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Effect of Strengthening of Scapular Stabilizers in Treatment of Rounded Shoulder Posture in Dental Students

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Abstract

Objective: The objective of this study was to investigate the effects of scapular stabilizer strengthening in rounded shoulder posture in male dental students.

Method: Ethical clearance was obtained from the institutional ethical committee. Total 30 Subjects were selected as per the inclusion criteria and rests were excluded. Participants were informed about the study & written consent was taken prior to participation. In pre test assessment, subjects were assessed by scapular index. They were given strengthening exercises of scapular stabilizers as a treatment of rounded shoulder posture before they start working for 30 minutes per day, 5 days a week and were continued for 4 weeks. Post test assessment was done by using same outcome measure. Interpretation of the study was done on the basis of comparing pre test and post test assessment. Thus, the study was concluded with the help of statistical analysis by using paired 't' test.

Results: The study showed effect of strengthening of scapular stabilizers on rounded shoulder posture in dental students is ($p>0.0001$), which is extremely significant.

Conclusion: On the basis of the results of our study, it is concluded that strengthening of scapular stabilizersis extremely significant effective in correcting rounded shoulder posture among male dental students.

Keywords: *Rounded shoulder, external rotation, scapular stabilizers.*

Introduction

Rounded shoulder posture is characterized by acromion protraction in front of the line of gravity, shoulder protraction and downward rotation as well as anterior tilt[1]. According to previous study rounded shoulder is described as abduction and elevation of the scapula and a forward position of the shoulders which gives appearance of a hollow chest[2]. Posture and comparative alignment of the body is affected due to shortening and weakness of the muscles. rounded shoulder posture deform the normal relationship of the muscles and the bony structures which are correlated to each other[3]. It is described as a result of shoulders being pulled forward by over-developed, shortened or tight anterior shoulder girdle muscles such as serratus anterior, upper trapezius etc.[4, 5] Additionally, it may also caused by weakness and lengthening of the upper and middle trapezius muscle that function to pull the scapulae toward spine[1].

It has been also documented in factors which are contributing to head, shoulder as well as neck pain[6]. Trapezius and lower serratus anterior act as the prime movers for scapular upward rotation. Rhomboids and levator scapulae are downward rotators and serratus anterior, rhomboids, trapezius, levator scapulae are stabilizers of scapula[7]. Position and control of the scapula on thorax, play a critical role in the normal function of the shoulder. While doing overhead activities periscapular muscles provide stability and help in pain free mobility at shoulder complex in healthy individuals[8].

Although many technical advances have arrived in recent years, many occupational health problems

still persists in modern dentistry [9].Musculoskeletal disorders are common problem in dentists as its incidence is 63 to 93%.Some of these musculoskeletal disorders may recognized to postural abnormalities or poor posture specifically in demanding jobs such as dentistry. Prevalence of rounded shoulder posture in dentists contributes to 68.8% [10]. There are some factors which may play important role in pathogenesis and constant complaints are prolonged static and dynamic awkward postures and repetitive movements, physical conditioning [11]. Previous studies have acknowledged that these postural problems may considerably influence the social life and result in diminished working efficacy and early retirement in dentistry [12, 13].

It is found in early studies that, Stretching, McKenzie and Kendall exercises for shoulder girdle muscles are commonly used in the treatment of shoulder dysfunctions and correction of posture [1]. However there is limited research available to show any significant impact of strengthening of scapular stabilizers in treatment of rounded shoulder posture in dental students.

Strengthening exercises are defined as a systematic procedure of a muscle or muscle group lifting, lowering or controlling resistance for a relatively low number of repetitions or over a short period of time [14].These types of exercises can be performed in both closed chain as well as open chain positions. Exercise interventions aimed at strengthening of the weak that is scapular stabilizing muscles [15].The purpose of this study was to evaluate the effect of 4 weeks of strength training on rounded shoulder posture by scapular index as outcome measure. For assessing rounded shoulders, scapular index was used [16].

Method

Ethical clearance was obtained from the institutional ethical committee. Total 30 Subjects were selected as per the inclusion criteria and rest were excluded. Participants were informed about the study & written consent was taken prior to participation. In pre test assessment, subjects were assessed by scapular index. They were given strengthening of scapular stabilizers as a treatment of rounded shoulder posture before they start working. The exercises were given for 30 minutes per day, 5 days a week and was continued for 4 weeks.

Post test assessment was done by using same outcome measure. Interpretation of the study was done on the basis of comparing pre test and post test assessment. Thus, the study was concluded with the help of statistical analysis.

Sampling method: convenient sampling

Treatment

Exercise protocol for activation of scapular stabilizers:

1. Side lying external rotation with elbow 90° flexion using dumbbell.
2. Side lying external rotation with forward flexion using dumbbell.
3. Prone horizontal abduction at 90° with full external rotation using dumbbell.
4. Prone external rotation at 90° abduction and elbow at 90° using dumbbell.
5. Shoulder shrug at 0° abduction.
6. Shoulder shrug at 30° abduction.
7. Standing wall shrugs.

All the exercises were performed 30 minutes/day for 5 days/week for continuous 4 weeks.

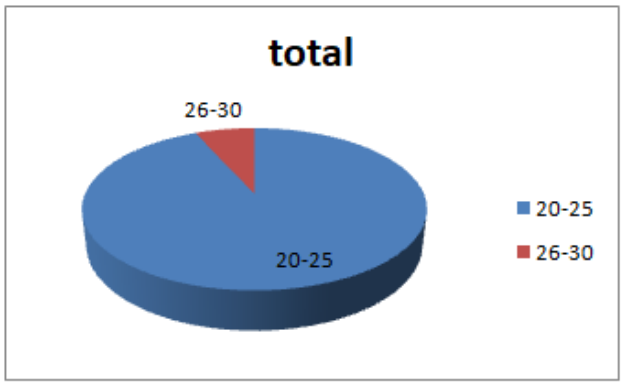
Strengthening exercises of scapular Stabilizers:

1. Scapular retraction against handheld resistance in prone
2. T to Y to W exercises
3. Scapular-clock exercise on the table
4. Scapular-clock exercises on a wall
5. Corner press-out

Subject Criteria: Total of 30 subjects, male interns and male PG dental students working more than 5 hours were selected in the study. They were aged between 20 to years. The explanations about the study procedure were given. The outcome measure was scapular index. The subjects who were not included in the study were dental students having history of diagnosed rheumatoid disorders,history of any neurological disorders,Female dental students,Trauma as well as surgery in shoulders and spine.

Results

1. Age Distribution in this Study:



Graph No. 01: Age distribution

Interpretation: This graph shows that, the age distribution in this study included is 28 in age group between 20-25 and 2 in 26-30 age group.

2. Pre and Post Comparison:

Table No. 01

Scapular Index	Pre	Post
	70.733	72.917

Chart: Pre and Post Comparison

Table No. 02

Group	PRE	POST	P value	t value	Remark
Scapular Index	70.733±2.337	72.917±2.567	<0.0001	8.297	Extremely Significant

Statistical Analysis: The outcome measure was assessed at the baseline. The collected data in this study was statistically analyzed using descriptive statistics as mean, standard deviation and percentage. The scapular index was analyzed by paired t' test. T values were calculated in the scapular index. Statistical significance was accepted for the values of ($p < 0.0001$).

Discussion

There are many technical advances arrived nowadays still many occupational health problems persists in dentists[9]. Musculoskeletal disorders are common problem in dentists as its incidence is 63 to 93%. Prevalence of rounded shoulder posture in dentists contributes to 68.8%[10]. A variety of factors which may contribute important role in pathogenesis and constant complaints are prolonged static and dynamic awkward postures and repetitive movements, physical conditioning [11].

In the current study, dental students between age group 20-30 fulfilling the inclusion criteria were included. Dental students working for more than 5 hours were included in this study.

The aim of our study was to find out the dental students having rounded shoulders and to strengthen their scapular stabilizers. Statistically the present study showed that there were significant changes in the outcome measure with significant difference seen in rounded shoulder posture mean difference (-2.183)(p value <0.0001).In our study we analyzed that the changes in scapular index,after incorporating strengthening exercises for rounded shoulder posture for 4 weeks were significant.

A study conducted to investigate the specific effects of a McKenzie exercises, Kendall exercises, self stretch exercises on rounded shoulder posture and forward head posture. In this study, rounded shoulder posture was measured by scapular index in which they found no significant differences between the groups ($p>0.05$)[1].

A study performed on intramuscular activation of scapular stabilizing muscles during push up plus and proprioceptive neuromuscular exercises. The proprioceptive neuromuscular exercises showed statistically significant higher level of lower trapezius and lower serratus anterior activities than push up plus exercises[7].

A study was done on the review of the exercises that produce optimal muscle ratios of the scapular stabilizers

on normal shoulder which included optimal positions and exercises for periscapular stability exercises. A conclusion that standing exercises tend to activate the upper trapezius at higher ratio,especially during 60-120^0 range[8].

At the end of 4 weeks in our study,it was seen that there were statistically significant difference between pre interventional and post interventional values of scapular index in rounded shoulder posture of male dental students after applying paired 't' test, concluding that there is a positive effect of strengthening of scapular stabilizers on rounded shoulder posture in dental students.

Conclusion

On the basis of the results of our study, it is concluded that strengthening of scapular stabilizersis extremely significant effective in correcting rounded shoulder posture among male dental students.

Conflicts of Interest: The authors declare that there are no conflicts of interest concerning the content of the present study.

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