Original Article

Rotator cuff tendinitis and functional status of shoulder in construction workers of Lahore, Pakistan

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Objective: To determine the frequency of rotator cuff tendinitis and functional status of shoulder in construction workers of Lahore.

Methodology: This cross sectional survey was conducted on the construction workers of Lahore, Pakistan from April to June 2016 and included 194 workers selected through convenience sampling. Pain with overhead activities, positive Hawkins-Kennedy test and painful arc test were used as diagnostic criteria of rotator cuff tendinitis. Shoulder pain and disability index was used to determine the functional status of shoulder.

Results: Mean age of the participants was 50.06±8.68 years. Out of 194 construction workers, 83(42.8%) worked 6-8 hours and 111(57.3%) worked 8-12 hours. Rotator cuff tendinitis was present in 57 (29.4%) construction workers. Total mean score for shoulder pain and disability index (SPADI) was 73.82±6.5. Total mean score for disability scale was 72.81±7.27.

Conclusion: Rotator cuff tendinitis is frequent among construction workers of Lahore. It is associated with working hours of construction workers. The severity of pain and disability were high among these people. (Rawal Med J 201;43:248-251).

Keywords: Disability, occupation, rotator cuff injuries, shoulder pain, tendinopathy.

INTRODUCTION

Work related musculoskeletal disorders are common among workers involved in manual labor. Workers involved in construction are more prone to develop shoulder pathologies as compared to other occupations requiring manual labor. Work-related symptoms of shoulder have been reported among construction workers, painters, insulator and crane operators.[1]

Lower back, upper back and shoulder are the most commonly affected regions. The main reasons for pain have been shown to be lifting of heavy loads and poor working conditions.[2]

Shoulder pain has been reported by a large percentage of laborers working at construction sites.[3] It has been hypothesized that working with arms in elevated position results in degenerative changes and tears in the rotator cuff tendons. But the range of arm elevation predisposing to rotator cuff tendinitis is still unclear. Working with arms above 60 degrees of elevation leads to rotator cuff tendonitis; other studies link angles above 90 degrees of arm elevation to the degenerative changes in rotator cuff tendons.[4] The factors that compromise the integrity of the musculo-tendinous structures include vascular changes in the rotator cuff tendons, tissue tension overload and collagen disorientation and degeneration. These factors typically involve the insertion sites of the tendons and may progress to insertion-site rotator cuff tears seen most often in those older than 40 years of age.[5]

Female construction workers are more prone to physical disability because of shoulder impingement than males.[6] This issue has been studied in other countries but not in Pakistan.

The objective of the study was to determine the frequency of rotator cuff tendinitis and functional status of shoulder in construction workers of Lahore.

METHODOLOGY

This cross sectional survey was conducted after the approval from the ethical review board of Azra Naheed Medical College, Lahore. Informed consent was taken from all the participants The study was completed in 3 months duration from April to June 2016 and included 194 construction workers selected using convenience sampling technique from different construction sites of Lahore. Construction workers who were above 40 years of

age and performed overhead activities such as lifting and carrying heavy load/bricks for at least 5-6 hours per day were included in the study. Construction workers with a history of shoulder surgery or any inflammatory or systemic disease were excluded from the study.

Pain with overhead activities, positive Hawkin's Kennedy test and painful arc test were used as diagnostic criteria of rotator cuff tendinitis. The functional status of upper limb was assessed using shoulder pain and disability index (SPADI). Shoulder pain and disability index is a validated and reliable tool to assess level of shoulder pain and disability. Internal consistency for the subscales of this index has been found to be greater than 92%.[6]

Data were collected using questionnaires consisting of basic demographic questions, questions related to diagnosis of rotator cuff tendinitis and shoulder pain and disability index. Because most of the construction workers had language barrier, the questionnaires were explained and filled in for them. All collected data was analysed through SPSS version 20. Chi square test was used to determine the association between categorical variables and independent sample t test was used to determine the differences between participants having rotator cuff tendinitis and those not having it. P-value of 0.05 was considered significant.

RESULTS

Mean age of the participants was 50.06±8.68 years. Out of 194 construction workers, 83 (42.8%) worked 6-8 hours and 111(57.3%) worked 8-12 hours. Pain with overhead activities was reported by 69 (35.6%) workers. Out of 194 workers, 67 (34.5%) had painful arc and Hawkin's Kennedy test was positive in 57 (29.4%) participants. Rotator cuff tendinitis was present in 57 (29.4%) workers.

Most of the participants having rotator cuff tendinitis worked for 8-12 hours (n=40). The association of working hour with rotator cuff diagnosis was statistically significant ($p<0.05$) (Table 1). Mean age of the participants having rotator cuff tendinitis was 56.41±8.56 years. There was statistically significant difference in the age of participants with and without rotator cuff tendinitis ($p<0.05$) (Table 2).

Table 1. Difference in working hours and age of participants with and without rotator cuff tendinitis.

		Rotator cuff tendinitis		Total	P value
		Present	Absent		
Working hours	6-8	17	66	83	0.019
	8-12	40	71	111	
		57	137	194	
Age in years (Mean±SD)		56.41±8.56	47.47±7.26		.013

Table 2. Pain with overhead activity, Painful arc and Hawkins and Kennedy test (n=194).

		Frequency	Percentage
Pain with overhead activity	Yes	69	35.6
	No	125	64.4
Painful arc	Yes	67	34.5
	No	127	65.5
Hawkin' Skennedy test	Positive	57	29.4
	Negative	135	70.6

Total Mean score for pain scale was 75.44±6.49 (range 56-86). Total Mean score for disability scale was 72.81±7.27 (range 56.25-88.75). Total Mean score for shoulder pain and disability index (SPADI) was 73.82±6.5 (range56.15- 86.92).

Table 3. Responses of individual items of pain scale.

	Mean±SD*
At its worst?	8.05±.64
When lying on the involved side?	7.37±1.32
Reaching for something on a high shelf?	7.35±.80
Touching the back of your neck?	7.24±.89
Pushing with the involved arm?	7.61±.75

Table 4. Responses of individual items of disability scale.

	Mean±SD
Washing your hairs?	7.47±.709
Washing your back?	7.47±.709
Putting on an undershirt or pullover sweater?	7.56±.82
Putting on a shirt that buttons down the front?	6.28±1.82
Putting on your pants?	6.04±1.69

On individual items of pain scale the highest rated item in severity was "pain at its worst" i.e. followed by "pushing with the involved arm", i.e. Mean±SD=8.05±0.64 and Mean±SD=7.61±0.75, respectively (Table 3). On individual items of

disability scale the highest rated items in severity was "placing on object on a high shelf" followed by "putting on an undershirt or pullover sweater" Mean±SD=7.81±0.64 and Mean±SD=7.56± SD=1.82, respectively (Table 4).

DISCUSSION

Findings of this study show that rotator cuff tendinitis was present in 29.4% participants. However, 12 out of 194 construction workers reported pain on overhead activities without rotator cuff tendinitis. Working hours had significant association with the presence of rotator cuff tendinitis. Moreover, there was significant difference in mean age of the participants with and without rotator cuff tendinitis. The results on SPADI, showing the functional status of shoulder, was noted on two subscales i.e. pain scale and disability scale. The mean score for pain scale was 75.43±6.49, mean score for disability scale was 72.80±7.27 and mean score of SPADI was 73.82±6.49.

Rotator cuff tendinopathy is the most common cause of shoulder pain. An occupational history may reveal heavy lifting or repetitive movements, especially above shoulder level.[6]

Ekpenyong et al[7] found relationship between threats and the rate of work related musculoskeletal disorder in construction workers. This study presents further evidence to the presented literature on the relationship between workers and workplace issues and the dominance of work related musculoskeletal disorders.

Pain on elevation of the arm is a common symptom of various shoulder disorders, and consequently, work above shoulder level may provoke pain. Relationship was found between forceful exertion a high level of static contractions, prolonged static loads and extreme posture, as well as combinations of these factors.[8] Phelan et al[9] reported a high incidence of musculoskeletal disorder in construction sector. It is hypothesised that work on ladder would result in greater muscle loading demand, increased level of discomfort and reduced performance due to restriction in posture and repetitive overhead work.[9]

Age has been found to be more strongly associated with rotator cuff syndrome than with shoulder pain without rotator cuff syndrome for both genders.[10] Rosenbaum et al[11] have reported that rotator cuff syndrome and low back pain were common in Latino workers and badly affected long-term health and contributes to occupational health discrepancy. Alipour et al[11] verified the results of psychosocial and physical causes of neck and shoulder pain in automobile manufacturing worker in low to middle income country as compared to relative youth. Silverstein et al[12] studied the work-related psychosocial and physical work load associated with rotator cuff syndrome among active workers and concluded that long duration of shoulder flexion and forceful exertion in job were significant risk factor for RCS.

The main limitation of our study was the language barrier. The construction workers could not understand English and the Urdu version of the SPADI was not available, so the questions were explained to the participants and the questionnaires were filled in for them.

The main strength of this study is that this issue has not been previously studied in our geographical zone.

CONCLUSION

Rotator cuff tendinitis is frequent among construction workers of Lahore. Rotator cuff tendinitis is associated with working hours of construction workers. The level of severity of pain and disability were high among those who had rotator cuff tendinitis. Further interventional research is recommended for the improvement of functional status of shoulder in our study population.

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Analysis and interpretation of the data: Sarah Ehsan, Hira Riaz
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