Effectiveness of Structured Exercise Programme Versus Elastic Band Exercie on Individuals with Rounded Shoulder

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Abstract

Background: Rounded shoulder is a common postural abnormality in young adults due to abnormal posture adaptation while working. It may lead to decrease in thoracic mobility and increase in intradiscal pressure. In severe cases breathing problem may occur due to changes in the anterio-posterior diameter. Few studies have shown the effect of elastic band exercise on rounded shoulder to improve the postural alignment. Shoulder stabilization exercises and pectoralis minor stretching is also effective in rounded shoulder. In these study structured exercise were use to correct the rounded shoulder posture and to prevent the further complication.

Objective: To find out the effectiveness of structured exercise programme on subjects with rounded shoulder.

Material and method: In this pre-post intervention study 32 individuals with rounded shoulders were included. They were randomly divided into 2 groups with 16 individuals in each group. Group A were treated with structured exercises and Group B were treated with elastic band exercises for 4 weeks. After pre-post assessment, data was analysed with the help of appropriate statistical methods.

Results: According to the statistical analysis there is significant decrease in measurement of rounded shoulder in both Group A and Group B with p value <0.0010 and <0.0001 respectively.

Conclusion: Structured exercise and elastic band exercises both are equally effective in improving the rounded shoulders.

Keywords: *Rounded shoulders, vernier calliper, structured exercises and elastic band exercises.*

Introduction

Rounded shoulder posture is the commonest abnormal structural anomalies of the shoulder complex. Incidence of rounded shoulder posture is increasing in young adults due to repetitive work and bad posture while working.[1] It is a posture in which scapulae are elevated and the acromion processes are protruded forward to compromise the centre of gravity. It involves anterior tilt of the cervical vertebra and the posterior tilt upper thoracic vertebra which leads to shoulder protraction, turn downwards and anterior tilting.[1,4] Any changes in the skeletal alignment can indicate changes in antagonist and agonist muscles, imbalance in stretching and shortening of muscles. Inappropriate posture may aggravate the pain and soft tissue damage. Rounded shoulder increases the thoracic kyphosis which abdominal muscles may shorten and the anterior part of vertebral bodies is compressed it leads to increase in the intradiscal pressure.[1,11]

Stretching of trapezius muscle is also seen in this individual due to scapular protraction. In individuals with this condition there is shortening of pectoralis

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minor due to adaptation and through the restriction of the scapular motion.[1,12,13,14]

In this study to assess the rounded shoulder vernier calliper was used. Patient position is supine and examine the distance between plinth and the acromion process with vernier caliper. If the distance is > 2.5 cm then the individuals are included in this study.[2,19]

Posture correction programs can correct the postural alignment and help in decreasing the pain. In this study elastic band exercise and structured exercise programme was used to correct the rounded shoulders. Velocity and intensity of elastic band can be varied. It is used to improve the muscular strength, flexibility and balance control. Elastic band exercise programme consists of the following exercises – lateral pull down, shoulder external rotation, shoulder horizontal abduction exercise, a seated bend row, shoulder abduction exercise, shoulder flexion exercise, shoulder extension exercise. 1) For lateral pull down subjects held both the ends of elastic band and stretch the band in sideway direction and pull it down to their chest, abdominal muscles should be contracted while performing this exercise. 2)To perform shoulder external rotation subjects should be in standing position and their elbow in 90 degree, palm towards the ceiling. Elastic band should be stretch in outward direction while performing this, elbow should be in stable position. 3) Shoulder horizontal abduction – subjects extend their arm in front of their body at 90^0 and place the shoulder width apart. Their palm should face down and held the elastic band and slowly stretch the elastic band horizontally keep elbow straight while performing it. 4) In seated bend row, the subjects place the elastic band in such a way that their leg should be in middle of the band and stretch the band towards body. 5) shoulder abduction exercise – subjects should keep one feet on the elastic band and another end of elastic band should be hold on one hand after that stretch it out in outward direction or away from the body. 6) For the shoulder flexion exercise kept one end of elastic band under feet and another end hold in hand, perform shoulder flexion with elbow straight. 7) Shoulder extension exercise, the examiner holdd one end of elastic band and other end hold by the patients and ask them to extend the arm backward with elbow straight as much as possible.[3]

In structured exercise programme exercises consists of- chin tucks, reverse plank, cat and camel, Bhujangasana (cobra pose), wall push ups, shoulder blades squeeze. Chin tucks is exercise to improve the neck strength, flexibility and neck function. To perform it subjects should sit upright, place a finger on chin then pull the chin until the stretch is felt. Hold it for 10 seconds and repeat for 10 times, per session. Reverse plank is done in supine position subject should be in supine position place a palm on floor slightly behind hips. Press the palm and lift the hips towards ceiling, squeeze the core muscle and hold it for 5-10 seconds. To perform cat and camel subjects should be in quadripod position, slowly alternate between arching and rounding your back so that spine extend and flex alternately. In cobra position subjects should patients should be in prone lying gently lift the forehead, elbow should be straight while performing it and hold the position for 10 seconds and it will be done for 10 times. Wall push ups- patient should stand in front of wall keep one arm distance between wall and patients then palm should be rest on wall after that gently try to push the wall and come forward towards wall. Shoulder blade squeeze- in standing position patient should keep arm at sides then squeeze the shoulder blade together.[5,6,7,8]

Rounded shoulder may cause complications like increase in intradiscal pressure, decrease in thoracic mobility and in severe cases there may be breathing problems. Rounded shoulder should be corrected with the help of stretching and strengthening exercise of the scapular muscles to prevent the further complications.

Methodology

An experimental study was carried out using pre and post study design. The place of the study was Krishna institute of medical sciences, Physiotherapy department, Karad. There were 32 participants in the study with rounded shoulders.. The samples were chosen using the simple random sampling method. Participants was included as per inclusion and exclusion criteria.

Procedure

Subjects were selected for the study according to the selection criteria. Demographic data and consent form was taken from them. Included participants was divided into two groups by random sampling method. Pre and post assessment was taken before and after 4 weeks of the treatment respectively with the help of outcome measures. Group A received structured exercise programme, 15 repetitions of 3sets, 3 times per week for 4weeks. Structured exercises consist of chin tucks, reverse plank, cat and camel, Bhujangasana (cobra pose), wall push ups, shoulder blades squeeze,

shoulder shrug.

Group B received elastic band exercise consists of lateral pull down, shoulder external rotation, shoulder horizontal abduction exercise, a seated bend row, shoulder abduction exercise, shoulder flexion exercise, shoulder extension exercise. Each exercise are for 15 repetitions of 3 sets per session, 3 session per week. The effect of each treatment were assess after 4weeks using outcome measures.

The effect of exercises of the group was noted with the help of outcome measures. The experimental results was statistically analysed. The significant difference between the two groups was investigated with the unpaired t test and within the group with paired t test.

Findings

Pre and post data was analysed according to the result within group A of both right and left side and it considered extremely significant with p value <0.0010. The mean ± SD of pre assessment of left and right side is 6.36 ±1.17. Mean ± SD of post assessment of left and right side is 5.80±1.06 (fig. no. 1).

The pre and post data was also analysed according to the result within group B of both right and left side and it considered extremely significant with p value <0.0001. The mean ± SD of pre assessment of left and right side is 5.90 ±0.95. Mean ± SD of post assessment of left and right side is 5.73±0.91 (fig. no. 2).

The mean±SD of post intervention of group A is 5.80±1.06 and of group B is 5.73±0.91 (fig. no. 3)

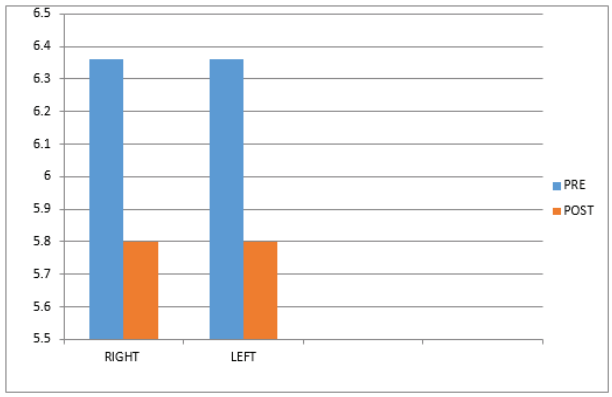

Figure no.1-Group A pre and post assessment of right and left side.

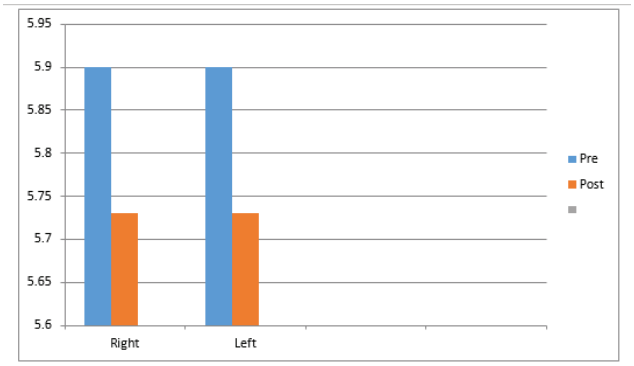

Figure no.2- Group B pre and post assessment of right and left side.

Figure no. 3- Post assessment measurement comparission between group A and group B.

Disscusion

This study aimed to investigate the effectiveness of structured exercise programme versus elastic band exercise on individuals with rounded shoulder with an objective of finding the benefits of each exercise and comparing its effects to fulfil the aim of the study.

The individuals with rounded shoulders are assessed with the help of vernier caliper. There were 32 participnts which were selected according to the inclusion and exclusion criteria and they were randomly divided into 2 groups (group A and group B) with 16 in each group. Group A was asked to perform structured exercises and group B was asked to perform elastic band exerciss. Pre and post assessment were taken prior to treatment with the help of vernier calliper. In structured exercise programme exercises included are chin tucks, reverse plank, cat and camel, Bhujangasana (cobra pose), wall push ups, shoulder blades squeeze. Elastic band exercises are lateral pull down, shoulder external rotation, shoulder horizontal abduction exercise, a seated bend row, shoulder abduction exercise, shoulder flexion exercise, shoulder extension exercise. The study was carried out for 4 weeks 5 times in a week. After the pre

and post assessment the data was statistically analysed.

The result indicated that both the exercise groups appeared to be equally effective in improving the rounded shoulder posture. Various study showed that stabilization exercises and stretching exercises are helpful in improving rounded shoulder posture[1]. According to the study by author Kim TW, An DI, Lee HY, Jeong HY, Kim DH, Sung YH.[3] which was on effects of elastic band exercise on subjects with rounded shoulder posture and forward head posture suggest that elastic band exercises are effective in improving the rounded shoulder posture.

Conclusion

On the basis of the result it is concluded that the structured exercises and elastic band exercises are equally effective in improving the posture in individuals with rounded shoulders. The impact of these exercises on the rounded shoulders needs to be taken into consideration.

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Conflict of Interest: There were no conflicts of interest in my study.

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Ethical Clearance: The Institutional Ethics committee has hereby given permission to inititate the research project titled, "Effectiveness of structured exercise programme versus elastic band exercise on individuals with rounded shoulder".

References

1. Kim MK, Lee JC, Yoo KT. The effects of shoulder stabilization exercises and pectoralis minor stretching on balance and maximal shoulder muscle strength of healthy young adults with round shoulder posture. Journal of physical therapy science. 2018;30(3):373-80.
2. Go SU, Lee BH. Effects of scapular stability exercise on shoulder stability and rehabilitative ultrasound images in office workers. Journal of physical therapy science. 2016;28(11):2999-3002.
3. Kim TW, An DI, Lee HY, Jeong HY, Kim DH, Sung YH. Effects of elastic band exercise on subjects with rounded shoulder posture and forward head posture. Journal of physical therapy science. 2016;28(6):1733-7.
4. Fathollahnejad K, Letafatkar A, Hadadnezhad M. The effect of manual therapy and stabilizing exercises on forward head and rounded shoulder postures: a six-week intervention with a one-month follow-up study. BMC musculoskeletal disorders. 2019 Dec;20(1):86.
5. Wang MY, Greendale GA, Kazadi L, Salem GJ. Yoga improves upper-extremity function and scapular posturing in persons with hyperkyphosis. Journal of yoga & physical therapy. 2012 Jun 1;2(3):117.
6. Pizzari T, Wickham J, Balster S, Ganderton C, Watson L. Modifying a shrug exercise can facilitate the upward rotator muscles of the scapula. Clinical Biomechanics. 2014 Feb 1;29(2):201-5.
7. Castelein B, Cools A, Parlevliet T, Cagnie B. Modifying the shoulder joint position during shrugging and retraction exercises alters the activation of the medial scapular muscles. Manual therapy. 2016 Feb 1;21:250-5.
8. Do YL, Nam CW, Sung YB, Kim K, Lee HY. Changes in rounded shoulder posture and forward head posture according to exercise methods. Journal of physical therapy science. 2017;29(10):1824-7.
9. Griegel-Morris P, Larson K, Mueller-Klaus K, Oatis CA. Incidence of common postural abnormalities in the cervical, shoulder, and thoracic regions and their association with pain in two age groups of healthy subjects. Physical therapy. 1992 Jun 1;72(6):425-31.
10. Chansirinukor W, Wilson D, Grimmer K, Dansie B. Effects of backpacks on students: measurement of cervical and shoulder posture. Australian Journal of physiotherapy. 2001 Jan 1;47(2):110-6.
11. Singla D, Veqar Z. Association between forward head, rounded shoulders, and increased thoracic kyphosis: a review of the literature. Journal of chiropractic medicine. 2017 Sep 1;16(3):220-9.

12. Borstad JD, Ludewig PM. Comparison of three stretches for the pectoralis minor muscle. Journal of shoulder and elbow surgery. 2006 May 1;15(3):324-30.
13. Williams PE, Goldspink G. Changes in sarcomere length and physiological properties in immobilized muscle. Journal of anatomy. 1978 Dec;127(Pt 3):459.
14. Williams PE, Goldspink G. The effect of immobilization on the longitudinal growth of striated muscle fibres. Journal of Anatomy. 1973 Oct;116(Pt 1):45.
15. Ruivo RM, Pezarat-Correia P, Carita AI. Effects of a resistance and stretching training program on forward head and protracted shoulder posture in adolescents. Journal of manipulative and physiological therapeutics. 2017 Jan 1;40(1):1-0.
16. Lynch SS, Thigpen CA, Mihalik JP, Prentice WE, Padua D. The effects of an exercise intervention on forward head and rounded shoulder postures in elite swimmers. British journal of sports medicine. 2010 Apr 1;44(5):376-81.
17. McDonnell MK, Sahrmann SA, Van Dillen L. A specific exercise program and modification of postural alignment for treatment of cervicogenic headache: a case report. Journal of Orthopaedic & Sports Physical Therapy. 2005 Jan;35(1):3-15.
18. Ludewig PM, Borstad JD. Effects of a home exercise programme on shoulder pain and functional status in construction workers. Occupational and environmental medicine. 2003 Nov 1;60(11):841-9.
19. Nijs J, Roussel N, Vermeulen K, Souvereyns G. Scapular positioning in patients with shoulder pain: a study examining the reliability and clinical importance of 3 clinical tests. Archives of physical medicine and rehabilitation. 2005 Jul 1;86(7):1349-55.