

ASSESSMENT OF RISK FACTORS OF THE PATIENTS WITH LATERAL EPICONDYLITIS

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Abstract

Background: Lateral epicondylitis, is prevalent in the world of sports; however, this injury still causes confusion among healthcare professionals. Numerous studies have evaluated treatment options, but few have taken into consideration the extent to which tennis players, themselves, understand this ailment.

Objectives: To identify the risk factors associated with lateral epicondylitis.

Materials and methods: An observational case control study design was carried out among 120 patients attended at outdoor Department of Physical Medicine and Rehabilitation, BSMMU, Dhaka from April 2018 to march 2019. Sixty (60) patients with lateral epicondylitis as case group and another 60 patients without lateral epicondylitis as control group. Data was collected using a structured interviewer- administered questionnaire, enquiring about demographic data and details of risk factors.

Result: The mean age was found 39.4:6.3 years in case group and 36.97.4 years in control group. Twenty- seven (45.0%) patients had more than 2 hours of use hand in case group and 12(20.0%) in control group. More than half (53.3%) patients had moderate VAS scale in case group and 9(15.0%) in control group, Nine (15.0%) patients were found past history of recurrent injury in case group and not found in control group. The difference was statistically significant ($p < 0.05$) between two groups. Patients having use hand more than 2 hours 3.273 (95% CI 1.453% to 7.36%) times more likely to developed lateral epicondylitis.

Conclusion: Use of hand with repetitive wrist extension more than 2 hours was significantly associated with lateral epicondylitis.

Key words: Lateral epicondylitis, risk factors.

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Introduction

Lateral epicondylitis is the condition characterized by pain and tenderness over the lateral epicondyle of the elbow (or, more accurately the bony insertion of the common

extensor tendon) is a common complain among tennis players but even more common is non-players who perform similar activities involving forceful repetitive wrist extension. It is the extensor carpi radialis tendon (which

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automatically extends the wrist when grip) which is pathological in tennis elbow. Tennis elbow also called lateral epicondylitis, epicondylosis, epicondylgia or tendinopathy. This disorder was first described by Runge in 1873 and the term tennis elbow was coined in 1883 by Major.

Lateral epicondylitis is a major arm disorder with an estimated prevalence of 0.7-4.0% in the general population. Lateral epicondylitis is the result of overuse of the wrist extensor muscles, leading inflammation or irritation of the tendon insertion! The prevalence of lateral epicondylitis in workers whose job requires repetitive work ranges from 1.3% to 12.2% and the prevalence of lateral epicondylitis 1-3% in the general population and 7% in manual workers. Microvascular damage has been histologically identified in lateral epicondylitis and hence, conditions that cause damage such as diabetes mellitus and tobacco smoking may be associated factors. Diabetes mellitus has been associated with upper limb musculoskeletal disorders in other studies other conditions such as obesity and rheumatoid arthritis have been independently linked with lateral epicondylitis Lateral epicondylitis is one of the causes of elbow pain which number increasing worldwide and is associated with significant pain and disability incidence and prevalence of LE rise in our country also. The prevalence of LE in Bangladesh seen to be increasing due to poor working condition, heavy physical labor and occupational hazards. This will ultimately create higher clinical and socioeconomic burden to the population and national economy. By conducting this research, it is expected that some of these factors can be identified to minimize the cost treatment, morbidity and moreover physical and psychological distress. Ascertain of the risk factors of lateral epicondylitis gives us evidence by which we take necessary preventive measure to manage this condition as well as to minimize the sufferings of this condition. Identification of these factors supplements policy development and infrastructure modification, utilizing agronomical design methods.

The identification of the risk factors of lateral epicondylitis can help to act as preventive

measure to lessen the suffering of community people as a whole. Other Health professional will get update knowledge about factors which causing lateral epicondylitis. By this knowledge also mass of population will be benefited.

Bangladesh is a developing country with huge population & very limited resources. So, it is quite difficult to manage such a huge number of patients with lateral epicondylitis with our existing resources and management system. So, the study was conducted to identify with the risk factors of lateral epicondylitis for Bangladeshi people.

Materials and methods

It is an Observational case control study which was done in the department of Physical Medicine and Rehabilitation, BSMMU, Dhaka and patients with LE diagnosed by history and clinical findings. Controls were taken without lateral epicondylitis during the time of data collection, from all corner of the country attended BSMMU outdoor department for comprehensive management.

For the study 120 (60 Cases and 60 Controls) patients (irrespective of sexes) were selected After taking informed written consent, detail history and physical examination of each patient were performed and recorded and treated (and a pretest data form was filled for every patient) Sample was collected during the period of April 2018 to March 2019:

Selection criteria: Patients were selected according to the inclusion and exclusion criteria given below Inclusion criteria for case

- Patients with lateral epicondylitis diagnosed clinically who was attending in Physical Medicine and Rehabilitation outdoor department for treatment as a case
- Both male and female was same priorities.
- Age 20-50 years.

Inclusion criteria for control

- Patients without lateral epicondylitis diagnosed clinically were considered as control
- Both male and female was same priorities
- Age 20-50 years.

Exclusion criteria for case

- Patients with other co-morbidities associated diseases like referred pain from cervical to elbow
- Subject who was cognitive problem.
- Mentally challenged people.

Exclusion criteria for control

- Patients with other co-morbidities associated diseases like referred pain from cervical to elbow
- Subject who was cognitive problem.
- Mentally challenged people

Sampling method: Sampling method was taken purposive as per convenience.

Research instruments

Data was collected by semi-structured interviewer questionnaire Research instruments were prepared by using the selected variables according to objectives. Questionnaire was pretested and necessary modification was done and finalized before collection of data. All the patients and controls were recruited as per inclusion and exclusion criteria who came to BSMMU for treatment or as attendants. The relevant socio-demographic characteristics, risk factors as well as family history was recorded.

Data collection procedure:

Patient of lateral epicondylitis (Case) and controls (without lateral epicondylitis) fulfilling the selection criteria were enrolled. Perspectives of the study were explained to the respondents and informed consent was taken from each respondent. Data was collected by researcher by face-to-face interview and medical record and recorded in a semi structured questionnaire.

Data processing and data analysis:

Statistical analysis of the study was done by Statistical Package for Social Science (SPSS) for Windows version 23. The mean values were calculated for continuous variables. The quantitative observations were indicated by frequencies and percentages, Chi-Square test was used to analyze the categorical variables, shown with cross tabulation. Student t-test was used for continuous variables, Univariate and Multivariate analysis was used for risk factors

of lateral epicondylitis. P values <0.05 was considered as statistically significant.

Result

An observational case-control study was carried out among a number of total 120 patients were collected samples were divided into two groups according to 60 patients with lateral spondylitis as cases and another 60 patients without lateral epicondylitis as controls. All relevant information was analyzed using SPSS (version 23) for windows.

It was observed that more than half (51.7%) patients were male in case group and 27(45.0%) patients in control group. Age in case and control group were 39.4 ± 6.3 and 36.9 ± 7.4 respectively. This study observed that majority (43.3%) patients were housewives in case group and 28(46.7%) patients in control group. This study observed that 7(11.7%) patients were Day labor in case group and 01 (1.7%) patients in control group. The difference was statistically significant ($p < 0.05$) between case and control groups (obtained by chi square test) (Table II), Study found that mean weight lifting by the hand was found 9.3 ± 5.7 kg in case group and 9.3 ± 4.1 kg in control groups The difference was not statistically significant ($p > 0.05$) between two groups (obtained by unpaired t-test) (Table III). It was observed that 27(45.09%) patients had more than 2 hours of use hand in case group and 12(20.0%) in control group. The difference was statistically significant ($p < 0.05$) between two groups (obtained by chi square test) (Figure 3:). Pain VAS scale of the study patients, it was observed that 32(53.3%) patients had moderate VAS scale in case group and 9(15.0%) in control group. The difference was statistically significant ($p < 0.05$) between two groups (obtained by chi square test) (Figure 4). Regarding dominant hand of the study patients, it was observed that 54(90.0%) patients was found right of dominant hand in case group and 55(91.7%) in control group. The difference was not statistically significant ($p > 0.05$) between two groups (obtained by chi square test) (Table VI). In this study it was observed that 9(15.0%) patients were found past history of recurrent injury in case group and not found in control group. The difference was statistically

significant ($p < 0.05$) between two groups (obtained by chi square test) (Table VIII). In univariable analysis, patients having use of hand more than 2 hours 3.273 (95% CI 1.453% to 7.369%) times more likely to developed lateral epicondylitis which was significantly associated with lateral epicondylitis (Table IX).

Table-I

Distribution of the study patients by age (n=120)

Age (years)	Case group (n=60)		Control group (n=60)		P value
	N	%	n	%	
d"30	7	11.7	12	20.0	
31-40	29	48.3	30	50.0	0.049
>40	24	40.0	18	30.0	
Mean±SD	39.4 ±6.3		36.9±7.4		
Range (min-max)	28 -50		22-50		

P value reached from unpaired t-test

Table I shows age distribution of the study patients, it was observed that almost half (48.3%) patients were belonged to age 31-40 years in case group and 30(50.0%) in control group. The mean age was found 39.4±6.3 years in case group and 36.9±7.4 years in control group. The mean age difference was statistically significant ($p < 0.05$) between two groups.

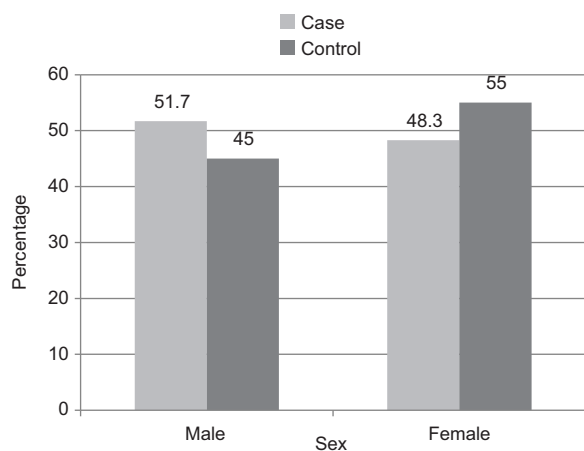


Figure 1: Bar diagram showing sex distribution of the study patients (n=120)

p value =0.465

P value reached from chi square test

Figure 1 shows sex of the study patients, it was observed that more than half (51.7%) patients were male in case group and 27(45.0%) patients in control group. The difference was not statistically significant ($p > 0.05$) between two groups.

Table-II

Distribution of the study patients according to occupational status (n=120)

Occupational status	Case group (n=60)		Control group (n=60)		P value
	N	%	n	%	
Farmer	2	3.3	0	0.0	
Garment worker	3	5.0	1	1.7	
Driver	2	3.3	0	0.0	
Businessman	4	6.7	13	21.7	
Day labor	7	11.7	1	1.7	0.017
House wife	26	43.3	28	46.7	
Teaching	0	0.0	2	3.3	
Unemployment	0	0.0	2	3.3	
Others	16	26.7	13	21.7	

P value reached from chi square test

Table II shows occupational status of the study patients, it was observed that majority (43.3%) patients were housewives in case group and 28(46.7%) patients in control group. The difference was statistically significant ($p < 0.05$) between two groups.

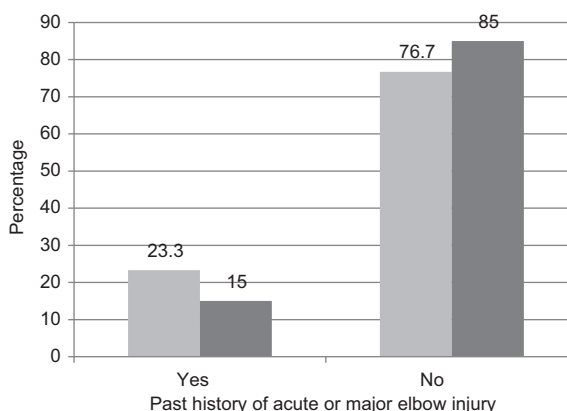


Figure 2: Bar diagram showing past history of acute or major elbow injury of the study patients (n=120)

P value=0.246

P value reached from chi square test

Figure 2 shows past history of acute or major elbow injury of the study patients, it was observed that 14(23.3%) patients was found past history of acute or major elbow injury in case group and 9(15.0%) patients in control group. The difference was not statistically significant ($p>0.05$) between two groups.

Table-III

Weight lifting by the hand of the study patients (n=120)

	Case group (n=60)		Control group (n=60)		P value
	Mean	±SD	Mean	±SD	
Weight lifting by the hand (Kg)	9.3	±5.7	9.3	±4.1	1.00
Range (min-max)	3.0	-30.0	3.0	20.0	

P value reached from unpaired t-test

Table III shows weight lifting by the hand of the study patients, it was observed that mean weight lifting by the hand was found 9.3±5.7 kg in case group and 9.3±4.1 kg in control group. The difference was not statistically significant ($p>0.05$) between two groups.

Table-IV

Past medical history of the study patients (n=120)

Past medical history	Case group (n=60)		Control group (n=60)		P value
	N	%	n	%	
DM	6	10.0	11	18.3	0.191
Hypertension	10	16.7	3	5.0	0.040
Previous elbow injury	11	18.3	4	6.7	0.053
Steroid injection	5	8.3	0	0.0	0.029

P value reached from chi square test

Table IV shows past medical history of the study patients, it was observed that 10(16.7%) patients had hypertension in case group and 3(5.0%) in control group. Five (8.3%) patients had steroid injection in case group and not found in control group Which were statistically significant ($p<0.05$) but other past medical history was not significant ($p>.05$) between two groups.

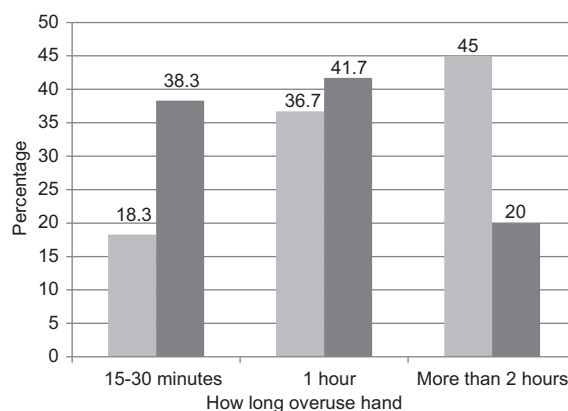


Figure 3: Bar diagram showing how long overuse hand of the study patients (n=120)

p value= 0.006
P value reached from chi square test

Figure 3 shows how long overuse hand of the study patients, it was observed that 27(45.0%) patients had more than 2 hours of overuse hand in case group and 12(20.0%) in control group. The difference was statistically significant ($p<0.05$) between two groups.

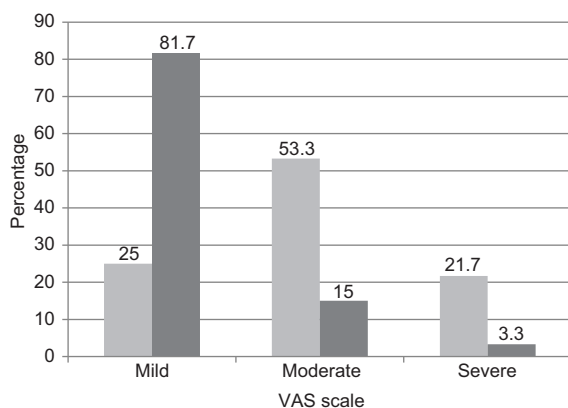


Figure 4: Bar diagram showing type of pain on VAS scale of the study patients (n=120)

p value= 0.001
P value reached from chi square test

Figure 4 shows pain VAS scale of the study patients, it was observed that 32(53.3%) patients had moderate VAS scale in case group and 9(15.0%) in control group. The difference was statistically significant ($p<0.05$) between two groups.

Table-V

Smoking of the study patients (n=120)

Smoking	Case group (n=60)		Control group (n=60)		P value
	N	%	n	%	
Never smoker	36	60.0	41	68.3	0.631
Ex-smoker	16	26.7	13	21.7	
Current smoking	8	13.3	6	10.0	

P value reached from chi square test

Table V shows smoking of the study patients, it was observed that 16(26.7%) patients was found ex-smoker in case group and 13(21.7%) in control group. The difference was not statistically significant (p>0.05) between two groups.

Table-VI

Dominant hand of the study patients (n=120)

Dominant hand	Case group (n=60)		Control group (n=60)		P value
	N	%	n	%	
Right	54	90.0	55	91.7	0.752
Left	6	10.0	5	8.3	

P value reached from chi square test

Table VI shows dominant hand of the study patients, it was observed that 54(90.0%) patients was found right of dominant hand in

Table-IX

Risk factors analysis for lateral epicondylitis (univariable regression models) (n=120)

	Adjusted OR	95% CI		P Value
		Lower	Upper	
Age (>40 years)	1.556	0.730	3.313	0.252
Male	1.307	0.637	2.678	0.465
Day labor	7.792	0.928	65.433	0.059
Past history of acute or major elbow injury	1.725	0.682	4.360	0.249
Weight lifting by the hand (>10 Kg)	0.667	0.323	1.374	0.272
DM	0.495	0.170	1.439	0.196
Hypertension	3.800	0.990	14.584	0.052
Previous elbow injury	3.143	0.940	10.507	0.063
Steroid injection	0.176	0.001	0.282	0.999
Overuse hand (more than 2 hours)	3.273	1.453	7.369	0.004
VAS scale (Severe)	8.021	1.724	37.236	0.008
Smoking (Current smoking)	1.385	0.450	4.265	0.571
Dominant hand (Right)	0.818	0.236	2.841	0.752
When do you notice the pain (During work)	2.122	1.019	4.422	0.078
Recurrent injury	0.190	0.001	0.651	0.999

Univariable logistic regression analysis was performed

In univariable analysis, patients having more than 2 hours over use hand 3.273 (95% CI 1.453% to 7.369%) times more likely to developed lateral epicondylitis..

case group and 55(91.7%) in control group. The difference was not statistically significant (p>0.05) between two groups.

Table-VII

When do you notice the pain of the study patients (n=120)

When do you notice the pain	Case group (n=60)		Control group (n=60)		P value
	N	%	n	%	
During work	32	53.3	22	36.7	0.184
After work	21	35.0	28	46.7	
During rest	7	11.7	10	16.7	

P value reached from chi square test

Table VII shows when do you notice the pain of the study patients, it was observed that 32(53.3%) patients had notice the pain by during work in case group and 22(36.7%) in control group. The difference was not statistically significant (p>0.05) between two groups.

Table-VIII

Recurrent injury of the study patients (n=120)

Recurrent injury	Case group (n=60)		Control group (n=60)		P value
	N	%	n	%	
Yes	9	15.0	0	0.0	0.001
No	51	85.0	60	100.0	

P value reached from chi square test

Table VIII shows recurrent injury of the study patients, it was observed that 9(15.0%) patients were found recurrent injury in case group and not found in control group. The difference was statistically significant ($p < 0.05$) between two groups.

Discussion

This observational case control study was carried out with an aim to identify the risk factors associated with lateral epicondylitis. The present study findings were discussed and compared with previously published relevant studies.

In this study the mean age was found 39.4+-63 years in case group and more than half (51.7%) patients were male in case group. Other study showed that mean age was found 43.6+-9.8 years where male was 92.6% with tennis elbow injury group.

In this study it was observed that mean weight lifting by the hand was found 9.3+-5.7 kg in case group. The difference was not statistically significant ($p > 0.05$) between two groups. Other study has concluded that occupational physical factors such as repetitive movements of hands or wrists, handling loads heavier than 5 kg, activities demanding high hand grip forces and the use of vibrating tools were risk factors for lateral epicondylitis and medial epicondylitis.'

In this present study it was observed that 27(45.0%) patients had use hand more than 2 hours in case group. The difference was statistically significant ($p < 0.05$) between two groups. Similar result was found where lateral epicondylitis is associated with handling loads weighing 20 kg (at least 10 times/day). repetitive hand/arm movements for 2 hours per day, handling tools weighing 1 kg.

In this study it was observed that 54(90,0%) patients were found right of dominant hand in case group. Similar result was found in other study where 129 (61.7%) had tennis elbow on the right side 13-14

In this study it was observed that 32(53.3%) patients had pain by during work in case group. The difference was not statistically significant ($p > 0.05$) between two groups. A study observed 16 participants were doing pain during work

and 9 was notice pain after work in the case group.

In this study patients having use of hand more than 2 hours 3.273 (95% CI 1.453% to 7.369%) times more likely to developed lateral epicondylitis. Epicondylitis increased considerably with age, reaching an odds ratio of 11.0 for men aged 50 years and older compared to men under 30 years (8.7 for women, respectively).” Repetitive movements and forceful activities were also positively correlated with lateral epicondylitis found the relation between lateral epicondylitis and repetitive movement of elbow. The presence of repetitive movement in this study Odds ratio was 1.01 and 95% CI was 330 and 3.033. This study mentions overuse of hand in this study because the Odds ratio was 1.23 and 95% CI was 0.347 and 4.374. This means that, based on the data obtained from the sample, overuse of hand has occurred lateral epicondylitis incidence that is 1.23 times higher than light use of hand.” Handling loads >5 kg for 2 times/min at a minimum of 2 h/day (1-8 years), handling loads >20 kg for 10 times/day (1, 8 and 20 years) and working with high hand grip forces >1 h/day (1, 8 and 20 years) were positively associated with the presence of medial epicondylitis, with ORs varying between 2.2 and 2.5.”

Conclusion

In conclusion, use of hand more than 2 hours was significantly associated with lateral epicondylitis. This study suggested careful about the occupational activities during work which might be reduced the risk of Lateral Epicondylitis. Always maintain the correct working position during daily living activities and correct the use of hand which also reduces the risk of Lateral Epicondylitis.

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Conflict of interest

None

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