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Editorial

Original Article

Review Article:

Case Report:

Short Communications

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Institute for Professional Excellence & Research

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IPEX Journal

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Contents

Editorial

Evidence based orthopaedic surgery: obstacles and solutions

Munier Hossain

Healthcare delivery is under constant scrutiny due to the scarcity of resources, the changing demographics of our patients and daily scientific discovery. This is more important in a resource-challenged country like Bangladesh. In this setting, all healthcare professionals need to understand and implement the principles of evidence-based medicine (EBM). But it is especially imperative for the young doctor. Young, impressionable minds are at the threshold of a lifelong journey, and good (or bad) habits learnt at this stage will remain with them for the rest of their lives. Hence, I am so pleased and honoured to be asked to write this editorial on evidence-based orthopaedics in the inaugural edition of the IPEX journal. I hope the publication of the journal will encourage young surgeons to write about their patients, treatments, successes and challenges and ultimately improve patient care. Our country is currently at a crossroads. I hope young doctors will take this opportunity to improve patient care so that our hard-earned money remains in the country and is not wasted overseas.

EBM is not an ivory tower movement. No one in their right mind would consider buying a car from a used car salesman on his/her word- the car has to be road-tested first. Similarly, none of us would take out an expensive mortgage without asking around for the best quote. EBM movement only demands that while treating patients we employ the same skills that we so instinctively apply in our real life, i.e. testing unchallenged assertions, asking around for the right information etc. What the EBM movement demands is no different from what we, as media-savvy consumers in the World Wide Web era, constantly demand of ourselves.

Before discussing evidence-based orthopaedics it is important to understand what EBM is. Dave Sackett, one of the pioneering proponents of EBM, wrote "Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values"[1]. It is important to understand the concept well. First comes evidence. For every treatment we should be guided by the availability of best available evidence. As far as intervention is concerned the best level of evidence is found by conducting randomised controlled trials (RCT) because the trial design gets rid of the uncertainty surrounding chance, confounding factors, bias etc. However, conducting an RCT is expensive, time-consuming and not always feasible. Therefore, there will not always be the luxury of high-quality evidence for every intervention. When we find ourselves in that situation it is important to acknowledge that and discuss with the patient the uncertainty of available evidence. It is also important to emphasise that when we discuss best available evidence that evidence needs to be current, valid and relevant. Outdated evidence is no good. Because of the inherent design of the RCT the research question is always very narrow. Therefore when assessing evidence it is also important to be satisfied that it is relevant to the condition we are searching for and equally valid for our patient. But EBM is not a license to practice the tyranny of evidence. Even the best and most valid evidence has to be assessed against the reality of the individual patient[2]. Even though there is accumulating evidence that a total hip replacement is the best treatment for managing a displaced hip fracture in a healthy patient, in a resource-poor setting this may not always be the right option. Treatment will also have to consider the patient's cultural values and traditions. Red wine in moderation might be cardio-protective but a Muslim patient is unlikely to appreciate its therapeutic value. Finally, we have to remember that the patient is in charge and healthcare decisions ultimately have to be made by the well-informed patient balancing the pros and cons of individual treatment. Orthopaedic surgeons might prefer to operate on wrist fractures to improve the cosmetic appearance and functional outcome but the occasional well-informed patient may prefer a period of plaster cast treatment and some deformity and disability to the risks of surgery and perfect alignment.

Having discussed the principles of EBM let us now look at the challenges of practising it in Bangladesh. You are lucky to have ubiquitous internet nowadays. Because of the spread of smartphones, even the best and most recent evidence is just waiting to be found in the hands of the enquiring surgeon. I remember days as an internee doctor when I was writing up a case report. I had to go to ICDDR,B, and talk to the Librarian regarding my need, then wait a week before I could lay my hand on the relevant papers. Now one can get this instantly. Therefore, you have already won the first hurdle, that of getting hold of the evidence in your hand. Even in UK I do not have access to full text journals unless I have a subscription. Whereas from Bangladesh you can access many of these journals due to the HINARI initiative.

The next challenge is having time to read the evidence. Here I would advise a practice of spending a short period of time once or twice a week, even half an hour to keep yourself updated with the latest evidence. If you develop this habit early this will reap benefit for you in the long term and will not feel too onerous at all. Take notes, summarise what you read and collate it later.

Once you have access to evidence and you have read it you need to be able to digest and appraise it. Critical appraisal of medical literature is not for everyone but a basic skillset and understanding of research methodology is useful for everyone. If, however, critical appraisal or going through loads of primary evidence is not your thing then there is good news. You can read pre-appraised literature through systematic reviews. If you are keen for more digestible and systematic format of pre-appraised evidence, then the best place to go is Cochrane Library where thousands of pre-appraised systematic reviews are available to read[3]. Only problem with the Cochrane reviews is that they do not appraise non RCT studies and therefore if there is no RTC for your research question you will not find it in Cochrane. In that case, the TRIP database is another useful option[4]. A sure fire way to incentivize the practice and adoption of EBM is to undertake regular journal club meeting, have such a meeting once a month so that everyone has enough time to read, prepare and discuss the paper.

Once you have read the evidence, appraised it, and are ready to apply it in practice, your final hurdle- how do you compare with your peers? The truth is that medical practice is still not fully regulated in Bangladesh, as in many other countries. Patients are mostly uneducated, and medical practice is unaccountable. In this environment, it is a challenge to practice EBM when your friends and/or colleagues might be earning more money by peddling snake oil. Here it is important to start a war to shift a cultural change so that both the patient and the clinician will be interested in a practice that conforms to EBM. Further, it is my belief that as we develop further as a nation and progress forward our patients will also become more aware, more knowledgable and demand the best. By practicing EBM you will be at the vanguard of this movement.

My other advice is to remember to be cautious. EBM is not perfect, and not all the faults of an intervention are always manifest early. Be wary of adopting shiny new treatment just because it is fanciful. Total hip replacement was being performed successfully for decades with plastic and metal until one company developed metal-on-metal implants. Everyone rushed to use this implant until it was found a few years later that metal on metal hips has too many disadvantages. Unfortunately, too many hips had already been implanted by then.

In summary, the biggest hurdle we faced in our days was getting hold of evidence. Nowadays, this is no longer an issue. At the same time, the doctors of today's generation are internet savvy and have the requisite information mastery to search and find the correct evidence. You only need to develop the critical appraisal skills to choose the valid evidence and the desire for knowledge translation where the evidence is put into practice.

I would write a few more points from the point of view of an educator. To be an EBM doctor you need to develop critical thinking skills. I would encourage you the reader to turn into active enquirers and self-instructors so that you can comfortably engage in a lifelong activity to ask, acquire, appraise, adopt and audit new and relevant information for the benefit of their patients. Constantly ask yourself, why?

Remember that adult learning is predominantly self-directed. You therefore need to become an active participant in the learning process. You need to construct your knowledge via your personal active experience and reflection thereof. One way to do this is via problem-based or case-based learning. Discuss cases between yourselves, with your senior and junior. Constantly challenging yourself how you can do better.

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3. Cochrane reviews | Cochrane Library
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Original Article

Postoperative Complications Following Repair of Acute Open Tendo Achilles Injury: Our Experience

Kadir MA[1], Roy LK[2], Rafi MAA[3], Alam M[4], Saha AC[5], Alam MK[6]

Abstract

Back ground: The Achilles tendon is the most superficial tendon in the body. Due to its position, it is usually prone to injury during trauma.

Objective: The aim of the present study was to assess the postoperative complications after repair of acute tendo-achilles injury.

Methodology: This Prospective observational Study study was carried out among 50 patients attending at the Department of Orthopaedics, Comilla Medical College Hospital,Cumilla within the defined period from January 2022 to December 2022. Ethical clearance was obtained from the Institutional Review Board (IRB) of Comilla Medical College Hospital. Purposive sampling was done according to availability of the patients. Statistical analyses of the results were obtained by using window based computer software devised with Statistical Packages for Social Sciences (SPSS-20.1).

Result: Majority patients (n=16, 32.0%) belonged to age group 21-30 years. More than two third (68.0%) patients were male and 16 patients (32.0%) were female. After operation excellent outcome was found in 30(60.0%) patients, good in 16(32.0%) patients, fair in 3(6.0%) patients and poor in 1(2.0%) patients. No post-operative complication was found in 36 (72.0%) patients and different types of complications were found in 14(28.0%) patients. Swelling is the most common post operative complication (12%) followed by ugly scar (10%). There was significant association between complications and outcome ($p<0.05$).

Conclusion: Approximately 14 in 50 patients undergoing operative repair of an acute Achilles tendon injury developed a postoperative complication.

Keywords: post-operative complication, tendo-achilles injury

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Introduction

The body's strongest and thickest tendon is the tendon of Achilles. The name Achilles comes from the Greek warrior who was unstoppable and unstoppable. Another name for it is a Tendocalcaneus[1]. The Achilles tendon is one of the most frequent ruptured tendons in the human body[2] and it's the 3rd most frequent major tendon injury behind those of the rotator cuff and knee extensor mechanism[3]. Despite being the strongest and largest tendon in the body, its superficial location in the body makes it vulnerable to injury in both athletes and non-athletes[4-5]. Achilles tendon injuries can result from sports injuries, road traffic accidents, penetrating injuries, unintentional cuts from

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sharp household objects, and foot slips in flat toilet pans.[6] The most common mechanisms of rupture are push-off of the weight-bearing forefoot with knee extension, sudden unexpected dorsiflexion of the ankle, and abrupt dorsiflexion of the plantar-flexed foot as at all heights. Disruption can also occur with a direct blow to the contracted tendon or laceration.[7] It's a generally accepted that surgical repair of fresh ruptures of tendo-achiles give excellent result. The complications of operative intervention however are not infrequent which are including adherence of the scar, wound infection, sloughing of the overlying skin and tendon, keloid formation.[8]

Materials & method

This Prospective observational Study study was carried out among 50 patients attending at the Department of Orthopaedics, Comilla Medical College Hospital,Cumilla within the defined period from January 2022 to December 2022. Ethical clearance was obtained from the Institutional Review Board (IRB) of Comilla Medical College Hospital. Purposive sampling was done according to availability of the patients. The collected data were entered into the computer and analyzed by using SPSS (version 20.1) to assess the postoperative complications after repair of acute tendo-achilles injury. Evaluation of primary repair of tendo-achilles injury was done according to Juhana Leppilahti's modified scoring scale.

Juhana Leppilahti's modified scoring scale given below

Clinical feature Score	Score
Pain	
None	15
Mild, no limitations on recreational activities	10
Moderate, limitations on recreational, but not daily activities	5
Severe, limitations on recreational and daily activities	0
Stiffness	
None	15
Mild, occasional, no limitations on recreational activities	10
Moderate, limitations on recreational, but not daily activities	5
Severe, limitations on recreational and daily activities	0
Call muscle weakness (Subjective)	
None	15
Mild, no limitations on recreational activities	10
Moderate, limitations on recreational, but not daily activities	5
Severe, limitations on recreational and daily activities	0
Footwear restrictions	
None	10
Mild, most shoes tolerated	5
Moderate, unable to tolerate fashionable shoes, modified shoes tolerated	0
Active range of motion (ROM) difference between ankles	
Normal (<6)	15
Mild (6-10)	10
Moderate (11-15)	5
Severe >15)	0
Subjective result	
Very satisfied	15
Satisfied with minor reservations	10
Satisfied with major reservations	5
Dissatisfied	0
Power of plantar flexion	
MRC -5	15
MRC -4	12
MRC -3	9
MRC -2	6
MRC -1	3
Result (Total score)	100
Rating	
Excellent	90-100
Good	75-89
Fair	60-74
Poor	<60

Table 1 shows that majority patients (n=16,32.0%) belonged to age group 21-30 years. The mean age was 29.48 with standard deviation of 13.53 years. More than two third (68.0%) patients were male and 16 patients (32.0%) were female. DM was found in 2(4.0%) patients, HTN was found in 2(4.0%) patients and HTN+DM+COPD was found in 1(2.0%) patients.

Parameter	Number	percentage
Age group (years)		
≤20	13	26.0
21-30	16	32.0
31-40	10	20.0
41-50	07	14.0
>50	04	8.0
Mean±SD	29.48±13.53	
Sex		
Male	34	68.0
Female	16	32.0
Co-morbidity		
DM	02	4.0
HTN	02	4.0
HTN+DM+COPD	01	2.0

Figure 1 shows that excellent outcome was found in 30(60.0%) patients, good in 16(32.0%) patients, fair in 3(6.0%) patients and poor in 1(2.0%) patients.

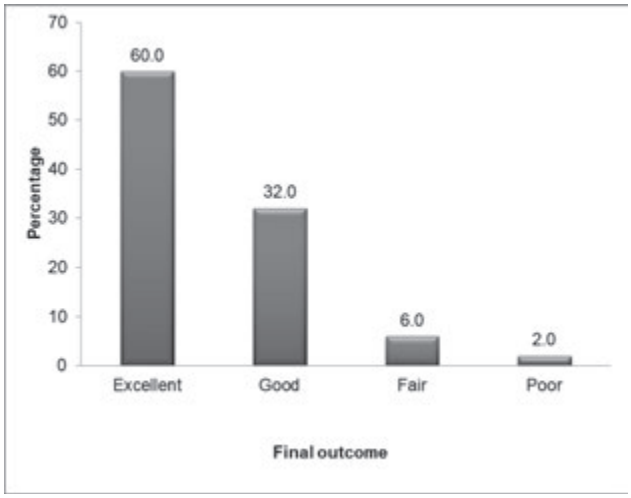

Figure 1: Distribution of the study patients by final outcome (n=50)

Table 2 shows that no complication was found in 36 (72.0%) patients and different type of complications were found in 14(28.0%) patients.

Table 2: Distribution of the study patients by post-operative complications (n=50)

Complications	Frequency	Percentage
No complication	36	72.0
Complication	14	28.0

Table 3 shows that, 6 patients (12.0%) had swelling, 5 patients had (10.0%) ugly scare, 1 patient had (2.0%) surgical site infection, and 1 patient had (2.0%) SSI+ re-rupture and 1 patient had (2.0%) wound gap.

Table 3: Common post-operative complications after operation (n=50)

Common Complications	Frequency	Percentage
Surgical site infection (SSI)	01	2.0
SSI+ re-rupture	01	2.0
Swelling	06	12.0
Ugly scar	05	10.0
Wound gap	01	2.0

Table 4 shows that there was significant association between complications and final outcome ($p<0.05$).

Table 4: Association of complications with final outcome (n=50)

Complications	Excellent (n=30)	Good (n=16)	Fair (n=3)	Poor (n=1)	P value
No complication	30 (100%)	5 (31.3%)	1 (33.3%)	0 (0%)	
Complication	0 (0%)	11 (68.8%)	2 (66.7%)	01 (100%)	0.001s
Surgical site infection (SSI)	0 (0%)	0 (0%)	01 (33.3%)	0 (0%)	
SSI+Re rupture	0 (0%)	0 (0%)	0 (0%)	01 (100%)	
Swelling	0 (0%)	06 (37.5%)	0 (0%)	0 (0%)	
Ugly scar	0 (0%)	05 (31.3%)	0 (0%)	0 (0%)	
Wound gap	0 (0%)	0 (0%)	01 (33.3%)	0 (0%)	

Discussion

The majority of the 16 (32.0%) patients in this study were between the ages of 21-30 years. The mean age was 29.48 years, with a standard deviation of 13.53 years. Awe et al.[9] reported the age range was 3–70 years with a mean of 37.5+SD13.58 years, while the most affected age groups were the teenagers and the young adults with 33 (63.5%) patients. In terms of gender, this study observed that about two-thirds (68%) of patients were male and one-third(32%) were female, which is consistent with other studies that found a higher prevalence of tendo Achilles injuries in males. Ahmed et al.[10] reported among 50 patients, 38(76.0%) were male, and 12(24.0%) were female. When it came to co-morbidity, this study found that a small number of patients had diabetes, hypertension, or COPD. Other studies also reported similar findings, with some noting that smoking was a risk factor for tendo Achilles injuries. According to the results of this study, the majority of patients (72.0%) did not experience any complications, while 28.0% did have some complications. Among them majority 6(12.0%) had swelling, 5(10.0%) ugly scare, 1(2.0%) surgical site infection, 1(2.0%) SSI+ re rupture and 1(2.0%) wound gap. There was no mortality. Rayhan et al.[11] reported in 15 (50%) cases shown no complications and in another 15 (50%) cases shown different types of complications. Among minor complications 5(17%) was superficial skin infec tion,4 (13%) was swelling and 4 (13%) was ugly scar. Among major complications 1 (3.33%) was failure of tendon healing due to deep

wound infection and 1 (3.33%) was skin necrosis requiring flap coverage. Ahmed et al.[10] regarding minor complications, 4(8.0%) patients had superficial skin infection, 4(8.0%) had mild swelling, 2 (4.0%) had ugly scar and 1(2.0%) had wound gap. Bishop et al.[12] reported suture granuloma/spitting suture was found in 17(4.6%) patients, skin edge necrosis in 3(0.8%) patients, blister in 2(0.54%) patients, pressure ulcer in 2(0.54%) patients, superficial dehiscence in 7(1.89%) patients and deep infection in 2(0.54%) patients. Awe et al.[9] observed complications occurred in 11(21.2%) patients which included wound infection in 5 cases, flap tip necrosis in 4 cases and wound dehiscence in 2 cases.

Conclusion

Approximately 14 in 50 patients undergoing operative repair of an acute Achilles tendon injury developed a postoperative complication. Swelling is the most common post operative complication followed by ugly scar.

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Conflict of Interest

Authors declare no conflict of Interest.

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Original Article

Correlation Between Length Of Ulna And Stature Among Bangladeshi Garo People

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Abstract

Back ground: The present study was designed to construct an anthropometric data of 20-40 years aged 104 Bangladeshi Garo people (60 male and 44 female) regarding carrying angle and an attempt has been made out to grow interest among the researchers for future study and also to compare the data with the data of the people of other races. Participants were selected through purposive sampling for this cross sectional, observational, descriptive and analytic type study which was carried out in different areas of Mymensingh district (Mymensingh Sadar, Haluaghat), Bangladesh during the period of July 2015 to June 2016. The length of ulna of both side were measured by measuring tape. Data were tabulated and statistically analyzed using Microsoft excel and SPSS software. Length of ulna was found to be higher in males but angle of inclination was higher in females. Comparison of differences of means between male and female was statistically significant. Significant positive correlation was found between the stature and length of ulna in both Garo male and female. The results of present study would be useful for Anthropologist and Forensic Medicine experts.

Key words: Anthropometry, length of ulna, Garo.

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Introduction

Anthropometry is the study of the human body in terms of the dimensions of bone, muscle and adipose tissue. The word "Anthropometry" is derived from the Greek word "anthropo" meaning human and the Greek word "metron" meaning measure. Anthropometry is a widely used, inexpensive and non-invasive measure of the general nutritional status of an individual or a population group[1].

Anthropometry provides the data used in the indirect appraisal of body composition. In the nineteenth century, anthropometry was used in the creation and validation of racial typologies. Recent studies have demonstrated the applications of anthropometry to include the prediction of who will be benefited from interventions, identifying social and economic inequity and evaluating responses to interventions[2].

An individual's anthropometry influences his interaction with his workstation. A mismatch between an anthropometry and workstation may increase the physical stresses on the body as the individual may be forced to assume awkward postures to accommodate to the workstation design[3].

Bangladesh is a pluralistic society where people from different religions, races and castes have been living together since time immemorial. Among 30 ethnic minority groups living in different parts of the country, the "Garo" is one of the larger marginalized ethnic minority groups in Bangladesh. This matriarchal community differ noticeably from the rest of the population in term of their appearance, language, religion and social organization[4].

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In the early years of the 9th century, Garo migrated to Bangladesh from 'Tibet'. They started living at the Garo hills of Mymensingh where they lived until the 13th century under the 'Garo Empire'. Still now, Garo are living in some hill areas of Mymensingh, Netrokuna, Tangail, Gazipur, Sylhet, Sunamganj, Jamalpur and some other places of the country[5].

Estimation of stature from measurements of various long bones of the extremities has been attempted by many scientists with varying degree of accuracy. Stature reconstruction is important as it provides a forensic Anthropological estimate of the height of a person in the living state; playing a vital role in the identification of individuals from their skeletal remains, regression formulae for stature estimation have been generated[6].

The present study was designed to formulate a standard for 20-40 years aged Bangladeshi Garo population and to assess the sex specific variation in the carrying angle.

Methods:

The study was carried out in different areas of Mymensingh district (Mymensingh Sadar, Haluaghat), Bangladesh during the period of July 2015 to June 2016. The study was cross sectional, observational, descriptive and analytic type. The participants were selected through purposive sampling. A total number of 104 Garo people (60 male and 44 female) were selected. All of them were 20-40 years old and dwelling in different areas of Mymensingh district. They were healthy individual and Bangladeshi by nationality.

Standing height was measured with a fixed stadiometer with a vertical board and a moveable headboard1. The stature was measured as the vertical distance from the vertex to the floor. Measurement was taken by making the subject stand erect on a horizontal resting plane with bare foot, having the palms of the hands turned inwards and the fingers pointing downwards. The head was in the Frankfort plane ie. a horizontal plane passing through the external auditory meatus to the lower border of the orbit which is parallel to the floor and perpendicular to the vertical board. Then the moveable headboard was brought in contact with the vertex in the mid sagittal plane after removing hair ornaments from the top of the head in order to measure stature properly. The subject was instructed to take a deep breath and stand as erect as possible. Sufficient pressure was put to compress the hair.

The length of each ulna was measured from behind by using a measuring tape. The subject was asked to extend elbow when the apex of the olecranon could be felt in a transverse line with the two epicondyles. From this point a measuring tape was extended downwards along the posterior surface of the forearm to the tip of the styloid process of the ulna (Fig. 1). This measurement was recorded in centimeters following Laila (2008)7.

Fig. 1 Procedure of measurement of length of ulna using measuring tape

Result:

Present study showed that mean value of stature male and female were 163.275(±6.1044) cm and 150.511(±5.2512) cm respectively (table I).

Table I: Stature and length of ulna in the Garo males and females

Variable		Sex	Range	Mean (±SD)
Stature (cm)		Male	151.0 - 176.2	163.275(±6.1044)
		Female	138.0 - 162.0	150.511(±5.2512)
Length of ulna (cm)	Right	Male	22.3 - 28.4	25.163(±1.2847)
		Female	21.1 - 25.4	23.518(±1.0617)
	Left	Male	22.6 - 28.3	25.132(±1.2504)
		Female	21.2 - 25.4	23.498(±1.0626)

The stature of Garo males of 20-40 years age ranged from 151 cm to 176.2 cm. More than 76% of the respondents possessed stature between 155 cm to 170 cm. Besides, the stature of 44 Garo females ranged from 138 cm to 162 cm. More than 86% of the respondents had stature between 145 cm to 160 cm (fig. 2)

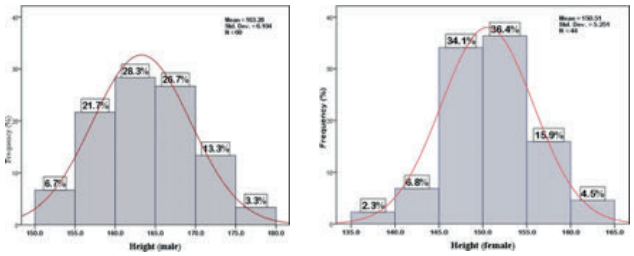
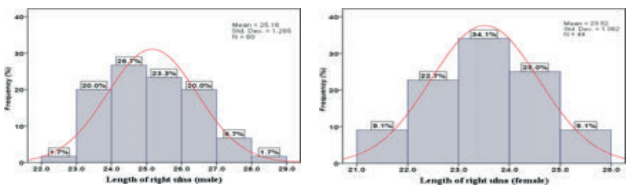


Fig. 2 Frequency distribution of the stature of Garo male and female

The length of right ulna of 60 Garo males of 20-40 years ranged from 22.3 cm to 28.4 cm. More than 89% of the respondents possessed between 23 cm to 27 cm. Besides, the length of

right ulna of 44 Garo females of 20-40 years ranged from 21.1 cm to 25.4 cm. More than 81% of the respondents measured between 22 cm to 25 cm (fig. 3).

The length of left ulna of 60 Garo males of 20-40 years ranged from 22.6 cm to 28.3 cm. More than 90% of the respondents measured between 23 cm to 27 cm. Also, the length of left ulna of 44 Garo females of 20-40 years ranged from 21.2 cm to 25.4 cm. More than 81% of the respondents were between 22 cm to 25 cm (fig. 3).



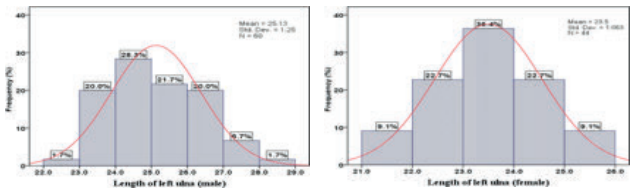


Fig. 3 Frequency distribution of length of ulna of Garo male and female

Table II: Comparison of means of length of ulna between Garo males and females

Variable	Mean difference	Std. error	'P' value
Length of ulna(cm)	1.645152	0.237334	0.000^{HS}

HS= Highly-significant at 5% level of significance on two-sample independent t- test.

Mean length of ulna of right side was found to be greater in Garo males than females among 20-40 years age and statistical analyses showed that the differences between the two sexes were found to be highly significant (fig 4).

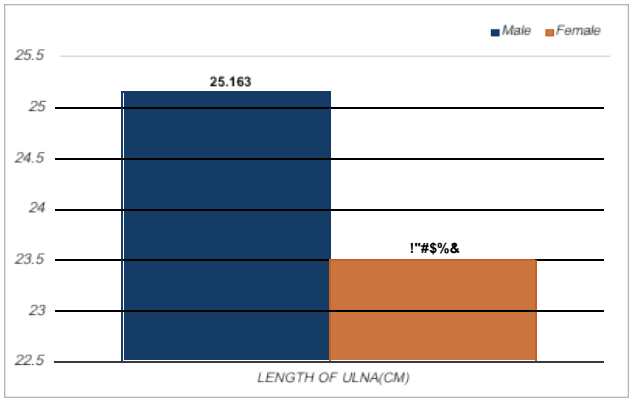


Fig. 4 Bar diagram showing comparison of means between Garo males and females regarding length of ulna right side (p= 0.000, highly significant).

Table III: Correlation and regression analysis between stature and Length of ulna in Garo males and females:

Variable		Sex	Constant	B	Correlation with stature	
					r	P-value
Length of ulna (cm)	Right	Male	85.573	3.087	0.649^{S}	0.000*
		Female	63.121	3.716	0.751^{S}	
	Left	Male	83.497	3.174	0.650^{S}	
		Female	65.279	3.627	0.734^{S}	0.000*

*= Correlation is significant at the 0.01 level (2-tailed). B = Regression co-efficient
S = Significant r = Pearson's correlation

The length of right ulna showed a significant positive correlation with the stature in both Garo male (r= 0.649, p= 0.000) and female (r= 0.751, p= 0.000). The constant and regression co-efficient value regarding length of right ulna are 85.573 and 3.087 in Garo male and 63.121 and 3.716 in Garo female respectively for estimating the stature (table III).

The length of left ulna showed a significant positive correlation with the stature in both Garo male (r= 0.650, p= 0.000) and female (r= 0.734, p= 0.000). The constant and regression co- efficient value regarding length of left ulna are 83.497 and 3.174 in Garo male and 65.279 and 3.627 in Garo female respectively for estimating the stature (fig 5).

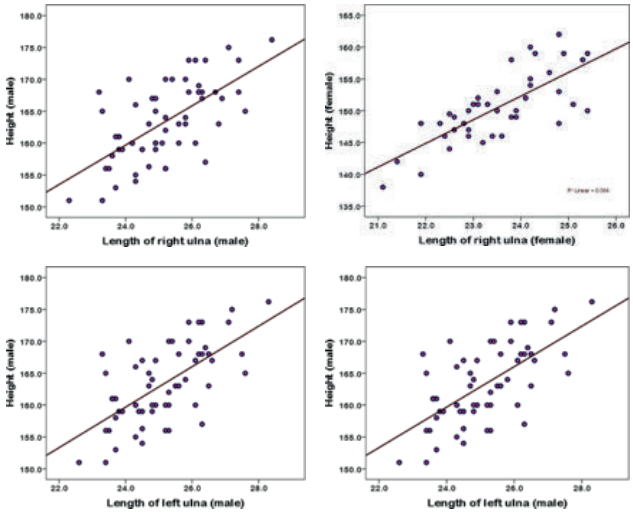


Fig. 5. Scatter diagram showing significant positive correlation between the stature and length of ulna in both Garo male and female.

Discussion

According to the present study, in Garo male, the minimum value of length of right ulna was

22.3 cm and the maximum value was 28.4 cm. The mean length of right ulna was 25.163(±1.2847) cm. Also, the minimum value of length of left ulna was 22.6 cm and the

maximum value was 22.6 cm in Garo male. The mean length of left ulna was 25.132(±1.2504) cm.

On the other hand, in Garo female, the minimum value of length of right ulna was 21.1 cm and the maximum value was 25.4 cm. The mean length of right ulna was 23.518(±1.0617) cm. Also, the minimum value of length left ulna was 21.2 cm and the maximum value was 25.4 cm in Garo female. The mean length of left ulna was 23.498(±1.0626) cm.

There was a significant (p=<0.001) positive correlation between the stature and the length of ulna on either side of both Garo male or female.

Thummar et al. (2011) mentioned that mean ulnar length in Gujarat for right ulna of male was

28.48 cm, of female was 25.99 cm and combined length of right ulna was 27.35 cm. Thummar et al. (2011) also mentioned that mean ulnar length in Gujarat for left ulna of male was 28.39 cm, of female was 25.54 cm and combined length of left ulna was 27.38cm. The current study shows that Bangladeshi Garo male and female possess shorter ulna than Gujarati people[8]. Green and Gabriel (2014) stated that mean ulnar length of adult male was 27.69 ± 2.44 cm and that of female was 24.66 ± 2.42 cm among Canadian population which was higher than the present study on Bangladeshi Garo population[9].

Shah, Saiyed and Patel (2012) performed a study on 'A Study of relation of stature and percutaneous ulnar length' and observed that mean ulnar length of adult male was 27.22 ± 1.40 cm and that of female was 24.93 ± 1.38 cm in Ahmedabad. But the current study figure out that Bangladeshi Garo people have a lower ulnar length than that of people of Ahmedabad[10]. Mohanty et al. (2013) stated that mean ulnar length of adult male was 23.69 ±1.01 cm and that of female was 23.66 ±0.632 cm in population of Eastern India. But the present study shows that Bangladeshi Garo male have a longer ulna than Eastern Indian male. Besides, Eastern Indian women have similar ulnar length to that of Bangladeshi Garo female[11].

Chittawatanarat et al. (2012) stated that the mean length of the non-dominant ulna was 25.0±2.3 cm in adult male and was 23.2±2.0 cm in adult female in Thai people which are similar to that of Bangladeshi Garo people as shown in the present study[12].

Bansal et al. (2014) described that mean ulnar length in Gujarat for right ulna of male was 27.81±2.02 cm and of

female was 24.80±1.92 cm. Bansal et al. (2014) also stated that mean ulnar length in Gujarat for left ulna of male was 27.79±2.03 cm and of female was 24.70±1.80 cm. But, the present study figured out that Bangladeshi Garo people have smaller ulnar length.

Ebite et al. (2007) observed that mean length of ulna in male was 30.33±1.53 cm and in female, it was 28.50±1.87 cm among people of Uromi, Edo state, Nigeria. Bangladeshi Garo people have a smaller ulnar length than Nigerian people as found in the present study[13].

Mondal et al. (2012) described that the means of the left and the right ulnar lengths are calculated as 24.46±1.18 cm and 24.55±1.17 cm in adult female of West Bengal, India which was higher than the findings on the current study among Bangladeshi Garo population[14].

Fallahi and Jadidian (2011) mentioned that mean length of ulna of dominant upper limb of athlete was 26.86±1.84 cm and that of non-athlete was 25.76±2.05 cm. But Bangladeshi Garo people own a smaller ulna than athlete and similar ulnar length like non-athlete as found in the present study[15].

Madden, Tsikoura & Stott (2012) conducted a study in a gender-stratified sample of 60 Asian, 69 Black and 65 White healthy volunteers, aged 21–65 years and described that mean length of ulna was 26.6 ±1.0 cm in Asian men, 29.3±1.5 cm in Black men, 27.5±1.2 cm in White men, 24.7±0.7 cm in Asian women, 26.3±1.8 cm in Black women, 24.7±1.4 cm in White women. According to the present study, both Bangladeshi Garo male and female possess shorter ulna than Asian, Black and White people[16].

Bamne et al. (2014) stated that mean length of ulna of right side was 27.90 ± 1.20 cm and of left side was 27.75 ± 1.17 cm in male. Bamne et al. (2014) also stated that mean length of ulna of right side was 27.90 ± 1.20 cm and of left side was 27.75 ± 1.17 cm in female among Maharastrian population. The present study figures out that Bangladeshi Garo individual have a smaller length of ulna than Maharastrian population[17].

Ruparelia et al. (2010) mentioned that the mean length of ulna of right limb in adult male was 22.70±1.21 cm and that of left limb was 22.69±1.22 cm among asymptomatic healthy students of Nursing School in Gujrat which was lower than the length of the length of Bangladeshi Garo male. Ruparelia et al. (2010) also stated that the mean length of ulna of right limb in adult female was 24.96±1.30 cm in Gujrat. Thwas finding was higher than the length of ulna of Bangladeshi Garo female[18].

As per current study individual from Maharashtra, Ahmedabad, Gujrat, Canada, Nigeria, Black & White Asia have longer ulna than Bangladeshi Garo individual. But, individual from West Bengal, Thailand, Eastern India have almost similar length of ulna in comparison to Bangladeshi Garo individual (fig 5).

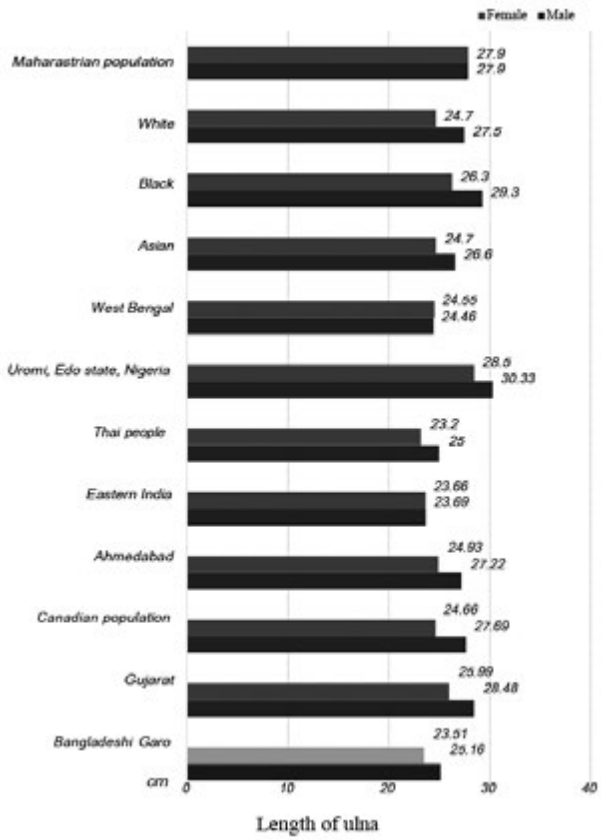


Fig. 6 Length of ulna of Bangladeshi Garo and Other population of different country

Conclusion:

Findings of the present study indicate that different anthropometric measurements between men and women is different. The length of ulna among 20-40 years aged Garo male were larger than females.

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Original Article

Early Laparoscopic Cholecystectomy Versus Interval Laparoscopic Cholecystectomy in Acute Cholecystitis; A Comparative Study in A Tertiary Care Hospital

Sardar A[1], Hossain SM[2], Islam MS[3], Dr. Shaha J[4], Galib A[5]

Abstract

Introduction: Acute cholecystitis, often caused by gallstones blocking the cystic duct, leads to gallbladder inflammation. Symptoms include anorexia, nausea, vomiting, fever, and right upper quadrant discomfort. Gallstones are present in 95% of cases. Severe cases may result in gangrenous cholecystitis with gallbladder wall necrosis. Conservative management includes intravenous fluids, analgesia, and antibiotics, but early cholecystectomy is the preferred treatment, offering quicker recovery. Laparoscopic cholecystectomy is the gold standard, with the timing of surgery debated. Some advocate for early surgery, while others consider it risky, opting for elective cholecystectomy after the initial phase.

Aim of the study: The study aims to compare the outcomes of early surgery with interval or delayed surgery for acute cholecystitis at a tertiary care hospital in Khulna, Bangladesh.

Methods: This prospective comparative study at Khulna Medical College and Hospital focused on acute cholecystitis patients 2.5 years from June 2020 to December 2023. Thirty patients were divided into two groups: Group A underwent early cholecystectomy (N=64), and Group B had interval cholecystectomy after conservative management (N=64). Inclusion criteria involved symptoms, optimistic Murphy's sign, and elevated leukocyte count. Exclusion criteria included specific complications and comorbidities. Thorough examinations, baseline investigations, and pre-anesthetic workups were conducted. Operative principles included stabilizing patients, antibiotic therapy, and early or interval cholecystectomy based on group allocation. Continuous monitoring and follow-ups were performed, revealing varied adherence to scheduled appointments

Result: A total of 128 patients were divided into two groups (A and B) for a comparative analysis; Group A had a prominent age range of 41-50 (26.56%), while Group B had a majority in the 51-60 age range (42.19%). Gender distribution showed a higher proportion of females in both groups. Types of operations were similar, with laparoscopic cholecystectomy being predominant. Complication rates were 26.56% in Group A and 18.75% in Group B, hemorrhage was common in both groups. Outcomes were comparable, including nausea, vomiting, and surgical site infections but there were no bile injurie. Mean hospital stays were 2.54 days for Group A and 2.76 days for Group B, with no significant differences.

Conclusion: Despite minor age differences, both groups had similar outcomes, complications, and postoperative issues. The study suggests both approaches are viable with comparable safety and efficacy, emphasizing individualized considerations.

Keywords: Laparoscopic cholecystectomy, early, interval, and acute cholecystitis.

IPEX J 2025; 1(1) : 13-17

Introduction

When a gallstone typically blocks the cystic duct, acute cholecystitis develops, causing the gallbladder to expand and causing inflammation due to bacteria or chemicals[1]. Anorexia, nausea, vomiting, fever, and persistent right upper quadrant discomfort are common symptoms of acute cholecystitis. Gallstones (calculous cholecystitis) are present in around 95% of patients with acute cholecystitis, and 5% do not have gallstones (acalculous cholecystitis). Gangrenous cholecystitis, or severe acute cholecystitis, is characterized by gallbladder wall necrosis[1]. Acute cholecystitis is a frequent surgical condition that affects both genders equally[2]. Gallstones rank among the most prevalent gastrointestinal disorders, impacting approximately 10% of the Western population[3]. Research conducted

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among rural people in Bangladesh's southern coastline area found that the overall frequency of gallstone disease was 5.4%[4]. Surgeons sometimes favor the conservative management of acute cholecystitis, employing intravenous fluids and analgesia, often in combination with antibiotics[5]. However, the most suitable therapy for those with acute cholecystitis is cholecystectomy. It is preferable to do an early cholecystectomy two to three days after presentation. A delayed or over-interval cholecystectomy is carried out six to ten weeks following the start of medical treatment. Approximately 20% of patients require surgery either during the initial admission or before the anticipated cooling-off period because they do not respond well to early medicinal treatment[6]. Compared to open cholecystectomy, laparoscopic cholecystectomy (LC) improves quality of life more quickly. As a result, it has gained more clinical recognition and is currently the gold standard for cholecystectomy[7]. The best time to operate on individuals with acute cholecystitis is an area of debate [8]. Some studies suggest early surgery as the preferred treatment option, and Ganey et al. endorse this approach, highlighting its effectiveness with an exceptionally low mortality rate of 0.5%[9]. Various randomized studies have yielded diverse outcomes concerning hospital stay, surgery feasibility, and operative morbidity rates[8]. According to Alinder et al, the majority of surgeons still view an early cholecystectomy as a risky procedure, and they typically only conduct it when a patient's condition deteriorates during the first 24 to 48 hours after admission[10]. An elective cholecystectomy is performed once the initial assault has subsided, usually within 4 to 6 weeks[11]. The study aims to compare the outcomes of early surgery with interval or delayed surgery for acute cholecystitis at a tertiary care hospital in Khulna, Bangladesh.

Methodology & Materials

This prospective comparative was carried out in the Department of Surgery at Khulna Medical College and Hospital. The study duration was 2.5 years, from June 2020 to December 2023. Throughout this period, a total of 340 patients presenting symptoms indicative of acute cholecystitis were admitted to the hospital. Among these patients, 174 underwent laparoscopic cholecystectomies, divided into two distinct groups. Sixty-four cases received early definitive cholecystectomy (Group A), while the remaining 110 cases were managed conservatively and subsequently discharged. Those in the conservative management group were readmitted for cholecystectomy after a 4-6-week interval. Due to a lack of follow-up data, 46 patients were excluded from Group B. Ultimately, each group consisted of 64 patients for analysis.

Group A (N=64): Early cholecystectomy was performed.

Group B (N=64): Interval cholecystectomy after initial conservative management.

- Inclusion criteria
- Individuals experiencing abdominal pain indicative of acute cholecystitis, displaying an optimistic Murphy's sign, a total leukocyte count exceeding 10,000/μl, and confirmed acute cholecystitis through ultrasonographic findings.
- Exclusion criteria
- Patients with ultra-sonographic findings of common bile duct calculi/pancreatitis/gall bladder perforation/gall bladder gangrene/gall bladder abscess.
- Patients with other associated abdominal pathology.
- Patients with any previous abdominal surgery, septic shock, pregnancy/breast-feeding mothers, patients with any significant systemic disease.
- Patients who were missing follow-up.

All individuals thoroughly examined their medical history, encompassing chief complaints, current and past illnesses, personal details, family background, prior treatments, and medication usage. Subsequently, comprehensive physical assessments were conducted, such as general surveys, abdominal examinations, and other systemic evaluations. The chosen participants were then subjected to baseline investigations, including a routine blood examination, which involved assessing hemoglobin levels, total leukocyte count, differential leukocyte count, erythrocyte sedimentation rate (ESR), random blood sugar (RBS), urea, and creatinine levels. Leucocytosis was commonly observed in most patients with uncomplicated acute cholecystitis. Liver function tests were also performed, covering total serum bilirubin, liver enzymes, and protein levels. The coagulation profile, including prothrombin time, chest X-ray (posteroanterior view), and electrocardiogram, constituted essential components of the pre-anesthetic workup. A plain abdomen X-ray was also conducted to rule out other potential acute abdominal conditions.

Operative principles: Initially, the patient's condition was stabilized through interventions such as fluid and electrolyte correction, IV antibiotics, and supportive measures like antiemetics. Subsequently, an anesthetic evaluation was conducted. Individuals presenting with symptoms of acute cholecystitis were considered for early cholecystectomy from an elective optional list. In Group A, patients were offered early laparoscopic cholecystectomy within seventy-two hours. Meanwhile, the second group of patients was provided with the option of interval laparoscopic cholecystectomy, to be performed six weeks after the onset of acute cholecystitis symptoms. All surgical procedures were performed during the same hospital admission in the early surgery group. Continuous monitoring and follow-up of patients occurred in the surgical outpatient department, with regular check-ups scheduled at two weeks, six weeks, and six months, although some patients had irregular follow-ups.

Data analysis: Data were organized in appropriate tables or graphs based on their relationships. A comprehensive description accompanied each table and graph to facilitate clear comprehension. Statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) program on Windows. Continuous parameters were presented as mean±SD, while categorical parameters were expressed as frequency and percentage. Group comparisons for continuous parameters were conducted using the student's t-test, and the Chi-Square test was employed for categorical parameter comparisons. Results were deemed statistically significant if the P-value was less than 0.05.

Result

In this prospective comparative study, 128 patients were enrolled and analyzed into two groups. The study age distribution is shown in Table 1. Specifically, in Group A, the age range of 41-50 emerged prominently, constituting the highest percentage at 26.56%. In contrast, Group B exhibited a distinct pattern, with the majority of patients, a significant 42.19%, falling within the 51-60 age range. This divergence in age distribution is underscored by the calculated mean ages of the two groups, with Group A presenting a mean age of 43.65±15.23 and Group B demonstrating a slightly higher mean age of 47.13±15.75. The statistical analysis revealed a non-significant p-value of 0.578 (Table 1). Figure 1 illustrates the gender distribution as it shows both groups have a higher proportion of female participants than male participants. In Group A, 81.25% of the patients were female and 18.75% were male. In contrast, 73.44% were female, and 26.56% were male in Group B, according to the types of operations within the two study groups. In Group A, laparoscopic cholecystectomy was the predominant procedure, accounting for 93.75% of cases, while 6.25% necessitated a lap-to-open conversion. Conversely, in Group B, laparoscopic cholecystectomy remained the primary approach, constituting 87.50% of cases, with a slightly higher lap-to-open conversion rate at 12.50%. The calculated p-value of 0.216 suggests that the observed differences in the types of operations between the two groups are not statistically significant. Table 3 presents the complications observed in the study population, categorized by group. Hamorrhage occurred in 20.31% of cases, and 6.25% experienced a failure to proceed, necessitating conversion to an open procedure. However, in Group B, hamorrhage occurred in 12.50% of cases, and 6.25% reported a failure to proceed. No cases of bile duct injury were reported in both groups. The complication rates were slightly higher (26.56%) in Group A than in Group B (18.75%). Table 4 shows the study outcomes stratified by group. As in Group A, nausea and vomiting were reported in 12.50% of cases, and surgical site infections occurred in 6.25%. Whereas, in Group B, the prevalence of nausea and vomiting was also 12.50%, while surgical site infections occurred in 12.50%. No instances of bile discharge were documented in either group. The overall occurrence of outcomes was 18.75% for Group A and 26.56% for Group B. The mean hospital stays were 2.54±1.32 days for Group A and 2.76±1.45 days for Group B.

Table 1: Age distribution of the study population.

Age group (years)	Group-A (N=64)		Group-B (N=64)		P-value
	n	%	n	%	
20-30	13	20.31	17	26.56	0.578
31-40	13	20.31	8	12.50	
41-50	17	26.56	4	6.25	
51-60	13	20.31	27	42.19	
>60	8	12.51	8	12.50	
Mean±SD	43.65±15.23		47.13±15.75		

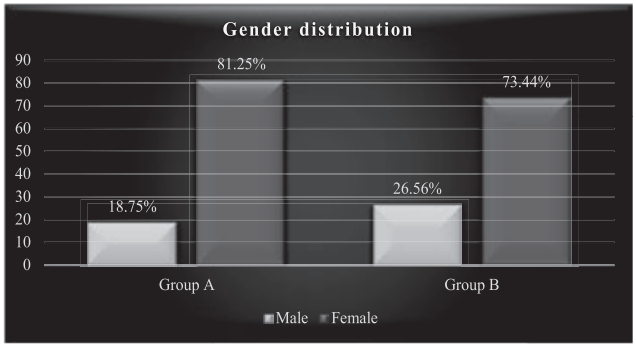

Figure 1: Gender distribution of both groups.

Table 2: Type of operation based on groups.

Type of operation	Group-A (N=64)		Group-B (N=64)		P-value
	n	%	n	%	
Lap cholecystectomy	60	93.75	56	87.50	
Lap to open conversion	4	6.25	8	12.50	0.216
Total	64	100.00	64	100.00	

Table 3: Complication of study population based on groups.

Complication	Group-A (N=64)		Group-B (N=64)		P-value
	n	%	n	%	
Hemorrhage	13	20.31	8	12.50	
Bile duct injury	0	0	0	0	>0.05
Failure to proceed (conversion to open)	4	6.25	4	6.25	
Total	17	26.56	12	18.75	

Table 4: Outcomes of the study based on groups.

Outcomes	Group-A (N=64)		Group-B (N=64)	
	n	%	n	%
Nausea vomiting	8	12.50	8	12.50
Surgical site infection	4	6.25	8	12.50
Bile discharge	0	0	0	0
Total	12	18.75	16	25.00
Hospital stays (days)	Mean±SD		Mean±SD	
	2.54±1.32		2.76±1.45	

Discussion

Cholelithiasis is an illness that comes with many difficulties. Acute cholecystitis is related to several risk factors; however, it may put surgeons at risk for a challenging dissection because of Callot's triangle adhesion. Two distinct approaches exist for managing this illness. Prospective research was established to compare the two methods of treating acute cholecystitis. It was discovered that the best method of action for treating individuals with acute cholecystitis was an early cholecystectomy carried out seventy-two hours after the first onset of symptoms. Our study compared the results of early vs interval cholecystectomy in terms of age, gender, type of operation, complications and hospital stay. According to our study findings, the mean age for early cholecystectomy was 43.65 years, and interval cholecystectomy was 47.13 years. A study by Singh and Al-Salamah et al. found the mean age of both groups to be almost similar to ours[12, 13]. In this current study, most patients in both groups were females, similar to another study[12,14]. Our open conversation rate was minimal in both groups (one patient in group A and two patients in group B), and it shows non-significance with a p-value of 0.216 (Table 2). A comparison between the two groups was conducted regarding both operative and post-operative complications. It was observed that 13(20.31%) patients in Group A experienced primary haemorrhage, whereas in Group B, 8(12.50%) patients experienced the identical complication. A study by Mahmood et al. found 32.00% in the early LC group and 14.00% in the interval LC group, which is almost similar to ours[15]. Nevertheless, it is noteworthy that all instances of haemorrhage were effectively managed without complications. Additionally, none of the patients experienced bile duct injuries. Various research provides varying outcomes regarding problems following surgery[16,17]. Post-operative complications in both groups were assessed, focusing on factors such as nausea and vomiting, surgical site infection, and bile discharge.[18,19] Post-operative nausea and vomiting were present in 12.50% of cases in both groups. Surgical site infection occurred in four patients in Group A, while eight patients in Group B experienced identical complications. However, none of the patients in both groups exhibited post-operative bile discharge. Similar findings were reported in the research projects led by Aggarwal S. and Shikata S.[20,21]. The research examined the length of hospital stays for two groups. In group A, the average length of stay was 2.54±1.34 days. On the other hand, group 2's average hospital stay was 2.76±1.45 days. The outcomes of Lau H's study were comparable[22]

Limitations of the study: Despite the valuable insights gained from this comparative study on early laparoscopic cholecystectomy versus interval laparoscopic cholecystectomy in acute cholecystitis, several limitations must be acknowledged. Firstly, the sample size of 128 patients, though sufficient for a preliminary assessment, may not fully capture the heterogeneity of patients with acute cholecystitis. A more extensive and diverse sample could provide a more comprehensive understanding of the outcomes of each approach. Additionally, the study's single-centre design within the Department of Surgery may limit the generalizability of the findings to broader populations and healthcare settings. Variability in surgical expertise, equipment, and patient demographics across different institutions could impact the external validity of the results.

Conclusion And Recommendations

This study compared early laparoscopic cholecystectomy (Group A) with interval laparoscopic cholecystectomy after conservative management (Group B) for acute cholecystitis in a Khulna, Bangladesh hospital. Despite minor age differences, both groups had similar gender distributions. Surgical outcomes, complications, and postoperative issues did not significantly differ between the two groups. Rates of laparoscopic cholecystectomy and conversions were comparable, with minimal differences in complication rates. Postoperative complications, including nausea and infections, showed similar patterns. No significant differences were observed in hemorrhage, failure to proceed, or hospital stay. The study suggests that both approaches are viable with comparable safety and efficacy, emphasizing the need for individualized considerations.

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Original Article

Causes and Characteristics of Depression in Stroke Patients: A Cross-Sectional Study

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Abstract

Introduction: Background: Stroke is a leading cause of death and disability worldwide, with post-stroke depression (PSD) being a prevalent psychological complication. PSD negatively impacts stroke recovery, leading to increased disability and mortality. Identifying factors associated with PSD can guide early intervention strategies and improve outcomes. Objective: This study aimed to assess the prevalence and factors associated with PSD in stroke patients, focusing on demographic, clinical, and treatment-related variables. Methods: A cross-sectional study was conducted at Evercare Hospital, Dhaka, from January to June 2024, involving 190 stroke patients. Patients were assessed for depressive symptoms using the Hamilton Depression Rating Scale (HDRS) and Beck Depression Inventory (BDI). Key variables analyzed included age, gender, education, stroke type, stroke severity, functional outcomes, comorbidities, rehabilitation, and medication compliance. Chi-square tests were used to explore associations, with significance set at $p<0.05$. Results: PSD was present in 58.9% of stroke patients. Depression was significantly associated with younger age (<50 years, $p=0.012$), lower education (below SSC, $p=0.042$), severe stroke (NIHSS >16, $p<0.001$), and recent stroke onset (<3 months, $p<0.001$). Higher dependency, measured by FIM and Barthel Index scores, and diabetes ($p=0.034$) were also linked to depression. Patients receiving regular physical therapy and adhering to medications had lower rates of depression ($p=0.017$, $p=0.035$). Conclusion: PSD is prevalent among stroke survivors and is associated with younger age, lower education, severe stroke, functional dependency, and diabetes. Regular rehabilitation and treatment compliance reduces the risk of depression. Early screening and comprehensive rehabilitation programs are essential to improving mental health outcomes in stroke patients.

Keywords: post-stroke depression, stroke severity, rehabilitation, functional outcomes.

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Introduction

Stroke is the second leading cause of death worldwide after myocardial infarction and is a major cause of adult disability, affecting millions globally[1,2,3]. In 2010, it was estimated that 16.9 million people experienced their first stroke, with 33 million stroke survivors and 5.9 million stroke-related deaths[4]. Of all stroke cases, approximately 88% are ischemic, 9% are intracerebral hemorrhagic, and 3% are subarachnoid hemorrhagic[5]. Both stroke mortality and morbidity are increasing globally. According to the World Health Organization, in 2002, the total number of deaths due to cerebrovascular accidents in Pakistan was 78,512. Similarly, in Brazil, between 1994 and 1997, the annual hospitalizations due to stroke ranged between 198,705 and 295,596, with an estimated 25% of these cases being

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recurrent strokes[6]. Among stroke survivors, motor impairment is present in approximately 80% of cases.

Depression is a common psychological complication in stroke survivors. It is characterized by periods of sad mood and anhedonia, which is the inability to experience pleasure from previously enjoyable activities such as eating, exercising, or social interactions, persisting for at least two consecutive weeks as per DSM-IV criteria[7, 8]. Post-stroke depression (PSD) significantly impacts recovery, leading to increased disability and mortality among stroke survivors[9]. Morris et al. reported in 1993 that stroke patients with depression were 3.4 times more likely to die within 10 years than their non-depressed counterparts[10]. Depression negatively influences stroke recovery through various mechanisms. For instance, depressed patients may be less motivated to participate in rehabilitation due to persistent fatigue or hopelessness, while cognitive impairments may further delay recovery by reducing adherence to treatment schedules, leading to increased mortality rates.

Post-stroke depression is prevalent in both men and women, with a systematic review of 51 studies by Hackett et al. in 2005 estimating that the overall frequency of PSD is approximately 33%[11]. Stroke survivors experience debilitating morbidity, and superimposed PSD further diminishes their quality of life and impairs recovery.

The present study was conducted to estimate the magnitude of post-stroke depression in a clinical setting to facilitate the development of departmental protocols for early screening and referral for PSD treatment. Early detection and intervention for PSD can improve the quality of life, expedite recovery, and increase functionality for stroke survivors[12,13].

Methodology

The cross-sectional study was conducted at the Department of Neurology, Evercare Hospital, Dhaka, to explore the causes and characteristics of depression among stroke patients. A total of 190 patients diagnosed with stroke were included in the research, spanning a study period from January to June 2024. The patients were selected based on specific inclusion and exclusion criteria, focusing on individuals who had experienced a stroke and were exhibiting depressive symptoms.

Data collection involved face-to-face interviews with the participants, using both structured questionnaires and validated tools to assess depressive symptoms. The Hamilton Depression Rating Scale (HDRS) and Beck Depression Inventory (BDI) were employed to evaluate the severity of depression. In addition, detailed sociodemographic and clinical data were gathered, including age, gender, stroke type, stroke severity, and time since the stroke. These data points helped in understanding the relationship between stroke and depression in this patient population.

Informed consent was obtained from all participants before their inclusion in the study. Patients were assured of confidentiality and the voluntary nature of their participation. The research adhered to ethical standards, with approval obtained from the institutional review board of Evercare Hospital. All patients were informed about their right to withdraw from the study at any time without any consequence to their medical treatment. The data collected were analyzed using statistical techniques to identify key causes and characteristics of depression in stroke patients. Factors such as stroke severity, type of stroke, duration since the stroke, as well as sociodemographic variables like age, gender, and educational level were examined about depression. The results were used to provide insights into the mental health challenges faced by stroke patients, contributing to better-targeted interventions for this vulnerable group.

Result

Table 1: Demographic Characteristics of Stroke Patients and Their Association with Depression (N = 190)

Variable	Category	Total (N= 190)	Depression Present (n= 112)	Depression Absent (n= 78)	P-Value
Age Group	< 50 years	55 (28.9%)	40 (35.7%)	15 (19.2%)	0.012*
	50-65 years	90 (47.4%)	50 (44.6%)	40 (51.3%)	
	> 65 years	45 (23.7%)	22 (19.6%)	23 (29.5%)	
Gender	Male	110 (57.9%)	60 (53.6%)	50 (64.1%)	0.098
	Female	80 (42.1%)	52 (46.4%)	28 (35.9%)	
Educational Level	Below SSC	70 (36.8%)	45 (40.2%)	25 (32.1%)	0.042*
	SSC-HSC	80 (42.1%)	50 (44.6%)	30 (38.5%)	
	Graduate and above	40 (21.1%)	17 (15.2%)	23 (29.4%)	

*P-value derived from Chi-square test, *Significant at $P < 0.05$

Table 1 shows that age and educational level are significantly associated with the presence of depression among stroke patients. Patients below 50 years and those with lower education levels (below SSC) had higher rates of depression. Gender, although analyzed, was not found to be significantly associated with depression in this cohort.

Table 2: Clinical Characteristics of Stroke and Their Association with Depression (N = 190)

Variable	Category	Total (N = 190)	Depression Present (n = 112)	Depression Absent (n = 78)	P-Value
Type of Stroke	Ischemic	130 (68.4%)	80 (71.4%)	50 (64.1%)	0.184
	Hemorrhagic	60 (31.6%)	32 (28.6%)	28 (35.9%)	
Stroke Severity	Mild (NIHSS 0-5)	80 (42.1%)	30 (26.8%)	50 (64.1%)	<0.001**
	Moderate (NIHSS 6-15)	70 (36.8%)	55 (49.1%)	15 (19.2%)	
	Severe (NIHSS > 16)	40 (21.1%)	27 (24.1%)	13 (16.7%)	
Time Since Stroke	< 3 months	100 (52.6%)	72 (64.3%)	28 (35.9%)	<0.001**
	3-6 months	90 (47.4%)	40 (35.7%)	50 (64.1%)	

Table 2 shows that stroke severity and time since stroke are significantly associated with the presence of depression ($P < 0.001$). Patients with more severe strokes and those who had their stroke less than three months prior exhibited higher rates of depression. The type of stroke, ischemic or hemorrhagic, did not show a significant association with depression.

Table 3: Association of Depression with Functional Outcomes and Dependency Levels (N = 190)

Variable	Category	Total (N = 190)	Depression Present (n = 112)	Depression Absent (n = 78)	P-Value
Functional Independence Measure (FIM) Score	< 60 (Severe dependency)	70 (36.8%)	50 (44.6%)	20 (25.6%)	0.008*
	60-100 (Moderate dependency)	80 (42.1%)	45 (40.2%)	35 (44.9%)	
	> 100 (Mild dependency)	40 (21.1%)	17 (15.2%)	23 (29.5%)	
Barthel Index	< 20 (Severe)	60 (31.6%)	45 (40.2%)	15 (19.2%)	0.004*
	20-60 (Moderate)	80 (42.1%)	50 (44.6%)	30 (38.5%)	
	> 60 (Mild)	50 (26.3%)	17 (15.2%)	33 (42.3%)	

Table 3 demonstrates that lower FIM scores and lower Barthel Index scores, indicating higher levels of dependency and poorer functional outcomes, were significantly associated with depression among stroke patients.

Table 4: Comorbid Conditions and Their Association with Depression (N = 190)

Comorbidity	Category	Total (N = 190)	Depression Present (n = 112)	Depression Absent (n = 78)	P-Value
Hypertension	Yes	120 (63.2%)	75 (67.0%)	45 (57.7%)	0.083
	No	70 (36.8%)	37 (33.0%)	33 (42.3%)	
Diabetes	Yes	100 (52.6%)	65 (58.0%)	35 (44.9%)	0.034*
	No	90 (47.4%)	47 (42.0%)	43 (55.1%)	
Dyslipidemia	Yes	80 (42.1%)	52 (46.4%)	28 (35.9%)	0.065
	No	110 (57.9%)	60 (53.6%)	50 (64.1%)	

Table 4 reveals that diabetes is significantly associated with depression among stroke patients ($P = 0.034$). While hypertension and dyslipidemia were also assessed, no statistically significant association was found with depression in this population.

Table 5: Treatment and Rehabilitation Factors Associated with Depression (N = 190)

Variable	Category	Total (N = 190)	Depression Present (n = 112)	Depression Absent (n = 78)	P-Value
Rehabilitation Type	Physical Therapy	140 (73.7%)	90 (80.4%)	50 (64.1%)	0.017*
	None	50 (26.3%)	22 (19.6%)	28 (35.9%)	
Medication Compliance	Regular	130 (68.4%)	70 (62.5%)	60 (76.9%)	0.035*
	Irregular	60 (31.6%)	42 (37.5%)	18 (23.1%)	

Table 5 shows that stroke patients who received regular physical therapy and adhered to their medication regimen were less likely to suffer from depression. Both rehabilitation type and medication compliance were significantly associated with depression status ($P < 0.05$).

Discussion

This study aimed to identify the causes and characteristics of depression in stroke patients. Based on the analysis, 58.9% (112 out of 190) of stroke patients exhibited symptoms of depression, indicating that depression is a prevalent comorbidity in stroke survivors. This finding is consistent with previous studies, which reported depression rates ranging from 30% to 60% among stroke patients depending on the population studied and assessment methods[14].

Our results indicate that age and education are significantly associated with depression among stroke patients. Specifically, depression was more common among patients younger than 50 years (35.7%) compared to those aged over 65 years (19.6%) ($P = 0.012$). This aligns with the findings of Choi et al., who also reported that younger stroke survivors were at higher risk for depression. The higher incidence of depression in younger patients may be attributed to the profound impact stroke has on their quality of life, as they are more likely to be in their working years and may experience greater psychological distress due to sudden loss of independence[15].

The educational level also emerged as a significant predictor of depression, with 40.2% of patients having education below SSC experiencing depression, compared to only 15.2% of those with a graduate or postgraduate degree ($P = 0.042$). Lower educational attainment may be associated with poorer coping mechanisms and reduced access to healthcare resources, both of which can contribute to higher rates of depression, as noted in studies conducted in developing countries[16].

Stroke severity, as measured by the National Institutes of Health Stroke Scale (NIHSS), was a strong predictor of depression. Among patients with severe strokes (NIHSS > 16), 24.1% were depressed, while only 26.8% of those with mild strokes (NIHSS 0-5) exhibited depression ($P < 0.001$). These findings corroborate those of Hackett et al., who demonstrated that stroke severity is one of the most significant clinical predictors of post-stroke depression. Severe strokes often result in greater physical disability and functional dependency, which can lead to increased emotional distress[17].

Additionally, the time since the stroke was a significant factor. Depression was more prevalent among patients who had experienced a stroke within the past three months (64.3%) compared to those who had a stroke three to six months prior (35.7%) ($P < 0.001$). This early onset of depression may be due to the acute psychological trauma and adjustment challenges immediately following a stroke, as supported by other studies showing that depression is most prevalent in the early months post-stroke[14].

Functional outcomes, measured using the Functional Independence Measure (FIM) and the Barthel Index, were also closely associated with depression. Patients with severe dependency (FIM < 60) showed a 44.6% depression rate, while those with mild dependency (FIM > 100) had a lower depression rate of 15.2% ($P = 0.008$). Similarly, a Barthel Index score below 20, indicating severe disability, was associated with a 40.2% rate of depression ($P = 0.004$). These findings are consistent with the work of Shewangizaw et al, who noted that poor functional recovery is a major risk factor for depression in stroke survivors[19]. Patients who experience significant physical limitations and dependency on caregivers are likely to feel a loss of autonomy, which can contribute to feelings of hopelessness and depression[18].

Diabetes was the only comorbid condition significantly associated with depression in this study. Among patients with diabetes, 58.0% experienced depression, compared to 42.0% without diabetes ($P = 0.034$). This is in line with findings by Yang et al., who reported that stroke patients with diabetes have higher rates of depression due to the compounded effects of managing a chronic disease along with stroke recovery[20]. Hypertension and dyslipidemia, although common in the study population, were not significantly associated with depression, suggesting that the presence of these conditions may not be as impactful on the psychological health of stroke patients as diabetes.

Rehabilitation and treatment adherence were key factors in reducing the likelihood of depression. Patients who received regular physical therapy had an 80.4% depression rate, compared to 64.1% among those who did not receive therapy ($P = 0.017$). This suggests that physical therapy can alleviate depression by improving functional recovery and fostering a sense of progress and control over the recovery process. Similar results were observed by Lavu et al., who found that active rehabilitation programs are associated with lower depression rates in stroke survivors[21].

Moreover, regular compliance with medication was associated with lower rates of depression, with 62.5% of compliant patients being depressed compared to 37.5% of those with irregular compliance ($P = 0.035$). This highlights the importance of ensuring that patients adhere to their prescribed treatment regimens, as poor compliance may worsen stroke outcomes and, in turn, increase the risk of depression.

Conclusion

This study highlights several demographics, clinical, and treatment-related factors associated with depression in stroke patients. Younger age, lower education levels, severe stroke, early post-stroke period, functional dependency, diabetes, and lack of rehabilitation or medication compliance are all significantly linked to depression. These findings underscore the importance of early intervention and comprehensive rehabilitation programs to address the mental health challenges faced by stroke survivors. Future studies should aim to explore long-term outcomes and the impact of psychological support services on post-stroke depression.

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Original Article

Exploring the Mental Health Challenges of Mothers of Children with Disabilities

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Abstract

Background: Mothers of children with disabilities often experience significant mental health challenges due to the emotional, physical, and financial demands of caregiving. In Bangladesh, where access to mental health services and social support is limited, these mothers may be particularly vulnerable to stress, anxiety, and depression. Despite the growing recognition of their struggles, there remains a lack of research addressing the factors that contribute to the mental health burden of these mothers.

Objective: This study aims to explore the mental health challenges faced by mothers of children with disabilities in Dhaka, Bangladesh, and examine the socio-demographic, economic, and family factors associated with these challenges.

Methods: A cross-sectional study was conducted from January to December 2023 among 260 mothers of children receiving care at CRP, Savar, and Shishu Shorgo (Child's Heaven) Therapy Centre in Dhaka. Data were collected using a structured questionnaire, which assessed socio-demographic variables, family support, the severity of the child's disability, and the mental health status of the mothers (depression, anxiety, and stress). Statistical analyses were performed to identify associations between the variables, and p-values were calculated to determine significance. Results: The results revealed high rates of depression (55.4%), anxiety (47.7%), and stress (43.1%) among the mothers. Younger mothers (66.7%, $p = 0.032$) and those with no formal education (70%, $p = 0.015$) reported the highest levels of depression. Socio-economic status and family support also had significant impacts, with lower-income mothers and those with limited family support experiencing greater mental health challenges ($p = 0.008$, $p = 0.001$, respectively). Mothers of children with severe disabilities had the highest rates of depression (78.6%, $p = 0.001$). Conclusion: The study highlights the critical need for mental health support services for mothers of children with disabilities in Bangladesh. Interventions addressing socio-economic disparities, educational opportunities, and family support systems could significantly alleviate the mental health burden on these mothers.

Keywords: Mental health, Mothers, Disabilities, Depression, Bangladesh

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Introduction

Parents of children with disabilities face exceptional, daily, and lifelong challenges that impact every aspect of their lives, including their physical and mental health, employment, finances, and relationships. Mothers, in particular, are more likely to experience mental health difficulties compared to those of typically developing children[1-4]. A recent study of 300 Australian mothers of children with disabilities found that nearly half had clinically significant depression (44%) and anxiety (42%), compared to 5% and 15%, respectively, in the general female population5. Additionally, the study revealed a substantial gap between those who perceived a need for professional mental health support and those who accessed it[5]. Early detection and treatment strategies for mental health issues in mothers of

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children with disabilities are urgently required. Without intervention, mental health challenges can negatively impact the quality of care provided to children with disabilities and their siblings[6,7]. Many mothers with school-aged children with disabilities reported that their health affected their ability to provide the necessary care[8]. It is well-established that depressive symptoms in mothers can lead to significant negative consequences for children, with mothers feeling less attached to and more negatively toward their children[9-11].

Mothers of children with disabilities frequently visit their child's health professionals, including pediatricians, general practitioners (GPs), and allied health professionals such as physiotherapists, speech pathologists, occupational therapists, and psychologists. One potential point of early intervention for maternal mental health issues is for child health professionals to regularly monitor and discuss maternal mental health. Mothers have emphasized the importance of this, particularly during key moments such as at the time of their child's diagnosis and during significant developmental transitions 5. Supporting the mental health of these mothers aligns with the growing adoption of family-centered practice as a standard of care[12]. While this approach does not explicitly address maternal mental health, it underscores the importance of family well-being in promoting child well-being[13].

Although little is known about how health professionals working with families of children with disabilities address maternal mental health, insights can be drawn from studies on mental health in the peri- and postpartum period. In the United States, researchers have advocated for pediatricians to engage in maternal mental health screening and discuss family stress[14]. However, this literature highlights numerous barriers preventing pediatricians from addressing maternal mental health, including inadequate training, lack of time, perceptions of poor-quality community mental health services, and beliefs that mothers are in denial[15,16]. Other studies have found that significant barriers for pediatricians and other health professionals include a lack of confidence in raising mental health concerns and a fear of mothers feeling stigmatized[17].

In the context of disability, Early Childhood Intervention Services (ECIS) provide specialized support for young children with disabilities and developmental delays, as well as their families, to promote development, well-being, and community participation. Allied health professionals within ECIS collaborate closely with families, helping to improve their knowledge, skills, and support systems to care for their child while taking a holistic approach to the family's needs. Given their close relationships with families, these professionals are well-positioned to address maternal mental health. However, there is a lack of research in this area, and no existing guidelines explicitly address how to respond to maternal mental health difficulties. The National Guidelines for Best Practice in Early Childhood Intervention recommend that allied health professionals consider risk factors, such as parental mental health, which may undermine parents' ability to meet their child's needs[18]. However, it is left to the professionals' discretion to identify suitable strategies within a family-centered and strengths-based framework.

Mothers of children with disabilities often face unique and overwhelming challenges in their caregiving roles. The physical, emotional, and financial demands of caring for a child with disabilities can significantly impact their mental health, leading to elevated levels of stress, anxiety, and depression. In developing countries like Bangladesh, where mental health services are limited, the burden on these mothers may be even more pronounced. Social stigma, economic strain, and inadequate access to healthcare services further compound their challenges, placing them at a high risk for poor mental health outcomes.

Existing literature highlights the mental health struggles of parents caring for children with disabilities, with many studies focusing on developed nations. Research consistently shows that caregivers of children with severe or complex disabilities often report higher levels of psychological distress. However, limited research has explored this issue in low-resource settings like Bangladesh, where socio-economic factors, family dynamics, and lack of support services can exacerbate mental health issues. Understanding the unique factors contributing to the mental health challenges of these mothers is essential for developing targeted interventions and support systems.

In Bangladesh, the role of mothers as primary caregivers is culturally ingrained, with many facing these challenges in isolation, particularly in rural or low-income urban settings. The intersection of socio-economic status,

education level, family support, and the severity of the child's disability is likely to influence their mental health. This study seeks to fill the gap in understanding the mental health challenges faced by mothers of children with disabilities in Bangladesh.

The objective of this research is to examine the mental health outcomes of these mothers and identify the socio-demographic and family-related factors that are associated with elevated levels of stress, anxiety, and depression. This knowledge can inform the development of effective support programs and policies to improve the well-being of these mothers.

Methodology

This study employs a cross-sectional descriptive design to explore the mental health challenges faced by mothers of children with disabilities. Conducted in Dhaka, Bangladesh, the study spans from January to December 2023. A sample size of 260 mothers, whose children are receiving care at two well-known therapeutic centers—CRP (Centre for the Rehabilitation of the Paralysed) in Savar and Shishu Shorgo (Child's Heaven) Therapy Centre, Shahjadpur—was selected for this research. Data was collected through structured, face-to-face interviews, designed to capture the psychological, emotional, and social dimensions of the mothers' mental health. The primary tools for data collection included validated scales that assess depression, anxiety, and stress, along with a semi-structured questionnaire aimed at understanding coping mechanisms and external stressors. Trained professionals administered the assessments, ensuring accurate and reliable results. Informed consent was obtained from all participants after they were thoroughly briefed on the study's objectives and procedures. Ethical principles such as confidentiality, voluntary participation, and respect for the participants' rights were strictly adhered to. The collection process was carefully managed to create a supportive and non-intrusive environment for the mothers, encouraging them to share their experiences openly. This study seeks to provide a deeper understanding of the mental health struggles of mothers caring for children with disabilities, shedding light on the emotional burdens they bear and highlighting the need for targeted mental health interventions to support their well-being.

Result

Table 1: Age and Mental Health Status of Mothers (n = 260)

Age Group	Frequency (n)	Percentage (%)	Depression (%)	Anxiety (%)	Stress (%)	p-value
20-30 years	60	23.1	40 (66.7%)	35 (58.3%)	28 (46.7%)	0.032
31-40 years	120	46.2	60 (50%)	55 (45.8%)	50 (41.7%)	0.021
41-50 years	80	30.8	30 (37.5%)	25 (31.3%)	40 (50%)	0.045

The age of the mothers shows a significant relationship with mental health outcomes. Younger mothers (20-30 years) exhibited the highest rates of depression (66.7%) and anxiety (58.3%) compared to older mothers, with p-values indicating statistically significant differences ($p = 0.032$ for depression and $p = 0.021$ for anxiety).

Table 2: Educational Level and Mental Health Status of Mothers (n = 260)

Education Level	Frequency (n)	Percentage (%)	Depression (%)	Anxiety (%)	Stress (%)	p-value
No formal education	100	38.5	70 (70%)	60 (60%)	50 (50%)	0.015
Primary school	80	30.8	45 (56.3%)	40 (50%)	35 (43.8%)	0.041
Secondary school and above	80	30.8	25 (31.3%)	15 (18.8%)	33 (41.3%)	0.038

Educational attainment had a significant impact on mental health outcomes. Mothers with no formal education reported significantly higher levels of depression (70%, $p = 0.015$) and anxiety (60%, $p = 0.041$), while those with higher education experienced fewer mental health challenges.

Table 3: Socio-Economic Status and Mental Health Status of Mothers (n = 260)

Socio-Economic Status	Frequency (n)	Percentage (%)	Depression (%)	Anxiety (%)	Stress (%)	p-value
Low	110	42.3	75 (68.2%)	60 (54.5%)	55 (50%)	0.008
Middle	100	38.5	45 (45%)	40 (40%)	40 (40%)	0.027
High	50	19.2	20 (40%)	15 (30%)	13 (26%)	0.046

There was a strong association between socioeconomic status and mental health outcomes. Mothers from low-income households had significantly higher levels of depression (68.2%, $p = 0.008$) and stress (50%, $p = 0.008$), compared to those from middle- and high-income households.

Table 4: Marital Status and Mental Health Status of Mothers (n = 260)

Marital Status	Frequency (n)	Percentage (%)	Depression (%)	Anxiety (%)	Stress (%)	p-value
Married	200	76.9	90 (45%)	80 (40%)	70 (35%)	0.025
Divorced/Separated	30	11.5	25 (83.3%)	20 (66.7%)	18 (60%)	0.014
Widowed	30	11.5	22 (73.3%)	18 (60%)	15 (50%)	0.018

Mothers who were divorced or widowed showed significantly higher levels of depression (83.3%, p = 0.025) and anxiety (66.7%, p = 0.014) compared to married mothers, suggesting that marital status has a significant influence on mental health.

Table 5: Employment Status and Mental Health Status of Mothers (n = 260)

Employment Status	Frequency (n)	Percentage (%)	Depression (%)	Anxiety (%)	Stress (%)	p-value
Unemployed	180	69.2	100 (55.6%)	95 (52.8%)	80 (44.4%)	0.012
Employed (part-time)	50	19.2	20 (40%)	18 (36%)	15 (30%)	0.041
Employed (full-time)	30	11.5	10 (33.3%)	7 (23.3%)	5 (16.7%)	0.049

Employment status was significantly associated with mental health. Unemployed mothers had higher rates of depression (55.6%, p = 0.012) and anxiety (52.8%, p = 0.012), while full-time employed mothers reported the lowest levels of mental health challenges.

Table 6: Family Support and Mental Health Status of Mothers (n = 260)

Family Support	Frequency (n)	Percentage (%)	Depression (%)	Anxiety (%)	Stress (%)	p-value
Adequate	140	53.8	40 (28.6%)	30 (21.4%)	25 (17.9%)	0.001
Limited	120	46.2	80 (66.7%)	70 (58.3%)	68 (56.7%)	0.003

Family support had a significant effect on mental health outcomes. Mothers with limited family support showed significantly higher levels of depression (66.7%, p = 0.001) and stress (56.7%, p = 0.003), compared to those who received adequate support.

Table 7: Severity of Child's Disability and Mental Health Status of Mothers (n = 260)

Severity of Disability	Frequency (n)	Percentage (%)	Depression (%)	Anxiety (%)	Stress (%)	p-value
Mild	90	34.6	30 (33.3%)	25 (27.8%)	20 (22.2%)	0.014
Moderate	100	38.5	50 (50%)	40 (40%)	45 (45%)	0.026
Severe	70	26.9	55 (78.6%)	50 (71.4%)	45 (64.3%)	0.001

The severity of the child's disability was a significant predictor of mental health challenges in the mothers. Those caring for children with severe disabilities reported the highest levels of depression (78.6%, p = 0.001), anxiety (71.4%, p = 0.001), and stress (64.3%, p = 0.001).

Discussion

The current study highlights the substantial mental health burden experienced by mothers of children with disabilities, with significant associations found between socio-demographic factors, family dynamics, and the severity of the child's disability. The results underscore the importance of tailored interventions aimed at alleviating the mental health challenges faced by this vulnerable population.

Age was found to be significantly associated with depression, anxiety, and stress levels. Younger mothers, particularly those aged 20-30 years, reported the highest levels of depression (66.7%) and anxiety (58.3%), with a p-value of 0.032. This is consistent with previous research, which suggests that younger parents of children with disabilities often have fewer coping strategies and less life experience to manage the stress associated with caregiving[19,20]. Moreover, younger mothers may face increased social pressures related to family responsibilities, compounding their emotional distress.

Education played a crucial role in mental health outcomes, as mothers with no formal education reported significantly higher levels of depression (70%, p = 0.015) and anxiety (60%, p = 0.041). These findings align with existing studies, which demonstrate that higher educational attainment equips mothers with better coping skills and access to social resources, reducing the psychological burden of caregiving. In contrast, less educated mothers may lack access to information or mental health services, exacerbating their emotional challenges[21,22].

Socio-economic status (SES) was strongly correlated with mental health outcomes, with mothers from low-income households experiencing higher rates of depression (68.2%, p = 0.008) and stress (50%, p = 0.008). This is consistent with findings from other studies, where low SES has been associated with poor mental health due to financial strain, limited access to healthcare, and higher levels of chronic stress. The financial burden of caring for a child with disabilities can exacerbate feelings of helplessness, especially in resource-limited settings like Bangladesh[23,24].

Marital status also had a significant impact on mental health. Mothers who were divorced or widowed showed higher levels of depression (83.3%, p = 0.025) and anxiety (66.7%, p = 0.014) compared to married mothers. This finding is supported by research suggesting that the absence of spousal support increases the emotional and

caregiving burden on single mothers. Single or widowed mothers often have fewer social and financial resources, which exacerbates their psychological distress[25,26].

Employment status was another critical factor, with unemployed mothers reporting higher levels of depression (55.6%, p = 0.012) and anxiety (52.8%, p = 0.012). Similar results were found in studies that show unemployment increases mental health risks by reducing social engagement, financial stability, and self-esteem[27,28]. In contrast, employed mothers, particularly those in full-time jobs, reported lower levels of stress, which may be due to the additional social support networks and sense of purpose provided by employment.

Family support emerged as one of the most significant protective factors against poor mental health outcomes. Mothers with limited family support experienced significantly higher levels of depression (66.7%, p = 0.001) and stress (56.7%, p = 0.003) compared to those with adequate support. The role of family support in mitigating stress and depression has been widely documented. Social support networks, including emotional and practical assistance from family members, can alleviate some of the caregiving burdens and provide mothers with opportunities for respite and emotional relief.

The severity of the child's disability was a strong predictor of mental health issues. Mothers caring for children with severe disabilities reported the highest levels of depression (78.6%, p = 0.001), anxiety (71.4%, p = 0.001), and stress (64.3%, p = 0.001). This is consistent with previous studies, which have shown that the level of caregiving required for children with severe disabilities creates a heavy emotional and physical toll on parents. Severe disabilities often require constant attention and medical care, leading to caregiver burnout, especially in settings with limited healthcare resources[29,30].

The findings of this study are consistent with previous research conducted in both developed and developing countries. For example, a study in the United States found that parents of children with severe disabilities are more likely to experience psychological distress compared to those caring for children with mild disabilities. Similarly, research conducted in India found that mothers of children with cerebral palsy reported higher levels of stress and depression, particularly those from lower socio-economic backgrounds.

The findings of this study highlight the urgent need for mental health support services for mothers of children with disabilities in Bangladesh. Targeted interventions, such as counseling services, support groups, and financial assistance programs, should be implemented to alleviate the psychological burden on these mothers. Additionally, enhancing social support networks and improving access to healthcare services may further mitigate the emotional stress associated with caregiving.

Conclusion

The mental health of mothers of children with disabilities is influenced by multiple factors, including age, education, socioeconomic status, family support, and the severity of the child's condition. Addressing these issues through a multi-faceted approach could significantly improve the well-being of these mothers and enhance their capacity to care for their children effectively.

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Review Article

Rising Salinity in Bangladesh: Implications for Public Health and Sustainable Solutions

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Abstract

Background: Rising water salinity in coastal areas of Bangladesh poses a significant public health threat, exacerbated by climate change, sea-level rise, and human activities such as groundwater over-extraction and shrimp farming. This review explores the sources, health impacts, and public health interventions related to water salinity in Bangladesh. It synthesizes findings from peer-reviewed studies published between 2000 and 2024, focusing on the relationship between salinity and various health outcomes. The coastal regions of Bangladesh, particularly Khulna, Satkhira, and Barisal, experience salinity levels exceeding 1,000 mg/L, far surpassing the WHO guideline of 200 mg/L for aesthetic quality in drinking water. Salinity in drinking water is linked to a variety of adverse health effects, including hypertension, preeclampsia, gestational hypertension, waterborne diseases, and skin disorders. Vulnerable populations, such as pregnant women, children, and the elderly, are particularly at risk. Salinity also increases the incidence of infant mortality and exacerbates existing cardiovascular conditions in the elderly. The review identifies climate change as a primary driver of salinity intrusion, with frequent storm surges and rising sea levels contributing to saltwater contamination of freshwater sources. Additionally, human interventions like the construction of the Farakka Dam and over-extraction of groundwater further aggravate the problem. Public health interventions, such as the installation of saline-free water filters, rainwater harvesting, and awareness programs, have been initiated but face challenges due to resource constraints and inadequate monitoring of salinity levels. The review highlights gaps in research, particularly the need for longitudinal studies on the long-term health impacts of salinity and the effectiveness of current interventions. Addressing these challenges will require a comprehensive approach involving policymakers, healthcare professionals, and researchers to mitigate the health impacts of rising salinity and promote sustainable solutions for affected populations.

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Introduction

Water salinity has been identified as an increasing public health concern affecting thousands of households every year. Salinity intrusion occurs significantly in coastal areas of Asian countries, such as Bangladesh, China, and Vietnam, but has also been reported in California, Brazil, and the Netherlands[1]. Exposure to high levels of saline via drinking water in coastal populations has led to increased cardiovascular and other diseases. Climate change, which leads to sea level rise and exacer bates cyclones and storm surges, is one of the primary drivers of water salinity[2]. Over-extraction of groundwater and the construction of canals and dams are some human activities that aggravate the situation[3-7].

The geomorphology of Bangladesh has always made the country vulnerable to natural hazards such as storm surges, cyclones, inundation, and seawater intrusion. The southern coastal regions of Bangladesh are only 1m to 3m above

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mean sea level[3], which has resulted in seawater contamination of its drinking water[7]. The wide river mouths make drinking water prone to excessive salinity, as they allow the seawater to flow with great rapidity further inland.

Drinking water salinity is expected to further increase due to climate change and the consequent rise in sea level[2]. In addition to natural causes for increased salinity in drinking water in Bangladesh, several anthropogenic reasons are at play. One such is the construction of the Farakka Dam in 1975 on the Ganges River. The freshwater diversion upstream caused a change in the natural water flow downstream. The dry months from December to May saw a significant reduction in flow, which resulted in increased river salinity[8]. Other significant contributing factors are shrimp farming, construction of coastal polders, and over-extraction of groundwater[3-6,9].

Consumption of excess saline in drinking water has been linked to a variety of health effects. Salt in drinking water is generally found in low levels (20 mg/L) and is considered a negligible contributor to daily salt intake. WHO, therefore, does not have a health-based standard, but an aesthetic guideline value of 200 mg/L[10]. However, several studies identified an association between excessive salinity in drinking water with increased risk of hypertension[11,12]. Drinking water salinity has also been linked to risks of preeclampsia and gestational hypertension[13]. In addition, there are reports on associations with infant mortality, cholera outbreaks, and skin and diarrheal diseases[14,15]. Proxies of water salinity are total dissolved solids (TDS) and electrical conductivity. While the US Environmental Protection Agency (EPA) has set a secondary standard (non-mandatory guideline) value of TDS at 500 mg/L, risks of heart diseases have been associated with increased TDS[16,17]. Thus, increased water salinity may lead to several adverse health effects. This may not only improve the hospital visit rates of the affected population but may also drive-up healthcare costs.

Methodology

This review article aims to provide a comprehensive examination of the rising salinity in Bangladesh and its implications for public health. A systematic literature search was conducted to gather relevant studies, reports, and grey literature published between 2000 and 2024. The primary sources of data were peer-reviewed articles from databases such as PubMed, Google Scholar, Scopus, JSTOR, and Web of Science. The search employed keywords including "salinity," "water salinity," "public health," "Bangladesh," "climate change," "coastal regions," "drinking water," "hypertension," "cholera," "gestational hypertension," "infant mortality," "salinity intrusion," "seawater contamination," and "salinity-related diseases." To ensure the relevance and quality of the selected studies, inclusion and exclusion criteria were applied. Studies that focused on salinity and its health effects in Bangladesh or similar coastal regions were included. Only peer-reviewed English-language articles were considered, which explored the impact of salinity on specific diseases or health conditions and provided data on both the physical environment and public health outcomes. Studies that did not align with the topic or focused on irrelevant geographical areas were excluded, as were articles lacking clear health-related outcomes or those inaccessible in full text. The data extraction process involved systematically collecting key information from the selected studies. This included salinity levels and sources (such as seawater intrusion or groundwater extraction), health outcomes related to increased salinity in drinking water (such as hypertension, preeclampsia, and infant mortality), and demographic factors influencing vulnerability. Additionally, the review identified the effects of climate change on salinity levels and examined the measures and policies aimed at mitigating the health impacts of salinity in Bangladesh.

The findings from the selected studies were synthesized to identify common themes and patterns in the health impacts of water salinity. Special attention was given to the relationship between salinity and cardiovascular diseases, particularly hypertension, as well as the effects on pregnancy outcomes, such as gestational hypertension and preeclampsia. The review also explored the links between salinity and infant mortality rates and assessed the role of environmental and social factors in influencing salinity levels. Public health interventions and strategies aimed at reducing salinity-related health risks, including health education, technological solutions, and government policies, were critically analyzed. To assess the quality of the included studies, standard tools for systematic reviews were used. These included the Newcastle-Ottawa Scale (NOS) for evaluating non-randomized studies and the GRADE approach for grading the quality of evidence in health-related research. The quality of the evidence was categorized as high, moderate, low, or very low, based on the methodological rigor and findings of the studies reviewed.

Finally, the article concluded by synthesizing the main findings and providing actionable recommendations for policymakers, healthcare professionals, and researchers. The review also highlighted existing gaps in the literature and suggested directions for future research to further investigate the health implications of salinity in Bangladesh. By drawing from the existing body of knowledge, this review aims to inform ongoing efforts to address the public health challenges posed by rising salinity and promote sustainable solutions for the affected populations.

Results

The systematic review of the available literature revealed several significant findings regarding the rising salinity in Bangladesh and its impact on public health. The results of the study were categorized into key themes, which include the sources of salinity, the health effects associated with increased salinity, the demographic factors influencing vulnerability, and the public health interventions being implemented to mitigate these effects.

Sources and Levels of Salinity in Bangladesh

A combination of natural and anthropogenic factors primarily drives the rising salinity in Bangladesh. Salinity intrusion in the coastal areas of Bangladesh has been exacerbated by climate change, particularly sea level rise and increased frequency of cyclones and storm surges. The southern coastal regions, particularly the Khulna, Satkhira, and Barisal districts, are most affected, with saline water intrusion into freshwater sources. Studies indicated that salinity levels in these regions can reach up to 1,000 mg/L in drinking water, significantly exceeding the WHO aesthetic guideline value of 200 mg/L for drinking water.

Human activities such as the construction of the Farakka Dam in India, shrimp farming, and over-extraction of groundwater for irrigation have contributed to the increase in salinity. These interventions have disrupted the natural hydrological cycle, allowing saline water to intrude further inland. The dry season, which typically lasts from December to May, sees an exacerbation of salinity levels due to reduced freshwater flow, further compounding the issue[18-21].

Health Impacts of Increased Salinity

The review highlighted several health consequences associated with increased salinity in drinking water in coastal Bangladesh. The most prominent health effect identified was an increased risk of hypertension. Multiple studies showed a significant association between high salinity levels in drinking water and elevated blood pressure in coastal populations. A meta-analysis of existing studies confirmed that individuals living in high salinity areas had a higher prevalence of hypertension compared to those in low-salinity areas. Moreover, there was evidence linking increased water salinity to an increased risk of preeclampsia and gestational hypertension among pregnant women. This was particularly concerning given the high rates of maternal and infant mortality in coastal Bangladesh[22-25].

In addition to cardiovascular health risks, salinity exposure was linked to other health problems, including cholera outbreaks, diarrhea, and skin diseases. Several studies documented a direct correlation between high salinity levels and the incidence of waterborne diseases, with salinity-induced changes in the microbial composition of water sources. The risk of infant mortality was also higher in areas with increased salinity, possibly due to dehydration and compromised immune function in infants.

Skin conditions such as eczema and other dermatological disorders were frequently reported in individuals exposed to saline water. These conditions were particularly prevalent among children, who have more sensitive skin, and in communities where access to safe drinking water was limited[22-24].

Vulnerable Populations

The review also highlighted specific vulnerable groups within the population who are more susceptible to the health impacts of salinity. Coastal communities, particularly those living near the river mouths, are at the highest risk due to their dependence on local water sources for drinking and agriculture. Women, especially pregnant women, were found to be at greater risk of hypertension and preeclampsia, which can lead to severe complications during pregnancy.

Children were identified as another vulnerable group, particularly regarding the health effects of waterborne diseases like cholera and diarrhea. Increased salinity was associated with a higher incidence of gastrointestinal disorders among children, leading to dehydration and higher rates of hospital admissions.

Additionally, the elderly population, already prone to cardiovascular diseases, was found to suffer more severe effects from hypertension caused by high salinity. The poor, who often have limited access to healthcare and clean drinking water, were disproportionately affected by the salinity crisis.

Public Health Interventions

Several public health initiatives were identified in the reviewed studies as efforts to mitigate the adverse effects of salinity. The government and non-governmental organizations (NGOs) have been working on improving access to safe drinking water by providing saline-free water filters, promoting rainwater harvesting, and improving sanitation facilities in affected areas. Awareness programs focusing on the health risks of salinity and educating the population about the importance of using filtered or purified water were also highlighted as key interventions.

Despite these efforts, the implementation of effective interventions remains a challenge due to resource constraints, particularly in rural and remote coastal areas. Additionally, there is a lack of sufficient monitoring and regulation of salinity levels in drinking water, which hinders the effectiveness of health interventions.

Gaps in Research and Future Directions

While the existing studies provided valuable insights into the health impacts of salinity in Bangladesh, several gaps in research were identified. A major gap was the limited longitudinal data on the long-term health effects of salinity exposure, especially regarding its effects on chronic diseases like hypertension and cardiovascular diseases. Additionally, there is a need for more research on the effectiveness of existing interventions and the development of low-cost, sustainable technologies to remove or reduce salinity from drinking water.

Furthermore, future research should focus on the intersection of climate change, human interventions, and salinity levels, with particular attention to the potential impacts of future sea level rise. Investigating the socio-economic determinants of vulnerability to salinity-induced health risks could also help target interventions more effectively.

Discussion

Bangladesh's geographical and climatic vulnerability is a major concern when assessing the implications of rising sea levels and cyclonic activity. The nation's low-lying topography, with half of its land area located less than 5 meters above sea level, significantly heightens the risk of inundation due to storm surges and saltwater flooding. As highlighted in previous studies, Bangladesh has experienced frequent cyclonic activity, with over 178 cyclones recorded from 1891 to 2008[21]. The deadliest cyclones, including those in 1970, 1982, 1991, Sidr in 2007, and Ayla in 2009, have caused extensive damage and flooding along the coastline[22]. In fact, it is expected that Bangladesh will face more than one cyclone annually, with moderate surges occurring at an average interval of every 5.4 years. This suggests that over 12% of the country is at high risk of saltwater flooding every 5.4 years, and 1-2% of the country could experience seawater flooding annually. In the Shyamnagar Upazila, this means that 64% of the area could be flooded by saline water over time, with 5.6% affected annually[23].

In extreme scenarios, storm surges can reach up to 9 meters, and while these are less frequent, they remain plausible. Historical records reveal that 10-15 meter storm surges have occurred in the past, such as the 13-meter surge in 1876 and a 10-meter surge in 1970[24]. The prediction of a 10-meter wave hitting the coast every 20 years emphasizes the potential for widespread saltwater intrusion, particularly in coastal regions like Shyamnagar. With projections indicating sea levels will continue to rise due to climate change, these storm surges are likely to become more frequent and intense. The vulnerability of coastal areas will increase as storm intensity, driven by rising ocean surface temperatures, is expected to intensify[28].

The review of chemical archives from stations in Kalaroa, Benarpota, and Elarchar demonstrates clear evidence of saltwater intrusion, with significant spikes in salinity levels during major storms[28]. These salinity spikes reflect the damage caused by these storm surges and the resulting contamination of freshwater systems, both in terms of surface waters and groundwater. The data shows that during these events, Electrical Conductivity (EC) levels in affected areas exceeded 10,000 dS/m, indicating severe salinization[29,30].

Saltwater intrusion, driven by storm surges, has permeated far into Bangladesh's soil and freshwater systems. Soil samples from affected regions reveal high salinity levels, which can cause metal salt toxicity and phosphorus deficiency in crops. These conditions severely impair agricultural productivity, with studies confirming high salinity in soils in areas like Gabura and Burigoalini, where soil salinity ranged from 4.21% to 8.02%[31]. Such soil conditions, combined with the competition for essential nutrients like potassium and calcium due to sodium dominance, undermine crop and fish cultivation. This has led to significant challenges for local farmers, particularly those involved in shrimp farming, where increased salinity is causing shrimp mortality[32,33]. The suggestion to relocate shrimp farms to inland regions less affected by salinity and climate change is a viable strategy but highlights the growing challenges to the agricultural economy.

Furthermore, high sodium concentrations in water are causing public health concerns, particularly in terms of elevated blood pressure among local populations. Excessive sodium also affects plant health by limiting nutrient absorption, exacerbating agricultural challenges. The presence of chloride in seawater further accelerates the corrosion of metal infrastructure, including pipes, which can increase the concentration of harmful metals in the water supply and pose a risk to human health[34,35].

The analysis of the correlation between water and soil salinity reveals a direct link, with higher salinity in water correlating with increased potassium in the soil, a pattern consistent with findings from other studies[36] This indicates that rising salinity levels will not only damage agricultural productivity but also worsen the quality of the soil, further complicating the region's agricultural prospects. Water and soil salinity have a negative correlation, meaning that salt stored in soils during dry periods is more likely to dissolve and enter the water system during monsoons, compounding the problem[37-39]

Conclusion

The rising salinity in Bangladesh, driven by both cyclonic activity and sea-level rise, presents significant challenges for agriculture, public health, and the overall sustainability of the coastal population. Storm surges and their aftermath lead to long-lasting impacts on water quality, soil fertility, and the local economy, particularly for farming and aquaculture. The urgency of addressing the growing risks of salinity intrusion through sustainable management practices, improved infrastructure, and targeted relocation strategies is paramount to mitigating these adverse effects. With climate change predicted to worsen the intensity and frequency of cyclones, the need for comprehensive coastal protection strategies and resilient farming systems is more pressing than ever.

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Case Report

Recurrent Flexor Tenosynovitis in a Diabetic Patient: A Rare Candida Infection

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Abstract

Background: Fungal infections of the hand are relatively rare but can lead to significant morbidity, especially in individuals with underlying risk factors such as diabetes. Candida species, while commonly associated with mucosal and systemic infections, are less frequently implicated in tenosynovitis or other soft tissue infections. In diabetic patients, the risk of fungal infections is elevated due to altered immune function and poor wound healing.

Case presentation: A 52-year-old diabetic male presented with pain, swelling, and numbness in his left hand, diagnosed with compound palmar ganglion, flexor tenosynovitis, wrist arthritis, and carpal tunnel syndrome. Following surgery, symptoms recurred four months later with swelling, redness, and exudate, and Candida albicans was identified as the causative pathogen. Antifungal therapy with voriconazole and fluconazole successfully treated the infection, though the patient experienced residual limitations in finger flexion. This case highlights the importance of considering fungal infections in diabetic patients with hand complications.

Conclusion: This report highlights the rare occurrence of Candida tenosynovitis and underscores the importance of considering fungal pathogens in patients with hand infections, especially those with risk factors like diabetes, even when initial cultures are negative. Prompt diagnosis and tailored antifungal treatment can prevent severe complications in such cases.

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Introduction

Flexor tenosynovitis is a condition characterized by the inflammation of the synovial sheaths surrounding the flexor tendons, most commonly affecting the hand and wrist. While often associated with inflammatory conditions such as rheumatoid arthritis or bacterial infections, fungal pathogens are an infrequent cause of flexor tenosynovitis. The vast majority of cases involve bacterial infections, with fungi like Candida being a rare but potentially significant etiological agent, especially in immunocompromised individuals. Diabetes mellitus, an immunocompromising disease, predisposes patients to a higher risk of opportunistic infections, including fungal ones, due to altered immune responses, increased glucose levels, and compromised wound healing. These factors highlight the importance of considering fungal infections in patients presenting with atypical symptoms of hand infections.

Candida species, particularly Candida albicans, are most commonly recognized as causative agents of superficial infections such as chronic paronychia and nail infections. However, deep tissue infections involving synovial sheaths and tendons due to Candida are exceedingly rare. A search of available literature reveals only a handful of reported cases of Candida tenosynovitis, underlining the unusual nature of such infections. Notably, these cases often involve patients who are immunocompromised or have had prior invasive medical interventions, which suggests that these factors may increase the susceptibility to fungal infections in deep tissues. Among the limited number of cases reported, some have involved patients with acquired immunodeficiency syndrome (AIDS), while others have been linked to surgical trauma or local injections, further emphasizing the role of predisposing factors in the development of such infections.

In the rare cases of Candida tenosynovitis documented, the infection has been diagnosed in patients with a variety of risk factors. For example, one case involved a patient with AIDS[1], while another involved a patient with a history of intravenous drug use[2]. Candida has also been implicated in post-surgical infections, such as those following ganglion cyst excision or joint replacements[3]. Despite being a rare occurrence, these infections have a potential for significant morbidity if left undiagnosed or improperly treated. Given the rarity of Candida tenosynovitis, clinicians may not always consider it in the differential diagnosis, especially in the absence of initial positive cultures or obvious signs of fungal infection.

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This case report presents the unusual occurrence of recurrent flexor tenosynovitis caused by Candida albicans in a 52-year-old diabetic male. The patient initially underwent surgical intervention for carpal tunnel syndrome and synovitis, but four months later, he experienced a recurrence of symptoms, which ultimately led to the identification of a Candida infection. The report underscores the need for clinicians to maintain a high index of suspicion for fungal infections in patients with atypical hand infections, especially those with diabetes or other immunocompromising conditions, and highlights the role of antifungal therapy in preventing complications.

Prompt recognition of such rare infections is critical, as it can prevent prolonged symptoms, irreversible tendon damage, or the need for further invasive surgical interventions. This case serves as an important reminder to healthcare professionals about the potential role of fungal pathogens, specifically Candida, in causing tenosynovitis and the importance of comprehensive diagnostic approaches, including fungal cultures, even when initial bacterial cultures are negative.

Case Report:

An 52-year-old man visited our clinic due to pain and swelling in his left hand. He also had complaints of numbness in his fingers. On examination, local temperature was raised, fingers were slightly flexed. There was a palpable, firm, mobile mass in distal forearm. Carpal compression test was positive. His medical history included diabetes. No other systemic abnormalities were present.

We advised him a musculoskeletal ultrasonogram of left hand. USG showed compound palmar ganglion with flexor tenosynovitis with wrist arthritis with median nerve entrapment. So, we diagnosed this condition as compound palmar ganglion with flexor tenosynovitis with CTS. We decided to perform carpal tunnel release with tenosynovectomy with synovial biopsy. Synovial proliferation around the flexor tendons were observed. Pathological examination of synovial tissue did not reveal findings specific to rheumatoid arthritis or acid-fast bacteria. A culture of synovial tissue tested negative for bacteria.

Four months later, pain was again triggered. The patient complained of pain with a handgrip. Fingers had limited flexion, and the wound site became swollen, tenderness, and redness was present. A serous exudate from the surgical wound was seen and sent for culture and sensitivity. Culture was positive for Candida albicans.

Oral Voriconazole (400 mg/day) was administered. The swelling reduced, and the serous exudate decreased gradually. Two months later, the fluconazole dose was reduced to 300 mg per day and was continued for another month. The patient informed us that the level of disability in flexing the ring finger was more acceptable than undergoing additional surgery for flexor tendon reconstruction.

Discussion:

Candida species are recognized as a cause of cutaneous and subcutaneous hand infections, such as chronic paronychia.[4] However, deep hand infections due to Candida are exceptionally rare. According to available literature, only six cases of Candida tenosynovitis have been documented in English. In these cases, the patients' medical history appears to have played a crucial role in predisposing them to the condition. Among the six cases, three involved individuals who were immunocompromised due to conditions such as acquired immunodeficiency syndrome, Buckley's immunodeficiency, or treatment with cyclosporine and methylprednisolone.[5-7] The remaining three cases occurred in patients who experienced invasive events before developing tenosynovitis. One patient with extensor tenosynovitis in the wrist and forearm had a history of recreational intravenous drug use, with visible injection marks on the forearm.[8] Another patient developed finger flexor tenosynovitis following surgery to remove a ganglion cyst and subsequent triamcinolone injections.[9] The final case involved flexor tenosynovitis extending from the wrist to the little finger, which occurred after a total thumb replacement.[3]

Our study highlights the need to consider infections caused by low-virulence pathogens, such as fungi, even when culture results are negative. In cases of hand tenosynovitis, Candida infection should remain a diagnostic consideration, even in the absence of positive bacterial or fungal cultures.

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Short Communications

Dengue Taking a High Toll On South Asian Nations

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Introduction

Dengue, also known as break-bone fever due to the severe pain is a viral infection and more common in tropical and subtropical climates like in Bangladesh. Dengue is a RNA virus and the disease is transmitted by infected mosquito. About 75% cases of dengue who get dengue will not have any symptoms. In dengue the most common symptoms are high grade fever, headache, body aches, nausea, and rash. Most will get better in 1–2 weeks. Some people develop severe dengue and need care in a hospital.

Burden Of Disease

Dengue fever is the fastest-spreading mosquito-borne viral disease, affecting 100-400 million people annually worldwide. Dengue is the leading cause of arthropod-borne viral disease worldwide, posing a significant global health concern. Endemic across most provinces in Bangladesh, dengue incidence has increased in recent years largely due to expansion of the vector Aedes aegypti and Aedes albopictus, as well as the movement of people and the introduction of imported cases. The disease is widespread throughout the tropics with risk factors influenced by local spatial variations of rainfall, temperature, relative humidity, degree of urbanization and quality of vector control services in urban areas. It is estimated to infect 390 million people annually of which 96 million manifests clinically. One study on prevalence of dengue estimates that 3.9 billion people in 128 countries are at risk of infection with dengue viruses. Before 1970, only 9 countries had experienced severe dengue epidemics, today the disease is endemic in more than 100 countries.[1,2,3]

Vector Characterictics

Dengue is caused by a flavivirus of 4 virus serotypes (DENV1, DENV2, DENV3, DENV4). Over the past 20 years, these serotypes have spread worldwide from South East Asia and are now found throughout Asia, Africa and the Americas. (Figure: 1) International travel, trade, migration, decreased access to health care and urbanization are considered among the main drivers behind the rapid dissemination of all four dengue serotypes. Compounding the problem has been the global spread of the dengue mosquito vectors, Ae. aegypti and Ae. albopictus, throughout the last century.[4]

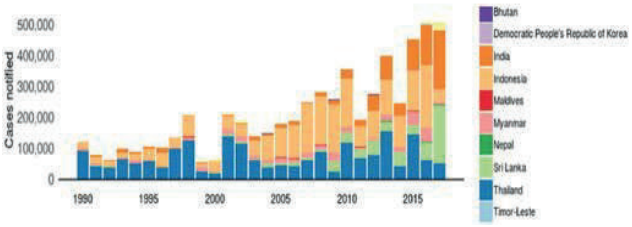

Figure: 1 Dengue cases notified by SEAR countries to WHO during the period 1990-2017

Dengue is transmitted primarily by the female mosquito Aedes aegypti, which thrives in and around urbanized areas. It is diurnal and highly anthropophilic, with domestic forms showing increased propensity towards exclusive human feeding. It has greater competency for transmission than Ae. albopictus, and coupled with short, frequent biting behavior, it can transmit dengue multiple times during a single gonotrophic cycle. Once infected, humans are the main carriers and multipliers of the virus, serving as a source of virus for the uninfected mosquitoes. The virus circulates in the blood of an infected person for 2-7 days, at approximately the same time that the person develops a fever.

Clinical Features And Management

After an incubation period of 4- 10 days, dengue virus can produce a wide spectrum of illness although most infections are asymptomatic or mildly symptomatic.

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Most common symptoms are high grade fever, headache, body aches, nausea, and rash. Most of the time dengue disease has three phases febrile phase which last for 2-7days than critical phase and recovery phase. In humans, recovery from infection by one dengue virus provides lifelong immunity against that particular virus serotype. However, this immunity provides only partial and transient protection against subsequent infection by the other three serotypes of the virus. Some evidence show that sequential infection increases the risk of developing severe dengue. The severity of the disease is determined by the individual risk factors such as secondary infection, age and presence of co- morbid conditions like diabetes mellitus, sickle cell anemia, renal disease, etc. there is no specific medicine for the management of dengue. Patient should be managed symptomatically. According to World Health Organization Dengue case is classified as Dengue without warning signs, Dengue with warning signs and severe Dengue.

Situation Worldwide And In Bangladesh

Dengue was first recorded in the 1960s in Bangladesh (then known as East Pakistan) and was known as "Dacca fever". Since 2010 cases of dengue appear to coincide with the rainy season from May to September and higher temperatures. Bangladesh's climate conditions are becoming more favorable for the transmission of dengue and other vector-borne diseases including malaria and chikungunya virus due to excessive rainfall, waterlogging, flooding, rise in temperature and the unusual shifts in the country's traditional seasons.

Climate conditions like temperature, humidity, and rainfall impact the life cycle of mosquitoes and the pathogen it harbors and influences the distribution and prevalence of both the virus and its vector. In South Asia, the peak season for dengue is from June to September, when climate conditions are most favorable for the mosquito to thrive and spread dengue. Dengue cases rise from mid-June to September due to heavy rainfall and humidity. Frequent outbreaks of dengue in South Asia are often attributed to a lack of public awareness, insufficient health infrastructure, and poor vector control measures. Many people in the region are not aware of the risk associated with dengue and do not take appropriate measures to protect themselves from the disease. Additionally, the health infrastructure in many parts of South Asia is inadequate, and there is a shortage of medical supplies and trained personnel. This can make it difficult to diagnose and treat cases of dengue and can lead to delays in the implementation of effective control measures. Finally, vector control measures, such as the use of insecticides and the elimination of breeding sites, are often inadequate or poorly implemented. This allows the mosquito vector to thrive and spread the virus, leading to frequent outbreaks of the disease. Overall, addressing these issues will be critical in reducing the burden of dengue in South Asia.

Situation At Glance

From 1 January to 7 August 2023, the Ministry of Health and Family Welfare of Bangladesh reported a total of 69 483 laboratory-confirmed dengue cases and 327 related deaths, with a case fatality rate (CFR) of 0.47%. Of these, 63% of cases and 62% of the deaths were reported in the month of July 2023. Although dengue is endemic in Bangladesh, the current dengue surge is unusual in terms of seasonality and the early sharp increase in comparison to previous years, where the surge started around -late June. The CFR so far this year is relatively high compared to previous years for the full-year period. The pre-monsoon Aedes survey shows that the density of mosquitoes, and the number of potential hotspots is at the highest level in the past five years. The higher incidence of dengue is taking place in the context of an unusual episodic amount of rainfall, combined with high temperatures and high humidity, which have resulted in an increased mosquito population throughout Bangladesh.[5]

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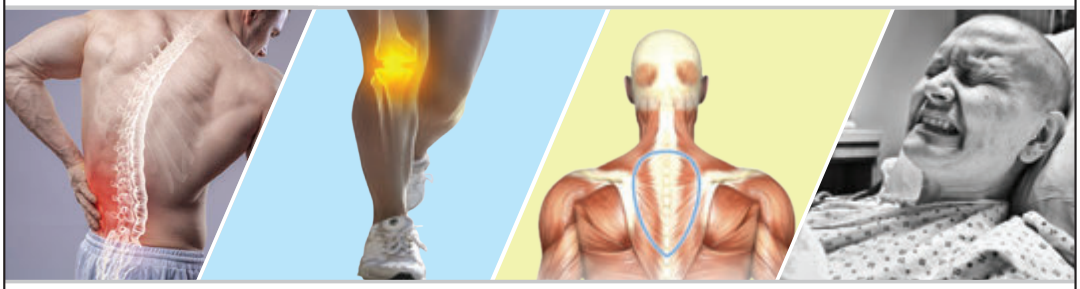

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