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Editorial

Heat Stroke and Related Health Hazards: Bangladesh Perspective

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Heat stroke is a life-threatening condition that necessitates neurocritical care. Heat stroke results from exposure to a high environmental temperature or from strenuous exercise. Between 2006 and 2010, there were at least 3,332 deaths attributed to heat stroke in the USA.[1] The 28-day and 2-year mortality rates for heat stroke have been reported at 58% and 71%, respectively.[2] Additionally, climate change is expected to increase the number of heat stroke deaths. By the 2050s, heat stroke-related deaths are projected to be nearly 2.5 times the current annual average of approximately 2,000 deaths.[1] Data on the incidence of heat stroke are imprecise because this illness is underdiagnosed and because the definition of heat-related death varies.[3] In an epidemiologic study during heat waves in urban areas in the United States, the incidence of heat stroke varied from 17.6 to 26.5 cases per 100,000 population.[3] In Saudi Arabia, the incidence varies seasonally, from 22 to 250 cases per 100,000 population. The crude mortality rate associated with heat stroke in Saudi Arabia is estimated at 50 percent. The incidence of heat exhaustion in Saudi Arabia, in contrast, ranges from 450 to more than 1800 cases per 100,000 population.[4] Heat stroke is defined by patient symptoms at the time of clinical admission, including profound central nervous system (CNS) abnormalities like delirium, seizures, coma and severe hyperthermia like core temperature typically but not always above 40°C.[5] Despite adequate lowering of the body temperature and aggressive treatment, heat stroke is often fatal, and those who do survive may sustain permanent neurologic damage. Recent epidemiological studies indicate that multi-organ system dysfunction can continue to manifest in patients following clinical treatment, increasing the risk of mortality during the subsequent months and years of recovery.[2] Preexisting conditions, such as mental illness, alcoholism, or drug use like diuretics, anticholinergic may compromise an individual's physiological adjustments to heat stress and increase the incidence of passive heat stroke. Athletes like marathon runners, race car drivers, occupational workers like fire fighters, agricultural workers and military personnel are highly motivated populations at risk for exertional heat stroke while performing strenuous physical work or exercise in temperature or hot climates. A recent epidemiological study identified a variety of factors that are associated with increased incidence of exertional heat illness, including sex (women are more than men), geographic region of origin (Northern is predominant than Southern states), and race/ethnicity (Caucasian are more than African American).[6] The incidence of exertional heat stroke is influenced by a multitude of factors, including pre-existing illness, drug use like alcohol, amphetamines, ecstasy and wearing protective clothing like uniforms in athletes that limits heat dissipation. The inability to properly anticipate, diagnose, and treat the long-term consequences of heat stroke is a significant limitation in modern medicine, reflecting our limited understanding of the pathophysiological mechanisms mediating tissue injury.

Hyperthermia due to passive heat exposure facilitates the leakage of endotoxin from the intestinal mucosa into the systemic circulation and the movement of interleukin IL-1 and IL-6 proteins from muscles into the bloodstream. This results in excessive activation of leukocytes and endothelial cells, leading to the release of various cytokines and high-mobility group box [1] protein (HMGB[1]), a prototypic alarming signaling tissue and cellular damage. These processes collectively trigger the systemic inflammatory response syndrome (SIRS). The inflammatory and coagulation responses to heat stroke, combined with the direct cytotoxic effects of heat, injure the vascular endothelium, causing microthrombosis. Platelet counts decrease due to micro thrombosis, secondary platelet consumption, and hyperthermia -induced platelet aggregation.

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Heat stroke also suppresses platelet release from bone marrow because megakaryocytes are susceptible to high temperatures. Consequently, heat stroke-induced coagulation activation and fibrin formation clinically manifest as disseminated intravascular coagulation (DIC).[5] Heat is a leading cause of natural-hazard-related deaths in the United States, as evidenced by the significant morbidity and mortality associated with recent heat waves. Recent research has shown that heat stroke survivors have a substantially elevated 30-year mortality rate compared to individuals who have never experienced heat stroke. Despite this, our knowledge of the pathophysiology of heat stroke and the mechanisms of the systemic inflammatory response syndrome (SIRS) that predispose individuals to morbidity and mortality remains severely limited.

From 1961 to 2020, Bangladesh experienced an average temperature increase of 0.13°C per decade and a relative humidity rise of 0.3% per decade, leading to a rapid increase in the Discomfort Index (DI) by 0.13°C per decade, Heat Days (HD) by 0.22°C per decade, and Wet-Bulb Temperature (WBT) by 0.17°C per decade.[6] These increases were more pronounced in coastal regions, where thermal stress was already high. The rapid temperature rise significantly contributed to the increase in annual and monsoon DI, HD, and WBT, while rising relative humidity drove the increase in these indices during the pre-monsoon season.[7] The study also revealed a sharp rise in severe DI or dangerous HD days, with the number of such days tripling in the densely populated city of Dhaka and increasing twelvefold in Sylhet over the decades.[6]

Currently, there is a lack of data supporting the efficacy of existing clinical treatments, highlighting the urgent need for more effective therapeutics. The use of novel biotechnologies, including radiotelemetry, genomic, and proteomic analyses, will be crucial in advancing our understanding of heat stroke pathophysiology. These technologies, combined with innovative in vivo, in vitro, and in silico models, will be essential for enhancing our understanding of SIRS and developing new strategies to reduce the morbidity and mortality associated with heat stroke.[7]

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Original Article

Technique of Excision of Double Head Pterygium with Conjunctival Autograft from both Eyes

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Abstract

Background: Pterygium is not just a degenerative disease, but may be a proliferative disorder of the ocular surface. ***Objective:*** The aim of this study was to describe a technique of conjunctival autograft from both eyes for primary double head pterygium and evaluate its post operative result. ***Methodology:*** This retrospective study was conducted in the department of Ophthalmology at Monno Medical College, Manikganj, Bangladesh from July 2022 to December 2022 for duration of six months. After fulfill the selection criteria underwent conjunctival autograft from both eyes. Primary outcome measure was recurrence rate, graft retraction, Tenon's granuloma, dellen formation. ***Results:*** The highest patients belong to 35 to 45 years age group is about 18(60.0%) in this study. The number of male patients was 10 and that of female patient 20. There was no recurrence in this study. However, there were postoperative oedema (6.66%), sub-conjunctival haemorrhage (63.33%), graft retraction (20.0%), dellen (0.0%), Tenon's granuloma (10.0%). ***Conclusion:*** In conclusion conjunctival autograft from both eyes appears to be successful technique with 0 recurrence rate in treating double head pterygium.

Key Words: Primary pterygium; double head pterygium; conjunctival autograft

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Introduction:

Pterygium is the commonest degenerative condition of conjunctiva. Pinguecula and conjunctival concretion are other two conjunctival degenerative states. Pterygium means a small wing, is a raised triangular fibrovascular growth that extends horizontally from the bulbar conjunctiva across the limbus onto the cornea.[1] It occurs in the palpebral fissure area more towards the nasal than the temporal, although either or both (double pterygium) may occur.Pterygium is associated with ultraviolet light exposure. It occurs at highest prevalence in tropical area near the equator and to a lesser degree in cooler climates.[2,3] Both blue and ultraviolet may be responsible for development of pterygium which was demonstrated by Watermen.[2] Pterygium was graded according to the corneal involvement (grade 1: crossing limbus, grade 2: midway between limbus and pup, grade 3: reaching up to pupillary margin, grade 4: crossing pupillary margin). New theory of pathogenesis is possibility of damage to the limbal stem cell by ultraviolet light and by activation of matrix metalloproteinase.[4,5] The histopathology of pterygium is elastotic degeneration of conjunctival stroma.[6] And Bowman's membrane of the cornea is also destroyed. Double head pterygium which means both nasal and temporal pterygia in the same eye is rare. Conjunctival autograft is the gold standard in the management of

primary pterygium.[7] Excision of pterygium with adjuvants[8] e.g. Mitomycin C (MMC) is also a good choice for management of pterygium but MMC may cause corneal and scleral melting. Amniotic membrane transplant has been found effective but not easily available and not cost effective.

We reported an approach for treating pterygium by excision of it followed by suturing of conjunctival graft from both eyes. We also document long term effect of this technique on patient with primary double head pterygium.

Methodology

Study Setting and Population: This retrospective study was conducted in the department of Ophthalmology at Monno Medical College, Manikganj, Bangladesh. This study was carried out during the period from July 2022 to December 2022 for duration of six months. Data were collected from Shaheed Monsur Ali Medical College Hospital, Uttara, Dhaka, Bangladesh and Ideal Eye Care Centre, Shyamoli, Dhaka, Bangladesh. All surgeries were performed by one surgeon. Data included patient's age, sex, ocular, medical and surgical history and visual acuity before and after surgery, surgical techniques and complications. Primary double head pterygium up to grade 3 was included in our study. Grade 4 and recurrent pterygium was excluded from this study.

Surgical Procedure: The 2% Xylocaine was used as local peribulbar anesthesia. Head of the nasal pterygium was detached from the corneal surface using Saint Martin forceps and crescent blade. Pterygium body and underlying fibrovascular tissue were excised with conjunctival scissor. The cornea and limbal area were cleaned by scraping the residual tissue with a crescent blade. Gentle wet field cautery was applied to achieve hemostasis. A similar technique was performed for the temporal pterygium. Superior bulbar conjunctiva of both eyes was selected as the donor site. Balanced salt solution was injected sub-conjunctively which was useful for dissection of conjunctiva from Tenon's capsule. A small incision was made at the fornix with conjunctival scissor. A thin conjunctival graft of adequate size was fashioned. Graft was placed on bare scleral defect. Conjunctival autograft was secured with interrupted 10-0 polyamide monofilament suture. Autografts were sutured at the limbus with scleral anchoring suture superiorly and inferiorly and the remaining margin was attached to conjunctiva with 2 to 4 interrupted sutures. The eye was patched for 24 hours. Post operatively, Moxifloxacin and Dexamethasone combination eye drop and artificial tear eye drop 4 times a day were given for one month. Patients were examined on postoperative day 1 and later asked for follow up after 1 week, 6 weeks and 6 months. The data from each visit was analyzed and documented. Recurrence was defined as fibrovascular tissue in growth of 1.5 mm or more beyond limbus on to clear cornea with conjunctival dragging.[9]

Statistical Analysis: Statistical analyses was performed with SPSS software, versions 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). Continuous data that were normally distributed were summarized in terms of the mean, standard deviation, median, minimum, maximum and number of observations. Categorical or discrete data were summarized in terms of frequency counts and percentages. When values are missing, the denominator was stated. Chi-square test was used for comparison of categorical variables. Every effort was made to obtain missing data. A two-sided P value of less than 0.05 was considered to indicate statistical significance.

Ethical Clearance: All procedures of the present study were carried out in accordance with the principles for human investigations (i.e., Helsinki Declaration) and also with the ethical guidelines of the Institutional research ethics. Formal ethics approval was granted by the IRB of Monno Medical College. Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and analyzed using the coding system.

Results

A total number of 30 eyes of 30 patients were recruited after following inclusion and exclusion criteria. The minimum age was 35 years and maximum 65 years. The age group from 35 to 45 years, about 18(60.0 %) patients were predominant in this study (Table:1)

Table 1: Distribution of Patients according to Age Group (n=30)

Age Group	Frequency	Percent
35 to 45 Years	18	60.0
46 to 55 Years	8	26.66
56 to 65 Years	4	13.33
Total	**30**	**100.0**

Among them, female patients were more prominent than male which were 20(67.0%) cases and 10(33.0%) cases respectively (Figure I)

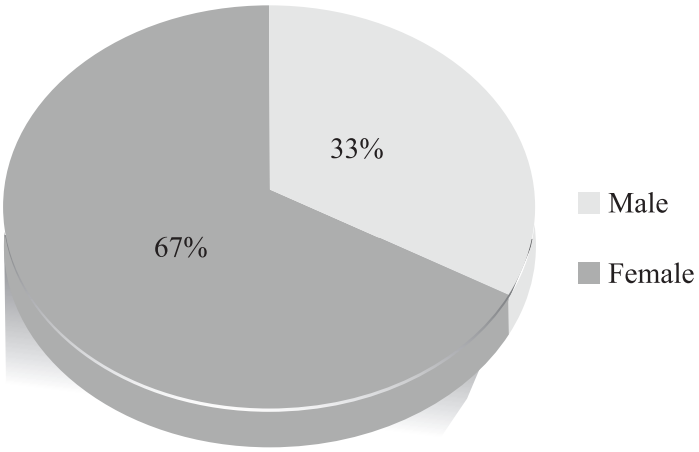

Figure I: Distribution of patients according to gender (n=30)

There was no recurrence in this study. However, most frequent postoperative outcome was sub-conjunctival haemorrhage which was 19(63.33%) followed by graft retraction, Tenon's granuloma and oedema which were 6(20.0%), 3(10.0%) and 2(6.66%) respectively (Table 2)

Table 2: Percentage of Various Outcomes of this Study (n=30)

Complications	Frequency	Percent
Oedema	2	6.66
Subconjunctival hemorrhage	19	63.33
Graft retraction	6	20.0
Dellen	0	0.0
Tenon's granuloma	3	10.0
Recurrence	0	0.0
Total	**30**	**100.0**

Discussion

Primary surgical resection using a bare sclera technique with meticulous conjunctival dissection remains the initial approach for many surgeons. This technique is associated with very high recurrence rates. After excision, the resultant defect can either be left exposed or covered by adjacent tissue in primary closure or a pedicle graft or by transposition of pterygium head. In other way, the defect can be covered by conjunctiva with or without limbal stem cell.

Without covering the defect adjunctive treatment such as Mitomycin C has been used. These adjunctive treatments have additional side effects[10,11] such as superficial punctate keratopathy, poor epithelial healing, late onset scleral ulceration, microbial infection, glaucoma and endophthalmitis. The current preferred method advocates covering the scleral defect with conjunctiva and limbal stem cell. Practitioners are reporting use of amniotic membrane for closure of the defect. Amniotic member is costly, needs preservation and is not easily available. Some studies have reported more recurrence rate with amniotic membrane.[12] Most recently, a new technique named "pterygium extended removal followed by an extended conjunctival transplant for double head pterygium" showed excellent cosmesis and no recurrence rate in 20 eyes at 1 year follow up.[13] In general, the recurrence of pterygium occurs within first 6 months of surgery.[14] In this study, the overall rate of recurrence was 0.0% which was comparable to other published studies. Published studies mentioned suture-related complications such as infection, prolonged operation time and postoperative discomfort which can sometimes require second surgery.[15,16] In a study by Solomon et al[17] with technique of pterygium excision with amniotic membrane graft, the recurrence rate was 9.0% (1 eye out of 11 eyes). Similarly, double-head pterygium excision using bare sclera technique with 0.02% MMC (5 minutes) was published by Avisar et al[18] which showed recurrence rate 0.0% (0 out of 10 eyes) in primary pterygium and 33.33% (1 eye out of 3 eyes) in recurrent double- head pterygium. Previous studies reported that limbal stem cell act as a barrier between conjunctiva and corneal epithelium and destruction of this barrier leads to growth of conjunctival tissue on to the cornea.[19] However, in this study, adequate size graft enough to cover the bare scleral defect had 0 recurrence rate comparable to other studies.

Conclusion

This study was retrospective in nature. Therefore, it had some limitations. Other technique using fibrin glue instead of suture would reduce postoperative discomfort, irritation, lesser time than our suturing method. But there is chance of dislodgement of the graft. Conjunctival autograft, large enough to cover the bare scleral defect may be a successful technique with zero recurrence rate for the surgical option

of double-head pterygium. In this technique, patients post operative visual acuity was found good, patient had less astigmatism, graft remained in situ and cosmetically acceptable.

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Original Article

Cytological Evaluation of Palpable Non-Neoplastic Breast Lesions among Women attended from Rural Community of Bangladesh: A Cross-Sectional Study

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Abstract

Background:Non-neoplastic palpable breast disease is one of the most common disorders from which women suffer throughout the world. The use of fine-needle aspiration cytology (FNAC) method has proven to be quick, simple and cost-effective with minimum risk of complications in the evaluation of breast lumps. ***Objective:*** This study was planned to find out the common causes of various types of non-neoplastic breast lesions of female at different ages through fine needle aspiration cytology. ***Methodology:*** The cross-sectional study was carried out in the Department of Pathology at Monno Medical College& Hospital, Manikganj, Bangladesh. It lasted 2 years 6 months from July 1, 2019 to December 31, 2021. This study examined all breast lumps found in female patients. For data analysis, the patient's age and FNAC report were recorded. Aspirates were done using 5ml/10ml syringe and 23-gauge needle. Smears were stained with Papanicolaou stain. ***Results:*** The study included total 349 female patients with breast lesions. Among these, non-neoplastic lesions were 183(52.44%) cases and neoplastic lesions were 166(47.56%) cases. Among the lesions 349, 105(30.08%) cases were in fibrocystic changes; 28(8.02%) cases were in non-suppurative mastitis; 24(6.87%) cases were in suppurative mastitis (abscess), 14 (4.01%) cases were in granulomatous mastitis. About 45(42.88%) cases of Fibrocystic changes, 13(44.84%) cases of non-suppurative mastitis and 9(37.5%) cases of Suppurative mastitis (abscess) were in the age group 21 to 30 years, 21 to 30 years and 41 to 50 years respectively. ***Conclusion:*** Fibrocystic changes were the most common non neoplastic lesions, frequently affecting the left breast among women aged 21 to 30 years.

Key Words: FNAC; Non-neoplastic; breast lesion

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Introduction:

Since ancient times, the breasts have been a subject of clinical interest to clinicians. Breast disease is the most common disorder suffered by women throughout the world. Women suffer about 30% of breast disease in their lifetime.[1] Fine needle aspiration cytology (FNAC) plays a significant role in the management of palpable breast lesions in surgical outpatient department. Fine needle aspiration cytology (FNAC) plays an important role in management in this aspect.[2] Fine needle aspiration cytology is an excellent, safe, and cost-effective diagnostic procedure. One can get a report with minimal cost using inexpensive

equipment and a simple technique. The high degrees of accuracy, quick results, and less invasive process compared to a tissue biopsy are the main benefits of FNAC. The number of open biopsies can be decreased using FNAC.[3-6] The clinical evaluation, mammography, and fine needle aspiration cytology triple diagnostic approach offers a precise diagnosis and lowers the chance of a missed breast cancer diagnosis to 1.0%.[7] The aim of this present study was to find out the common causes of female breast lumps at different ages with special interest on non-neoplastic breast diseases.

Methodology

Study Setting and Population: The cross-sectional study was conducted in the Department of Pathology at Monno Medical College, Manikganj, Bangladesh. The time period of study was 2 years 6 months. It spanned from July 1, 2019 through December 31, 2021. FNAC of consecutive patients were done after taking informed consent. This study examined all breast lumps found in female patients. All female patients aged 11 to 70 years who presented with unilateral or bilateral breast lumps in any quadrant of the breast were included in this study. Patients with no palpable breast lumps were excluded from this study.

Study Procedure: The clinical history pertaining to the lesion was obtained. The swelling was then examined locally in accordance with proper aseptic measures. After physical examination of the patients, the specimen was collected with full aseptic precaution. The collected specimens were kept properly in the collection container.

Specimens Collection: To conduct fine needle aspiration (FNA), essential equipment such as disposable 5ml/10ml plastic syringes, 23-gauge needles, gauze pads, glass slides, alcohol, gloves, a Coplin jar for immediate wet fixation of smears, and a container for collecting fluid from cystic lesions were used. The technique was thoroughly explained to the patient prior to carefully examining the swelling. After sterilizing the skin with an antiseptic, the thumb and index finger of one hand were used to fix the skin in a position suitable for needle aspiration. A disposable syringe was positioned at the appropriate angle towards the affected areas, and upon pulling the plunger, a negative pressure was created within the syringe. To collect samples from different surrounding areas, the needle was moved in various directions and up and down multiple times. After gradually releasing the plunger to restore the syringe's pressure, the needle was removed. Anesthesia was not necessary. FNAC was performed using both aspiration and non-aspiration techniques as needed. FNAC was completed. Without the use of ultrasound guidance, FNAC was performed on swelling that was easily accessible and palpable. After removing the needle from the syringe, a vacuum was formed, the needle was replaced, and the contents were gently and slowly released onto the glass slides that were dry, clean, and free of grease. The aspirates were then evenly spread using a second glass slide. To ensure fixation, two to four smears were wet fixed in 95% ethanol right away. All the slides were stained with Papanicolaou stain and examined under light microscope. A cytomorphological diagnosis was made based upon pathology.

Statistical Analysis: Statistical analysis was performed by Windows based software named as Statistical Package for Social Science (SPSS), versions 22.0 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.). Continuous data were expressed as mean, standard deviation, minimum and maximum. Categorical data were summarized in terms of frequency counts and percentages. Chi-square test was used for comparison of categorical variables and Student t test was applied for continuous variables. Every effort was made to obtain missing data. A two-sided P value of less than 0.05 was considered to indicate statistical significance.

Ethical Consideration: Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and were analyzed using the coding system. Written informed consent was obtained from each participant according to Good Clinical Practice guidelines.

Results

Total FNAC of breast was done in 357 patients. Of which, 8 patients were male. These cases were excluded. Among remaining, 349 cases, non-neoplastic lesions were 183 and neoplastic lesions were 166 cases (Table 1).

Table 1: Pattern of Breast of Lumps

Type of Lesion	Frequency	Percent
Non-neoplastic	183	52.4
Neoplastic	166	47.6
Total	**349**	**100.0**

The most common non-neoplastic breast lesions were benign epithelial lesions which were 106 cases followed by inflammatory disorders and development disorders which were 67 cases and 2 cases respectively. Only 8 cases were found as miscellaneous group (Figure I).

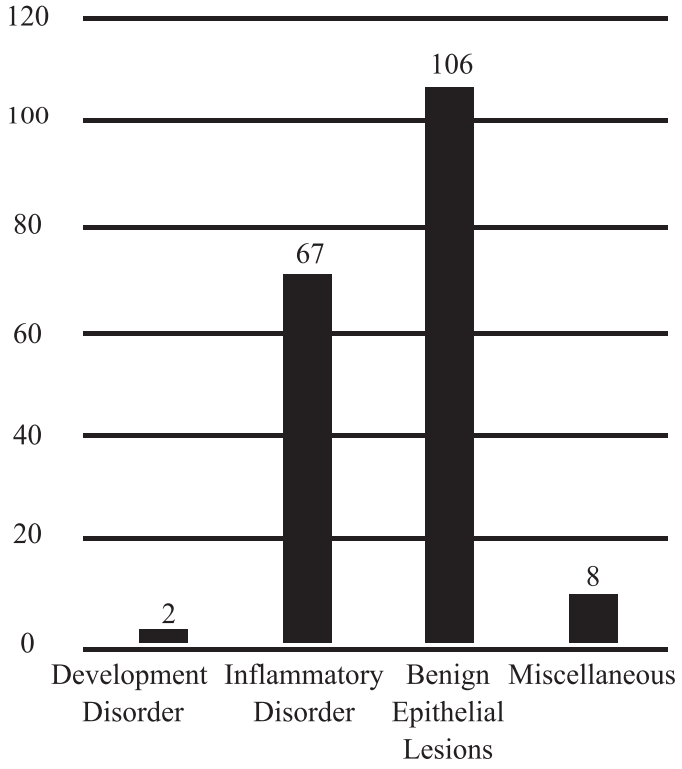

Figure I: Showing the Non-Neoplastic Breast Lesions (n=183)

Among inflammatory disorders, Non-suppurative mastitis, Suppurative mastitis (abscess), and Granulomatous mastitis were found in 28(15.30%) cases, 24(13.11%) cases and 14(7.65%) cases respectively. Non-proliferative breast changes (fibrocystic changes) and proliferative breast disease without atypia (epithelial hyperplasia) were found in 105(57.4%) cases and 1(0.5%) cases respectively. In miscellaneous group, galactocele and lipoma were found in 2(1.09%) cases and 6(3.27%) cases respectively (Table 2).

Table 2: Distribution of Different Variant of Non-Neoplastic Breast Lesions

Types of Non-Neoplastic Diseases	Frequency	Percent
Disorder of Development	**2**	**1.09**
• Accessory Axillary Breast Tissue	2	1.09
Inflammatory Disorder (Mastitis)	**67**	**36.6**
• Suppurative mastitis (abscess)	24	13.11
• Non-suppurative mastitis	28	15.30
• Granulomatous mastitis	14	7.65
• Duct ectasia	1	0.54
Benign Epithelial Lesions	**106**	**57.9**
• Non-proliferative breast changes (Fibrocystic changes)	105	57.4
• Proliferative breast disease without atypia (Epithelial Hyperplasia)	1	0.5
Miscellaneous	**8**	**4.4**
• Galactocele	2	1.09
• Lipoma	6	3.27

The age group of the study population were compared with the different non-neoplastic diseases. Fibrocystic changes were most common in the age group of 21 to 30 years which was 45(42.88%) cases followed by 31 to 40 years, 41 to 50 years and 51 to 60 years which were 28(26.66%) cases, 21(20.0%) cases and 5(4.76%) cases respectively. Again, suppurative mastitis was most common in the age group of 41 to 50 years which was 9(37.5%) cases. Non-suppurative mastitis was found mostly in the age group of 21 to 30 years which was 13(44.84%) cases. Granulomatous mastitis was found in 8(57.14%) cases mostly in the age group of 31 to 40 years (Table 3).

Table 3: Age Distribution of Non-Neoplastic Diseases

Age Group	Fibrocystic Changes	Suppurative Mastitis	Non-Suppurative Mastitis	Granulomatous Mastitis	P value
11 to 20 Years	4(3.8%)	(12.5%)	7(24.13%)	1(7.14%)	
21 to 30 Years	45(42.88%)	(33.3%)	13(44.84%)	5(35.72%)	
31 to 40 Years	28(26.66%)	(12.5%)	5(17.24%)	8(57.14%)	
41 to 50 Years	21(20.0%)	(37.5%)	4(13.79%)	-	0.223
51 to 60 Years	5(4.76%)	(4.2%)	-	-	
61 to 70 Years	2(1.9%)		-	-	
Total	105 (100%)	24 (100%)	29(100%)	14(100%)	

Among benign epithelial lesions non-proliferative breast changes (fibrocystic changes) was found in 55(52.4%) cases and 50(47.6%) cases in in left and right breast respectively. Among mastitis, suppurative (abscess) was found in 13(19.40%) cases and 11(16.41%) cases in left and right breast respectively. Non-suppurative mastitis was detected in 13(19.40%) cases and 15(22.40%) cases in left and right breast respectively. Granulomatous was found in 5(7.46%) cases and 9(13.43%) cases in left and right breast respectively. Galactocele and lipoma were found in 2 cases and 3 cases in left breast respectively (p=0.21) (Table 4).

28 cases (15.30%), granulomatous mastitis 14 cases (7.65%) and duct ectasia 1(0.54%) case. Benign Epithelial Lesions are predominant, totaling 106(57.9%) cases, with non-proliferative breast changes (Fibrocystic changes) at 105(57.4%) cases and proliferative breast disease without atypia (Epithelial Hyperplasia) at 1(0.5%) case. Miscellaneous findings encompass galactocele at 2 cases (1.09%) and lipoma at 6 cases (3.27%) (Table 2). These findings consistent with Priyanka et al.[13] The frequency of benign epithelial lesions is nearly similar to studies done by Yusuf et al[14] (54.5%) and Sharif et al[15] (54%).

Fibrocystic alterations are described as "lumpy bumpy"

Table 4: Distribution of Non-Neoplastic Breast Lesions in Right and Left Side

Name of Diseases	Left Breast	Right Breast	Total	P value
Developmental Ectopic Breast Tissue (n=2)	1 (50.0%)	1 (50.0%)	2(100.0%)	-
Benign Epithelial Lesions (n=106)				
• Non-Proliferative Breast Changes (Fibrocystic changes)	55(52.4%)	50(47.6%)	105(100.0%)	
• Proliferative Breast Disease Without Atypia (Epithelial Hyperplasia)	0(0.0%)	1(100.0%)	1(100.0%)	0.2967
Mastitis (n=67)				
• Suppurative (abscess)	13(19.40%)	11(16.41%)		
• Non Suppurative	13(19.40%)	15(22.40%)	67(100.0%)	0.51
• Granulomatous	5(7.46%)	9(13.43%)		
• Duct ectasia	1(1.50%)	0		
Miscellaneous (n=8)				
• Galactocele	2	0	8(100.0%)	0.21
• Lipoma	3	3		

Discussion

The various studies in Bangladesh have revealed a wide range of breast lesions. Lesions in the breast may be either non-neoplastic or neoplastic. However, fear of (neoplastic) malignancy is the main reason to compel the patient to report to the clinician. Thus, to relieve the stress of the patients, it is necessary to investigate these patients according to standard protocols.8 Fine Needle Aspiration Cytopathology (FNAC) is widely recognized as a reliable procedure for the initial evaluation of palpable breast masses. It is minimally invasive, cost-effective, safe, simple, rapid, and sensitive as compared to biopsy.[9,10]

This study shows neoplastic lesions were 47.6% and 52.4% were nonneoplastic (Table I). Similar study Rioki et al[11] shows Neoplastic lesions were 84.5% and 15.5% were non-neoplastic. Though neoplastic findings were comparable to those of Chaudhary et al[12] (81.9% and 79.5%). This study shows disorder of development represents (1.09%), while Inflammatory Disorders (Mastitis) account for 36.6%, with suppurative mastitis constituting 24 cases (13.11%), non-suppurative mastitis

breasts on palpation by a physician, "dense breast with cysts" by a radiologist, and "benign histologic findings" by a pathologist. Because these lesions do not raise the chance of developing breast cancer, they are referred as non-proliferative lesions.[16] Between the ages of 25 and 45, these lesions are most frequently found.[17] The three main non-proliferative morphologic alterations are adenosis, fibrosis, and cystic change, frequently with apocrine metaplasia.[16] In this study, the most common non-neoplastic lesion was fibrocystic disease (105/349) 30.08%, which is in accordance with the study of Khanam et al.[18] Khanam et al[18] also reported that 12(27.9%) had fibrocystic changes of the breast. Chaudhry et al[19] observed patients with benign breast lesions, fibrocystic changes were more common (38/208)18.27%. Lakhana et al[20] also reported fibrocystic disease to be more common in their study. In other study, done by Kumar[21] from Nepal, found fibrocystic disease (100/243) 41.2% while Ahtesham et al[22] seen fibrocystic disease 17.2%. Bukhari et al[23] and Khanzada TW[24] also observed that fibrocystic disease was the most common non neoplastic lesion seen in about

21.17%) cases and 21.0% cases respectively, in Pakistan. But there are variations in the percentage of fibrocystic disease in different studies (ranging from 17.2% to 41.2%). We included 183 non-neoplastic lesions out of 349 in our study. The different age distribution of diseases was from 11-70 years of the patient. In the present study, the vast majority of the patients with fibrocystic disease were more common (42.9%) in the age group of 21–30 years, followed by 26.66% in the age group of 31–40 years. Rahman et al[25] established the highest percentage of similar age groups. In Rahman et al[25] study, the prevalence of fibrocystic disease was found to be 37.14% in the 21–30 age group and 30% in the 31 to 40 age group, respectively. In contrast, Sagar et al[26] have observed in their study that fibrocystic disease is common among people aged 41 to 60, which is a slightly higher age group than in this study. These differences might be attributed to geographical, socioeconomic and cultural variations. Females may feel unwilling to seek consultation for this type of lesion. On the other hand, fibrocystic disease was less common, (1.9%), between the ages of 61–70 years.

Fibrocystic change consists of a spectrum of morphological changes comprising soft to rubbery-firm, ill-defined nodules.[27] Smears from such lesions may contain numerous "cyst macrophages" with an abundant, finely vacuolated cytoplasm, sheets and clusters of ductal epithelial cells with abundant granular eosinophilic cytoplasm (apocrine type/change), apocrine metaplastic cells. Bimodal cell populations of ductular epithelium, and single bipolar bare nuclei and may be interpreted as fibrocystic change.[27,28]

This present study has included patients from 11 to 70 years age group. In this study, the peak age group was found 41-50 years constituting 37.50% cases suppurative mastitis, 21 to 30 years constituting 44.84% cases non-suppurative mastitis and 31-40 years constituting 57.14% cases granulomatous mastitis.

Regarding the inflammatory conditions, the majority of cases consisting of non-suppurative mastitis is the most common (15.30%) followed by suppurative mastitis (abscess) (13.11%), granulomatous mastitis (7.65%), and duct ectasia (0.54%). Another study which has been conducted by Nemenqani and Yaqoob29 found acute mastitis/abscess in 26.5% of the cases, whereas Sharif et al15 discovered acute pyogenic mastitis (12.0%) followed by tuberculous mastitis (9%).[29]

Most of the non-neoplastic breast lesion i.e. fibrocystic changes involved in the right and slightly more in left breast, there was no substantial difference in our study. Frequency of fibrocystic changes were in the right and left breast (47.62%), (52.38%) respectively. Khanam et al[18] reported near to similar findings. Out of 50 cases, 29 cases (58%) in the right breast and 21 cases (42%) in the left breast were involved in their study.

Conclusion

From our study, we conclude that fibrocystic disease is the most common condition among non-neoplastic breast diseases, with a slight predominance in the left breast. Triple assessment by clinical, radiological and pathological examination is a standard approach in the evaluation of breast lumps. Along with clinical history and examination, FNAC can help to take decision for surgery or conservative treatment.

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Original Article

Epidemiological Study on Three Hundred Patients of Scabies in the Industrial Area of Dhaka, Bangladesh.

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Abstract

Background: Scabies is a common and highly contagious skin disease caused by a mite called sarcoptes scabiei. ***Objective:*** The aim of this study was to analyze the epidemiological factors associated with scabies infection in an industrial area. ***Methodology:*** This cross-sectional study was conducted on the department of Dermatology & Venereology, Monno Medical College, Manikganj, Bangladesh for a period of six (06) months from September 2023 to February 2024. Data obtained from Three hundred patients with scabies in the outdoor patient, Savar, Dhaka. It was considering age, sex, occupation, economical condition, educational status, family history of scabies of the selected patient. ***Results:*** The age group of 1 to 10 years (28.66%) is high prevalence then variable prevalence with age 11-20 years (28.0%), 21-30 years (7.7%), 31-40 years (10.7%), 41-50 years (14.3%), more than 50 years (6.7%) and patient in low socioeconomic condition (58.66%) affected more than middle (30%), high (11.3%). Primary (44.00%), Secondary (28.70) and above secondary (31.3%), overcrowding living (Madrasah 37.33%) showed the highest infestation rates and garments worker (29.68%), house wife(17%), school student (8.66%). ***Conclusion:*** In conclusion an improvement of socio-economic conditions, improve living facilities, education, social awareness may contribute to a reduction in the number of scabies infections.

Key Words: Scabies; epidemiological factors; outbreaks

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Introduction:

Scabies is a common global disease caused by Sarcoptes scabiei. It affects people of all races and social classes. It is a cosmopolitan obligatory human skin parasite.[1] Scabies can spread easily under crowded conditions where close body and skin contact is common. Each year about 300 million cases are reported worldwide.[2] Although the disease affects all social classes, some groups, such as children, the elderly, immunocompromised individuals, the residents of care facilities or overcrowded populations with low socio-economic status, are particularly at risk of becoming infected.[3] A classic symptom of scabies is intense pruritus, becoming particularly intense at night. Depending on the stage of the disease and inflammatory response, the clinical symptoms may vary.[4]

Scabies frequently occurs in body cleavage such as those between the fingers and toes, the buttocks, the elbows, the waist area, the genital area, and under the breasts in women. The face, neck, palms, soles and lips are usually not affected, except in infants or very young children.[5] The most common symptoms of scabies are itching, especially at night and papules is the earliest and most common symptom of scabies. Later may develop pustules, excoriation, nodules and secondary bacterial infection.[6] Scabies treatment involves eliminating the infestation with medication.[7] Several creams and lotions are available. Patients usually apply the medication all over the body from the neck down, and leave the medication on for at least eight hours. A second treatment is needed if new burrows and rashes appear. All people in the household who have had close skin-to-skin contact with a scabies affected person during the past month must be treated.[8] This usually includes everyone in the home, even if they don't have symptoms: the symptoms can take 4 to 6 weeks to develop after a person is infested.

Scabies is most commonly treated with permethrin 5% dermal cream. Permethrin is an insecticide that kills the mites that cause scabies.[9] Permethrin should be washed off after 8–14 hours and the application can be repeated 1–2 weeks later if live mites are seen. The cream should be washed off in 8–9 hours in children less than 6 years but can be left on for up to 12–14 hours for older children.[10] Oral ivermectin should be considered for patients who have failed treatment with or who cannot tolerate FDA-approved topical medications for the treatment of scabies. If used for classic scabies, two doses of oral ivermectin (200µg/kg/dose) should be taken with food, each approximately one week apart. The safety of ivermectin in children weighing less than 15 kg and in pregnant women has not been established11. Benzyl benzoate 25%, Sulfur (5%-10%), Crotamiton lotion 10% can be use for the treatment of scabies[12]. The purpose of the study was to analyze the epidemiology of scabies in industrial zone, Savar, Dhaka, Bangladesh, considering age, sex, socio-economic, education and occupational factors.

Methodology

Study Settings and Population: This cross-sectional study was conducted on the department of Dermatology & Venereology, Monno Medical College, Manikganj, Bangladesh for a period of six (06) months from September 2023 to February 2024. Data was obtained from Three hundred patients with scabies in the Alif Medical Centre (DEPZ) outdoor patient, Savar, Dhaka, Bangladesh.

Study Procedure: Scabies typically present itchy papules, pustule, nodules, excoriation and eczematous lesions. Lesions are symmetrical and mainly affect the hands, wrists, axillae, thighs, buttocks, waist, soles of the feet, areola and vulva in females and penis and scrotum in males. The neck and above are usually spared. The data included patient number, age, gender, occupation, monthly income, educational status and the scabies presentation (Primary and reinfection), clinical feature, diagnosis and family history of scabies of the selected patient.

Statistical Analysis: Computer based statistical analysis were carried out with appropriate techniques and systems. All data were recorded systematically in preformed data collection form (questionnaire) and quantitative data were expressed as mean and standard deviation and qualitative data were expressed as frequency distribution and percentage. Statistical analysis was performed by using window-based computer software devised with Statistical Packages for Social Sciences (SPSS-17) (SPSS Inc, Chicago, IL, USA). 95% confidence limit was taken. Probability value <0.05 was considered as the level of significance.

Ethical Consideration: Prior to the commencement of this study, the research protocol was approved by the ethical committee (Local Ethical committee) of Monno Medical College, Manikganj. Participants were awarded and investigators got written informed consent from them.

Results

A total number of 300 patients were recruited after fulfilling the inclusion and exclusion criteria. Among them age group of 1 to 10 years 86(28.9%) is high prevalence and more than 50 years is low prevalence 20(6.7%). Scabies patient is more in Male158(52.7%) compare to female 142(47.3%) (Table 1).

Table 1: Distribution of population according to age and sex

Age Groups	Male	Female	Total
1 to 10 Years	49(16.4%)	37(12.4%)	86(28.9%)
11 to 20 Years	48(16.0%)	36(12.0%)	84(28.0%)
21 to 30 Years	10(3.30%)	13(4.3%)	23(7.70%)
31 to 40 Years	18(6.00%)	16(5.3%)	34(10.7%)
41 to 50 Years	20(6.70%)	33(11.0%)	53(14.3%)
More Than 50 Years	13(4.3%)	7(2.3%)	20(6.7%)
Total	**158(52.7)**	**142(47.3)**	**300(100%)**

The madrasah students 112(37.33%) are affected more and subsequent reduce the number. Garment worker 89(29.68%), house wife 51(17%), school student 26(8.66%) and others (7.33%) (Table 2).

Table 2: Distribution of population according to occupation.

Occupation	Frequency	Percent
Madrasah student	112	37.33
Garment worker	89	29.68
House wife	51	17
School Student	26	8.66
Others	22	7.33
Total	**300**	**100**

Primary 120(40.00%) education level patients are affected more than secondary 56(28.7%) and above secondary 94(31.30%) education level (Table 3).

Table 3: Distribution of Population According to Educational Level

Education Level	Frequency	Percent
Primary	120	40.00
Secondary	86	28.70
Above secondary	94	31.30
Total	**300**	**100**

The primary 194(64.7%) scabies infection is generally more than reinfection 106(35.30%) (Table 4)**.**

Table 4: Distribution of Population According to Presentation (History)

History	Frequency	Percent
Primary Infection	194	64.70
Reinfection	106	35.30
Total	**300**	**100**

Scabies patient of low 176(58.7%) socioeconomic condition have high frequency compare to middle 90(30.00%) and high 34(11.30%) socioeconomic status. (Table 5).

Table 5: Distribution of population according to Socioeconomic state

Socioeconomic state	Frequency	Percent
Low	176	58.70
Middle	90	30.00
High	34	11.30
Total	**300**	**100**

Discussion

This study and literature data show that scabies continues to represent a health threat for society in Bangladesh, as well as globally. During the analyzed period in an industrial area of Savar, Dhaka considering age, sex, occupation, economical condition, educational status, family history of scabies of the selected patient.In the current study, the highest prevalence was seen in the 1 to 20 y age group (56.66 %), followed by 1 to 10 y age group (28.66 %) and 11 to 20 y age groups (28.00 %). The highest prevalence was seen in the 10 to 19 y age group (25.9%), followed by 0 to 9 (22.4%) and 20 to 29 y age groups (15.6%).[13]

The relationship between socio-economic conditions, educational status and scabies infection is complex. Scabies is hyperendemic in Bangladeshi madrasahs. This study shows higher incidence rate of scabies in madrasah student (37.33%) and next lower incidence in garment worker (29.66%), house wife (17%), school Student (8.66), others (7.33%). The student of madrasah in Bangladesh showed high prevalence of scabies in the study of Talukder et al.[14]

Our study showed lower educational status increase the incidence of scabies in primary level (44.00%), secondary level (28.66%) and above secondary level (33.33%). Karim et al[15] showed in Bangladesh, in families with low income, activities such as washing clothes and bed linen, bathing, and the use of soap are less frequent than in families in a better financial situation. Nair et al[16] showed poor socioeconomic conditions directly affect the body nutritional status, which may in turn result in impaired immunity, and thus make it more difficult to fight the disease.

In our study showed patient with low socioeconomic condition affected high (58.66%) and followed by middle class (30%) and higher society population are 11.33% affected. Rahman et al[17] showed their study that scabies more in children with primary infection associated with overcrowding, bizarre living, parental sociodemographic status and poorer household income. In this study we found incidence of scabies higher in primary disease (64.66%), less in reinfection (35.33%).

Conclusion

In conclusion there are many factors for increasing rate of scabies, so reduce the poverty, improve living facilities, educational status can reduce the prevalence of scabies. Outbreaks of scabies may be very difficult to control and require the implementation of appropriate control program.

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Original Article

Association between Exposure to Smokeless Tobacco Consumption and Carcinoma of Cervix

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Abstract

Background: Cervical cancer is the most destabilizing cancer that grows increasingly prevalent worldwide. The Southeast Asia region has the greatest incidence and mortality rates due to widespread use of smokeless tobacco (SLT) products, a lack of screening programmes, and immunization against cervical cancer. Objective: To assess the association between smokeless tobacco consumption and carcinoma of cervix. ***Methodology:*** A case-control study was conducted with 272 women aged 18-49 years, conveniently selected from both outpatient and inpatient settings at the National Institute of Cancer Research and Hospital (NICRH) in Dhaka, Bangladesh. The selection of NICRH was purposive. Participants underwent interviews using a pre-tested, semi-structured questionnaire between January and December 2019. ***Results:*** The mean age of cases was 49.8±8.8 years, while the mean age of controls was 48.5±9.3 years. In comparison to controls (52.2%), the majority of patients (65.4%) consumed SLT throughout their entire lives. A significant relationship was found between SLT use and the development of cervical cancer ($p<0.05$). Those who have consumed any SLT in their lives are 1.7 times more likely to develop cervical cancer than those who have not taken any SLT. Cases (22.8%) used betel quid with jorda >5 times, compared to controls (14.7%), and intensity of Gul used ≤5 among cases (9.6%) than controls (2.9%). Compared to controls (56.3%), the majority of cases (76.4%) had been using SLT for more than 10 years, with a statistically significant difference ($p<0.05$). Cases used SLT for a longer time (19.2±10.3) compared to controls (15.6±11.1), with a significant association ($p<0.05$). ***Conclusion:*** The study revealed a significant association between the risk of cervical cancer and the extent and duration of exposure to SLT. To minimize the risk of cervical cancer, contemplate restricting SLT production and utilization.

Key Words: Exposure, SLT, Cervical cancer, Bangladesh.

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Introduction:

Cancer is the most destructive disease, posing a global threat of death. Cancer is a generic word for a vast set of disorders characterized by the proliferation of aberrant cells beyond their usual borders, which can then infiltrate adjacent sections of the body and/or spread to other organs.[1] It is a sickness in which the body's cells proliferate without control. Cancer is usually named for the portion of the body

where it first appears, even if it spreads to other parts later. When cancer begins in the cervix, it is known as cervical cancer[2]. Women over 30 have a higher risk of having cervical cancer.[3,4] Cancer-causing infections, such as human papillomavirus (HPV) and hepatitis, account for around 30% of cancer cases in low- and lower-middle-income countries.[1,5] Long-term infection with certain forms of HPV is the primary cause of cervical cancer.[6,7] Cervical cancer can be readily avoidable because there are very effective screening tests (VIA, PAPs smear test), and a highly efficient vaccination to prevent HPV infections is available.[8,9]

Cancer is the most prevalent cause of death worldwide, accounting for almost 10 million fatalities in 2020, or almost one in every 6 deaths. Tobacco use, high body mass index, alcohol consumption, low fruit and vegetable diet, and lack of physical activity account for almost one-third of cancer-related fatalities.[1,10] Cervical cancer is the 4th most prevalent malignancy among women worldwide. Over 500,000 new cases were reported in 2018, with 604,000 expected in 2020, and 342,000 deaths in 2020. According to research from 2014-2016, approximately 0.6% of women will develop cervical cancer at some point in their lives.[11-13] Cancer-related death rates in Bangladesh were anticipated by the International Agency for Research on Cancer to reach 7.5% in 2005 and 13% by 2030. Cervical cancer is the 2nd most frequent malignancy among women aged 15-49 years in Bangladesh.[14] In Bangladesh, around 8,068 new cervical cancer cases are detected each year, with an estimated 5,214 deaths. In Bangladesh, cervical cancer deaths accounted approximately 18% of all cancer-infected women. It means that in Bangladesh, on average, 28 women die each day from cervical cancer.[15,16]

Tobacco usage is one of the most serious public health issues the world has ever faced. Tobacco use has been epidemic in recent years, despite the fact that we have known about the adverse effects of tobacco use for many years and decades. There are about 1.3 billion smokers globally, with millions or more using various oral tobacco products.[17] According to WHO, almost 80% of the world's 1.1 billion smokers live in middle-income and low-income countries, which bear the largest burden of tobacco-related sickness and mortality. Tobacco usage causes more than 6 million deaths each year around the world. Nearly two-thirds of these deaths occur in underdeveloped countries.[18,19]

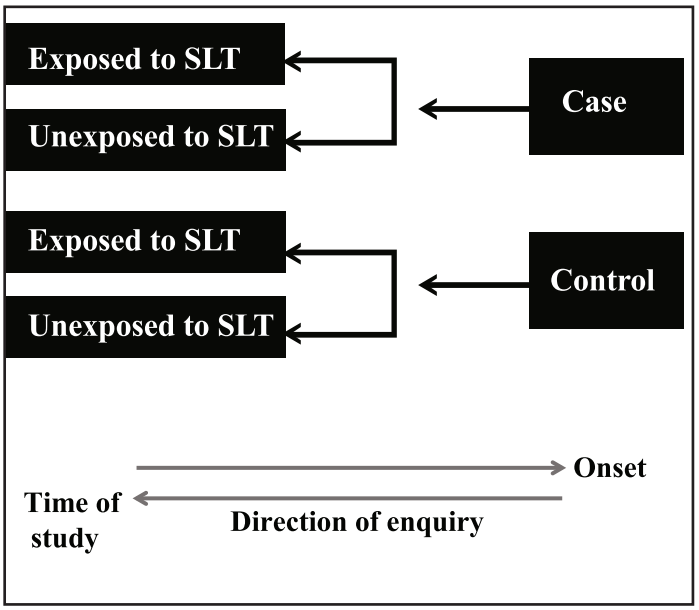
In Bangladesh, the prevalence of smokeless tobacco (SLT) is 27%. Tobacco addiction has become not only a major contributor to the country's high morbidity, but also the largest strain on the country's economy.[20,21] Several statewide studies in Bangladesh pointed out the high prevalence of both smoking and the habit of SLT.[21-23] Easy accessibility and cost, as well as misconceptions about its beneficial health consequences, are major contributing factors to increased smokeless tobacco consumption. While many people are aware that tobacco is harmful, the majority of users are unaware of the deadly link between SLT and fatal illness.[24]

Methodology

Study design and settings: This case-control study was carried out to in the outpatient and inpatient settings of National Institute of Cancer Research and Hospital (NICRH), Mohakhali, Dhaka 1212, Bangladesh from January and December 2019 for duration of one year.

Selection of cases and controls: The study included 272 women aged 18-49 years from NICRH's Gynaecological Oncology Department, both inpatient and outpatient during the study period. The study place was chosen purposefully. Cases were drawn from the NICRH, whereas controls were drawn from the hospital VIA center. In group case group, 136 married patients aged 18 to 49 years who tested positive for VIA and were diagnosed with Ca. cervix were interviewed conveniently in the hospital. In control group During the same study period, 136 married female patients aged ±5 years who were VIA negative and non-smokers were also interviewed conveniently in the hospital.

A schematic diagram of case-control study:



Data Collection Procedures: A face-to-face semi-structured questionnaire that had been pretested was used to interview the study participants between January and December 2019. The questionnaire's pretest was conducted at Bangabandhu Sheikh Mujib Medical University (BSMMU), in Dhaka, in the Department of Gynaecological Oncology.

Statistical Analysis: Collected data were checked, edited, coded, and recoded by using IBM SPSS version v25. Descriptive statistics such as mean, standard deviation and percent were computed for continuous variables of the participants. Chi-square test was used to assess the significance of associations between two nominal variables. To compare mean of continuous variables in two groups independent sample 't' test was done. Odds ratio and p-value of <0.05 and at a 95% confidence interval was taken as significant. Both univariate and multivariate analysis was done as required to find out Crude ORs and adjusted ORs. The results were presented in tables and chart.

Ethical Approval: Informed written consent was obtained from each participant. Ethical approval was obtained from the Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM), Dhaka 1212, Bangladesh. (NIPSOM/IRB/ 2019/111)

Results

Socio-demographics characteristics: The majority of cases 87(64.0%) were >49 years, compared to 75(55.1%) of controls. Mean age of cases was 49.8±8.8 years where mean age of controls was 48.5±9.3 years. The majority of cases 117(86.0%) were Muslim, as opposed to controls 131(96.3%). Above two-thirds of the cases 103(75.7%) were married, while 114(83.8%) of controls. The level of education diversified between cases and controls, with more cases 103(75.7%) being illiterate than controls 75(55.1%). The majority of the patients 133(97.8%) were homemakers, compared to the controls 124(91.2%). A greater percentage of cases' husbands were agricultural workers 37(27.2%), while the control's husbands were 38(27.9%). The mean household income in cases was 15,066.2±6,069.0 taka, while in controls it was 16,139.7±8,061.9 taka. More than half of cases' husbands were smokers 87(64.0%) and in control 74(54.4%). In the cases, 19(14.0%) of husbands were not circumcised, compared to 5(3.7%) in the controls group. (Table 1)

Table 1: Socio-demographic characteristics of the cases and controls (n=272)

Characteristics	Cases	Controls
	n(%)	n(%)
Age group (years)		
18-49	49(36.0)	61(44.9)
>49	87(64.0)	75(55.1)
Mean±SD	49.8±8.8	48.5±9.3
Religion		
Muslim	117(86.0)	131(96.3)
Others	19(14.0)	5 (3.7)
Marital status		
Married	103(75.7)	114(83.8)
Single	33(24.3)	22(16.2)
Education		
Illiterate	96(70.6)	75(55.1)
Primary and above	40(29.4)	61(44.9)
Occupation		
Homemaker	133(97.8)	124(91.2)
Others	3(2.2)	12(8.8)
Husband's occupation		
Agricultural worker	37(27.2)	38(27.9)
Day laborer	35(25.7)	29(21.3)
Businessman	35(25.7)	34(25.0)
Service holder	11(8.1)	20(14.7)
Others	18(13.2)	15(11.0)
Monthly household incomes (taka)		
≤5,000	3(2.2)	3(2.2)
5,001-10,000	28(20.6)	25(18.4)
10,001-15,000	62(45.6)	48(35.3)
>15,000	43(31.6)	60(44.1)
Mean±SD	15,066.2± 6,069.0	16,139.7±8, 061.9
Husband's smoking status		
Smoker	87(64.0)	74(54.4)
Non-smoker	49(36.0)	62(45.6)
Husband's circumcision status		
Circumcised	117(86.0)	131(96.3)
Not circumcised	19(14.0)	5(3.7)

Utilization and intensity of SLT usage

In comparison to controls (52.2%), the majority of patients (65.6%) ever consume SLT in their lifetime; and in relation to controls (47.8%), the remaining cases (34.6%) didn't ever consume SLT (Figure 1). As a contrast to controls (78.9%), the majority of cases (84.3%) started using SLT between the ages of 18 and 35, with a mean age of 30.2±9.1 years in cases and 34.6±10.7 in controls. The mean duration of SLT use was higher in cases (19.2±10.3 years) than in controls (15.6±11.1 years). Cases (22.8%) used betel quid with jorda >5 times, compared to controls (14.7%); and intensity of Gul utilized ≤5 among cases (9.6%) over controls (2.9%). (Table 2)

Table 2: Utilization and intensity of SLT usage among the women (n=272)

Attributes		Cases	Controls
		n(%)	n(%)
Utilization of SLT			
Age of start of SLT consumption (n=89, 71)	<18 years	5(5.6)	1(0.1)
	18-35 years	75(84.3)	56(78.9)
	>35 years	9(10.1)	14(19.7)
	Mean±SD	30.2±9.1	34.6±10.7
Duration of SLT usage (n=89, 71)	≤10 years	21(23.6)	31(43.7)
	>10 years	68(76.4)	
	Mean±SD	19.2±10.3	15.6±11.1
Intensity of SLT usage			
Betel quid with jorda	≤5 times	29(21.3)	29(21.3)
	>5 times	31(22.8)	20(14.7)
Betel quid with sadapata	≤5 times	4(2.9)	4(2.9)
	>5 times	5(3.7)	3(2.2)
Only sadapata	≤5 times	4(2.9)	3(2.2)
	>5 times	5(3.7)	3(2.2)
Gul	≤5 times	13(9.6)	4(2.9)
	>5 times	1(0.7)	2(1.5)
Betel quid without jorda	≤5 times	12(8.8)	11(8.1)
	>5 times	1(0.7)	2(1.5)

The majority of cases (70.6%) were illiterate compared to controls (55.1%), with a significant difference (p=0.010). When compared to controls, cases with an illiterate education level were 1.95 times more likely to develop cervical cancer. There was a significant difference (p=0.005) between the number of Muslim controls (96.3%) and cases (86.0%). Those who were not Muslims, as opposed to those who were Muslims, had a 0.23-fold higher risk of developing cervical cancer. The majority of control husbands (96.3%) were circumcised, as opposed to the cases' husbands (86.0%). Those whose husbands were not circumcised had a 0.24 times higher risk of developing cervical cancer than those whose husbands were circumcised. In comparison to controls (52.2%), the majority of patients (65.4%) have consumed SLT throughout their lifetime. A significant association was found between SLT use and the development of cervical cancer (p=0.04). Those who have ever consumed any SLT in their lives have a 1.7 times greater risk of developing cervical cancer than those who have never consumed SLT. The highest number of cases (84.3%) start SLT use at the age of 18-35 years in comparison to controls (78.9%) and a significant association was found (p=0.032). There was a significant difference (p=0.005) in the mean age of start of consumption of SLT among controls (34.6±10.7) and cases (30.2±9.1). In comparison to controls (56.3%), the majority of cases (76.4%) had been using SLT for >10 years, with a statistically significant difference (p=0.008). Cases had a prolonged mean duration of SLT usage (19.2±10.3) than controls (15.6±11.1), with a significant association (p=0.040). (Table 3 and Figure-I)

Table 3: Comparison of different variables between cases and controls

Attributes		Cases	Controls	p-value	OR
		n(%)	n(%)	(χ2 test)	95% CI of OR
Education	Illiterate	96(70.6)	75(55.1)	*0.010	1.95(3.22-1.18)
	Primary & above	40(29.4)	61(44.9)		
Religion	Muslim	117(86.0)	131(96.3)	*0.005	0.23(0.09-0.65)
	Others	19(14.0)	5 (3.7)		
Husband's circumcision status	Circumcised	117(86.0)	131(96.3)	*0.005	0.24(0.09-0.65)
	Not circumcised	19(14.0)	5(3.7)		
Utilization of SLT	Ever consume	89(65.4)	71(52.2)	*0.040	1.70(1.06-2.82)
	Never consume	47(34.6)	65(47.8)		
Age of start of SLT consumption	<18 years	5(5.6)	1(0.1)	*0.032	
	18-35 years	75(84.3)	56(78.9)		
	>35 years	9(10.1)	14(19.7)		
	Mean±SD	30.2±9.1	34.6±10.7		t= -2.822, p= *0.005
Duration of SLT usage	≤10 years	21(23.6)	31(43.7)	*0.008	
	>10 years	68(76.4)	40(56.3)		
	Mean±SD	19.2±10.3	15.6±11.1		t= 1.520, p= *0.040

*Statistically significant value

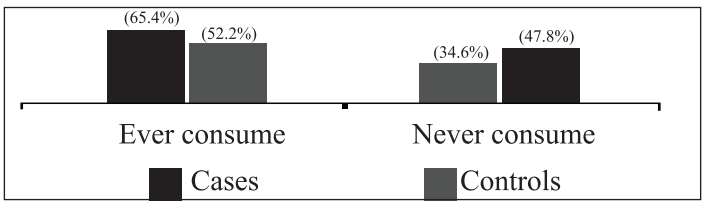


Figure-I: SLT utilization status of the women (n=272)

Among the cases, there was a significant positive correlation (p=0.000) between the age and duration of passive smoking exposure. Among the controls, age had a significant and positive relationship with the duration of SLT exposure (p=0.000). There was a significant negative correlation (p=0.004) between the years of SLT exposure

and total family income among cases, but not among controls. There was a positive correlation among cases between husband smoking duration and total SLT exposure. The relationship was statistically significant (p=0.004), but not among the controls. (Table 4)

Table 4: Correlation between duration of SLT use with different variables

Attributes	Duration of SLT			
	Cases		Controls	
	R	p-value	R	p-value
Age group (years)	0.444	*0.000	0.458	*0.000
Household income	-0.292	*0.004	0.007	0.960
Husband's smoking status	0.449	*0.004	0.126	0.597

Discussion

The mean age of cases was 49.8±8.8 years, while the mean age of controls was 48.5±9.3 years. Above two-thirds of the cases (75.7%) were married, while 83.8% were controls. Cervical carcinoma was found to be more prevalent among 48-62-year-old women in a study done in the Philippines married women, where the mean age was 47.2 years for cases and 48.4 years for controls.[25] The majority of cases (70.6%) were illiterate compared to controls (55.1%), with a significant difference (p=0.010). When compared to controls, cases with an illiterate education level were 1.95 times more likely to develop cervical cancer. The majority of the patients (97.8%) were homemakers, compared to the controls (91.2%). A similar age-matched case-control study conducted in India found that cases had a lower education level than control subjects (OR of 2.7 for no education), while the majority of cases and controls who were housewives had an OR of 4.3.[26] This apparent similarity is due to India's proximity to our country and similar economic conditions. The mean household income in cases was 15,066.2±6,069.0 taka, compared to 16,139.7±8,061.9 taka in controls.

The majority of control husbands (96.3%) were circumcised, whereas the cases' husbands (86.0%) were not. Those whose husbands were not circumcised were 0.24 times more likely to develop cervical cancer than those whose husbands were circumcised. A similar finding was reported in a study carried out by Bosch et al., which also reveals circumcision is preventative for cervical cancer (OR = 0.75).[25] Cases used SLT for a longer time (19.2±10.3) compared to controls (15.6±11.1), with a significant association (p=0.040). In a Bangladeshi study, substantial and long-term SLT usage was found to be highly associated with cervical cancer.[20]

Conclusion

The educational level of women; the majority of them did not complete their primary education.

The majority cases consumed SLT for a long time. This study revealed that SLT could raise the risk of developing cervical cancer. To prevent cervical cancer associated with SLT exposure, women's educational levels must be improved. The adverse consequences of SLT on cervical cancer must be disseminated to women through appropriate means, such as mass media. The obligatory procedures also must be taken to cease SLT manufacture and sales.

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Original Article

Comparison between Effects of Intralesional Platelet Rich Plasma and Corticosteroid Injection on Pain and Functional Outcome in Patients with Lateral Epicondylitis of Elbow

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Abstract

Background: A debilitating and painful elbow problem is lateral epicondylitis. **Objective:** In this study, pain and functional outcomes were examined in relation to intralesional platelet-rich plasma (PRP) and corticosteroid injections patients with lateral epicondylitis. **Methodology:** This randomized experimental study was done in the Department of Physical Medicine and Rehabilitation, Bangabandhu Sheikh Mujib Medical University (BSMMU) from March 2017 to February 2018. Thirty patients with diagnosed lateral epicondylitis, aged between 21- 60 years and had been ill for more than a month were enrolled and randomly assigned into two groups. In Group A received two doses of intralesional PRP injection, and Group B received two doses of intralesional corticosteroid injection. Pain and functional outcomes were evaluated by using a visual analog scale (VAS) for pain and a patient-rated tennis elbow assessment (PRTEE) questionnaire, respectively. In the lateral epicondylar region, intralesional PRP or corticosteroids were administered during the first (week 1=W1) and fourth (week 7=W7) treatment visits. **Results:** The findings revealed a statistically significant decline in pain over time, as well as improvements of functional outcomes in both groups as evidenced by significantly lower VAS scores and lower PRTEE scores up to 11 weeks post-injection. There was no discernible difference in progress between the two groups up until W1 to W9 scores, however at the eleventh week, group A showed greater improvement than group B ($p<00.5$). **Conclusions:** Intralesional PRP injection is a promising therapy option for lateral epicondylitis, offering sustained pain relief and improved functional outcomes over time compared to corticosteroid injection.

Key Words: Lateral epicondylitis of elbow; intralesional platelet rich plasma; corticosteroids; pain; functional outcome

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Introduction

Lateral epicondylitis (LE) is a painful, disabling, soft tissue injuries which affects Extensor Carpe Radialis Brevis (ECRB) due to high demand of gripping or repetitive wrist movements.[1,2] There are chronic degenerative changes that occur in the LE, which is the hallmarks of tendinosis.[1] The most typical signs of LE are lateral elbow discomfort, pain with wrist extension, and reduced grip strength[2] and it significantly lowers quality of life in daily activities.[3,4]

There are various conservative treatment modalities, which include pain medications, physical therapy such as ultrasound therapy, extracorporeal shock wave therapy, low-level laser therapy, therapeutic exercises and epicondylar counterforce orthoses. Interventions such as intralesional corticosteroid (CS) injection, autologous blood, platelet rich plasma (PRP) have shown promising effects.[1,4] Skin atrophy, skin depigmentation and fatty atrophy are noted after intralesional corticosteroid injections1. The transforming growth factor beta, epidermal growth factor, platelet-derived growth factor, and vascular endothelial growth factor all have a significant impact on tissue repair.[5] PRP may be more effective in promoting tissue repair due to its supra-physiological levels of growth factors.[5,6]

A randomized controlled trail, demonstrated that inadequate reduction of pain and disability in tennis elbow by the interventions with PRP and CS.[7] In a meta-analysis, comparison to intralesional CS injections with PRP in lateral epicondylitis, CS injection produced superior results within the brief follow-up time frame (4 weeks and 8 weeks post-treatment). Another systematic reviews and meta-analysis revealed that PRP injections demonstrated better pain and functional result (up to 24 weeks post-treatment follow up).[3] Limited information was found about lateral epicondylitis in Bangladeshi population.[4,8] However, no published article was found regarding the effectiveness of PRP and CS injection; both administered twice on 6 week apart, and evaluate pain and functional outcome. Hence, an attempt was made to find out the effectiveness of intralesional PRP and CS injection in terms of pain alleviation and functional status in the patient suffering from lateral epicondylitis.

Methodology

Study Design and Population: A single blind, single centered, randomized experimental study was conducted at Bangabandhu Sheikh Mujib Medical University (BSMMU), Physical Medicine and Rehabilitation department from March 2017 to February 2018. Comparison between 2 treatment options was evaluated. The patients with diagnosed lateral epicondylitis between the ages of 21 and 60, regardless of gender, VAS for pain >5, suffering more than 3 months attending outpatient's department of Physical Medicine and Rehabilitation were included in this research. Those patients were excluded who had arthritis, trauma to the elbow, previous elbow surgical procedure, severe anemia, an active systemic infection, bleeding disorder, infectious arthropathies, malignancy, radiculopathy, peripheral nerve deficit, use of antiplatelets 10 days before injection or NSAIDs 48 h before injection, steroid applied within 3 last weeks. According to the selection criteria, 42 patients were selected using the n=z2pq/d2 formula, where z=1.96, p=0.5, q=1-p, and d=0.15.

Randomization and Blinding: Participants were randomly assigned to either the PRP treatment (Group A) or corticosteroid group (Group B) using lottery. During the study, 3 patients withdrew themselves from the study due to post-procedure pain, and 9 patients were dropped out due to incomplete follow-up. All participants had given informed written consent prior procedure. Intervention/Allocation: Group A (n=15) patients received 4 ml of intralesional PRP injection. Group-A patients were sent to the Department of Transfusion Medicine to create platelet-rich plasma. About 20-25 mL of blood was drawn sterilely (the venipuncture procedure same as regular blood collection for pathology testing) and spun for 15 minutes at around 3,200 rpm in a centrifuge machine. The blood was then divided into its various components: platelets in the center, plasma at the top, and red blood cells at the bottom. A buffy coat was seen on top of the layer of red blood cells. About 4-5 mL of buffy coat was taken. Platelet-rich plasma was created using this buffy coat. The entire process didn't take more than 30 minutes. Group B (n=15) patients received 1 ml-2% lidocaine plus 1ml-40mg Triamcinolone acetonide in peppering technique over the most tender point of lateral epicondylar region of elbow. Both groups received activities of daily living (ADL) instructions, which included avoiding twisting movements, carrying heavy objects, and weight lifting using the affected limb. Additionally, both groups were instructed to take oral Paracetamol 500 mg twice daily for the entire treatment period if pain increased.

Follow up and Outcome Measures: Patients were assessed every 2 weeks interval up to 11 weeks (W11). 2nd dose of Intralesional PRP or corticosteroids injection was given on the lateral epicondylar region on 4th (W7) treatment visits. Patients were evaluated using a visual analogue scale (VAS)9 for pain (0=no pain; 10= maximum pain) and a patient-rated tennis elbow evaluation (PRTEE)10 at each visit where (Best Score= 0 Worst Score = 100).

Statistical Analysis: Statistical Packages for Social Sciences (SPSS-21) was carried out for statistical analysis. Categorical variables were described as frequencies, and continuous variables were described using the mean standard deviation (SD), median, and range; Paired t- test was done to find out the treatment effectiveness between the groups over time measured by VAS and PRTEE. Statistical significance was considered as a P value of 0.05 or below.

Ethical consideration: The research protocol was approved by the IRB (Institutional Review Board) of BSMMU; ID no BSMMU/2016/2380 on a meeting held on 15-12-2016. In this study precautions were taken to protect confidentiality of the participants. Information identifying the participant was kept to a minimum. There was no physical, psychological, and social risk to the patients. Privacy, anonymity, and confidentiality of data information identifying any patient were maintained strictly. Each patient enjoyed every right to participate or refuse or even withdraw from the study at any point of time. The study conforms to the code of ethics of the world medical association (Helsinki Declaration).

Results

In this study, there were 14(46.70%) male and 16(53.30%) were female and the ratio of men to women was 1:1.4. The patients' age, sex, height, weight, and elbow discomfort duration were all identical in both groups. Most of the participants were housewives from middle-class families. Majority of the participants complained that the character of pain was intermittent (73.3%), repeated activity (70.0%) was the most common aggravating factor and rest (93.3%) was the most common relieving factor (Table 1).

According to VAS, there was a noticeable improvement in both groups over time. From pretreatment week 1 (W1) through week 11, group A showed differences in progress every alternate week up to W 11. Whereas in group B, difference of improvement was found in every alternate week from pretreatment week 1 (W 1) up to week 9 (W 9). Nevertheless, there was no difference in improvement between W9 and W11 (Table 2)

It was discovered that there was no discernible difference in progress between the two groups for scores from W1 to W9. However, at the 11th week, group A showed a difference in improvement from group B shown in. (Table 3).

According to PRTEE, there was also a considerable improvement over time in both groups. By comparing the pretreatment W1 (immediately before the first intervention) score to the W11 score on a biweekly basis, both groups exhibited different levels of improvement over time shown in (Table 4).

In comparison between two groups, it was found that there was no significant difference in improvement up to W1 to W9 scores, but difference of improvement was found in group A than group B at 11th week (Table 5).

Table 1: Distribution of Evaluation of Pain (n=30)

Evaluation of Pain Pain Characteristics	**Group A**	**Group B**
• Persistent	5(33.33%)	3(20.0%)
• Intermittent	10(66.67%)	12(80.0%)
Exacerbating Factors		
• Heavy weight lifting	4(27.0%)	3(20.0%)
• Twisting action	1(6)	1(6.67)
• Recurring stress	10(67)	11(73.33)
Relieving Factors		
• Rest	14 (93.33)	14 (93.33)
• Taking NSAIDs	1(6.67)	1(6.67)
Severity Of Pain		
• Mild	1(6.67)	0
• Moderate	12 (80)	15 (100)
• Severe	2	0

Table 2: Treatment effectiveness in both group over time measured by VAS

Time-based scoring	Group A (n=15)			Group B (n=15)		
	Mean±SD	p-Value	95% CI	Mean±SD	p-Value	95% CI
W1 (Before 1st Intervention) Vs W3	6.20±2.14 vs 4.07± 1.62	0.000	1.476 to 2.791	5.87 ±1.72 Vs 2.80 ±1.74	0.000	2.143 to 3.990
W3 Vs W5	4.07 ± 1.62 vs 3.07± 1.33	0.001	0.487 to 1.513	2.80 ±1.74 Vs 2.93 ±1.75	0.546	-0.595 to 0.328
W5 Vs W7 (Before 2nd Intervention)	3.07±1.33 vs 2.73±1.03	0.096	-0.067 to 0.0734	2.93 ±1.75 Vs 3.13 ±1.92	0.271	-0.574 to 0.174
W7 (2nd Intervention) Vs W9	2.73±1.03 vs 1.40±0.63	0.000	0.92 to 1.675	3.13 ±1.92 Vs 1.67 ±0.90	0.001	0.746 to 2.188
W9 Vs W11	1.40±0.63 vs 0.53±0.51	0.000	0.512 to 1.221	1.67 ±0.90 Vs 1.27 ±0.88	0.054	-0.008 to 0.808

The outcomes are presented as mean and standard deviation(SD); N= Number of patients who took part in clinical study; W= Week, W1= 1st week, W3= 3rd week, W5= 5th week, W7= 7th week, W9= 9th week, and W11= 11th week

Table 3: Treatment Effectiveness between the Groups Over Time Measured by VAS (Mean±SD)

Groups	W1(Immediately before 1st injections)	W3	W5	W7 (Immediately before 2nd Injections)	W9	W11
Group A (n=15)	6.2±2.1	4.1±1.6	3.1±1.3	2.7±1.0	1.4±0.6	0.5±0.5
Group B (n=15)	5.8±1.7	2.8±1.7	2.9±1.7	3.1±1.9	1.6±0.9	1.2±0.8
P-value	0.651	0.089	0.836	0.516	0.334	0.003
95% CI	-1.21 to 1.88	-0.22 to 2.75	-1.22 to 1.48	-1.68 to 0.88	-0.83 to 0.30	-1.17 to -0.29

The outcomes are presented as mean and standard deviation (SD); N= Number of patients who took part in clinical study; W= Week, W1= 1st week, W3= 3rd week, W5= 5th week, W7= 7th week, W9= 9th week, and W11= 11th week

Table 4: Treatment Effectiveness in Both Group Over Time Measured by PRTEE

Time-point score	Group A (n=15)			Group B (n=15)		
	Mean±SD	p-Value	95% CI	Mean±SD	p-Value	95% CI
W1 (Immediately before 1st Injection) Vs W3	52.27±13.31 Vs 42.40±12.96	0.000	5.760 to 13.973	52.93±12.29 Vs 35.20±15.90	0.000	10.223 to 25.244
W3 Vs W5	42.40±12.96 Vs 34.27±11.58	0.000	5.373 to 10.893	35.20±15.90 Vs 31.07±14.53	0.003	1.640 to 6.626
W5 Vs W7 (Immediately before 2nd Injections)	34.27±11.58 Vs 24.13±7.80	0.000	6.720 to 13.546	31.07±14.53 Vs 32.00±14.20	0.444	-3.475 to 1.608
W7 (Immediately before 2nd Injections) Vs W9	24.13±7.80 Vs 12.93±5.54	0.000	8.494 to 13.906	32.00±14.20 Vs 19.87±10.99	0.000	8.988 to 15.279
W9 Vs W11	12.93±5.54 Vs 4.27±3.10	0.000	6.858 to 10.475	19.87±10.99 Vs 13.33±9.46	0.002	2.735 to 10.335

The outcomes are presented as mean and standard deviation (SD); N= Number of patients who took part in clinical study; W= Week, W1= 1st week, W3= 3rd week, W5= 5th week, W7= 7th week, W9= 9th week, and W11= 11th week

Table 5: Treatment effectiveness between the groups over time measured by PRTEE

Groups	W1(Immediately before 1st injection)	W3	W5	W7 (Immediately before 2nd injection)	W9	W11
Group A (n=15) Vs Group B (n=15) Mean±SD	52.2±13.3 Vs 52.9±12.2	42.4±12.9 Vs 35.2±15.9	34.2±11.5 Vs 31.0±14.5	24.1±7.8 Vs 32.0±14.2	12.9±5.5 Vs 19.8±10.9	4.2±3.1 Vs 13.3±9.4
P-value	0.865	0.232	0.554	0.079	0.061	0.002
95% CI	-8.943 to 7.610	-5.153 to 19.553	-8.124 to 14.524	-16.781 to 1.048	-14.243 to 0.376	-14.017 to -4.116

The outcomes are presented as mean and standard deviation (SD); N= Number of patients who took part in clinical study; W= Week, W1= 1st week, W3= 3rd week, W5= 5th week, W7= 7th week, W9= 9th week, and W11= 11th week

Discussion

The results of the current study demonstrated that intralesional platelet-rich plasma and intralesional corticosteroid treatment at the lateral epicondylar area of the elbow improved the subjective and objective measures of pain and functional indices. All the interventions were uneventful except mild discomfort and swelling, which was managed by ice therapy. However, none of them were found to have any sorts of infections. In the group A intervention with intralesional PRP, a statistically significant difference in improvement was seen from pretreatment W1 (immediately before the first intervention) to W11 score over time on a biweekly basis according to VAS and PRTEE. Similar research revealed that intralesional platelet-rich plasma significantly reduced pain levels using the visual analogue scale at 12 and 24 weeks compared to placebo (p value 0.001).[11] In additional research, it was shown that intralesional platelet-rich plasma injection, even with a single injection, demonstrated considerable pain alleviation and improvement in function as well as quality of life 6 months after intervention by PRTEE instrument.[12]

The patient's discomfort eased as the inflammatory process subsided and the damaged tendon began to repair due to various growth factors generated by platelets.[13,14] In this present study, the difference of improvement was discovered in terms of pain and functional parameters over time due to decline in inflammation, tissue regeneration and greater tensile strength.[15] Hence, PRP was fruitful since it lowers subjective and objective pain as well as functional outcome.

Recent studies on chronic lateral epicondylitis showed no evidence of inflammatory process rather fibro-elastic tissue and vascular invasion known as Angio fibroblastic tendinosis16. Therefore, local corticosteroid injection provided short time pain relief and functional improvement. The results of the current study shown that, over the brief follow-up period of up to 5 weeks, local corticosteroid injection significantly reduced VAS and PRTEE scores compared to PRP therapy. However, it was notable that the treatment with PRP regimen significantly lower VAS and PRTEE scores than steroid treatment at 7 week and subsequent follow-up.

In several clinical studies, individuals with elbow lateral epicondylitis were compared for activity and effectiveness between PRP and corticosteroid injection.[6,16] Epicondylitis was discovered to respond well to local corticosteroid injection. Nevertheless, these investigations revealed a short-term impact (2–6 weeks).[15,17]

Hence, the difference in improvement from pretreatment W1 (immediately before 1st Injection) to W11 score in every other week was found measured by VAS and PRTEE. The difference in improvement between the two groups was therefore significantly greater in group A, which was validated by other research.1,18,19

The PRTEE was a reliable, reproducible, and sensitive instrument for assessment of chronic lateral elbow tendinopathy. The PRTEE may become the standard primary outcome measure in research of tennis elbow.[20] A Visual Analogue Scale (VAS) is a reliable measurement instrument the amount of pain that a patient feels usually a horizontal line, 10cm in length patient marks on the line the point that they feel represents their perception of their current state.[21] Different studies from various corner of world are available regarding effect of various intervention methods based on multiple tools for lateral epicondylitis. Among Bangladeshi population, to search comparative effect between PRP and corticosteroid based on VAS and PRTEE were our target. We had an endeavor to find the comparison by this experimental study.

We have a few limitations. Smaller sample size, single blinded study, single centered study is few of them.

Conclusions

Intralesional PRP treatments injections demonstrated substantial improvement in pain and functional outputs compared with those of intralesional corticosteroids for lateral epicondylitis of elbow. To get firm results, higher power research with significantly bigger sample size is advocated.

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Contributions to authors: Conceptualized the research question, designed the study, and supervised the data collection and analysis: Islam MT; Contributed to the study design, conducted the statistical analyses, and drafted the manuscript: Mahjabin A; Provided critical feedback on the study design, data analysis, and manuscript, Rashid Al Mahmood M, Gomes LC, Shoma FK, Emran MA, Shakoor MA. All authors read and approved the finalize the manuscript for publication.

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Original Article

Management of Emergency Department Services at a Secondary Level Hospital

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Abstract

Background: The primary purpose of the Emergency Department (ED) is to provide immediate medical attention and resuscitation to seriously ill patients. Prompt treatment and efficient service management play crucial roles in preventing fatalities and disabilities. ***Objective:*** To evaluate the management of emergency department services at a secondary-level hospital in Bangladesh. Methodology: A descriptive cross-sectional study was carried out in the emergency department at Narayanganj General Hospital from January to December 2018. The study involved 229 participants, including both service recipients and providers. Data was collected using a pre-tested, semi-structured questionnaire administered through face-to-face interviews. ***Results:*** The majority of participants easily identified the ED room (82.3%) and waited ≤15 minutes (91.2%) to see a doctor. They also felt that doctors listened attentively to their complaints (88.9%) and behaved well (92.5%). Service providers' behavior was also positively rated by patients, with 90.8% expressing satisfaction. Most patients did not receive all prescribed medicines from the pharmacy (81.4%), expressed dissatisfaction with the cleanliness of the environment (52.1%), and facilities in the waiting room (60.0%). Despite these concerns, they mostly stated satisfaction with the treatment received (51.6%) and the overall management of the ED (45.1%). Service providers identified several shortcomings across multiple areas, such as laboratory facilities (78.6%), staffing levels of doctors (78.6%), nurses (64.3%), and supporting staff (85.7%). Despite these challenges, they expressed satisfaction (64.3%) with their roles. ***Conclusion:*** The study demonstrated that both service recipients and service providers were satisfied with the management of medical services. However, hospital administration and health service providers should prioritize resolving deficiencies in order to improve patient satisfaction more substantially.

Key Words: Management, emergency department services, secondary-level hospital, Bangladesh.

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Introduction

A hospital serves as a healthcare hub where specialized health science professionals, auxiliary healthcare staff, and advanced medical equipment collaborate to deliver patient care.[1]It is a crucial component of our society since it provides comprehensive health treatment to the entire population[2]. It constitutes a variety of indoor and outdoor emergency departments as well as specialized units such as cardiology, intensive care unit etc.[3] Hospitals hold significant importance in people's lives, often representing pivotal moments. They demonstrate resilience by sustaining and expanding services during emergencies, while also aligning with the needs and values of local communities. Integral to achieving the Sustainable Development Goals (SDGs), hospitals play a vital role in Universal Health Coverage (UHC). [1,4]

The emergency department of a hospital plays a crucial role in providing immensely important services to patients5. The quality of service and care provided by the emergency room significantly influences a hospital's reputation.[5-6] The primary aim of the majority of emergency medical services is either to administer prompt treatment to individuals requiring urgent medical attention, with the objective of effectively addressing their presenting conditions, or to ensure the timely transfer of patients to the next stage of definitive care.[7] It is prepared and equipped to provide the community with comprehensive emergency care for both emergency and non-urgent conditions.[8] The patient management services are primarily administered by ED staffs and doctors.[3,8]

Patient satisfaction consistently impacts an individual's assessment of the quality of their healthcare services.[9-10] To assess the quality of healthcare, individuals are often asked to score their satisfaction with the services they received or impart their experiences.[11-12] Satisfaction with medical services is a desirable outcome and can impact overall health status. A patient's optimism or discontent with hospital care can provide insight into its overall quality, including strengths and deficiencies.[13-14] Management services survey should be part of a quality improvement process that includes evaluating results, consulting with key stakeholders, developing improvement plans, implementing them, and re-evaluating progress to identify new areas for improvement.

Methodology

Study Design and Settings: This descriptive cross-sectional study aimed to assess the management of emergency department services at Narayanganj General Hospital, a purposively selected secondary-level hospital in Narayanganj 1400, Bangladesh. A total of 229 participants were conveniently selected for the study, comprising 215 service receivers and 14 service providers (including both doctors and nurses). Service receivers were individuals seeking urgent medical or surgical intervention at the emergency department due to a disease condition or injury, while service providers were doctors and nurses working in the ED during the interview period. Doctors and nurses who were on leave during the observation period were excluded from the study.

Data Collection Procedures: The participants under study were interviewed face-to-face using a pretested, semi-structured questionnaire from January to December 2018. This questionnaire covered socio-demographic characteristics and information regarding the management of services in the ED from both service receivers and providers. Observations were also made within the hospital premises using an observational checklist.

Statistical Analysis: Descriptive statistics, including mean, standard deviation, and percentages, were calculated for continuous variables using IBM SPSS v23. The findings were showed through tables and charts.

Ethical Approval: Participation was voluntary, and confidentiality was ensured, and informed written consent was obtained from all participants. Ethical approval for the study was approved by the Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM), Dhaka 1212, Bangladesh (Reference: NIPSOM/IRB/2018/471).

Results

The mean age of the service receivers was 36.1±16.3 years, and 47.5% of them belonged to the 21-40 age groups. Majority of the respondents were female (57.7%) and unmarried (63.3%) among those who attended as patients. A significant portion of the respondents (34.4%) had no formal education, while only 6.5% had completed higher secondary or above. The majority of the patients were housewives (41.4%) and day laborers (18.6%). The average monthly income of the families was 12,700.6±5,084.7 taka, with more than half of them (54.8%) earning ≤10,000 taka per month. (Table 1)

Table 1: Particulars of the service receivers (n=215)

Particulars	n(%)
Age groups (years)	
≤20	42(19.5)
21-40	102(47.5)
41-60	47(21.9)
>60	24(11.1)
Mean±SD	36.1±16.3
Sex	
Male	91(42.3)
Female	124(57.7)
Marital status	
Unmarried	136(63.3)
Married	45(20.9)
Others (widowed & separated)	34(15.8)
Education	
Illiterate	74(34.4)
Primary	94(43.7)
Secondary	33(15.3)
Higher secondary and above	14(6.5)
Occupation	
Housewife	89(41.4)
Day labour	40(18.6)
Businessman	17(7.9)
Service holder	12(5.6)
Agricultural worker	10(4.7)
Others (student, unemployed etc.)	47(21.8)
Monthly average income (taka)	
≤10,000	118(54.8)
10,001-20,000	86(40.0)
20,001-30,000	11(5.2)
Mean±SD	12,700.6±5,084.7

The emergency department easily identified the majority of service receivers (82.3%) and promptly attended to them by service providers (81.4%). On average, patients waited 8.8±5.9 minutes for services, though a small portion (8.8%) waited >15 minutes to see a doctor. Most respondents (88.9%) felt that doctors attentively listened to their complaints and behaved well (92.5%). Patients also generally rated other staff behavior positively, with 90.8% expressing satisfaction. Over half of patients (54.9%) weren't advised of any investigations by attending doctors. Among those advised, more than half (58.3%) underwent tests outside the hospital. A majority (57.7%) were advised hospital admission. Nearly half of respondents (48.4%) found the emergency department busy. However, most patients (81.4%) didn't receive all prescribed medicines from the pharmacy. (Table 2)

Approximately half of the patients expressed poorly satisfied with the cleanliness (52.1%) and the facilities in the waiting room (60.0%). However, they were generally satisfied with the treatment received (51.6%) and the overall management at the emergency department (45.1%). (Figure-I)

Table 2: Information on the management of services in the ED by service receivers (n=215)

Outlines		n(%)
Easily identification of ED by	Yes	177(82.2)
respondents	No	38(17.7)
Easy accessible of treatment	Yes	175(81.4)
by service providers	No	40(18.6)
Waiting time to attend the	≤15	196(91.2)
doctor (minutes)	>15	19(8.8)
	Mean±SD	8.8±5.9
Attention of doctor while	Attentively	191(88.9)
listening of problem	As usual	5(2.3)
	Not attentively	19(8.8)
Opinion regarding doctor's	Very cordial	140(65.1)
behavior	Well	59(27.4)
	As usual	14(6.5)
	Not well	2(0.9)
Opinion regarding other	Very cordial	88(41.0)
staff's behavior	Well	107(49.8)
	As usual	16(7.4)
	Not well	4(1.9)
Doctor advised for	Yes	97(45.1)
investigation	No	118(54.9)
Respondents done	Yes	40(41.7)
investigation in this hospital	No	57(58.3)
Types of management	Treatment with	73(34.0)
received form the ED	discharged	
	Admission	124(57.7)
	Referred	18(8.4)
Opinion regarding ED	Very busy	89(41.4)
environment	Busy	104(48.4)
	Haphazard	20(9.3)
	Calm and quite	2(0.9)
Availability of medicine	Yes	40(18.6)
supply	No	175(81.4)

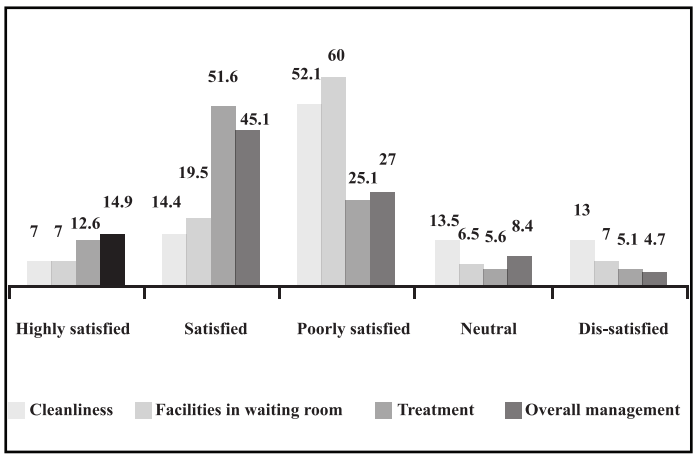

Figure-I: Opinions on the cleanliness of the environment, waiting room facilities, treatment quality, and overall management in the ED (n=215)

The predominant suggestions regarding improvement of management services included ensuring an adequate supply of medicines (82.8%), increasing the availability of wheelchairs (68.6%), providing more space in the waiting room (65.6%), maintaining a clean environment (63.5%), ensuring sufficient instrument supply (58.9%), providing safe drinking water (58.6%), and establishing separate toilet facilities (55.6%). (Figure-II)

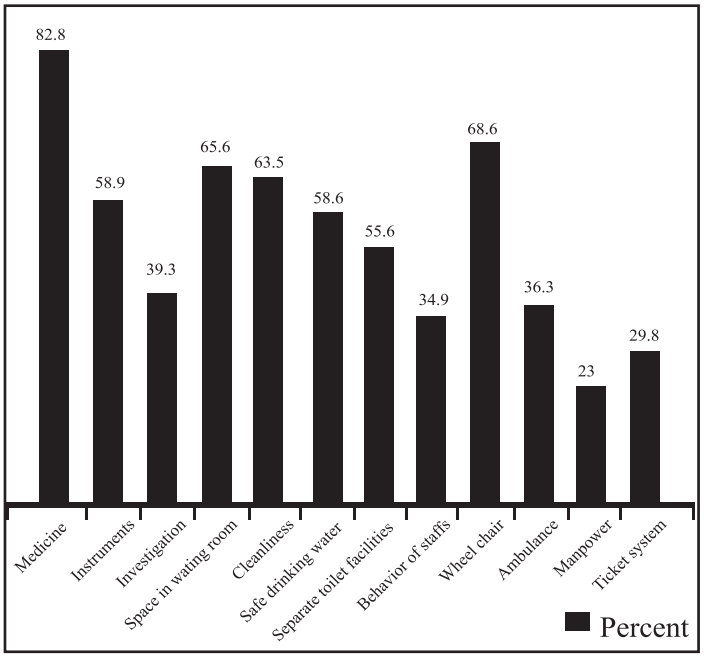

Figure-II: Suggestions regarding improvement of ED management services (n=215)

The average working experience of the service providers was 11.0±8.6 years, and a majority (42.8%) had been working there for over 10 years. Patient load was highest during the morning shift (64.3%). Nearly all respondents (92.7%) encountered some form of problem during their duty. A significant portion of service providers (64.3%) lacked special training in ED patient management and expressed dissatisfaction with the supply of equipment. Most respondents' highlighted inadequacies in various aspects, including laboratory facilities (78.6%), were staffing levels of doctors (78.6%), nurses (64.3%), and supporting staff (85.7%), as well as competency in basic life support (35.7%). However, they emphasized the importance of adequate medicine supply (92.9%), maintaining patient privacy (92.9%), and keeping patient records (92.9%). All respondents reported referring patients to tertiary or specialized hospitals for better treatment. Half of the respondents (50%) used personal protective equipment (PPE) for their safety during work hours. (Table 3)

Table 3: Information on the management of services in the ED by service providers (n=14)

Outlines		n(%)
Working experiences (years)	≤5	4(28.6)
	6-10	4(28.6)
	>10	6(42.8)
	Mean±SD	11.0±8.6
Time of patient load	Morning shift	9(64.3)
	Evening shift	3(21.4)
	Night shift	2(14.3)
Problem faced during provision of services	Yes	13(92.9)
	No	1(7.1)
Received special training for patients' management	Yes	5(35.7)
	No	9(64.3)
Adequately equipped present	Yes	5(35.7)
	No	9(64.3)
Adequate laboratory facilities	Yes	3(21.4)
	No	11(78.6)
Enough number of doctors	Yes	3(21.4)
	No	11(78.6)
Enough number of nurses	Yes	9(64.3)
	No	5(35.7)
Enough number of supporting staffs	Yes	2(14.3)
	No	12(85.7)
Competence for the basic life support facilities	Yes	5(35.7)
	No	9(64.3)
Availability of medicine supply	Yes	13(92.9)
	No	1(7.1)
Maintained the patients privacy	Yes	13(92.9)
	No	1(7.1)
Maintained the patient's record	Yes	13(92.9)
	No	1(7.1)
Patient's referral	Yes	14(100)
	No	0(0.0)
Necessity about using PPE	Yes	7(50.0)
	No	7(50.0)

Approximately two-thirds of service providers (64.3%) expressed satisfaction (ranging from satisfied to highly satisfied) with their roles in this department. (Figure-III)

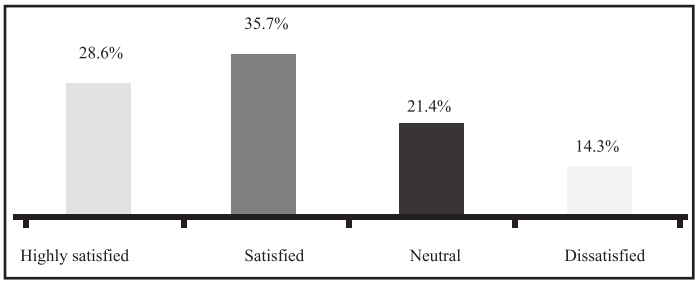

Figure III: Satisfaction with the services provided by the service providers (n=14)

An overview of the emergency department in the hospital under this study was outlined in the table 4. Across all categories of manpower, there were shortages, with no AYA posted. The waiting room lacked sufficient space for patients, did not have separate toilet facilities, and lacked a

safe drinking water supply. Transport facilities were also insufficiently provided. While most treatment facilities were available, antibiotics and over-the-counter drugs were in short supply, although there was an adequate supply of IV infusions. Basic treatment and diagnostic facilities were generally available, though there were shortages in essential equipment such as a power generator, defibrillator machine, serum electrolytes, and CT scan.(Table 4)

Table 4: Checklist

Outlines		Present
Manpower at the ED	Adequate doctor posted	Inadequate
	Adequate nurse posted	Inadequate
	Ward boy	Inadequate
	AYA	No
	Sweeper	Inadequate
Facilities in waiting room	Reception room	Yes
	Adequate space in waiting area	Absent
	Separate toilet facilities	Absent
	Toilet facilities for patient	Yes
	Toilet facilities for service provider	Yes
	Safe drinking water	Absent
	Waste basket	Yes
Transport facilities	Ambulance	Inadequate
	Patient trolley	Inadequate
	Patient stretcher	Inadequate
	Wheel chair	Inadequate
Facilities in treatment room	Sign post and display	Yes
	Emergency ticket system	Yes
	Registered book	Yes
	Observation bed	Yes
	Surgical bed	Yes
	Screen and stand	Yes
	Stethoscope and BP instrument	Yes
	Thermometer	Yes
	Glucometer	Yes
	Weight machine	Yes
	Height scale	No
	Torch light	Yes
	Tongue depressor	Yes
	Auroscope	Yes
	Sputum box	No
	Emergency trolley (With minor surgical seat)	Yes
Availability of drugs facilities	OTC drugs	Inadequate
	Antibiotics	Inadequate
	IV Infusion	Yes
Availability of treatment facilities	Basic treatment equipment	Yes
	Emergency treatment equipment	Yes
Availability of diagnostic facilities	Biochemical and clinical pathology	Yes
	Radiology and imaging	Yes

Discussion

The emergency department faces the challenge of providing care that is safe, effective, patient-centered, prompt, efficient, and equitable, which is a difficult undertaking regardless of conditions.[15] Patient satisfaction with accessing health services is regarded as a fundamental outcome of the healthcare system and a key indicator of service quality, directly influencing service utilization.[16] Presently, external pressures, inadequacies in healthcare, and constraints within the hospital sector are prompting the formulation of fresh perspectives on hospitals across various global regions, also in our country.

The service recipients' mean age were 36.1±16.3 years, with 47.5% of them belonging within the 21-40 age groups. A significant part (34.4%) had no formal education. Day laborers (18.6%) and housewives (41.4%) constituted most of the patients. The families' monthly average income was 12,700.6±5,084.7 taka, and over half of them (54.8%) made ≤10,000 taka or less. These results were nearly comparable to the study findings.[17,18] The emergency department easily identified the majority of patients (82.3%) and punctually attended to them by service providers (81.4%). On average, patients waited 8.8±5.9 minutes for services. Most respondents (88.9%) felt that doctors attentively listened to their complaints and behaved well (92.5%). Patients also generally rated other staff behavior positively, with 90.8% expressing satisfaction. Studies also shown that patients waited less than 15 minutes and that service providers behaved satisfactorily.[18,19] Over half of patients (54.9%) weren't advised of any investigations by attending doctors. Among those advised, more than half (58.3%) endured tests outside the hospital. Nearly half of respondents (48.4%) found the emergency department busy. However, most patients (81.4%) didn't receive all prescribed medicines from the pharmacy. The results showed resembles with the studies in terms of investigations and hospital supplies.[3,9,20] Above half of the patients expressed poorly satisfied with the cleanliness of the environment (52.1%) and the facilities in the waiting room (60.0%). Despite this, they expressed general satisfaction with the medical services they received (51.6%) and the emergency department's the overall management (45.1%). Satisfaction with medical services among patients was deemed satisfactory in this studies. [9,19-21]

In terms of work experience, most of the service providers (42.8%) had been there for over 10 years. Patient burden

was highest during the morning shift (64.3%). Nearly all respondents (92.7%) encountered some sort of problem during their duty. A significant portion of service providers (64.3%) lacked special training in ED patient management and expressed dissatisfaction with the supply of equipment. They also emphasized the importance of adequate medicine supply (92.9%), maintaining patient privacy (92.9%), and keeping patient records (92.9%). All respondents reported referring patients to tertiary or specialized hospitals for better treatment. Half of the respondents (50%) used personal protective equipment (PPE) for their safety during work hours. Approximately two-thirds of service providers (64.3%) stated satisfaction (varying from satisfied to highly satisfied) with their roles in this department. The job satisfaction of service providers, including doctors and nurses, plays a crucial role in delivering medical services within a hospital.[16,22]

Conclusion

The attitude and responsiveness of care professionals to patient requirements is the key element influencing the quality of treatment at the emergency department. Improving doctor-patient and doctor-nurse ratios is crucial for providing responsive healthcare services. The study revealed that both service receivers and service providers held satisfactory opinions regarding the management of medical services. The foremost recommendations entailed of ensuring a sufficient supply of medicines, enhancing the availability of medical logistics, expanding the waiting room space, maintaining cleanliness in the surroundings, providing safe drinking water, and establishing separate toilet facilities.

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Review Article

Influenza Virus Types, Subtypes and Genomic Lineage with Its Prevention and Control: A Narrative Review

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Abstract

Since influenza viruses continue to be a serious hazard to both humans and animals, they are still very important. Types A, B, and C influenza viruses are among the members of the Orthomyxoviridae family. A quick summary of the molecular factors is provided, which determine pathogenicity and clinical signs and symptoms of influenza. A review of host range and evolution highlights the genetic diversity of influenza A viruses and their capacity to successfully infect a variety of hosts, including avian and mammalian species. Moreover, influenza viruses may reassemble segments because of the way their segmented genome is designed. The significance of host sialic acid distribution and viral receptor-binding hemagglutinins in species-restricted virus binding is emphasized. It results in yearly outbreaks and necessitates the creation of novel vaccination formulations. This may ultimately result in the creation of a virus that can spread among humans and has unique antigenic qualities, perhaps sparking a pandemic. Current developments in our knowledge of the seasonality, transmission, and prevention of influenza viruses are outlined, along with their significance for halting the virus's spread.

Key Words: Acute respiratory infections; influenza virus; orthomyxoviridae; reassortment; antigenic shift

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Introduction:

Acute respiratory infections (ARIs) are prevalent worldwide and the leading cause of death in developing countries.[1] The most striking disparity between developing and developed countries with regard to ARI epidemiology is the case-fatality rate of lower respiratory infection (LRI), mainly pneumonia, bronchiolitis, and influenza,[2,3] influenza is an acute viral respiratory infection that affects all age groups and is associated with high mortality during pandemics, epidemics, and sporadic outbreaks. Nearly 10.0% of the world's population is affected by influenza annually, with about half a million deaths each year.[1] Influenza viruses are significant human respiratory pathogens that cause both seasonal, endemic infections and periodic, unpredictable pandemics.

In tropical countries, influenza activity may occur year-round as well as in outbreaks more typical of temperate regions. These infections cause serious diseases in populations weakened by malnutrition, with limited access to medical care.[4] Of note, the predisposition induced by influenza to superimposed bacterial infections, mainly Streptococcus pneumoniae, may greatly affect morbidity and mortality, mainly among impoverished populations.[5] In addition, influenza viruses can reassort or sometimes cross species barriers to generate emergent strains that may cause localized outbreaks or potentially pandemics with enormous impact for health on a global scale.[6] Since 2011, a swine-origin virus (H3N2) outbreak has been reported in the USA that predominantly involved young children exposed to swine. According to public

health laboratory specimens for the 2018-2019 season, the predominant influenza A subtype was (H1N1)pdm 09 (56.6% of positive specimens), followed by the A/H3N2 subtype (43.6%) and influenza B (4%).[7]

Epidemiology

Influenza viruses have made an impact throughout the world, causing highly contagious respiratory infections with high morbidity and mortality (in seasonal peaks), specially, in infants and the elder people. Influenza has already been associated with an average of 5% of ARIs leading to physician contact in developing countries.[8,9] This low proportion probably represents only the most intense cases, since 30% to 50% of under-five children in tropical Africa have been found to seroconvert in one outbreak.[9] Prior to that, healthy children less than [1] year of age are hospitalized for influenza at rates similar to those for adults at high risk, and influenza accounts for a great number of outpatient visits and courses of antibiotics in children of all ages.[10] Despite the seasonal dependency, influenza infections in the respective countries can also occur outside the normal influenza epidemics and can even lead to locally and temporally limited outbreaks. According to degree of severity, the influenza epidemics can also be clearly distinguished from each other. Approximately 500000 people are dying in every year worldwide.[11] Influenza pandemics are characterized by the recurrence of influenza A subtype against majority of non-immunized human population, and causing a worldwide epidemic. The past century was characterized by three major pandemics: one is, Spanish Flu of 1918 (H^1N^1) caused about 40 million deaths, second one is Asian influenza of 1957 (H2N2) and third one is Hong Kong Flu of 1968 (H2N3) were estimated at 1–2 million and 0.75–1 million deaths, respectively.[11] In 2001, Madagascar experienced high morbidity and mortality rates associated with a conventional influenza A/H3N2 subtype virus due to limited access to care and malnutrition within the population. Conversely, while influenza A outbreaks in temperate countries show sharp seasonality, the seasonal patterns of influenza in tropical countries have shown variability across different studies. In southern India[12] and Thailand,[13] influenza has been present throughout the year with occasional outbreaks. Consistent outbreaks have occurred in June–July and November–January, coinciding with the winter seasons in the southern and northern hemispheres. However, there seems to be no clear association with meteorological factors.[14] In the Philippines, influenza has been more common between November and January,[15] while in Senegal, Nigeria, and Taiwan, there has been a distinct association with increased rainfall. In southeastern Brazil,[16] Argentina,[17] and South Africa,[18] seasonal outbreaks of influenza A have occurred annually from May through August (mid-autumn through winter), in conjunction with cold temperatures but not with rainfall. Influenza B outbreaks occur periodically, yet less frequently than influenza A, in both temperate and tropical regions,[19,20] whereas influenza C is generally nonseasonal.[20] Antigenic drift, minor changes in antigenicity, is caused by accumulation of point mutations in the genes coding for influenza HA and NA, generate new strains and spread in annual epidemics. Influenza B and influenza C are less prone to antigenic drift. Major and abrupt antigenic changes in influenza A are called antigenic shift and resulting in novel HA subtype with or without new NA to which humans lack significant immunity.[21] It may be caused by acquisition of new gene segments through genetic rearrangements in hosts infected with both human and non-human viruses (usually avian), or by the re-emergence of subtypes in reservoir. Pigs are susceptible to both human and avian influenza viruses and can serve as host for recombinant or mammalian species. Novel influenza virus subtypes resulting from the shift, have caused catastrophic pandemics, including three in the last century. In February 2004, a highly pathogenic H7N3 virus emerged in domestic poultry in British Columbia with two documented human cases of conjunctivitis and mild “flulike” illness.[22] Recent clusters of human infections caused by avian influenza (particularly H5N1 subtype viruses) in Asia continent, have raised concerns about new pandemic threats.

Agents

The name "Influenza" is derived from the Latin word "influence," and the pathogens that cause this disease are single stranded RNA virus with segmented genome, pleomorphic, enveloped, and belong to Orthomyxoviridae family. These RNAs are negative-sense molecules, meaning that they must be copied into positive-sense molecules in order to direct the production of proteins. On the basis of antigenicity of the nucleoprotein (NP) and matrix protein, Influenza viruses are distributed in three (03) genera—A, B, and C. Influenza A virus is further classified in subtypes based on its two surface

glycoproteins: hemagglutinin (HA) and neuraminidase (NA).[23] Among the 15 HA and 9 NA subtypes recognized in nature, six HA (H1, H2, H3, H5, H7, and H9) and three NA (N1, N2, and N7) subtypes have been identified in human isolates of influenza A viruses.[22] Among these, only three subtypes of HA (H1, H2, and H3) and two of NA (N1 and N2) have caused pandemics in human populations in recent years.[24] The genomes of influenza viruses contain eight RNA segments in influenza A and B viruses, and seven RNA segments in influenza C.[23]

The glycoprotein HA is responsible for binding the virus to sialic acid containing cellular receptors and mediating fusion and penetration. Proteolytic cleavage of HA by cellular serine proteases exposes the hydrophobic fusion domain that mediates membrane fusion. NA cleaves terminal sialic acid from glycoconjugates present on respiratory mucins, cells, and progeny virions. This effect destroys the receptors recognized by HA, allowing the budding virus to be released from infected cells and spread in the respiratory tract. Influenza C virus contains a single surface glycoprotein that binds to receptors, promotes membrane fusion and cleaves sialic acid.[23]

Influenza A viruses are primarily viruses of waterfowl, particularly duck and include in all subtypes. Selected subtypes naturally infect a range of terrestrial mammals (pigs, horses, humans) and aquatic mammals (seals). Influenza B viruses infect humans and, in rare cases, seals, dogs, cats, and pigs, while influenza C viruses are primarily human viruses. Depending on the virus type and subtype, experimental infections can be induced in mice, ferrets, chickens, pigs and primates, and mainly in renal cells, continuous cell lines (MDCK, Vero, PER. C6 and LLC- MK2), also present in embryonic eggs.[24] The biological properties of influenza virus binding to red blood cells can be used for early detection of the virus in cell culture and the development of serological tests through hemagglutination inhibition.[24] Temperature above 50°C as well as lipid solvents, acids, formaldehyde, ionizing radiation and ultraviolet (UV) can inactivate influenza viruses.[24]

Mechanisms of influenza virus evolution – antigenic drift and shift

Antigenic shift and antigenic drift are the two main mechanisms that propel the evolution of influenza viruses. When two distinct influenza viruses co-infect the same cell, their genomic RNA segments reassort, resulting in the formation of novel strains and/ or subtypes that have the potential to cause serious illness and/or spread swiftly in a population lacking prior protection, is known as antigenic shift. A review of the influenza virus reassortment mechanism has been conducted.[25] A primary factor in the development of pandemic or zoonotic strains is antigenic shift or reassortment. Recombination of an H3 avian virus and a human H2N2 virus produced the 1968 pandemic influenza virus, whereas reassortment of an H2N2 avian virus and a human H1N1 virus produced the 1957 pandemic influenza virus. Multiple reassortment events in swine led to the generation of the 2009 H1N1 pandemic virus (2009 H1N1pdm). Avian H5N1 and H7N9 viruses, which are highly fatal zoonotic illnesses that infect people, are produced by reassortment with other subtypes of birds, particularly H9N2 viruses. The accumulation of mutations in the viral genome during replication due to the absence of RNA-dependent RNA polymerase proofreading activity is known as antigenic drift.[26] Mutations in the surface envelope proteins' HA and NA antibody epitopes can lessen the recognition of pre-existing antibodies produced in response to earlier viral strains. Seasonal influenza infections and the requirement for yearly influenza booster vaccinations are explained by antigenic drift.

Transmission

Seasonal flu is highly contagious and spreads quickly, especially in crowded places like schools and nursing homes. When an infected person coughs or sneezes, they release droplets containing viruses into the air, potentially infecting those nearby. The virus can also be passed on through contact with surfaces contaminated with the influenza virus. To reduce the risk of transmission, it's important for people to cover their mouth and nose when coughing and to regularly wash their hands. In regions with temperate climates, seasonal flu outbreaks are most common in the winter, whereas in tropical areas, influenza can occur at any time of year, leading to less predictable outbreaks. The incubation period for the flu is typically around 2 days, but it can range from 1 to 4 days.

Pathogenesis and Immunity

The virus infects the respiratory mucosa, where it causes lytic infection of cells and desquamation of the respiratory epithelium, mononuclear cell infiltrates in the lamina propria, and altered mucociliary clearance. Tracheobronchitis is a typical feature and often associated

with prolonged abnormalities in small airway pulmonary function and airway hyper reactivity. Primary influenza viral pneumonia results in diffuse alveolar damage, alveolar hemorrhage and exudate, hyaline membranes, and later reactive fibrosis. Fatal cases show pathologic changes in non-respiratory organs, such as brain congestion and swelling, myocardial inflammation, and fibrinoid changes in arterioles.[27] Viral replication in the upper respiratory tract generally peaks within 1 or 2 days of symptom onset and, depending on age and prior immunologic experience, continues for about 3 to 8 days. The severity of illness broadly correlates with upper respiratory tract viral levels. Constitutional symptoms with influenza are due in part to the release of pro-inflammatory cytokines and chemokines. Levels of interferon (IFN-α and IFN-ϒ), tumor necrosis factor (TNF-α), interleukins and chemokines (IL-1β, IL-6, IL-8, IL-10, MCP-10, MIP-1α and MIP-1β) are increased in nasal secretions, and IFN, IL-6, and TNF-α are increased in blood in human influenza. The tissue tropism of a strain of influenza virus depends, among other factors, on a combination of susceptibility of its HA to be cleaved by, and tissue availability of proteases with specificity to cleave it, thus rendering the virus infectious.[28] Extra-pulmonary dissemination of virus has been uncommonly documented in humans, but systemic spread is a regular feature of highly pathogenic avian viruses in chickens and sometimes in rodents or other mammalian hosts. Serum and secretory antibodies directed to HA and NA appear about 10 days after infection. Protection against reinfection by the homologous strain is durable following natural infection and is correlated with serum and nasal neutralizing antibody levels, principally directed against HA. Vaccine-induced protection may last for up to 2 to 3 years against homotypic virus. Infection also induces cell-mediated immunity, which is detectable 3 to 6 days after infection and seems to be important for recovery.[29] Cytotoxic T-lymphocyte responses against internal proteins may provide some degree of heterosubtypic immunity.

Clinical Features

After an incubation period of one to two days, classic influenza presents with fever, chills, malaise, headache, myalgia, and prostration. It is also frequently accompanied by a nonproductive cough, sore throat, and moderate rhinorrhea. While sub-sternal pain may worsen along with a sore throat, hoarseness, and cough, systemic issues typically persist three to five days. Asthenia and cough frequently last for two weeks or more. At first, respiratory symptoms may be slight or nonexistent, particularly in the elderly or young children. The main symptoms in elderly people who are weak may be lassitude, lethargy, disorientation, low grade fever, and occasionally gastrointestinal issues. While influenza C usually results in colds or bronchitis, influenza B is usually milder than influenza A.[27] Aside from these common symptoms, influenza can also cause vomiting, diarrhea, croup (laryngotracheobronchitis), unexplained fever, and neurological symptoms in young children. Subclinical influenza virus infections can account for up to 50% of adult cases.[27] Numerous viral respiratory disorders, such as otitis media, sinusitis, tracheobronchitis, pneumonia, and, in younger children, bronchiolitis and croup, are brought on by influenza. Relapses of fever, chest pain, and cough should be suspected of secondary bacterial infections, particularly pneumonia caused by Staphylococcus aureus, Streptococcus pneumoniae, and Haemophilus influenzae. These infections are common sequelae.[27] Meningococcal infections that are invasive are also linked to influenza. The additional issues include flare-ups of asthma, congestive heart failure, and chronic bronchitis. Myocarditis, arthritis, meningoencephalitis, polyneuritis, myocarditis, disseminated intravascular coagulation, myositis, and myoglobinuric renal failure are rare diseases that occur after influenza. Reye's syndrome occurs in less than 1 in 100,000 cases of influenza in people under the age of 18 who have taken salicylates. Pregnant women, immunocompromised hosts, and HIV-positive patients are particularly susceptible to severe disease and its consequences.[27]

Diagnosis

Clinicians and epidemiologists often use clinical and epidemiologic data to diagnose influenza. Outside of season, a heightened index of suspicion and laboratory tests are required, especially in isolated, rare cases or inexplicable outbreaks of febrile respiratory disease. Viral isolation from respiratory specimens is still the accepted method and can be performed in a variety of cell types, including PRMK, MDCK, and LLC-MK2.27 By hemadsorption with guinea pig erythrocytes, the virus can be found in cell cultures either before or after the cytopathic effect (CPE) becomes apparent. In nearly all positive samples, blind hemadsorption is positive three days after inoculation.[27] Immunofluorescence using

type-specific antisera or hemagglutination inhibition can be used to confirm isolates. Additionally, it can make a diagnosis in one to two days. Immunofluorescence of pathogens on monolayers of MDCK cells injected using centrifugation (shell-vial).[30] A variety of methods (such as immunofluorescence [IF] and enzyme immunoassay [EIA]) can be used to directly detect conserved influenza antigens (M or NP) in clinical samples, and a number of point-of-care kits are commercially available with turnaround times of 15 to 30 minutes. A commercial assay relies on the identification of NA activity specific to influenza. These tests' sensitivity ranges from 90% in infants to 50% to 70% in adults, depending on the kind of sample and length of sickness.[27] With the added benefit of identifying non-infectious viral genomes, a variety of reverse transcription–polymerase chain reaction (RT-PCR) assay formats have been employed to identify influenza A and B RNAs in clinical samples.[27] Even though RT-PCR takes longer to complete than commercial quick antigen detection kits, it may be less expensive—especially in impoverished nations. Assays that offer quick, very sensitive quantitative detection of influenza A and B have been developed thanks to real-time RT-PCR.[31,32] Because these tests are simultaneously quick, extremely sensitive, quantitative, and amenable to being employed in multiplex format—which may include probes for numerous distinct respiratory pathogens—they have a great deal of potential to replace other approaches.[32] Nevertheless, most laboratories in developing countries still cannot afford the prices. Numerous procedures can be used to retrospectively perform a serologic diagnosis of influenza utilizing paired acute and convalescent serum, mostly for serologic survey purposes.[27]

Treatment

M2 ion channel blockers such as amantadine and rimantadine prevent influenza A virus replication during the uncoating stage.[27] Treatment with either medication might shorten the length of influenza sickness in adults with uncomplicated influenza A by about one to two days if initiated early, within 48 hours of the onset of symptoms. This applies to persons without underlying medical conditions. Whereas rimantadine undergoes substantial metabolism following absorption and fewer than 10% of the dosage is eliminated unchanged in the urine, amantadine is eliminated in its undisturbed form from the urine. Only half the dose is required for elderly people to reach comparable plasma levels. Amantadine or rimantadine adverse effects can include upset stomach and have impact on the central nervous system. Amantadine is more likely to cause central nervous system (CNS) intolerance, which can cause agitation, psychosis, seizures, and coma in severe cases. When stopped, mild side effects such as nausea, anorexia, dry mouth, anxiety, and insomnia might be resolved. Amantadine and rimantadine are available as 10-mg/mL syrup and 100-mg tablets. For people over 65, a dose of 100 mg twice daily is advised (patients under 65 should take 100 mg daily). A dose of 5 mg/kg/day (maximum 150 mg/day) of rimantadine has been recommended for children under the age of ten.[27] Dose reductions proportional to the creatinine clearance (ClCr) are suggested for patients with renal insufficiency (amantadine for ClCr <60 to 80 mL/min/1.73 m2; rimantadine for ClCr <10 to 20 mL/min/1.73 m2). About one-third of patients receiving treatment develop influenza viruses resistant to amantadine-rimantadine; these viruses can spread to close contacts and produce the common flu sickness. These medications become useless when resistance develops spontaneously, as it has in several recent human isolates of the H5N1 virus.[27] By obstructing the active site of the enzyme responsible for cleaving sialic acid, the neuraminidase inhibitors zanamivir and oseltamivir suppress influenza A and B viruses. This prevents the viruses from escaping from infected cells and from spreading throughout the respiratory system.[33] Inhaled zanamivir (10 mg twice day for 5 days) lowers illness by 1 to 2.5 days in adults and children over 5 years of age. It also reduces the need for antibiotics by 40% for lower respiratory problems. Although zanamivir is usually well tolerated, it can sporadically cause bronchospasm, especially in people who already have an underlying respiratory condition or the flu.[27] Oseltamivir (75 mg taken twice daily for five days) decreases the intensity of the sickness, the amount of time it takes to resume normal activities, and the proportion of adult problems that require hospitalization and antibiotic prescriptions by almost 50%. Oseltamivir decreases the prevalence of otitis media and, as a result, the need for antibiotic prescriptions in children aged 1 to 12. Mild to moderate nausea or vomiting are examples of side effects. There is no need to modify the dosage of neuraminidase inhibitors for older patients.[27] Resistance emergence is rare with both medications, but a recent study of kids on oseltamivir treatment found drug-resistant viruses in 18% of the patients, frequently in

connection with prolonged viral excretion. This study also demonstrated that kids can still spread viruses even after five days of treatment.[34] Antipyretic-analgesic medications can be used to treat fever and pains brought on by influenza. Given its link to Reye's syndrome, aspirin should be avoided.

Prevention and Control

The two ways to prevent influenza are by immunizing against live-attenuated or formalin-inactivated multivalent influenza viruses and by administering influenza virus A chemoprophylaxis. The World Health Organization (WHO) surveillance network selects the influenza viruses most likely to circulate in the upcoming influenza season, and the influenza vaccine, which is administered prior to the influenza season, currently contains one strain of influenza B and two strains of the influenza A subtypes, H3N2 and H1N1.[27,35] In healthy children and adults, the inactivated vaccination has a about 70% to 90% efficiency in preventing disease.[35] Additionally, it lowers mortality and hospitalizations linked to influenza in elderly and high-risk individuals. The Centers for Disease Control and Prevention (CDC) advise vaccinating people who are 50 years of age or older, live in assisted living facilities, have children or adults with long-term respiratory or cardiovascular disease, including asthma, are chronically ill with diabetes mellitus, renal dysfunction, or hemoglobinopathies, are immunosuppressed patients, including those with HIV infection, have children and adolescents on long-term aspirin therapy who may develop post influenza Reye's syndrome, are pregnant women during the flu season, have children between the ages of 6 and 23 months, and are among those who can infect people at high risk, including healthcare providers and people who live with those at-risk individuals, cruise ship workers, service providers, unvaccinated visitors to regions where influenza may be prevalent (such as the tropics, the southern hemisphere between April and September), and tourists traveling in sizable organized travel groups are among the groups that fall into this category. Furthermore, the vaccination is made available to everyone who wants to lower their risk of contracting influenza.[27,35] The inactivated vaccine is safe to use during pregnancy but should be avoided in people who have a history of egg allergies. It should be given as a single intramuscular (IM) injection immediately before the influenza season (two doses in previously unimmunized children <9 years of age).[35] A thorough evaluation of the safety and effectiveness of vaccines in children has revealed a good safety profile and an efficacy rate of 77% to 91% in children aged 1 to 15. Although immunization of household contacts and caregivers should lower the risk of influenza infection in these high-risk children, inactivated vaccine is not currently advised for children under 6 months of age. vaccinations can be administered intranasally using live-attenuated vaccinations or inactivated for healthy individuals between the ages of 5 and 49 who are not in close contact with immunocompromised patients.[35] Recently, the influenza inactivated vaccine—whose composition is based on influenza viruses circulating in the southern hemisphere—was released in several tropical regions of the world. The vaccination is administered before the onset of the influenza season, which typically occurs in southern hemisphere nations between May and July. Annual immunization campaigns against respiratory infections have decreased hospitalizations and mortality rates among the elderly in South America.[36] The results of ongoing surveillance already demonstrate that while developing influenza vaccines with compositions more suitable for South America, consideration should be given to regional differences in circulating influenza virus strains.[37] In addition to being highly tolerated, genetically stable, and seldom transmissible, live-attenuated, cold-adapted vaccinations given intranasally also have the benefit of eliciting local secretory immunoglobulin A (IgA) responses. It could be necessary to give young children two doses due to possible component interference.[27] After receiving a license in 2003, this vaccine is now available to healthy individuals between the ages of 5 and 49 in the United States. This includes those who wish to avoid influenza as well as those who are in close contact with high-risk groups.[35] This vaccination is not advised for people who have hemoglobinopathies, diabetes, or other underlying medical conditions; people who are receiving immunosuppressive therapies; people with known or suspected immunodeficiency diseases; children or adolescents taking aspirin or other salicylates; people with a history of Guillain-Barré syndrome; pregnant women; and people who have previously experienced egg hypersensitivity.[35] The cold-adapted trivalent influenza vaccination has been shown in several studies to offer protection against drift variant strains and is extremely effective (92% in phase 3) in preventing culture-confirmed

influenza in healthy youngsters. Generally speaking, the effectiveness of inactivated vaccines is similar to that of young to middle-aged persons.[35] Additional experimental methods have been investigated in the creation of influenza vaccines, such as recombinant HA generated in insect cells, virosomes containing glycoproteins on their surface, M2 protein conjugated with the core of the hepatitis B virus, and bare DNA encoding the nucleoprotein or HA of influenza viruses.[27] European approvals for cell culture-based vaccines (MDCK, Vero) may provide a substitute for the drawbacks of the existing egg-grown vaccinations. Reverse genetics has been utilized to quickly generate candidate vaccines against viruses that could pose a pandemic hazard. Amantadine and rimantadine are 70% to 90% effective in preventing influenza A during outbreaks and are licensed for use. Amantadine or rimantadine may be used as prophylaxis for individuals who are immunocompromised, elderly individuals who have not received vaccinations, patients in long-term care facilities where outbreaks are occurring, individuals who are unable to obtain vaccinations, and those who received a vaccine strain that differs from the outbreak strain. Prophylaxis should begin as soon as feasible at dosages comparable to those used for therapy and be sustained for a minimum of two weeks, or one week after the epidemic ends.[35] Influenza mutations resistant to amantadine and rimantadine Up to 30% of treated individuals had a virus, which may be linked to medication prophylactic failure.[34] Although only oseltamivir (75 mg twice daily) has been licensed for this indication in the US, both oseltamivir and inhaled zanamivir (10 mg/dose twice day) are more than 80% effective in preventing influenza during epidemics.[27,35] Antiviral medications, particularly neuraminidase inhibitors, may be able to prevent hospitalizations and lower respiratory problems associated with influenza pandemics in the future by lowering the risk of person-to-person transmission. Still, supply constraints44 provide a significant challenge. Thus, it is crucial to take into account regulations to guarantee a sufficient supply of these medications as well as guidelines to make the most use of those that are available.[22]

Conclusion

Infection with influenza A virus is the most frequent and severe type, and typically found in humans. It spreads quickly and affects people in a wide geographic area in a short period of time, causing pathology ranging from moderate to severe. The influenza A virus is mostly spread by wild aquatic birds and other animal species, including pigs, ferrets, horses, seals, whales, mink, giant anteaters, cats, and dogs. The influenza B and C viruses mostly affect humans and have a fairly narrow host range. The influenza virus acquires the potential to spread globally through a process known as "genetic shift," which involves the complete regrowth of surface antigen and a slow-moving genetic alteration caused by mutations that enable the virus to effectively adapt to the human population. Increased seasonal influenza vaccination rates are anticipated to significantly lower the disease burden in our country and improve population readiness in the event of a pandemic. By following the most recent ACIP recommendations and seizing every chance to discuss the value of yearly vaccination with students, caregivers, and staff, school nurses can contribute to an increase in the rates of influenza vaccination. In addition to providing support, school nurses and their medical colleagues may ensure that they receive their annual vaccinations on time. While research on the epidemiology of influenza infection has been conducted for a number of years, several aspects of the disease's spread remain poorly understood. To improve understanding of the pathophysiology and transmission of influenza viruses, this article summarizes key virological, epidemiological, and clinical characteristics.

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Information for Author(s)

A. Manuscript submission

Authors must submit electronic version in MS Word and two hard copies of the manuscript with a 'Cover letter' with sequences and contributions as well as signatures of all authors (a sample is given below) to the Editor-in-Chief via e-mail (jmomc2015@gmail.com, jmomc@monnomch.edu.bd) or surface mail or by hand to the address on right:

Editor-in-Chief
Journal of Monno Medical College
Office of the Principal
Monno Medical College
Monno City, Gilondo
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To
The Editor-in-Chief
Journal of Monno Medical College (JMoMC)
Monno City, Gilondo, Manikganj-1800, BANGLADESH

Subject: **Submission of manuscript** for Original Article (OA)/Brief Communication (BC)/ Letter to Editor (LE) / Case Report (CR)/ Review Article (RA)/ Others

Dear Sir,
I/we the following author(s) am/are submitting a soft copy in MS word and 2 hard copies of my/our manuscript for OA /BC /LE /CR /RA /Other with the tile: _____
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for publication in the upcoming issue of JMoMC.

I/we ensure that the manuscript has NOT been published in or has been accepted or has been submitted for publication in any other medical/dental journal at home and abroad.

I/we ensure that the manuscript has been seen and approved by all authors and bear responsibility for all pieces of information included in the manuscript and am/are ready to handle any legal issues entailed thereof.

I/we also ensure that following are the authors with their sequences by authorship criteria for the study/manuscript, endorsed by signatures of all authors and none of the individuals fulfilling authorship criteria has been omitted.

Sequence	Author Name	Author signature against contribution of authorship criteria			
		(1)	(2)	(3)	(4)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					

Authorship criteria:

(1) Substantial contributions to conception or design of the work, or acquisition, analysis or interpretation of data for the work; AND
(2) Drafting the work or revising it critically for important intellectual content; AND
(3) Final approval of the version to be published; AND
(4) Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

B. Manuscript preparation for JMoMC

B.1. For manuscript preparation, the Journal of Monno Medical College (JMoMC) encourages authors to follow recommendations by the International Committee for Medical Journal Editors (ICMJE) (https://www.icmje.org/recommendations/).

B.2. Brief guidelines of manuscript preparation for JMoMC:

B.2.1. For Original Research articles- - Limit within 4,500 words including up to 40 references, up to 6 tables and figures, notes and titles- that corresponds to a maximum of 5 printed pages of the JMoMC. Divide the text into IMRAD (Introduction, Methods, Results and Discussion). However, authors can also add subheadings within these sections to further organize the contents.

Following are general formats of manuscript sections for all study designs and manuscript formats.

i. **Title page-** Includes the article title, author information (full names of all authors with study-time affiliations), any disclaimers, source of support, word count and number of tables and figures.
Article title- Provides a clear description of the total article with no more than 40 characters including letters and spaces. The title should include key words that will make electronic retrieval of the article sensitive and specific.
Author information- Include full names of the authors with name of the department(s) and institution(s) or organization(s) where the work has been completed (to be attributed).
Provide full contact information, including land/surface mail, e-mail address and telephone number of the corresponding author.
Disclaimers- Include a statement that views expressed in the submitted article are his/her/their own and not an official position of the institution or funder.
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Word count- Provide word counts for abstract and the text excluding acknowledgements, tables, figure legends and references.
Number of tables and figures- Provide to ensure that all tables and figures are actually included with the manuscript.

ii. ***Abstract-*** The JMoMC requires 'structured abstract' within 250 words for manuscripts of Original research, Systematic reviews and Meta-analyses providing Background, Objectives, Methodology, Results and Conclusion of the study. Ensure that the abstract accurately reflect the content of the article and be careful that information in the abstract do not differ from that in the text.

iii. ***Introduction-*** Provide a context or background for the study mentioning the nature of the problem (research question) and its significance. Cite only strictly pertinent references and do not include data or conclusions from the work being reported. Take care that all key words of the title have been elaborated from recent previous works and no important work has been omitted. State specific purpose or research objective of, or hypothesis tested by the study or observation.

iv. ***Methods-***The JMoMC names this section as 'Methodology' and includes clarity about why and how the study was done with sufficient details to facilitate reproducibility. Give details about any funding that helped to conduct the research. Should include a statement that the research was approved by an independent local or national review body (i.e., Ethics committee or Institutional review board). Describe statistical methods with enough detail to enable knowledgeable reader to judge and verify reported results.

v. ***Results-*** Present results in logical sequence in the text, tables and figures, giving the most important findings first. Do NOT repeat all the data in the table or figures in the text- emphasize or summarize only the important observations. Provide data on all primary and secondary outcomes identified in the Methods section. Give numeric results not only

as 'derivatives' (e.g., percentages) but also as 'absolute' numbers from which the derivatives were calculated. Restrict tables and figures to those required to explain the argument. Use graphs as an alternative to tables with many entries- do NOT duplicate data in tables and graphs. Avoid non-technical use o f technical terms in statistics (e.g., 'random', 'normal', 'significant', 'sample' etc). Separate reporting of data by demographic variables like age, sex etc.

vi. ***Discussion-*** Begin by briefly summarizing main findings and explore possible mechanisms or explanations for these findings. Emphasize new and important aspects of the study. State limitations of the study and explore implications for the findings of the study for future research and for clinical practice or policy. Discuss influence or association of variables on the findings and limitations of the data. Do NOT repeat in detail the data or other information given in other parts of the manuscript. Link conclusions with goals of the study, but avoid unqualified statements and conclusions not adequately supported by the data. Avoid claiming priority or alluding to work that has not been completed. State new hypothesis when warranted, but label them clearly.

vii. ***References-*** Provide direct references to original research sources whenever possible. Designate references to papers accepted but not yet published as 'in press' or 'forthcoming'. Avoid citing a 'personal communication' unless it is essential, in which case mention name of the person and date of communication in parenthesis in the text. Accuracy of all reference citations are not checked by editors- authors are responsible for checking that none of the references cite retracted articles. Number references consecutively in the order in which they are first mentioned in the text. Identify references in texts, tables and legends by Arabic numerals in parenthesis (do NOT superscript them). Abbreviate titles of the journals according to the style used for MEDLINE (www.ncbi.nlm.nih.gov/nlmcatalog/journals).

Style and format- Follow NLM style (previous Vancouver style) with examples in webpage (www.nlm.nih.gov/bsd/uniform_requirements.html) or detailed in NLM's Citing Medicine, 2nd edition (www.ncbi.nlm.nih.gov/books/NBK7256/).

viii. ***Tables-*** Prepare tables according to standard requirements. Include tables after 'Reference' section to supplement and not to duplicate the text in 'Methodology' or 'Results' sections. Number tables consecutively in the order of their first citation in text and provide a title for each. Title of the table should be short but self-explanatory, containing information that allows readers to understand the table's content without going back to the text. Be sure that each table is cited in the text. Give each column a short or an abbreviated heading. Place explanatory matter in footnotes, not in the heading. Explain all non-standard abbreviations in footnotes and use symbols to explain information, if needed. For using data from another published or unpublished source, obtain permission and acknowledge that source fully.

ix. ***Illustrations (Figures)-*** Should be either professionally drawn and photographed or submitted as photographic quality digital prints. For Radiological and other clinical/ diagnostic images as well as pictures of pathology specimens or photomicrographs, send high-resolution photographic image files. Figures should be made as self-explanatory as possible. Ensure titles and detailed explanations belong in the legends- not on the illustrations (figures) themselves. Number figures consecutively in the order as they been cited in the text. If a figure has been published previously, acknowledge the original source and submit written permission from the copyright holder to reproduce it. In the manuscript, legends for illustrations should be on a separate page, with Arabic numerals corresponding to illustrations.

x. ***Units of measurement-*** Measurements of length, height, weight and volume should be in metric units (meter, kilogram or litre) or their decimal multiples. Temperatures should be in Celsius. Blood pressures should be in millimeters of Mercury.

xi. ***Abbreviations and symbols-*** Use only standard abbreviations. Avoid abbreviations in the 'Title' of the manuscript. The spelled-out abbreviation followed by the abbreviation in parenthesis should be used on first mention, unless the abbreviation is a standard unit of measurement.

B.2.2. For Case Reports- Limit within 2,500 words including up to 30 references and up to 4 tables and figures- corresponding a maximum of 3 printed pages of the JMoMC. Divide text into an abstract, an introduction, the case presentation, discussion and conclusion. For using identifiable pictures of patients, provide patient's informed consent for this publication, which includes his/her awareness of possible consequences after publication.

B.2.3. For Reviews- Limit within 6,000 words including up to 110 references and up to 6 tables and figures. Divide text into an abstract, an introduction that outlines the main themes, brief subheadings and/or an outline of important unresolved questions.

B.2.4. For Letters to Editor- Limit within 1,000 words including up to 5 references and up to 2 tables and figures- that corresponds to 1 printed page of the JMoMC.

C. Manuscripts management for JMoMC

C.1. Manuscript receive and management: Manuscripts are received throughout the year and a submitted manuscript is usually published and posted to the author within a highest of 9-months of submission. However, this timeline may be prolonged in cases of: (a) bad submission time (3-months before publication dateline, unless requested); (b) bad preparation (not followed appropriately the JMoMC requirements), (c) bad responses (failing to respond within set timeline and response is inadequate).

C.2. Stages and timelines of Management

C.2.1. Stage 1: Editorial Scanning (usually completed in 1st month of submission)

a. Received papers are entered into receive register giving an ID and acknowledged;
b. Editorial scanning- checked for appropriateness, integrity and plagiarism;
c. Primary author response- sent to corresponding author for primary response.

C.2.2. Stage 2: Peer Review (usually completed in 2nd month of submission)

a. Processed for Peer reviews (select Peer(s), sent to reviewers with timeline);
b. Sent to corresponding author for responses with a timeline;
c. Cross-check by Editorial staff for accommodation of the review comments.

C.2.3. Stage 3: Decision of Acceptance/ Rejection (usually completed within 3rd month of submission)

a. Information of 'Acceptance'/ 'Rejection' communicated with the corresponding author;
b. Accepted papers are processed for Pre-Press version and submitted to Printing Press;
c. Decisions of rejections of the submissions are made in cases of serious violation of publication ethics including plagiarism, allegations of misconduct pre- and post-publication, authorship dispute, undisclosed conflict(s) of interest, research misconduct (fabricated study and data falsification), unethical practice during research, and duplicate publication.

(2) ***Stage 4:*** Publication (usually within 6th month of submission)

a. Printed hard copies are distributed soon after publication (in no cost currently) to the faculty members of MoMC, Libraries of the BMDC-registered Medical/ Dental institutions in Bangladesh and the authors of the publications;

b. ***Usually 3-***copies of the published issue are sent for the authors of a publication to the address of communication of the corresponding author.