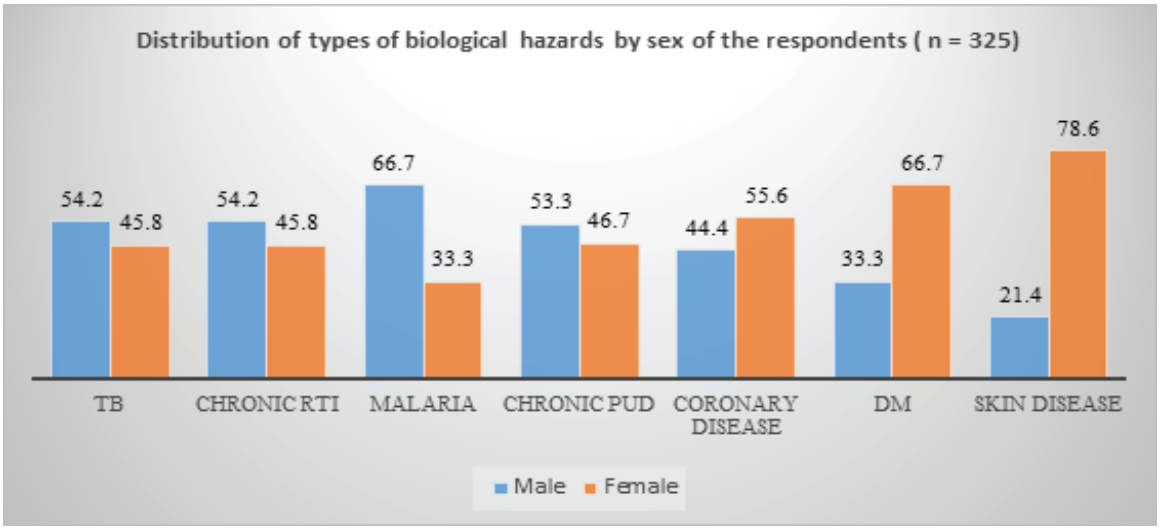


Table-4: Association between biological hazards by sex of the respondents:

Biological hazard	Sex		Total
	Male	Female	
No	92 (55.7%)	89 (55.6%)	181 (55.7%)
Yes	73 (44.3%)	71 (44.4%)	144 (44.3%)
Total	165 (100%)	160 (100%)	325 (100%)

Figure 7: Types of biological hazards by sex of the respondents (n=325):



Discussion:

This cross-sectional descriptive type of study was conducted in two tea gardens of Moulvibazar, to assess the health status of the tea garden workers to find out their occupation related risk factors. Tea garden workers are susceptible to several hazards in their workplaces due to physical, biological, mechanical, chemical and psychosocial factors. Very few micro-level studies on tea garden workers for Bangladesh have been done so far. Very limited literatures were available regarding occupational health hazards among the tea garden workers in Bangladesh. This study revealed findings related to the socio-demographic characteristics of the participants, their health hazards along with associated problems or factors and suggestions for improvement. These findings were compared with different subgroups of participants within the study and with the findings of other relevant studies.

This study used a random sample where 50.8% respondents were male and 49.2% were female. A study reveals that most of the employers reported that there is no gender preference in the recruitment process; but tea plantation industry is dominated by femaleworkers. Approximately 64% of all workers are female. This study had tried to maintain the ratio of national statistics[1].

It is observed that many tea plantation workers start work at an early age. In several instances, children are engaged in the tea gardens as relievers or helpers of their parents. Once they grow up, they change their status so that they are no longer assistants to or relievers to their parents but temporary workers and a portion of them become permanent workers. Workers who start working at an early age do not get access to education. In addition, child marriage, poverty and lack of consciousness are identified as major reasons for the low rate of education in community[1].

This study reveals that the education statuses of the tea garden workers are very poor. Similar kinds of findings also found by another study[1]. Only 35% of our respondents were found to be literate. Among them, a small portion (11.5%) completed secondary school certificate and large number (43.4%) simply attended some level of primary school but have forgotten how to read and write. They opined that they failed to continue their education mainly due to the poverty of their parents and lack of institutions closer to their habitats. Some had to take care of their siblings as their parents were engaged in the tea gardens as workers. Outside formal education, only 6.1% of workers had the opportunity to receive training provided by their employers for permanent workers.

Among the respondents, most of them were leaf pluckier (41.5%) while 7.4% were pesticide sprayer work, 29.5% were laborer work, 0.3% were Bungalow worker, 21.2% were others work.

Among the respondents, 44.3% faced some biological hazard. Those are mainly TB (33.6%) followed by Coronary PUD (31.5%). Other hazards are Chronic RTI (16.8%), Skin disease (9.8%), Coronary disease (6.3%), Malaria (4.2%) etc.

Parijat Borgohain founds that on his study "Occupational health hazards of tea garden workers of Hajua and Marangi tea estates of Assam, India" similar results. According to that study tea garden workers are susceptible to many biological hazards like insect bites, fungal infections and malaria, among others.

11.11 percent of the surveyed workers of Hajua Tea Estate and 20 per cent of the surveyed workers of Marangi Tea Estate have suffered from insect bites while working in the tea gardens. Besides, 6.67 per cent of the surveyed male workers and 11.11 percent of female workers of Hajua Tea Estate have been found to have suffered from malaria, while about 1 per cent of male and female workers of Marangi tea estate have been found to have suffered from malaria[6].

Another study revealed that, falls and injuries caused by agricultural equipment of the cutting and digging type are the most common types of accidents. This is not unexpected, considering the steep slopes on which tea is generally grown and the type of work involved in the processes of clearing, uprooting and pruning. Apart from exposure to natural hazards like lightning, workers are always in danger of being bitten by snakes or stung by hornets, spiders, wasps or bees[1].

In this study the result showed a similar trend. A high proportion (40%) of workers suffered different psychological hazards. The psychological health of the tea garden workers is also influenced by their overall occupational health conditions. Psychosocial workplace characteristics related to stress and work frustration may be due to health outcomes, the balance between a worker's efforts and the rewards (e.g., pay, recognition, status, prospects of promotion, etc.) received for his or her work, and the extent to which supervisors[7] and co-workers are supportive. Other psychosocial characteristics include work stability, service conditions, job satisfaction, welfare conditions in the tea estates, etc.[8]

Conclusion:

As a tea producing country, Bangladesh is well known in the world. From that point of view, tea workers and their contribution to the GDP is not negligible. Moreover, these workers, as being human should have all kind of human rights whereas they are mostly discriminated in our society.

From the study findings, it is concluded that tea gardens' workers are still lagging behind in terms of socially, economically and culturally. Health and sanitation coverage and facilities are still far from the minimum requirements. As they are less facilitated, thus they do not get necessary services regarding health and sanitation. Their limited income does not allow them to meet satisfactory and scientific healthy life. It is also found that, working environment, types of work, duration of work, sex differentials have impact on the health of the tea garden workers.

It is difficult to make any generalization for all the tea workers of all the gardens, but considering the different studies, differences might be negligible. In this reality it is necessary to act by the government. Along with institutional actions and support, it is also necessary to change their attitude and thinking to develop their level of awareness and understanding.

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MORPHOMETRIC ANALYSIS OF HEPATIC LOBULE DIAMETER IN NORTH-EAST BANGLADESHI CADAVERS

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ABSTRACT

Background: The hepatic lobule is the fundamental histological unit of the liver and serves as the basic architectural and functional unit in hepatic physiology. Morphometric variations of hepatic lobules among different populations can reflect environmental, nutritional, genetic, and lifestyle influences. This study was conducted on cadaveric liver samples from individuals of North-East Bangladesh to determine the average diameter of hepatic lobules, assess inter-individual variability, and contribute to a baseline for anatomical and pathological reference in this specific demographic. Using histological techniques and light microscopy, liver sections were examined, and the lobular diameters were measured. This study provides essential data for academic reference and enhances diagnostic precision in histopathological evaluations in the local context. Objective: To find out the relation of diameter of hepatic lobule with the proper diagnosis and treatment of parenchymal liver disease in the North-East Bangladeshi people. **Methods:** This post-mortem Cross-sectional study was conducted in the Department of Anatomy, Sylhet M.A.G. Osmani Medical College, Sylhet on 50 human liver that were collected form unclaimed and examined dead bodies from the Department of Forensic Medicine, Sylhet M.A.G. Osmani Medical College, Sylhet. The collected samples were divided into 4 groups upon age. Histological study was carried out on relatively 24 fresh samples. Then statistical analysis was done by SPSS. **Results:** The mean diameter of hepatic lobule was 1038.3 (SD±183.5) μm, 1166.0 (SD±85.9) μm, 1345.7 (SD±230.3) μm, 1147.5 (SD±68.6) μm in the age group of 2 to 15 years, 16 to 30 years, 31 to 45 years and 46 to 75 years respectively. **Conclusion:** Significant difference was observed between age and diameter of hepatic lobule ($p=0.023$).

Keywords: Liver, Hepatic lobule, Cadaver

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Introduction

The liver is the largest internal organ in the human body and is often referred to as "the custodian of the internal environment."[1] Though it functions as an accessory gland of the gastrointestinal tract, it plays numerous roles beyond digestion. It typically appears reddish-brown and varies in texture from soft to firm. The size and shape of the liver can differ-ranging from long and slender to short and broad-and often correspond to an individual's body habitus.[5]

Functionally, the liver is classified as a mixed gland due to its wide-ranging physiological activities. Among its primary responsibilities are the synthesis and secretion of bile and bile salts, the production of insulin-like growth factor I (IGF-I), the generation of clotting factors, and the detoxification of various harmful substances including toxins, hormones, and steroids. It also contributes to urea synthesis and acts as a biological filter by removing bacteria and foreign particles from the bloodstream. Furthermore, the liver produces heparin, a natural anticoagulant, and bile pigments resulting from the breakdown of hemoglobin.[6]

The liver is unique in having a dual blood supply: approximately 80% of its blood is delivered via the portal vein, while the hepatic artery supplies the remaining 20%.[7] However, when considering the nutritional content of the blood, the portal vein contributes about 66-75%, with the hepatic artery accounting for 25-33%.[8]

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The liver is unique in having a dual blood supply: approximately 80% of its blood is delivered via the portal vein, while the hepatic artery supplies the remaining 20%.[7] However, when considering the nutritional content of the blood, the portal vein contributes about 66-75%, with the hepatic artery accounting for 25-33%.[8]

Materials & Methods:

Human livers were collected from the unclaimed dead bodies autopsied in the Department of Forensic medicine in Sylhet M.A.G. Osmani Medical College, Sylhet during study period from January 2013 to December 2013 meeting the inclusion and exclusion criteria included in the study. The collected samples were divided into 4 groups, Group-A: 2 to 15 years; Group-B: 16 to 30 years; Group-C: 31-45 years Group-D: 46 to 75 years, according to age. Again each group (Group-A, B, C, D) was subdivided into Male and Female depending upon their sex.

Procedure for histological study: For the measurement of diameter of hepatic lobule six slides were selected from each group (Group-A, B, C, D). Preparation of the slide: Tissue blocks ($\leq$2cm2) were fixed in 10% formol saline for 12 hours in a plastic container. The tissues were washed in running tap water, dehydration was done with ascending grades of alcohol, cleared with xylene, infiltrated and embedded in paraffin. Paraffin blocks were cut at 5 mm thickness and were stained with routine (H &E) stain.

Measurement of diameter of hepatic lobule: To get the diameter of each hepatic lobule, two special measuring instruments were used, stage micrometer and ocular micro-meter. At first the stage micrometer was set on the microscope stage. Then the ocular micrometer was placed at the eye piece. On the stage micrometer there was a straight lines which was one millimeter in length was divided into 100 small divisions. Thus each small division measured 0.01mm. The ocular micrometer also had a line, calibrated into small divisions.

100 divisions of stage micro-meter = 1000μm

1 division of stage micrometer =10 μm

In medium magnification (40X)

3stager micrometer division =20 ocular ocularmicrometer division

1 stager micrometer division =20/3 ocular micrometer division

6.6 ocular micrometer division =10 μm

1 ocular micrometer division=10/6.66=1.501 μm.

It was to be noted that during this procedure, the objective to see the hepatic lobule and the eye piece lens used were those as would be used to see the hepatic lobule. After that standardization, the stage micrometer was removed. Then the slide was placed one by one and the greatest transverse diameter and the perpendicular diameter of mid transverse diameter of the hepatic lobule were measured and expressed in the term of μm.

For example, if the transverse diameter of hepatic lobule was equal to 5 small divisions on the ocular micrometer, then the transverse diameter in term of μm would be 5X1.501μm or 7.505 μm. Then the mean greatest transverse diameter and the mean greatest perpendicular diameter were calculated.

The diameter was then calculated by the following formula-

Diameter = (Transverse diameter + Perpendicular diameter)/ 2

Results:

In the present study, the mean diameter of hepatic lobule was 1038.3 (SD±183.5) μm in the age group of 2 to 15 years; 1166.0 (SD±85.9) μm in the age group of 16 to 30 years, 1345.7 (SD±230.3) μm in the age group of 31 to 45 years and 1147.5 (SD±68.6) μm in the age group of 46 to 75 years. The differences among the groups were statistically significant (F=3.939; p=0.023). Distribution of diameter of hepatic lobule by different age group was shown in Table 1.

Table 1: Distribution of diameter of hepatic lobule among age groups

Diameter of hepatic lobule (µm)	Age Group				*p-value
	Group-A (n=6)	Group-B (n=6)	Group-C (n=6)	Group-D (n=6)	
Mean ± SD	1038.3 ± 183.5	1166.0 ± 85.9	1345.7 ± 230.3	1147.5 ± 68.6	p=0.023
Range	770-1200	1075-1290	1063-1586	1060-1220	

Group-A: 2 to 15 years; Group-B: 16 to 30 years; Group-C: 31-45 years Group-D: 46 to 75 years.
*One way ANOVA test was applied to anlysed the data.

Discussion:

In this study diameter of hepatic lobule ranged from 770.0-1586.0 μm with the mean of 1174.4 μm. (SD±184.8). Garven stated that each of the hepatic lobule is a polyhedral prism often about 1000 μm (1mm) in diameter and seldom exceeding 2000 to 3000 μm (2-3mm) in length[19]. Copenhaver stated that each of the hepatic lobule is cylindrical or irregularly prismatic in shape a polyhedral prism often about 1000 μm (1mm) in diameter and seldom exceeding 2000 to 3000 μm (2-3mm) in length[20]. Miller and Leavell stated that the diameter of the hepatic lobule is 1000 to 2500 μm (1to 2.5mm)[21]. Arey described the hepatic parenchyma is subdivided into obvious anatomical units called lobules. Each lobule is an irregular prism, measuring about 1000×2000 μm (1×2mm)[13]. Leeson and Leeson stated that hepatic lobules are polygonal prism measuring about 1000 to 2000 μm (1to 2 mm)[4]. Krause and Cutts mentioned that the hepatic lobule is about 700μm (0.7mm) in wide and 2000 μm (2mm) in long[22]. Gartner and Hiatt mentioned that the hepatocytes are arranged in hexagon-shaped lobules about 2000μm (2mm) in length and 700 μm (0.7mm) in diameter[16]. Mescher stated that the hepatic lobule is formed of a polygonal mass of tissue about 700×2000 μm (0.7×2mm) in size[11]. Kumar described that classically the liver has been divided in to 1000 to 2000 μm (1 to 2mm) diameter hexagonal lobules oriented around the terminal tributaries of the hepatic vein with portal tract at the periphery of the lobule[23]. Borley stated that hepatic lobules are comprised of polygonal clusters of hepatocytes about 1000 μm (1mm) in diameter[17]. Ross stated that each of the hepatic lobule is about 2000×700μm (2.0×0.7mm)[18]. Datta stated that each of the hepatic lobule consists of hexagonal mass of liver cells and measures about 1000μm in width[24]. This study showed that The mean diameter of hepatic lobule in this study was 1038.3 μm (SD±183.5) in the age group of 2 to 15 years, 1166.0 μm (SD±85.9) in the age group of 16 to 30 years, 1345.7 μm (SD±230.3) in the age group of 31 to 45 years and 1147.5 μm (SD±68.6) in the age group of 46 to 75 years. The difference among the groups was statistically significant (p=0.023). similar results were found in the study of Sultana (2008) that the mean diameter of hepatic lobule was 1093±40.06 μm in the age group of age group of up to 15 years, 1108.63±5.09 μm in the age group of 16 to 30 years, 1364.91±72.46 μm in the age group of 31 to 45 years and 1120.25±16.45 μm in the age group of 46 to 75 years.

In the current study the diameter of the hepatic lobule were increased up to the age of 45 years then decreased. In this regards Robbins et al. described that there is relatively little variation in hepatic lobule size and structure in normal adult in middle life. But in the later life atrophy and dropping out of isolated cells followed by compensatory hypertrophy and regeneration, induces some variation in size of the hepatic lobule. Such changes before later life strongly suggest previous parenchymal injury and regeneration activity[1].

Conclusion:

In the current study the diameter of the hepatic lobule were increased up to the age of 45 years then decreased. There exist some similarities and some variations in the findings of different parameters. In cases of variations the findings of the present study were less than the findings of other countries. The variations may be due to racial difference of the study populations. In this study the specimen were preserved in 10.0% formol saline that may be caused some amount

of shrinkage of the specimens and subsequent lower value in some of the parameters in comparison to others reports in western books where the parameter were supposed to be from fresh specimen. Further studies on larger populations and different sex and ethnicity may be done to establish a complete data of Bangladeshi population.

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A STUDY ON LOWER LIMB SALVAGE-REVERSED SURAL FLAP FOR NO MAN'S LAND

Munny Momotaz[1], Kh. Kaniz Fatima Katha[2], Rashedul Alam Khan[3], Tanvir Khan[4]

ABSTRACT

Background: Coverage of defects of the distal lower extremity and foot remains a challenging reconstructive procedure. The reverse sural flap is a distally based fasciocutaneous flap that is used for coverage of defects that involve the distal third of the leg and foot. Distal third of leg is called No Man's Land as reconstructive coverage option is very limited. The surgical technique of sural flap is safe and provides alternative to microsurgical reconstruction. **Material and Methods:** A prospective study was conducted between October 2020 to September 2023, 21 patients with soft tissue defects in the distal third of leg and foot were treated with Reverse Sural Flap at TMMCH, Bangladesh. **Results:** Most of the flaps were done on post traumatic defects. Around 80% of the flaps had settled well with no or minimal donor site morbidity. **Conclusions:** The reverse sural artery flap is a reliable and versatile flap for defects over the lower third of leg and foot and can be used as a reliable alternative to free tissue transfer.

Keywords: Reverse sural flap/lower limb salvage/Sural flap/Limb defect/Free tissue trasfer

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Introduction

Coverage of defects of the distal lower extremity and foot remains a challenging reconstructive procedure. Now a days, coverage of this area is often made by use of free flaps because of advance surgical techniques. However, there are disadvantages in the use of free flaps like the need for a remote donor site, increased operative time, use of a major vessel of the leg, and microsurgical skills.[1] Besides these, trauma in the lower limb are often cause of damage for a major vessel of the leg, so the use of free flaps in these patients may be related to an higher incidence of complications,[2] also associated pathologies, like diabetes and vascular pathology, can increase the incidence of complications when a free flap is utilized.

The reverse sural flap is a distally based fascio-cutaneous that is used for coverage of defects that involve the distal third of the leg and foot. The surgical technique is safe and provides alternative to microsurgical reconstruction.

Vascular anatomy of Reverse sural flap

The distally based reverse sural artery flap is based on the fascio-cutaneous blood supply of the distal posterior lateral leg. The structures supplying the flap include the sural nerve superficially, the sural arteries and the lesser saphenous vein. These structures are all divided proximally while the flap is elevated. The arterial flow to the flap is provided by septo-cutaneous perforators arising from the peroneal artery,of which there are typically three to six.

Materials and Methods:

A prospective study was conducted between October 2020 to September 2023, 21 patients with soft tissue defects in the distal third of leg and foot were treated with Reverse Sural Flap at TMMCH, Bangladesh.

Inclusion criteria:

- Patients of any age, sex, on whom reverse sural flap for lower limb defect is suitable.

- Lower limb defect

- The pedicle area should be healthy.

Exclusion criteria:

- Patient with scar on flap pedicle area.

- Patients not agreed to take part in this study.

Surgical technique:

Patient position: prone position

A line was marked from a point halfway between the Achilles tendon and the lateral malleolus at the ankle extending to the midline between the two heads of the gastrocnemius muscle. This roughly describes the course of the medial sural cutaneous nerve and lesser saphenous vein .

The skin incision started distally along the line of the pedicle so that lesser saphenous vein was first localized. The skin island was then marked, with its centre along the line of the lesser saphenous vein. Pedicle included fascial and subcutaneous tissue and ranged 3-5 cm wide. After incision of the skin island, sural nerve was detected in the sub-fascial plane and harvested with the flap.

When designing the flap, first determines the pivot point distally. This is usually 5 to 7 cm proximal to the lateral malleolus and can be confirmed using a handheld Doppler. After raising the flap, flap is transfer to the defect. Donar site closed with skin graft.


Figure 1 & 2: Pre-operative marking. (Flap size 10x12 CM) & After excision, and incision is given


Figure 3 & 4: Raising of sural flapLorem ipsum dolor


Figure 5 & 6: Flap is transferred to cover the defect &: Harvesting of skin graft for donar

Figure 7 & 8 : Final result

Figure 9: 3 months after follow up

Case 2:

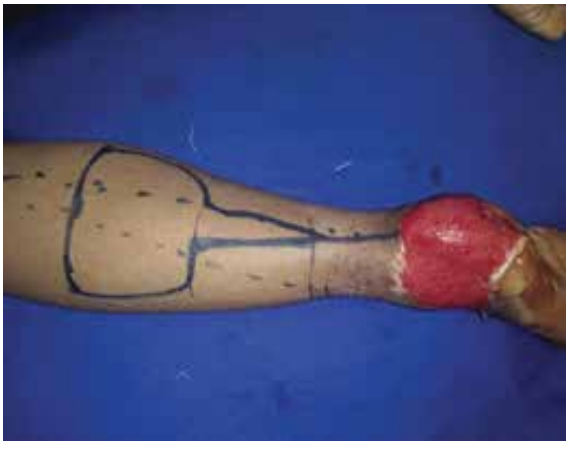

Figure 10: pre-operative marking & per-operative identification of sural nerve & sural artery

Figure 11: Post - operative view

Figure 12: After 3 months

Case 3:

Figure 13: Pre-operative view & After 3 months (partial flap loss treated conservatively)

Case 4:

Figure 14: Pre operative, peroperative & 3 months after follow up

Results:

Most of the study populations were 20-60 years old. Among 21 cases, 16(76%) cases were male and 5(23.80%) cases were female.

In our study, The distally based reverse sural artery flap was used as the choice for reconstruction of defects of the lower third of the leg, ankle and foot. We harvested the flaps with length ranged from 8 cm up to 16 cm with a mean length of 12 cm, while the width ranged from 5 cm up to 10 cm with a mean width of 7.5 cm.

In our study, out of the 21 flaps, 80.95% showed no complications, 14% showed Marginal flap necrosis, and only 4.76% showed partial flap necrosi

Discussion

The distal lower extremity and foot have long been recognized as problematic areas for reconstruction because local donor tissue is often insufficient or is located within the zone of injury. Also, unreliable blood supply plays a role in difficulty of reconstruction using local and regional flaps. Goals of reconstruction are to provide stable soft-tissue coverage.[3]

Table 1. Outcome of flap of the study population (n=21)

Outcome	Frequency	Percentages (%)
Marginal flap necrosis	03	14
Partial flap loss	01	4.76
Total flap loss	00	00
No loss (Complete survival)	17	80.95
Total	21	100

Coverage of wounds of the lower one-third of the leg are usually best treated using micro-vascular free-tissue transfer. These flaps provide for reliable single-stage coverage of these wounds. There are, however, disadvantages to use free flaps. Among these are the need for a remote donor site, increased operative time, use of a major vessel to the leg, and microsurgical skills. The alternative for coverage of these areas has historically been pedicled fascio-cutaneous flaps.[4]

In our study, The distally based reverse sural artery flap was used as the choice for reconstruction of defects of the lower third of the

leg, ankle and foot. We harvested the flaps with length ranged from 8 cm up to 16 cm with a mean length of 12 cm, while the width ranged from 5 cm up to 10 cm with a mean width of 7.5 cm. In our study, out of the 21 flaps, 80.95% showed no complications, 14% showed Marginal flap necrosis, and only 4.76% showed partial flap necrosis.

Our results were comparable with results of Morgan et al, who treated 15 cases with chronic ulcers using Reversed sural artery flap. They reported that complications occurred in about 33% (13% treated conservatively and only 20% of the cases flaps failed completely), so their success rate was about 80% after treatment of complications.[5]

Our results were also comparable with results of M. E. M. Mohamed and Al Mobarak, B. A. who treated 20 cases with RSSA flap for reconstruction of defects of the lower third of the leg, ankle and foot. They harvested the flaps with length ranged from 10 cm up to 20 cm with a mean length of 15 cm, while the width ranged from 5 cm up to 10 cm with a mean width of 7.5 cm. Out of the 20 flaps, 70% showed no complications, 20% showed epidermolysis due to mild venous congestion, and only 10% showed partial necrosis.[6]

Also our results are comparable with the results of A. Cheema et al, who showed their experience in treatment of 17 cases caused by different causes (posttraumatic, post reconstruction of foot or tendo-Achilles, tumor resection and gunshots). They harvested flaps with different sizes, the smallest flap was 6×4 cm and the largest was 15×12 cm, with the average size being 11×7.5 cm. During their study, only two cases (12%) developed partial superficial necrosis, 1 case had partial wound dehiscence that needed debridement and repair, and 1 case had postoperative discharge, which subsided after removal of the calcaneal plate.[7]

From all the previous results and other similar studies, we found that distally based reverse sural artery flap (RSSAF) can be harvested to cover defects over the lower third of the leg, ankle and foot. The flap is easy to harvest, can cover large areas, with good reliability, and low rate of complications. The flap can be used as a good reliable alternative for free tissue transfer in reconstruction of the difficult defects over the lower third of the leg, ankle, and foot.

Conclusion:

The distally based sural flap is an excellent option for covering defects in the lower third of lower limb, ankle and heel. It allows rapid, reliable coverage of defects extending as far distally as the forefoot.The reverse superficial sural artery flap, RSSAF can be used as a reliable alternative to free tissue transfer in reconstruction of defects over the lower third of leg, ankle, and foot. Tendency of venous congestions is a problems of this flap, so that rotation of the pedicle and his “tunnellization”, where possible, must be carefully valued.

Limitations of the study:

Sample size was not sufficiently enough. Duration of follow up period was short.

Conflict of interest: None

Ethical issues: Preserved

Source of fund: None.

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DIAGNOSTIC PERFORMANCE OF MAGNETIC RESONANCE IMAGING IN EVALUATION OF CRANIOPHARYNGIOMA WITH HISTOPATHOLOGICAL COMPARISON

Arpita Raut[1], Orin Afrin[2], Mehjabin Binte Rashid[3], Rashida Akter[4], Amit Guha[5]

ABSTRACT

Background: The sellar and parasellar region is anatomically complex and houses critical structures, making accurate imaging essential for diagnosing and differentiating pituitary and other sellar lesions. Considering this, the present study aims to evaluate the diagnostic performance of Magnetic Resonance Imaging (MRI) in detecting craniopharyngioma by comparing MRI findings with histopathological results to determine its sensitivity, specificity, and predictive values. **Methods:** This cross-sectional study at the Departments of Radiology and Imaging, Sir Salimullah Medical College, Mitford Hospital, and National Institute of Neuroscience, Dhaka (July 2018-June 2019) included 38 patients with suspected sellar lesions. All underwent 1.5T MRI, surgery, and histopathology. Inclusion required clinical suspicion and surgery consent; exclusions were MRI contraindications or refusal. Data were analyzed via SPSS v22 to assess MRI diagnostic accuracy versus histopathology. Ethical approval and consent were obtained. **Results:** Among 38 patients (mean age 39.5±24.17 years; 52.6% male), visual impairment (84.2%) and headache (57.9%) were common. Tumors were mainly sellar/suprasellar (71.1%). MRI diagnosed craniopharyngioma in 50%, confirmed histologically in 52.6%, mostly adamantinomatous (75%). Key MRI features included lobulated shape (68.4%), T1 hypointensity (57.9%), T2 hyperintensity (78.9%), hydrocephalus (52.6%), calcification (84.2%), and optic chiasma compression (71.4%). MRI showed 90.9% sensitivity, 94.7% specificity, and 92.2% accuracy. **Conclusion:** In conclusion, MRI demonstrates high diagnostic accuracy comparable to histopathology, making it a reliable pre-operative tool for diagnosing craniopharyngioma.

Keywords: Diagnostic Performance, Magnetic Resonance Imaging, Craniopharyngioma, Histopathological Comparison.

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Introduction

The sellar and parasellar region is an anatomically complex area adjacent to critical structures such as the orbits, cavernous sinus, hypothalamus, and pituitary stalk.[1] Accurate imaging of this region is essential not only to confirm pituitary lesions but also to differentiate among various sellar pathologies.[2] Craniopharyngiomas are common suprasellar and/or intrasellar tumors, accounting for approximately 3% of all primary intracranial tumors.[3] They represent the most frequent non-glial brain tumors in childhood, constituting 6-8% of pediatric brain tumors and 50% of suprasellar tumors in children.[4,5] These benign tumors have a bimodal age distribution, typically presenting in the first two decades and again in the fifth decade of life.[6] with no gender predilection. Headache, visual disturbance, and endocrine deficiency are common presenting symptoms.[7]

Histologically, craniopharyngiomas are classified into adamantinomatous and squamous-papillary types.[8] They arise from remnants of the craniopharyngeal duct or Rathke's pouch (adamantinomatous type) or from squamous epithelial rests (squamous papillary type). Despite being WHO Grade 1 benign neoplasms, they are clinically aggressive due to high recurrence rates often related to cerebrospinal fluid seeding and brain invasion.[3,9] Typically, these tumors appear as partly solid, partly cystic, calcified masses primarily in the suprasellar region (75%), with smaller proportions extending to parasellar and intrasellar areas.[10]

Magnetic Resonance Imaging (MRI) is the preferred imaging modality for sellar and parasellar lesions, offering superior soft tissue contrast, multiplanar capability, and absence of ionizing radiation.[2] MRI aids not only in diagnosis but also in surgical planning by delineating relationships to adjacent structures.

Although CT is useful for detecting calcifications and bony destruction, its use is limited due to radiation exposure and inferior soft tissue contrast. MRI signal characteristics of craniopharyngiomas vary depending on cyst contents and tumor type, with calcifications and T1 hyperintense cystic components more common in the adamantinomatous type.[3,11,12] Post-contrast images typically show strong heterogeneous enhancement of the solid tumor components.[7]

Preoperative differentiation between adamantinomatous and papillary types is important, as radiological features such as calcification and signal intensities provide useful clues.[3] MRI protocols typically include unenhanced T1 and T2 weighted images in coronal and sagittal planes, followed by post-contrast T1-weighted sequences.[11,13] Proper diagnosis is critical since treatment often involves multimodal approaches including surgery, radiotherapy, and endocrine management.[2]

Considering the clinical importance of accurate diagnosis and the evolving role of MRI, this study aims to evaluate the diagnostic performance of MRI in detecting craniopharyngioma with comparison to histopathological findings by determining its sensitivity, specificity, and predictive values.

Objective

- To evaluate the diagnostic performance of magnetic resonance imaging (MRI) in detecting craniopharyngioma, using histopathology as the gold standard.

Methodology & Materials

This observational, cross-sectional study was conducted at the Department of Radiology and Imaging, Sir Salimullah Medical College, Mitford Hospital, and the National Institute of Neuroscience, Dhaka, Bangladesh, from July 2018 to June 2019.

A total of 38 patients were included, selected through sequential sampling from those attending the emergency or neurosurgery outpatient departments with clinically suspected sellar lesions. All participants underwent MRI, followed by surgical intervention and histopathological evaluation according to the predefined inclusion and exclusion criteria.

Inclusion Criteria

- Patients with clinical and/or endocrinological features suggestive of craniopharyngioma referred for MRI examination.
- Patients who subsequently underwent surgical intervention and histopathological examination.

Exclusion Criteria

- Patients with contraindications to MRI examination.
- Patients unwilling to undergo surgery.

During the 12-month study period, approximately 3 to 4 patients fulfilling the inclusion criteria were recruited monthly, resulting in an initial pool of 40 patients with sellar region tumors. Two cases were excluded-one due to unavailability of histopathology and one due to refusal of surgery-yielding a final sample size of 38. Purposive sampling was employed. MRI scans were performed using a 1.5 Tesla machine with 5 mm slice thickness and 4 mm interslice gap. Imaging sequences included axial T1-weighted, axial/coronal/sagittal T2-weighted, axial FLAIR, and post-contrast axial T1-weighted imaging after administration of gadodiamide (0.1 mmol/kg). Histopathological samples were obtained following surgical intervention by neurosurgeons and analyzed by pathology departments, with histopathology considered the diagnostic gold standard. Data collection encompassed demographic, clinical, MRI, and histopathological variables. Diagnostic accuracy metrics-including sensitivity, specificity, positive predictive value, and negative predictive value-were calculated using standard formulas. Statistical analysis was performed using SPSS version 22.0. MRI diagnostic criteria for craniopharyngioma and differential diagnoses (meningioma, pituitary macroadenoma, Rathke's cleft cyst) were based on established imaging features. Ethical approval was obtained from the Institutional Review Board, and informed consent was secured from all participants.

Results

Table I shows the age distribution of the study patients, with 39.5% belonging to the age group ≤20 years. The mean age was 39.50±24.17 years, ranging from 5 to 75 years. The sex distribution indicates that among the 38 patients, the majority were male (20, 52.6%) and 18(47.4%) were female, with a male-to-female ratio of approximately 1.1:1.

Table II shows the clinical features reported by the study patients. Among all study patients, the most frequent complaint was visual impairment, reported by 32 patients (84.2%), with 19(50%) experiencing blurring of vision and 13(34.2%) experiencing loss of vision. The second and third most common complaints were headache in 22 patients (57.9%) and vomiting in 19 patients (50%), respectively.

Figure I illustrates the anatomical location of tumors among the study patients. Among all patients, 27(71.1%) had tumors in the sellar and suprasellar region, 9(23.7%) had tumors in the sellar and parasellar region, and 2(5.2%) had intrasellar tumors.

Table III presents the MRI and histopathological diagnoses of the study patients. On MRI, craniopharyngioma was the most common diagnosis, seen in 19 patients (50.0%), followed by meningioma in 9 patients (23.7%), pituitary macroadenoma in 8 patients (21.0%), and Rathke's cleft cyst in 2 patients (5.3%). Histopathological examination confirmed craniopharyngioma in 20 patients (52.6%), with 15(75.0%) cases being the adamantinomatous type and 5(25.0%) the squamous papillary type. Additionally, 9 patients (23.7%) had meningioma, 8(21.1%) had pituitary macroadenoma, and 1 (2.6%) had Rathke's cleft cyst.

Table IV summarizes the MRI features observed in patients with craniopharyngioma. Among 19 patients, 13(68.4%) had lobulated lesions while 6(31.6%) had round lesions. Signal intensity on T1-weighted images showed 11(57.9%) hypointense, 4(21.1%) isointense, and 4(21.1%) hyperintense lesions. On T2-weighted images, 15(78.9%) lesions were hyperintense and 4(21.1%) heterogeneously hyperintense. FLAIR images revealed hyperintensity in 14(73.7%) and heterogeneously hyperintense signals in 5 (26.3%) patients. Obstructive hydrocephalus was present in 10(52.6%) patients and absent in 9(47.4%). Calcification was observed in 16(84.2%) patients. Optic chiasma compression was noted in 15(71.4%) patients. Regarding enhancement patterns, 13(63.4%) showed heterogeneous with rim enhancement, 3(15.8%) had heterogeneous enhancement, and 3(15.8%) exhibited rim enhancement.

Figure II illustrates the diagnostic performance of MRI in detecting craniopharyngioma, showing a sensitivity of 90.91%, specificity of 94.70%, accuracy of 92.23%, positive predictive value of 94.74%, and negative predictive value of 89.47%.

Table I: Demographic Characteristics of the Study Population (n=38)

Variable		Number of Patients	Percentage (%)
Age (in years)	≤ 20	15	39.5
	21–40	4	10.5
	41–60	14	36.8
	> 60	5	13.2
	Mean ± SD	**39.50 ± 24.17**	
	Range	**5 – 75**	
Sex	Male	20	52.6
	Female	18	47.4

Table II: Distribution of Study Patients by Presenting Complaints (n=38)

Clinical Feature	Frequency	Percentage (%)
Headache	22	57.9
Nausea & Vomiting	19	50.0
Visual impairment	32	84.2
- Blurring of vision	19	50.0
- Loss of distal vision	13	34.2
Growth retardation	6	15.8
Convulsion	9	23.7
Amenorrhoea/Oligomenorrhoea	5	13.2

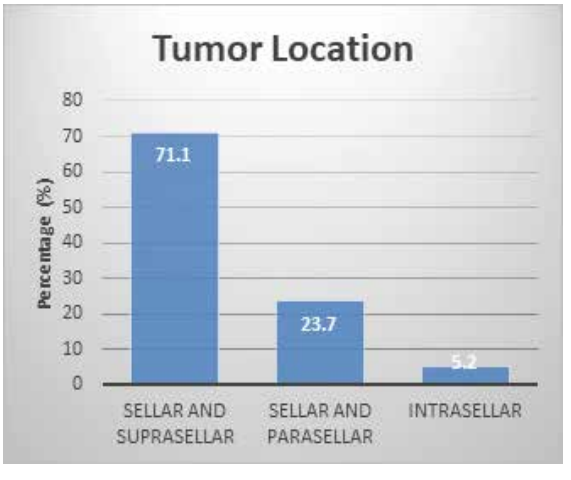

Figure I: Distribution of Study Patients by Tumor Location (n=38)

Table III: MRI and Histopathological Diagnosis of Study Patients

Diagnosis		Frequency	Percent (%)
MRI diagnosis	Craniopharyngioma	19	50.0
	Meningioma	9	23.7
	Pituitary macroadenoma	8	21.0
	Rathke's cleft cyst	2	5.3
Histopathological diagnosis	Craniopharyngioma	20	52.6
	– Adamantinomatous type	15	75.0
	– Squamous papillary type	5	25.0
	Meningioma	9	23.7
	Pituitary macroadenoma	8	21.1
	Rathke's cleft cyst	1	2.6

Table IV: MRI Characteristics and Imaging Features of Craniopharyngioma Patients

Feature Category		Number of Patients	Percentage (%)
Shape of lesion	Lobulated	13	68.4
	Round	6	31.6
Signal intensity	T1WI – Isointense	4	21.1
	T1WI – Hypointense	11	57.9
	T1WI – Hyperintense	4	21.1
	T2WI – Hyperintense	15	78.9
	T2WI – Heterogeneously hyperintense	4	21.1
	FLAIR – Hyperintense	14	73.7
	FLAIR – Heterogeneously hyperintense	5	26.3
Obstructive hydrocephalus	Present	10	52.6
	Absent	9	47.4
Calcification status	Present	16	84.2
	Absent	3	15.8
Optic chiasma compression	Present	15	71.4
	Absent	4	29.6
Enhancement pattern	Heterogeneous with rim	13	63.4
	Heterogeneous	3	15.8
	Rim	3	15.8

Figure II: Diagnostic Performance Metrics of MRI in Craniopharyngioma Evaluation

Discussion

This cross-sectional study was conducted to detect, characterize, and diagnose craniopharyngioma by MRI, observe histopathological diagnosis, and determine the diagnostic accuracy, sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of MRI compared to histopathology as the gold standard. A total of 38 patients fulfilling inclusion and exclusion criteria, referred to the Department of Radiology and Imaging of Sir Salimullah Medical College and Mitford Hospital (SSMC & MH) and National Institute of Neuroscience (NINS) between July 2018 and June 2019, were included in this study.

In this study, 15(39.5%) patients with sellar region tumors were aged ≤20 years, followed by 14(36.8%) patients in the 41-60 years age group, and 5(13.2%) patients aged over 60 years. The mean age was 39.50±24.11 years, ranging from 5 to 75 years. This closely resembles the findings of Zacharia et al.[14], who reported a typical bimodal age distribution for craniopharyngioma, with peaks at 0-19 years and 40-79 years.

A slightly higher male prevalence was observed, with 20 males (53%) and 18 females (47%), yielding a male-to-female ratio of approximately 1.1:1. This finding is comparable to Batra et al.[15], who reported 60% male and 40% female patients among 116 study subjects.

Analysis of clinical features revealed visual impairment as the most frequent symptom, reported by 32 patients (84.2%), including 19(50%) with blurring of vision and 13(34.2%) with loss of distal vision. Headache (22 patients, 57.9%) and vomiting (19 patients, 50%) were also common. Muller et al.[16] documented headache in 70-85%, visual impairment in 62-84%, and endocrine deficits in 52-87% of craniopharyngioma patients. Similarly, Larijani et al.[17] found headache in 77%, vomiting in 60%, and visual disturbances in 37% of cases. Dandurand et al.[18] reported visual deficits in 95.6%, headache in 36.4%, and endocrinological deficiency in 22.7%. Thus, the present study findings align well with these previous reports.

Regarding tumor location, 27(71.1%) tumors were sellar and suprasellar, 9(23.7%) were sellar and parasellar, and 2(5.2%) were intrasellar. Tariq et al.[19] reported suprasellar tumors in 61.5%of patients and sellar tumors in 53.8%, with

a single case extending into the third ventricle. Yiesmin et al.[20] reported 47.6% of patients with sellar tumors extending suprasellarly, 28.5% with intrasellar tumors, and 16.6% with lesions extending to the suprasellar and parasellar regions. Thus, the current study's tumor location distribution is comparable to these studies.

Among 19 craniopharyngioma patients, 13(68.4%) had mixed solid and cystic tumor components, 3(15.8%) had cystic tumors, and 3(15.8%) had solid tumors. This corresponds with Tsuda et al.[21], who reported 16 tumors with mixed components, 3 cystic, and 1 entirely solid among 20 surgically treated cases.

Histopathological examination revealed adamantinomatous craniopharyngioma in 15(75%) patients and squamous papillary type in 5(25%). Dandurand et al.[18] similarly found 65.6% adamantinomatous and 34.3% squamous papillary types in their systematic review.

Regarding tumor shape, 13(68.4%) craniopharyngiomas were lobulated and 6(31.6%) were round. Prieto et al.[22] reported round shape in 42%, elliptical in 22.5%, and multiloculated in 22.5% of 200 surgically treated craniopharyngioma cases, closely aligning with this study's findings.

MRI imaging characteristics showed 11(57.9%) hypointense, 4(21.1%) isointense, and 4(21.1%) hyperintense lesions on T1-weighted images. T2-weighted images revealed hyperintensity in 15(78.9%) patients and heterogeneous hyperintensity in 4(21.1%). FLAIR sequences showed hyperintensity in 14(73.7%) and heterogeneous hyperintensity in 5(26.3%). Batra et al.[15] described 68% mixed solid-cystic and 32% cystic lesions, with cystic components showing iso- to hyperintensity on T1WI and T2WI, while solid lesions had mixed signals. Tsuda et al.[21] observed hypointensity in 10, hyperintensity in 5, and isointensity in 2 patients on T1WI, with mixed T2WI signal intensity in 7 and hypersignal in others. Mollá et al.[23] found solid-cystic components in 92.3% of cases, with variable T1WI signals, hyperintense cysts, and heterogeneous solid components on T2WI and FLAIR.

Mass effect with obstructive hydrocephalus was present in 10 (52.6%) craniopharyngioma patients. Karavitaki et al.[24] reported 23% incidence among 121 patients, supporting this study's findings.

Calcification was detected in 16 (84.2%) patients. Lee et al.[3] reported calcifications in 65.8% of tumors, more frequently in pediatric (100%) versus adult (48%) patients. Kim et al.[25] found calcification in 46% of craniopharyngiomas, consistent with the present data.

Optic chiasma compression was present in 15 (71.4%) patients. Prieto et al.[26] reported 59.6% optic chiasma compression in a retrospective study of 150 cases, aligning closely with the current study.

Contrast enhancement patterns revealed heterogeneous with rim enhancement in 13 patients (63.4%), purely heterogeneous enhancement in 3 patients (15.8%), and solely rim enhancement in another 3 patients (15.8%). Batra et al.[15] reported peripheral enhancement in cystic components and heterogeneous enhancement in solid portions, while Tsuda et al.[21] observed heterogeneous solid and rim enhancement of cystic portions. MRI diagnostic performance for craniopharyngioma showed sensitivity of 90.91%, specificity of 94.70%, PPV of 94.74%, NPV of 89.47%, and accuracy of 92.22%. These findings are in line with those of Batra et al.[15], who reported a sensitivity of 85.7%, specificity of 95.4%, PPV of 85.7%, NPV of 95.4%, and an accuracy of 93.1%, as well as Yiesmin et al.[20], who

documented a sensitivity of 83.3%, specificity of 97.22%, PPV of 97.2%, NPV of 97.2%, and an accuracy of 95.2%.

Limitations of the study

This study had certain limitations, including a relatively small sample size and the use of MRI machines from two different manufacturers across the two participating institutes, which may have introduced variability in imaging results.

Recommendations

Further research could be conducted with a larger sample size and a longer study period to obtain more precise results.

Conclusion

In conclusion, it was observed that the performance of MRI in diagnosing craniopharyngioma is very close to that of histopathological diagnosis. Therefore, MRI can be inferred to be a reliable diagnostic tool for craniopharyngioma in the pre-operative setting.

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Conflicts of interest

There are no conflicts of interest.

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STUDY OF DEATH DUE TO SUICIDAL HANGING IN DHAKA MEDICAL COLLEGE

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ABSTRACT

Hanging or self-suspension is a form of violent asphyxial death. Worldwide Suicide is a major socioeconomic & public health issue now a day. It becomes a popular mode of suicide throughout the world as well as in Bangladesh. The objective is to find out the demography of hanging according to age group, sex, manner, types & post mortem findings. A retrospective study was done at Dhaka Medical College in the department of Forensic Medicine during July, 2022 - May, 2023. Total 58 post mortem were done caused by hanging in this period. All the cases were referred from 42 different police stations of Dhaka which are under and maximum cases were from shahbag station. Among those 43.10% were males and rest 56.90% were females. Most of these were young adult 11-30 years 65.52% where manner of death was suicidal in all cases. In post mortem findings we found Cyanosis in 55 (94.82%) cases, petechial hemorrhage in 19 (32.76%) cases, sub-conjunctival hemorrhage in 45(77.59%) cases, face congestion in 25 (43.10%), salivary mark in 15(25.86%) and injury of neck muscles were 10 (17.24%) cases respectively. We need to find out causative factors that increasing the rate of hanging & the preventive measures that may essential to reduce death due to hanging.

Key Words: Asphyxia, Hanging, Suicide.

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Introduction

Since ancient period hanging is the second common thought of executing suicide. Hanging is classically known as a form of violent asphyxia death which is caused by suspended with a ligature around the neck which causes constriction of the air passage preventing exchange of air between the atmosphere & the lung alveoli leading to asphyxia[1] and the constricting force being the weight of the body. A thin rope around the neck will cause unconsciousness in 15 seconds[2]. Hanging can be define as a form of "asphyxia" produced by wholly or partially suspending the body by a ligature round the neck, so that the constricting force applied to the neck is the weight of the head or the body of the victim which pulls upon the ligature[3]. Asphyxia is one of the modes of death due to hanging, caused by the interference of respiration or due to lack of O2 in respired air due to which the organs and tissues are deprived of oxygen together with failure to eliminate CO2 causing unconsciousness or death. Examples have also occurred of people killed in some other way and later suspended to simulate hanging. Hence death due to hanging is one of the most complex and controversial areas of asphyxial deaths. To ascertain cause and manner of death in cases of hanging, meticulous examination of ligature mark, neck structure findings and other autopsy findings are much helpful[4]. The other modes of death in hanging are apoplexy (congestive suboxia), anemia of the brain (acute arterial suboxia), reflex vagal inhibition, Fracture-dislocation of cervical vertebrae. These modes may occur individually or with other causes. It has been reported that a tension of 15 kg (33 lb) on the ligature will occlude the trachea, a tension of 2 kg (4.4 lbs) will compress the jugular veins, a tension of 45 kg will occlude the carotid arteries and a tension of 30 kg will compress the vertebral arteries[5].

Hanging is one of the 10 leading causes of death in the world accounting which hits more than a million deaths annually[6]. In Bangladesh, hanging is the second most common method of suicide, as it is least painful. Hanging material is easily available and it causes rapid death. The present study was carried to find out the demography of hanging according to age group, sex, manner, types & post mortem findings.

Material and Methods

The present study was conducted in the department of Forensic Medicine and Toxicology at Dhaka Medical College during July, 2022- May, 2023. Total 58 post mortem caused by suicidal hanging were done in this period. The details about victims regarding the age groups, sex, manner, types & post mortem findings has been picked up from the departmental register book & some were our direct observations. Written permission for sample collection was obtained from the authority of Forensic Medicine and Toxicology department of Dhaka Medical College.

Observations and results

Collected data were analyzed after observations. Observations and results were noted carefully. The results were presented in the forms of tables and chart. Medico-legal autopsies were conducted during the period from July, 2022- May, 2023 of which 58 were deaths due to hanging.

1. Sex wise distribution:

Table 1: Sex wise distribution

Sex	No. of Cases
Male	25(43.10%)
Female	33(56.90%)
Total	58(100%)

In present study, the majority of the victim males were 25(43.10%) while females were 33(56.90%) in number. Male and female ratio found to be 1:1.32

2. Age wise distribution:

Table 2: Age wise distribution

Age Group(yrs)	M	F	No. of cases	Percentage
0-10	00	02	02	3.45%
11-20	07	12	19	32.76%
21-30	10	09	19	32.76%
31-40	05	07	12	20.69%
41-50	01	02	03	5.17%
51-60	01	00	01	1.72%
61-70	01	01	02	3.45%
71-80	00	00	00	0.00%
80- rest	00	00	00	0.00%
Total	25	33	58	100%

3. Manner of death according to inquest:

All cases of hanging were suicidal according to inquest (100%)

4. Type of hanging according to position of knot:

During our study period total 58 cases of death due to suicidal hanging were observed. 16(27.59%) cases were typical hanging and 42(72.41%) cases were atypical hanging. Accidental hanging was not found during study period

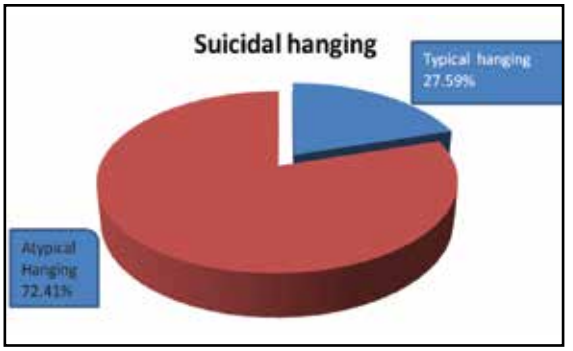

Fig1. Pie charts showing 16(27.59%) cases were typical and 42(72.41%) were atypical hanging.

5. Post mortem findings

Table 3: Post mortem findings

Post mortem findings	No. of cases	Percentage
Cyanosis	55	94.82%
Salivary mark	15	25.86%
Petechial haemorrhage	19	32.76%
Sub- conjunctival haemorrhage	45	77.59%
Face Congestion	25	43.10%
Injury of neck muscles	10	17.24%

Table 3 shows that Cyanosis in 55(94.82%) cases, petechial hemorrhage in 19 (32.76%) cases, sub-conjunctival hemorrhage in 45(77.59%) cases, face congestion in 25 (43.10%), salivary mark in 15(25.86%) and injury of neck muscles were 10 (17.24%) cases.

Discussion

According to a report by the World Health Organization 19,697 people committed suicide in Bangladesh in 2011[7]. Hanging is the most common method of suicide in Bangladesh. There is no cost involvement in this method other than ligature material, i.e., a rope, and thus that is why it is the preferred method by *Ahmad & Hossain*[8]. Now a days we are mostly dependent and passing our recreation or refreshment time with our social media, television from where we

see many serials, drama which is the reflection of our life style. So we don't hesitate what we watch and apply it in our own life.

i) Age factor:

Here most of the violent asphyxial death occurs in age group 11-30 were 38 cases (65.52%) & this duration of life is the most active period in our life. Maximum incidence of hanging in middle age group and minimal incidence in extremes of age was also found by many researchers[9-15] in different countries. But in the study of Bowen DA[16] and Simonsen J[17] hanging was more common in higher age group than our study. Sometimes our dream and ambition can't cope up with our achievement. So frustration of emotions breakthrough happens in our life. Causes of frustration are unemployment, family issues, poverty and failure of love and failure in examination.etc which is increasing day by day.

ii) Male female ratio:

Male 25(43.10%) cases, female were 33(56.90%) cases are found during our study and male female ratio were 1:1.32. This is supported by Ahmad & Hossain 8 but in the study of Ali E et al.,[18] they found among the 334 cases, 69.2% were male and 30.8% were female. In our populous country unemployment, poverty, depressions are very much common causes to suicide by hanging. Besides these quarrels in family issues, property issues, failure of love & examination are the others major motivational factor to terminate their lives.

iii) Manner of death:

Total cases of hanging 85 (100%) found to be ante-mortem and suicidal in nature.

iv) Types of hanging according to position of knot:

In our study 42(72.41%) cases showed right or left sided knot indicate atypical hanging where only 16(27.59%) cases showed knot were located nape of the neck which indicate typical hanging.

v) Post mortem findings:

In our present study of 58 cases, we found cyanosis in tip of fingers and nail beds of both hands among 55 (94.82%) cases, petechial hemorrhage in 19 (32.76%) cases, sub-conjunctival hemorrhage in 45(77.59%) cases, face congestion in 25 (43.10%), salivary mark in 15(25.86%) and injury of neck muscles were 10 (17.24%) cases. These findings are the most vital signs of asphyxia. Out of these 58 cases 15 (25.86%) were associated with injuries like abrasion & contusions.

Conclusions

From the study we may conclude as:

A. The maximum 38 (65.52%) cases of death due to hanging occurred in age group of 11-30years.

B. All hanging cases were suicidal in nature (100%).

C. Cyanosis of fingertips & nail beds 55 (94.82%) & sub-conjunctival hemorrhage in 45(77.59%) were the commonest findings in cases of asphyxial death due to hanging.

D. Suicide by hanging is increasing with the time of progress. To motivate the teenagers, adolescents and young people positively mass media like social media, newspaper, poster, stage performance throughout the country can be implemented. Creating more job opportunities by increasing the quantity of training centers, technical education for practical and vocational training. Good hope, proper job environment, standard life style, handsome income can give to young generation and may reduce rate of death due to hanging.

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AN ATYPICAL FINDINGS IN A CASE OF HANGING

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ABSTRACT

Hanging is a common method of suicide worldwide and is considered a form of asphyxial death. It is characterized by compression of the neck structures due to suspension by a ligature around the neck and constricting force being the weight of the body. The forensic evaluation of such cases is crucial to differentiate between Suicidal, Homicidal, and Accidental hanging.

Keywords: Hanging, Autopsy, Agonal Phase, Abdominal Congestion, Rectal bleeding

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Introduction

One of the most common methods of Suicide is Hanging. Usually a suicidal Hanging case mostly has a clear cut crime scene with nothing unusual or suspicious. But, sometimes the body or the circumstance in which the body was found can bring a confusion in the manner of death, traditionally more suggesting of a foul play. During Autopsy, even when the findings are clear-cut pointing towards a particular COD, there may be some unusual findings seen, which makes the Autopsy Surgeon in doubt for which a prior visit to Crime Scene is essential to Rule out & Correlate the findings in PME. A thorough medico-legal investigation of hanging cases is essential to determine the manner of death, underlying circumstances, and associated forensic findings. This journal aims to explore the pathophysiology, autopsy findings, and investigative aspects of hanging cases, providing a comprehensive overview for forensic and

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medical professionals. Understanding the forensic and clinical implications of hanging cases is crucial for accurate diagnosis, proper documentation, and legal proceedings. This journal will also highlight challenges in differentiating suicidal, homicidal, and accidental hanging, along with recent advancements in forensic examination techniques

Case Report:

The history was taken from the Mother of the deceased . Berkuti Srinivasulu 31 years old male, S/O Late Berkuti Hanmanthu, Hindu, from Ibrahimnagar village of Koilkonda Mandal, District- Mahabubnagar, P/S- Koilkonda.

As per information supplied by his mother that the victim was in toxic relationship. The 31 years old male was found hanging to the wooden ceiling in his living room, with pool of blood surrounding the crime scene. He was last seen alive on 22-11-2023 at 8 pm and was first found dead on 23-11-2023 at 8:30 am . The mother of the deceased saw pool of blood in the crime scene, and had allegation regarding some foul play. It was police case and sent for postmortem Examination to Government General Hospital Mahabubnagar Morgue. The case was filed at Koilkonda Police station, U/S- 174 CrPC, Crime number 221/2023, dated 23/11/23. Police handed over the dead body at 14:45 PM on 23/11/23 by PC no 3079 (name). The body was received at Mortuary at 15:30 PM on 23/11/2023 and Post mortem was done at 12:00 PM on 24/11/2023. Date and time of receipt of Requisition:- 24-11-2023 at 12:00 PM PME no:- 596/2023 Date and time of Commencement of Autopsy:- 24-11-2023 at 12:10 PM

Autopsy:

Autopsy of the body of the deceased was held on 24-11-2023 at 1:10 PM in the mortuary of Government General Hospital Mahabubnagar, Telangana. The body was brought by police constable and was identified by the police constable and the mother of deceased.

External examination:

The body of the deceased was wrapped in Orange color blanket, was dressed in Red color full sleeved T-shirt, white vest, Blue Track pant, Brown underwear. He was nourished, healthy young man with mixed complexion. His length was 5 feet 6 inches.

Body- Supine position on Autopsy table.

Face swollen & blackened, Lips were swollen & discolored.

Eyes & Mouth closed.

Post mortem purge oozing from the nostril and mouth.

He had black scalp hair of 4 inches in length.

Fingers and toes were cyanosed.

There were 16 teeth in each jaw.

Tongue was blackened and bitten between the teeth.

Post mortem staining was obscured.

Rigor mortis was absent .

Marbling on the top of both shoulders, both sides of flank.

Right iliac fossa shows greenish discoloration.

Skin peeling noted over front of upper chest, abdomen, both lower limbs

PM blisters noted at front of upper chest and lateral sides of lower 1/3rd of right leg.

Distension of abdomen , penis & scrotum

Hairs around the anal canal are matted with dried blood.

Dried blood stain seen over the inner aspect and back of both things.

There was no injury to external genital organ and Anus shows no Injury. No swelling, Ulcer, Polyp or Engorged vein around Anal canal.

Injuries:

1. An Obliquely placed Antemortem ligature mark on the front and sides of the neck, over a length of 27 cm, width 1.5 cm, above the level of Thyroid prominence, extending from a point 4 cm below right mastoid, 4 cm below right ear-lobule, 5 cm below right angle of mandible, 7 cm below chin, extending backwards and to the left side at 4 cm below left angle of mandible, 4.5 cm below left ear-lobule, 3 cm below left mastoid extending backwards upto hair line with a gap of 10 cm. The mark is incomplete, grooved, brownish in color, dry & hard. On reflection, tissues beneath the ligature mark are pale & surrounding areas are soft due to decomposition. Hyoid bone & Thyroid Cartilage are Intact.
2. Ant bite marks present over a surface area of 11 x 8 cm over lower back. Ant bite mark present over a surface area of 5 x 4 cm over dorsum of foot.

Internal examination :

The scalp was soft, Intact and there found no injury.

Skull was Intact. There was no fracture found in the skull.

Brain was softened, Partially Liquified & congested. Meninges was healthy and congested.

Soft tissues and the blood vessels of the neck were healthy.

Mouth closed, Tongue was blackened & bitten between the teeth, Pharynx softened, Oesophagus congested.

The larynx, trachea and bronchi were soft & congested.

There was no injury to thyroid gland, thyroid cartilage and hyoid bone were Intact.

Both lungs were soft & congested .

Great vessels, coronary arteries and muscles of and valves of the heart were congested and full. Blood- fluid in state.

Stomach was empty, No specific smell, Mucosa soft and congested.

Small intestine was congested and distended with gas.

The large intestine was congested and contained fecal matter.

Liver was soft & congested.

The gall bladder was healthy and contained bile. Bile duct was patent.

Spleen was soft and congested.

The pancreas was Liquified.

Both the kidneys were soft & congested. Capsules removed easily. Right kidney weighted 115gms.

The suprarenal glands were soft & congested.

Pelvic cavity contained about 100 ml of blood on the left side.

Urinary bladder contained about 10ml of residual urine.

Urethral meatus shows no blood stains or discharge.

Spinal column & Spinal cord were Intact.

Viscera were sent to chemical examination department for chemical analysis

Primary opinion:-

The cause of death was kept pending till the receipt of chemical examination report.

Investigation:-

Following viscera were preserved and sent to the forensic toxicology laboratory to detect poisons:

1. Whole stomach with its contents and upper 30 cm of small intestine with its contents- The result reveals Negative for any Poisonous substance.
2. Small portion (500gm) liver and half of the each kidney- The result reveals that liver and kidneys were congested
3. Blood 100 cc was preserved and sent for chemical examination- The result reveals no presence of alcohol.

Final opinion:

Considering the postmortem examination findings and chemical analysis reports (for evidence of poison) I am of the opinion that the cause of death to the best of my knowledge and belief was due asphyxia due to Hanging which was ante mortem.

Picture 5: A case of suicidal

Discussion:

The following points are required to be considered in this case-

1. The Cause and Mechanism of death
2. Circumstances of death
3. The Manner of death.
4. Etiology of the Rectal Bleeding
5. Nature of death

The cause and mechanism of death:

The primary cause of death in hanging is asphyxia, resulting from obstruction of the airway and/or vascular structures of the neck due to the constricting ligature. In some cases, death may also occur due to cervical spine injury or vagal inhibition.

The mechanism of death in hanging depends on the nature of pressure exerted by the ligature:

The mechanism of death in hanging depends on the nature of pressure exerted by the ligature:

1. Vascular Obstruction (Most Common)-Asphyxial Death
   - o Venous congestion: Compression of the jugular veins impairs cerebral venous return, leading to hypoxia and unconsciousness.
   - o Carotid artery compression: Restriction of arterial blood flow results in cerebral ischemia, causing loss of consciousness within seconds to minutes.
2. Airway Obstruction-Asphyxial Death
   - o Complete closure of the trachea prevents oxygenation, leading to anoxic brain injury. However, airway occlusion is not always complete in typical hanging cases.

3. Neurogenic Shock (Vagal Inhibition)- Reflex Cardiac Arrest
   - o Sudden pressure on the carotid sinus can trigger vagal inhibition, leading to instant cardiac arrest without significant asphyxia.
4. Cervical Spine Injury- Instantaneous Death (Rare)
   - o In judicial hanging, the drop height causes hyperextension and fracture-dislocation of the cervical vertebrae (especially C2-C3), leading to spinal cord transection and immediate death

Circumstances of death:

In this case, the victim was married young man of 31 years. He quarrels with his wife and become emotional and could not understand the consequence of committing suicide by Hanging . So, the victim in this case had a definite provocative attitude to destroy himself.

The Manner of death:

i) **Suicidal:**
- Ligature mark
- Door locked inside
- Adequate point of suspension
- No defence injuries
- No other fatal bodily injuries

ii) **Homicidal:**

Blood stains in the crime scene

iii) **Accidental:**

H/O Sexual perversion

Etiology of the Rectal Bleeding:

i) **Haemorrhoids:**
- No engorged vein
- No Swelling around Anal canal

ii) **Solitary rectal ulcer:**

No ulcer at Anterolateral wall

iii) **Coagulopathies:**
- No such History-By family
- On PME, No joint bleeding, No muscle bleeding

iv) **Chronic Intestinal Disease:**
- Ulcerative colitis
- No Anal fissure

v) **Autoerotic Hanging:**
- No Erotic or Pornographic Literature in the crime scene within the view
- No disturbance in dressing of the deceased

vi) **Abdominal Congestion:**

Long Agonal Phase → Bleeding rectum → Partial Hanging

vii) **Hemorrhagic Lividity:**
- Body Suspended for a long period of time
- Last seen alive- 8:00 pm
- First found dead- 8:30 am
- About 12 hours period

Nature of death:

Hanging is a form of asphyxial death caused by suspension of the body with a ligature around the neck, leading to airway obstruction, vascular compression, or neurogenic shock. It can occur in suicidal, homicidal, or accidental circumstances. The determination of the manner of death requires a detailed medico-legal investigation, including scene examination, autopsy findings, and circumstantial evidence.

Whether Suicidal, Homicidal or Accidental Hanging

- Suicidal Hanging: Typically, suicidal hanging is characterized by the presence of a ligature mark on the neck, a locked room from inside, and an adequate point of suspension.

The absence of defense injuries and other fatal bodily injuries further supports the suicidal nature of death.

- Homicidal Hanging: Although rare, homicidal hanging may be suspected if there are bloodstains at the crime scene, signs of struggle, or evidence suggesting post-mortem hanging after an assault.
- Accidental Hanging: This is often associated with a history of sexual perversion, such as autoerotic asphyxia, where the intent is not suicide but an accidental fatal outcome due to miscalculated asphyxiation.

Conclusion

The possible etiology for any unusual finding has to be ruled out, like "The Rectal wall bleeding" in this case.

In case of Partial Hanging, the Long Agonal Phase and Asphyxia is possible, and due to pelvic dependence of the body in upright position, it has been suggested that lots of blood accumulates in pelvic region resulting in bleeding from Rectum.

This finding may not be an Absolute one in a case of hanging, yet it could be a Vital finding to be aware of such obstacles and avoid potential harmful misinterpretation.

LIMITATIONS:

1. Investigating officer did not bring the body in due time (Hence there were signs of Decomposition)
2. At crime scene, examination of Blood stains was not done by Forensic crime scene expert (Time since death, Texture , Source of Bleeding-could have been found)
3. Detailed crime scene photographs were not presented/ Provided by the Investigating officer.

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