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RESEARCH ARTICLE

EFFECTS OF MYOFASCIAL TRIGGER POINT RELEASE AND THERABAND STRENGTHENING AMONG THE COLLEGIATE VOLLEY BALL PLAYERS WITH GLENOHUMERAL IMPINGEMENT

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Abstract

Background: Volley ball is one of the common sport and most of the college students choose this as a recreational game. Almost 80% of the shoulder injuries are related to spiking movement during the game. This stress the upper arm and the shoulder leading to increased risk of injuries. The common factors that results in shoulder injuries are Glenohumeral internal rotation deficit, Glenohumeral impingement syndrome, scapular dyskinesis and altered biomechanics of ball striking movement.

Aim of The Study: The present aim of the study is to identify the effectiveness of Myofascial trigger point release technique and Theraband strengthening on Glenohumeral muscles among the collegiate volley ball players with Glenohumeral impingement syndrome.

Methods: There were 30 players taken for the study and pretreatment values were taken. Myofascial trigger point therapy have been applied to supraspinatus muscle. The outcome measures used for the study is Numerical pain rating scale, range of motion and shoulder pain and disability index. The post treatment values were taken.

Results: The results of the present study were analyzed using paired‘t’ test and Wilcoxon signed rank test and the test statistics shows statistically significant improvement in the posttest p value < 0.05.

Conclusion: The present study concluded that Myofascial trigger point release and Theraband strengthening exercises shows significant improvement in pain reduction, improves range of motion and functional ability among the collegiate volley ball players.

Introduction:-

Volley ball is one of the common sport and most of the college students choose this as a recreational game. College students as they are not professional players and lack in warm up exercises and professional training, they are more prone to shoulder injuries. Almost 80% of the shoulder injuries are related to spiking movement during the game. This stress the upper arm and the shoulder leading to increased risk of injuries. The common factors that results in shoulder injuries are Glenohumeral internal rotation deficit, Glenohumeral impingement syndrome, scapular dyskinesis and altered biomechanics of ball striking movement.

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Glenohumeral impingement syndrome have become a common problem among the overhead athletes as the shoulder is subjected to overuse. This has become a repetitive strain injury as the shoulder is used above shoulder levels for a prolonged period. The rotator cuff muscles comprises of supraspinatus, infraspinatus, teres minor and subscapularis. As the supraspinatus muscle crosses close proximity under the coraco-acromial ligament, under surface of the Coracoacromial arch and the roof of the acromion, this muscle is more susceptible to impingement.

Moseley and Rothman et al reported in their previous studies about the 'critical zone' at the supraspinatus tendon where the vasculature of the muscle structure could be affected by the movement. Repetitive impingement and continuous irritation of this poorly vascularized region may lead to an inflammatory response which in turn may cause supraspinatus tendinitis. Kazutomo Miura et al stated that primary goal of spiking in volley ball is to hit the ball with a maximum velocity. Another cause of impingement among volley ball players is due to ball impact position during spiking. This can increase the internal impingement due to excessive external rotation of the Glenohumeral joint.

Charles s Neer et al states that the Glenohumeral impingement are progressive into three stages. The stage 1 consists of edema and hemorrhage which may result from overuse in most of the sports like volley ball, basketball. This is commonly observed in the age of 25 years and less than that. The stage 2 consists of fibrosis and tendinitis. This lesion is due to repeated episodes of mechanical inflammation and here the bursa may become fibrotic and thickened. This lesion is less common and is common among 25-40 years of age. The stage 3 consists tears of rotator cuff and biceps rupture with some bone changes. This is very common among age above 40 years. Here the tears of supraspinatus occurs before biceps rupture takes place. Jiu – jenq Lin et al in his study stated the adaptive patterns of movement in shoulder impingement syndrome and concluded that the serratus anterior and lower trapezius muscle be focused for strengthening.

Carel Bron, Arthur de gast et al in their study mentioned that most of the shoulder pain is due to impingement and muscle pain is always associated with myofascial pain and the presence of myofascial trigger points. So these trigger points in Glenohumeral muscles may cause weakness of the muscle and dysfunction. This in turn may affect the players' performance.

Myofascial trigger points are classified into active and latent trigger points. According to Simons et al. an active Myofascial trigger point causes a clinical pain complaint. It is always tender, prevents full lengthening of the muscle and also causes weakness of the muscle. Simons et al. defined a latent Myofascial trigger point as "clinically quiescent with respect to spontaneous pain; it is painful only when palpated. A latent myofascial trigger point may have all the other clinical characteristics of an active Myofascial trigger point and always has a taut band that increases muscle tension and restricts range of motion".

Many studies and researchers addressed the shoulder pain in general and used various manual therapy techniques. The present study is done focusing on the inhibition of myofascial active trigger points by myofascial release and strengthening the target muscles that goes for weakness and thereby promoting the shoulder mobility and improving the functional ability of the player.

Methodology:-

The study included 30 collegiate volley ball players who were selected on convenient sampling method. Informed consent obtained from each player and educated about the importance of the study. The players were selected based on the inclusion criteria and the pretreatment values have been taken. The outcome measure used in this study are numerical pain rating scale, Glenohumeral range of motion and shoulder pain and disability index.

The participants were positioned in sitting position and the shoulder is positioned to place optimum tension on the supraspinatus muscle for Myofascial trigger point palpation. The therapist stands behind the patient. The therapist first palpates the spine of scapula and the medial angle are located. The supraspinatus is palpated through the more superficial by flat palpation directly into Supraspinous fossa, by assessing along the length of the muscle. Now the therapist assess the local tenderness and referred pain. Compression applied on the palpable point along with stretching of the muscle. The compression pressure can be maintained until the release of the taut band felt by the therapist.

The static stretching applied for the supraspinatus muscle in patient sitting position by placing the forearm of the patient behind the back at the waist level for about 30 seconds hold with 5 repetitions per session on 20 seconds rest interval. The therapy was repeated once a week for 4 weeks duration.

The players were then given scapular strengthening exercises with Theraband. The exercises were given for 1-3 sets of minimum 20 repetitions. A gradual increase in resistance can be achieved by changing the color of the Theraband. The therapy is repeated for 4 week duration.

Figure 1:- MFR

Figure 2:- SCAPULA EXERCISES

Figure 3:-

Outcome Measures

1. Numerical pain rating scale
2. Goniometer
3. Shoulder pain and disability index

Results:-

The results of the present study which contains ordinal data were calculated using SPSS software. The data were analyzed using paired't' test and Wilcoxon signed rank test. The mean and standard deviation have been tabulated in the table.

The present study included 30 volley ball players and the data were analyzed before and after therapeutic interventions. The mean and standard deviations along with 'p' values are depicted here.

Numerical Pain Rating Scale

The mean and standard deviation of NPRS were 1.60 and 0. 598 with 'p' value 0.000 which shows significant improvement in reducing pain from inter group analysis 'p' value < 0.05.

External Rotation

The mean and standard deviation of EXTERNAL ROTATION were 70.00 and 3.627 with 'p' value 0.000 showing significant improvement in increasing the external rotation range of motion from intergroup analysis 'p' value < 0.05.

Internal Rotation

The mean and standard deviation of INTERNAL ROTATION were 77.50 and 2.565 with 'p' value 0.000 showing significant improvement.

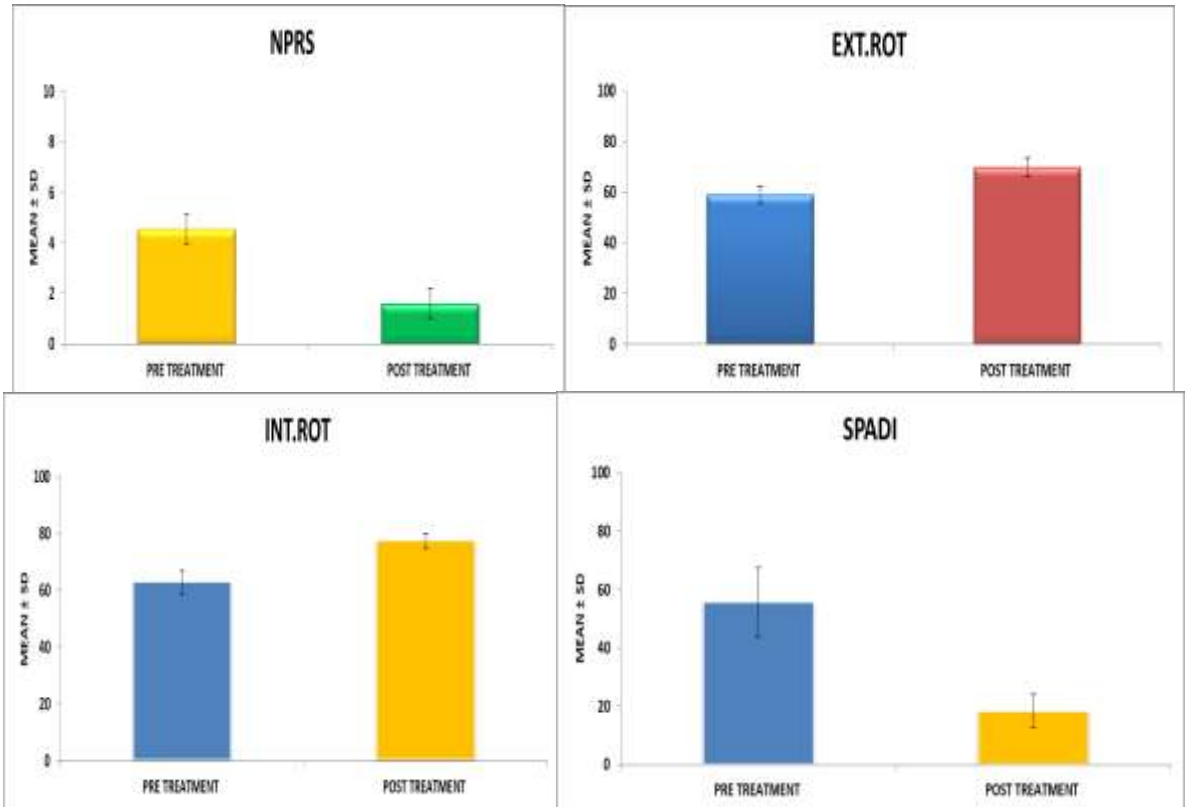
SPADI

The mean and standard deviation of SHOULDER PAIN AND DISABILITY INDEX were 18.40 and 5.619 with 'p' value 0.000 showing significant improvement in shoulder function.

Table 1:-

S.No	VARIABLES	MEAN	STANDARD DEVIATION	't' value	'p' value
01.	NPRS – pre treatment NPRS – post treatment	4.55 1.60	0.605 0.598	59.000	0.000

02.	EXT.ROT – pre treatment EXT ROT – post treatment	59.00 70.00	3.479 3.627	-23.974	0.000
03.	INT ROT – pre treatment INT ROT – post treatment	63.00 77.50	4.104 2.565	-15.218	0.000
04.	SPADI – pre treatment SPADI – post treatment	55.7635 18.4010	11.7473 5.6198	19. 245	0.000



Discussion:-

The present study included 30 players who were college level volley ball players who were selected from Vels School of physiotherapy. The study is a quasi-experimental design which focused on therapeutic intervention in a single group population who have Glenohumeral impingement.

Overuse injuries are more common among the overhead athletes and there are various factors which includes poor mobility, muscle imbalance, muscle weakness. As collegiate volley ball players are amateur who are lacking in warm ups and proper conditioning subjected to poor muscle imbalance and altered kinematics which is predisposing to injury. The results of the previous study reports that muscle imbalance and muscle weakness with low shoulder rotator muscle strength with weak shoulder external rotators which may be a predisposing factor for injury in overhead athletes.

Among the overhead athletes the volley ball skills need a high velocity shots during the spike which is always more explosive and also need much muscle strength. The injury rate may be high when this attacks or spike is done in a faulty manner. An elite athlete who practicing 16 hours – 20 hours in a week and also performs 40000 spikes in a single season. Jonathan C et al from his previous studies identified that maximal joint reaction force during spike was greater among male players.

Glenohumeral impingement is one of the common cause for shoulder pain in overhead athletes Phil page et al from his previous studies have reported from his research that functional supraspinatus impingement syndrome is more prevalent in younger patient and overhead athletes. Structural impingement may be common among older adults.

The ability of arm elevation is always correlated with scapula muscle function and Glenohumeral mobility. The coordinated scapula muscle function and the Glenohumeral muscle work together to maintain the sub acromial space. So any loss of scapular muscle work may also be one of another contributing factor for Glenohumeral impingement syndrome.

In these situations the players adapts a pattern of movement during arm elevation. Specifically, the compensatory mechanisms that elevate and upwardly rotate the scapula to increase sub acromial space have been related to compromise impaired Serratus anterior, lower trapezius muscle function due to sub acromial space. So the players may elevate and upward rotate the scapula to compensate for the reduced sub acromial space.

Carol bron et al reported from his study that one of the common cause for muscle pain is Myofascial pain which is caused by Myofascial trigger points in the fascia. These trigger points forms a tender spots in discrete taut bands of hardened muscle presenting Myofascial pain. These trigger points may be classified into active and latent trigger points. An active Myofascial trigger point will always present tenderness on the pain area and also doesn't allow the muscle to lengthen. The extensibility of the muscle is affected. This weakens the muscle and also produces a referred motor phenomenon which causes referred pain. Simons et al stated in his study that the latent trigger points produces pain only on palpation which causes severe pain due to increased muscle tension and restricts the range of motion.

There are lots of manual therapy techniques and stretching techniques that inactivates the trigger points in the muscle. The manual compression is applied on the painful trigger points and it is hold until the taut band released which is felt by the therapist. Also the patient reports decline in pain on the tender spot. The technique can be applied with stroking and stretching manipulations. Cryotherapy can be used to reduce the local inflammation reactions. Also the associated scapula muscles which is always weak can be strengthened with elastic resistance exercises.

There were less previous study that proves the use of manual therapy approach along with Theraband exercises in Myofascial pain among the collegiate volley ball players among Indian population. The present study focus on releasing the Myofascial trigger point and strengthen the associated scapular muscles and thus reducing the Glenohumeral impingement. The analyzed results reports there is statistically significant improvement among the collegiate volley ball players in reducing pain and improving the range of motion and functional ability on Glenohumeral impingement.

Conclusion:-

The present study concluded that Myofascial trigger point therapy shows significant improvement in reducing pain, improving Glenohumeral range of motion and shoulder function among the collegiate players.

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