

Original article

Effectiveness of Myofascial Release Therapy with Shoulder Taping on Subacromial Impingement Syndrome in Collegiate Basket Ball Players -A Quasi experimental Pilot study

Gandhi VM¹, Arun B^{2}, Kumar RKP³*

Abstract:

Background: Shoulder complex dysfunction can arise when any of its components goes for malfunction. Overhead athletes cause impingement in the shoulder due to subacromial impingement or anterior instability. Myofascial tightness is found to be the common causative mechanism for the shoulder pain, though the literatures were not detailed in considering the myofascial tightness and the management. **Aims & Objective:** The aim of the study was to find out the effect of myofascial release therapy with shoulder taping on subacromial impingement syndrome in collegiate basket ball players. Quasi experimental pilot study with 38 collegiate basket ball players who participated in the university tournaments were selected for the study. 19 players in control group who under myofascial therapy whereas 19 players in experimental group who underwent shoulder taping and myofascial release therapy. **Result:** The outcome measures were pain and functional ability. Pain was assessed using numerical pain rating scale, and functional ability was assessed using SPADI. Unrelated 't' test was done to evaluate the effect of the treatment for pain value between groups is 13.9 with the p value <0.05% and SPADI scale was 13.8 at the p value <0.05%. The result shows that the myofascial release therapy with shoulder taping shows more significant improvement than myofascial release therapy only. **Conclusion:** Study concludes that shoulder taping and myofascial release therapy helps in reducing pain and improvement of functional disability.

Key words: Subacromial impingement syndrome, Shoulder Taping, Myofascial release therapy, SPADI, NPR.

Bangladesh Journal of Medical Science Vol. 15 No. 03 July'16. Page : 347-351

Introduction:

Subacromial impingement syndrome affects 44% to 65% of individuals and it is one of the common diagnoses in all shoulder problems.^{1,2} Shoulder pain is the major contributor for non traumatic pain in the upper limb. Life time prevalence of the shoulder pain ranges from 7% to 36% of populations^{3,4}. Subacromial impingement syndrome was defined as the compression of the subacromial structures like rotator cuff, bursa, tendons against the acromion and the coracoacromial ligament, as the greater tuberosity passes below while elevation

of the arm⁵.

Pain and dysfunction is the commonest symptoms occurs when the shoulder is placed in positions of elevation, activity which is very common in most sporting , vocational pursuits and daily living activities. Sports and work activities that require repetitive stress especially in the overhead position often overstress the muscles, ligaments and the capsule of the shoulder. Some individuals are also predisposed structurally to problems with the shoulder that may be exacerbated by certain activity. Sports like golf, badminton, basket ball,

1. Prof V.Mohan Gandhi, HOD of Physiotherapy, Department of Physiotherapy, K.G. Hospital and Post graduate medical institute. Coimbatore. India. E-mail: mohangandhiv@kghospital.com.
2. Dr.B.Arun, Professor, K.G. College of Physiotherapy, K.G. Hospital and Post graduate medical institute. Coimbatore. India. E-mail: barunmpt@gmail.com.
3. Mr.R.K.Punitha Kumar, Asst Professor, K.G. College of Physiotherapy, K.G. Hospital and Post graduate medical institute. Coimbatore. India. E-mail: r.k.punit@gmail.com.

Corresponds to: Dr. B Arun. Professor of Physiotherapy, Department of Physiotherapy, K.G. Hospital and Post graduate medical institute. Coimbatore. 641018, Tamil Nadu, India.

E-mail: barunmpt@gmail.com

tennis, cricket and base ball has elevation as a component of sporting activities^{6,7}. 25%—60% of over head athletes / players will experience shoulder injuries^{8,9}.

Over head activities may cause forceful and repetitive nature of activities and cause microtrauma to the anterior region of the capsule, which may predispose to anterior shift of the humeral head, changing the rotational arc of the shoulder and increasing external rotation or reducing the internal rotation^{9,10}.

Myofascial syndrome leads to various neuro-muscular pathologies. Treatment attempting to stabilize muscle will also resolve the tightness in the fascia and relieve pain. Common cause of the shoulder pain is myofascial pain which is caused by myofascial trigger points. Several literatures showed that myofascial tightness or trigger point leads to musculoskeletal pain. Myofascial tightness is which cause increase muscle tension and restricted range of motion.^{31,32}

Management of the impingement of shoulder is done by various non operative procedures. Physiotherapist lays first line in the management of the shoulder problems. Various therapeutic options have been described by many authors still most are lacking with scientific background. Rehabilitation of shoulder joint invariably involves retraining of specific function of the contractile elements throughout motion and altering resting length of these components to improve length-tension relationship and indirectly improves the scapulohumeral rhythm.¹¹

Taping is the commonly used modality in the clinical setting¹². The use of tape by athletes is rapidly increasing in a therapeutic or in prophylactic reasons¹³. Myofascial release therapy is a hand on technique which is extensively used in the treatment of shoulder pain¹⁵. There are minimal studies focused on taping and myofascial release therapy. Though the extent of the myofascial therapy was briefed in articles the purpose of this study is to find out the effect of myofascial release therapy with shoulder taping on subacromial impingement syndrome in collegiate basket ball players. The study hypothesized that there will be no significant effect on myofascial release therapy with shoulder taping on subacromial impingement syndrome.

Materials and methodology:

Quasi experimental pilot study with 38 collegiate basket ball players were selected using systematic sampling method. After considering the inclusion

and exclusion criteria, players were divided into two groups with equal number of participants. Study was conducted for a period of 6 weeks. The study includes male basket ball players, age group of 18—22 years, clinical diagnosis of subacromial impingement syndrome, positive shoulder impingement test, and the study excludes any

Figure I : Taping for the shoulder



Figure II: Basic information's about the study participants

S.N	Characteristics	Percentage (%)
1	Age	
	18	13
	19	21
	20	37
	21	24
	22	5
2	Frequency of playing	
	Once a week	11
	Twice a week	18
	Thrice a week	21
	Daily	47
	Monthly (once / twice)	3
3	Pain management	
	Ice	27
	Hot	21
	Gel	21
	Medication	13
	None	5
	Others	13

The related 't' test analyses for the pre test and post test variable for the numerical pain rating scale and Unpaired 't' test value was shown in figure III. The related 't' value was 12.5 in control group and 18.3 in experimental group and the unrelated 't' value was 13.9. The Table was shown in figure III.

Figure III: Numerical Pain Rating Scale

S.N	Groups	Pre Mean	Post Mean	Related 't' value	Unrelated 't' value
1	Control Group	6.47	3.53	12.5	13.9 (p < 0.05%)
2	Experimental Group	6.39	1.06	18.3	

The related 't' test analyses for the pre test and post test variable for the SPADI and Unpaired 't' test value was shown in table II. The related 't' value was 16.6 in control group and 28.9 in experimental group and the unrelated 't' value was 13.8. Table is shown in figure IV.

Figure IV: SPADI

S.N	Groups	Pre Mean	Post Mean	Related 't' value	Unrelated 't' value
1	Control Group	79.4	63.6	16.6	13.8 (p < 0.05%)
2	Experimental Group	79.4	39.6	23.9	

Based on the statistical analysis and the myofascial release therapy with taping over the shoulder reduces the pain and improves the function of shoulder.

history of previous injury around shoulder, severe labrum or capsule tear, patient with radiating pain, severe pain around the shoulder, allergic to tape and skin infections. Block randomization process was used and randomly done 1 or 2 labeled envelopes to determine their groups allocation, the subjects done 1 of remaining 2 envelopes to and the process was repeated. A clear explanation about the study was given to every individual players and consent form was obtained from them. Both the groups underwent general advices about the shoulder. Control group receives myofascial release therapy for the shoulder whereas the experimental group receives myofascial release therapy with shoulder taping. The treatment was given alternative days. Taping was applied following the myofascial release therapy and advised to maintain it till the next visit. (approximately 2 days). The myofascial release therapy is focused on stretch of pectoralis minor and pectoralis major, and anterior part of deltoid. Taping was applied with two straps, first anchored over the anterior deltoid muscle and extended posteriorly along with the spine of scapula. Second strap anchored anterior part of deltoid over the coracoids process and extended posterior and inferomedially over the scapula which imitates the line of pull of lower trapezius. Pictorial representation of taping technique is in figure 1. The pain and the functional disability was assessed in the first visit and then on every alternate week.

For the analysis we chose the values of first week and the 6th week. The collected data was analyzed using SPSS package 19.1. Related 't' test was applied to find the difference between the pre test and post test values where as Unrelated 't' test was used to analyze the post test values between two groups. The study was approved by institutional ethical committee; all the participants were filled up the consent forms. Numerical pain rating scale used to assess the pain and the disability was evaluated through the disability index.

Result:

The demographic representations of the groups are given in figure II. Age group of the participants varies from 18 years to 22 years. 37% of players were from age of 20 yrs, 24% from 21 yrs, 21% from 19 yrs, 13% from the 18 yrs and 5% from 22 yrs. The mean age of participant is 20 ± 2 .

Frequency of playing due to pain was assessed most of the players has a knowledge on pain management using ICE, about 27% were used it, Heat was used for the management by 21%, and pain gel was used by 21% of players, medication were taken by 13% and other treatment like massage, yoga and sidda was taken by 13% and 5% doesn't take any measures for pain.

Discussion:

The purpose of the study was to find out the effect of myofascial release therapy with shoulder taping on subacromial impingement syndrome in

collegiate basket ball players. Shoulder pathology results in loss of function that increases with age. It is generally considered that effective treatment depends on understanding the mechanism of onset and identification of appropriate structures which produce the symptoms. Scapular dysfunction often results in shoulder impingement syndrome^{16, 17}. Myofascial release therapy is beneficial in reducing pain and improving the function and range of motion of shoulder. The application of myofascial release therapy helps in improvement of viscoelastic properties of the muscles. This help in improvement of normal biomechanics of the shoulder which result in pain reduction and functional improvement^{18, 19}. Studies showed that the myofascial release around the shoulder muscle proves very effective. However, because these studies focus much on MTrPs, there is no direct evidence that these interventions did have or did not have an effect on MTrPs.³¹

Taping helps in pain reduction by modulation of the pain fibers and altering the sensory input and facilitation or inhibition of the muscle activity²⁰. Taping help to stimulate the neuromuscular pathway via increased afferent feedback from cutaneous receptors and can facilitate neuromuscular response^{21, 22}. Taping stabilizes the joint act as splint and alters the length- tension relationship to create the required posture or movement pattern^{21, 23, 24}.

Scapular taping is a useful adjunct for promoting proper scapular kinetics and it should be used with other interventions²⁵. Elastic taping has positive changes in scapular motion and muscle performance²⁶. Previous studies done by variety of researchers have reported clinical benefits from use of taping for subacromial impingement syndrome. Taping theorized that it affect the muscle activity around the scapula and promotes the proprioceptive and psychological well being of the patient.^{27, 28, 29, 30}.

Conclusion:

The study concludes that the myofascial release therapy to the shoulder with taping helps in reducing pain and improvement of function in subacromial impingement syndrome. The study was directed to a particular sports group, work load, sleeping and the daily living activities are not under the control. Long term effect is not measured. The intra rater and inter rater reliability was not analyzed. This study will help future therapist include myofascial release therapy in the treatment protocol, myofascial release therapy doesn't require any kind of specialized equipment, but training is necessary for application and a clear understanding of the indications and precaution is needed for application of this technique.

Conflict of interest: None

Reference:

1. Guerra de Hoyos, J.A., Andres Martin Mdel, C., Bassas, Y., Baena d leon , E et al. Randomized trial of long term effect of acupuncture for shoulder pain. 2004. 112:289;298.
2. van der Windt D.A., Koes B.W., de Jong B.A., Bouter L.M. Shoulder disorders in general practice: incidence, patient characteristics, and management. *Ann. Rheum. Dis.* 1995, 54, 959-964.
3. Vecchio, P., Kavanagh, R., Hazleman, B.L., King, R.H. Shoulder pain in a community- based rheumatology clinic. *Br. J. Rheumatol.* 1995, 34, 440-442
4. Green, S., Buchbinder, R, Hetrick, S, Physiotherapy interventions for shoulder pain. *Cochrane data base syst rev.* 2003.
5. Neer, C, S. Impingement lesions. *Clin Orthop*, 1983, 173:70-7
6. Allingham, C. The shoulder complex. In: Zuluaga M, Briggs C, Carlisle J, et al, eds. *Sports Physiotherapy: Applied Science and Practice*. Melbourne, Australia: Churchill Livingstone. 1995, 5.357-406.
7. Altchek, D,W, Dines, D,M. Shoulder Injuries in the Throwing Athlete. *J Am Acad Orthop Surg.* 1995, 3.159- 165
8. Kibler, W,B, Safran, M. Tennis injuries. *Med Sport Sci*, 2005, 48:120-137.
9. Lo YP, Hsu YC, Chan KM. Epidemiology of shoulder impingement in upper arm sports events. *Br J Sports Med*, 1990, 24:173-177.
10. Jobe FW, Pink M. Classification and treatment of shoulder dysfunction in the overhead athlete. *J Orthop Sports Phys Ther*, 1993, 18:427-432.
11. Van der Hoeven H, Kibler WB. Shoulder injuries in tennis players. *Br J Sports Med*, 2006, 40:435-440.
12. Kneeshaw D. Shoulder taping in clinical setting. *Journal of Bodywork and Movement Therapies*. 2002, 6(1), 2-8
13. McConnell, J, Donnelly C, Hamner, S, Dunne, J, Besier, T, Effect of shoulder taping on maximal shoulder external and internal rotation range in uninjured and previously injured overhead athletes during a seated throw. *Journal of orthopedic research*, 2011, Mar(2) 1-5.
14. Brukner P, Khan K. *Clinical Sports Medicine Chapters 4 and 12*. McGrawHill Book Company, Sydney, 1997.
15. Karels C, Polling W, Bierma-Zeinstra S, Burdorf A, Verhagen, A, Koes B. Treatment of arm, neck, and/or shoulder complaints in physical therapy practice. *Spine*. 2006, 31: E584-9.
16. Brox, J, I. Regional musculoskeletal conditions: shoulder pain. 2003, *Best Pract Res Clin Rheumatol*. 2003, 17(1):33-56.
17. van der Heijden GJ. Shoulder disorders: a state-of-the-art review. *Baillieres Clin Rheumatol*. 1999, 13(2):287-309.
18. Cohen J, Gibbons R. Raymond L. The evolution of trigger point therapy, 1929-1986. *J Manip Physiol Ther*, 1998, 21: 167-72.
19. Hunter G. Specific soft tissue mobilization in the management of soft tissue dysfunction. *Man Ther*. 1998, 3: 2-11
20. Alexander CM, Stynes S, Thomas A, Lewis J, Harrison PJ. Does tape facilitate or inhibit the lower fibres of trapezius? *Man Ther*. 2003, 8:37-44
21. Parkhurst, T,M, Burnett, C,N. Injury and proprioception in the lower back. *Journal of Orthopaedic and Sport Physical Therapy*, 1994, 19(5): 282±294
22. Perla R. Frank C, Fick, G. The effect of elastic bandages on human knee proprioception in the uninjured population. *The American Journal of Sports Medicine*, 1995. 23(2): 251±255
23. Allingham C. *Shoulders 98*. Lecture notes. Australian Physiotherapy Association-sanctioned course, Sydney, Australia, 1998.
24. McConnell, J, New South Wales (Australia) Sports Physiotherapy Group lecture on Recent research on patellar taping. Australian Physiotherapy Association-sanctioned lecture, Sydney, Australia, 2000.
25. Kumar, N. , Nehru, A, Rajalakshmi, D. Effect of taping as a component of conservative treatment for subacromial impingement syndrome. *Health*, 2012, 4, 237-241.
26. Y-H hsu et al., Chena W-Y, Line H-C, Wanga T.J, Shiha, Yi-Fen. The effects of taping on scapular kinematics and muscle performance in baseball players with shoulder impingement syndrome. *Journal of Electromyography and Kinesiology* 19, 2009, 1092-1099
27. Hurrell, J. E., & Woodman, R. Diagnosis and intervention for a patient with shoulder and scapular pain. *Physical Therapy Case Reports*, 1999, 2, 175-186.
28. Host, H. H. Scapular taping in the treatment of anterior shoulder impingement. *Physical Therapy*, 1995, 75, 803-812
29. Pogliaghi, S., & Malgrati, D. A new taping technique for shoulder impingement. *Europa Medicophysica*, 1998, 34, 137-144.
30. Schmitt, L., & Snyder-Mackler, L. Role of scapular stabilisers in etiology and treatment of impingement syndrome. *Journal of Orthopaedic and Sports Physical Therapy*, 1999, 29, 31-38.
31. Hidalgo-Lozano A, Fernández-de-las-Peñas C, Alonso-Blanco C, Ge HY, Arendt-Nielsen L, Arroyo-Morales M: Muscle trigger points and pressure pain hyperalgesia in the shoulder muscles in patients with unilateral shoulder impingement: a blinded, controlled study. *Exp Brain Res* 2010, 202:915-925.
32. Simons DG, Travell JG, Simons LS: *Travell & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual*. Upper Half of Body. Volume I. 2nd edition. Baltimore, MD: Lippincott Williams & Wilkins; 1999.