



# EFFECTIVENESS OF SCAPULAR TAPING WITH ULTRASOUND THERAPY ON SHOULDER IMPINGEMENT SYNDROME: COMPARATIVE STUDY

K.Yogarajan<sup>1</sup>, S. Mercy clara<sup>2</sup> Dr. B.S. Santhosh Kanna<sup>3</sup>

<sup>1</sup>Associate Professor, college of physiotherapy, <sup>2</sup>professor, college of physiotherapy,<sup>3</sup>Hod of therapeutics, College of Physiotherapy, NIEPMD (Divyangjan) Chennai, Tamil Nadu.

(Affiliated to the Tamilnadu Dr.M.G.R.Medical university,Tamilnadu)

How to cite this article: K.Yogarajan<sup>1</sup>, Dr. B.S. Santhosh Kanna<sup>2</sup>. A study to compare Effectiveness of scapular taping with ultrasound therapy on shoulder impingement syndrome.

## Abstract

**Back ground:** Impingement syndrome is a describing as a mechanical tightness of soft tissues and impingement of supraspinatus and the long head of biceps muscle with the progression of pain is felt during extreme range of shoulder abduction and flexion. The most significant loss of functional scapula thoracic instability, thoracic muscle weakness. A stabilization program of taping techniques to normalize the scapulo humeral rhythm, reduce the pain ,corrects the function of the shoulder and reposition of the scapula.

**Aim & Objective of the study:** To compare and study to investigate the effectiveness of scapular taping with ultrasound therapy on pain and function in individuals with shoulder impingement syndrome and also find scapular taping has any added benefit and improvement in treating shoulder impingement syndrome.

**Method:** 20 males subjects with shoulder impingement syndrome participated in the experimental study, under went treatment duration of 4 weeks after receiving informed consent. They were evaluated and randomized into 2 groups,i.e experimental group receiving scapular taping along with ultrasound therapy and control group receiving ultrasound therapy only. The pre and post test values of pain and shoulder functional index questionnaire were recorded at the start of the treatment and consecutively after the end of the treatment.

**Conclusion:** The findings of the study showed that scapular taping with ultrasound therapy was more effective in reduce the pain and improvement in shoulder function in patients with shoulder impingement syndrome .scapular taping and ultrasound therapy shows better results in reposition of scapula and hence reduce the pain.

**Keywords :** Shoulder Impingement Syndrome (SIS), scapular taping, ultrasound therapy, visual analog scale, shoulder functional index questionnaire.

## Introduction

Shoulder joint is one of the most functional and rewarding joint necessary for normal daily activities, occupational performance and recreational activities.(cyriax, 1978).four joints that make up the shoulder complex move precisely, in unison, and simultaneously. The design of shoulder girdle allows for mobility of upper limb extremities. The sternoclavicular, acromioclavicular, Glenohumeral, and scapulothoracic gliding Mechanisms work together to produce these motions.

Shoulder impingement syndrome is a frequent condition that affects 7% to 34% of adults. Neer in 1982 first credited with describing the impingement sign as mechanical impingement of supraspinatus and long head of biceps underneath the acromial arch. Chard .et.al states that pain is felt during the abduction range of 80-120 degrees.

Scapula thoracic muscle weakness and relative decrease in the subacromial space due to functional scapula thoracic instability would be the underlying mechanism for the cause of impingement syndrome (kamker.et.al 1998 and kibler, 1998).

The clinical identification of shoulder impingement syndrome is pain when the arms are extended above your head, pain when lifting your arm, lowering your arm from a raised position or when reaching, pain or achiness at night , which affects your ability to sleep. Shoulder pain in commonly caused by impingement of the acromial , coracoclavicular ligament , and acromial joint over the underlying structures. The impingement is caused by the inflammation of any of the underlying structures.

The application of taping is widely used by the physical therapist in the rehabilitation and prevention of shoulder injuries(engstrom & renstrom, 1999). The purpose of the techniques is to normalize the scapula humeral rhythm, provide a low-load , prolonged duration stretch, promotes proximal scapular stability, reduces the pain and corrects the abnormal scapular position and function. Joannal et al., on the other hand, there is a significant effect on shoulder impingement syndrome with scapular, which resulted in patients ability to perform full glenohumeral flexion and abduction with out pain.

Ultrasound therapy, it is a non invasive treatment in which the device produces sound waves to penetrates deeper tissues, increasing blood flow, modify the activity of autonomous system,, relieve pain, promote circulation, enhance healing and chronic oedema.

## Aim of the study

The aim of the study is to investigate the effectiveness of scapular taping and ultrasound therapy on pain and function in individuals with shoulder impingement syndrome.

## Objectives of the study

The main objectives of the study is to find whether scapular taping has any added benefit and determine the improvement in treating anterior shoulder impingement syndrome and analysis of outcome of scapular taping as a component of physical therapy treatment of shoulder impingement syndrome in the stress to early recovery and fast return to functional activities when compared with ultrasound therapy along with conventional therapy devoid of scapular taping.

## Statement of the study

The statement of the study is that there is significant reduction in pain and improvement in function in individuals with shoulder impingement syndrome with scapular taping having an added advantage.

The results of the study if it explains scapular taping with ultrasound therapy for shoulder impingement syndrome which is better ,it will provide greater performance and significance in the selection of treatment approaches for shoulder impingement syndrome.

## Materials and Methodology

### Study design:

Pre test and post test comparative Experimental study design.

### Study setting :

Pandian multi speciality hospital, physiotherapy department, Chennai

### Study Duration:

2 months

### study sample :

A total number of 20 patients who were diagnosed as shoulder impingement syndrome by orthopaedician were selected by random sampling method and divided into 2 groups after due consideration to the inclusion and exclusion criteria.

### Criteria of selection:

#### Inclusion criteria

- Patients with 3-4 months duration of shoulder syndromes
- Sex -males
- Age group-25 to 50 years
- Unilateral condition.

## Exclusion criteria

- Any fracture around shoulder
- Hemiplegic shoulder
- Osteoporosis
- Dislocated shoulder
- Shoulder deformity
- Brachial neuralgia
- Stroke
- Parkinsonism

## Variables

- Shoulder functional index questionnaire
- Shoulder pain and restricted flexion and abduction

## Materials and tools

- Couch
- Adhesive tape
- Scissor
- Visual analogue scale
- Functional index questionnaire
- Pillow

## Interventions :

- Scapular taping
- Ultrasound therapy

## Procedure:

A total number of 20 subjects who met the inclusion criteria were recruited by simple random sampling method by obtaining consent form from the participants. After the informed consent obtained they were divided in to 2 groups- group A and group B with 10 subjects in each group.

After a brief demonstration about the procedures , group A subjects to scapular taping and ultrasound therapy for a period of 4 weeks. Group B subjects were received ultrasound therapy for a period of 4 weeks.

## Treatment Interventions:

### Taping technique:

1. Taping of supraspinatus from superior angle of the medial border of the scapula to the greater tubercle of the humerus
2. Taping of infraspinatus from the medial border of the scapula to the greater tubercle of humerus.

### Ultrasound therapy:

Ultrasound therapy for both groups A and B

20 KHz to 20000 cycles per second

Frequency of 1MHz

Continuous mode of ultrasound energy

Intensity – comfortable Limit

Duration – 15 minutes

Sessions- 20 sessions in the span of 4 weeks.

### Data analysis and results

Statistical tools are used in this study are dependent t-test and independent t-test.

The dependent t-test is used to find the statistical significance between the pretest and post test values.

The patient independent t-test is used to compare the difference between group-A and group B.

This chapter deals with the analysis and interpretation of data collected from 20 patients with shoulder impingement syndrome to find out and compare the differences in pain and function, collected data were analyzed and tabulated in the following section.

**TABLE-I**

Shows the comparative mean values, mean difference, standard deviation and paired t-test value between Pre Vs. Post test values of pain of subjects in group-A.

### GROUP-A

S.No.	variable	Improvement			Paired t-value
	pain	mean	Mean difference	Standard deviation	
1.	Pre test	6.7	4.2	0.632	21.00
2.	Post test	2.5			

Using paired t-test in the data ( $t=2.262$ ,  $DF=9$ ) the result showed the statistical significant at  $p>0.05$  level, therefore the present study indicates reduction of pain in the group-A.

**TABLE-2**

Shows the comparative mean values, mean difference, standard deviation and paired t-test value between Pre Vs. Post test values of pain of subjects in group-B.

**GROUP-B**

S.No.	Variable	Improvement			Paired t-value
	Pain	Mean	Mean difference	Standard deviation	
					15.231
1.	Pre test	7.8	2.3	0.48	
2.	Post test	5.5			

Using paired t-test in the data ( $t=2.262$ ,  $DF=9$ ) the result showed the statistical significant at  $p>0.05$  level, therefore the present study indicates reduction of pain in the group-B.

**TABLE-3**

Shows the comparative mean values mean difference, standard deviation and paired t-test value between Pre Vs. Post test values of function of subjects in group-A.

**GROUP-A**

S.No.	Variable	Improvement			Paired t-value
	Functional index questionnaire	Mean	Mean difference	Standard deviation	
					13.103
1.	Pre test	12.4	3.8	0.918	
2.	Post test	8.6			

Using paired t-test in the data ( $t=2.262$ ,  $DF=9$ ) the result showed the statistical significant at  $p>0.05$  level, therefore the present study indicates improvement in function in group-A.

**TABLE-4**

Shows the comparative mean values mean difference, standard deviation and paired t-test value between pre Vs. post test values of function of subjects in group-B.

**GROUP-B**

S.No.	Variable	Improvement			Paired t-value
	Functional index questionnaire	Mean	Mean difference	Standard deviation	
					9.012
1.	Pre test	10.2	2.1	0.737	
2.	Post test	8.1			

Using paired t-test in the data ( $t=2.262$ ,  $DF=9$ ) the result showed the statistical significant at  $p>0.05$  level, therefore the present study indicates improvement in function in group-B.

**TABLE-5**

Shows the comparative mean values, mean difference, standard deviation and unpaired t-test value between Post test of pain and function of subjects in group-A.

**GROUP-A**

S.No.	Variable group-A	Improvement			Un Paired t-value
		mean	Mean difference	Standard deviation	
1.	Pain (post)	2.5	3.9	1.609	12.745
2.	FIQ( post)	8.6			

**TABLE-6**

Shows the comparative mean values, mean difference, standard deviation and unpaired t-test value between post test of pain and function of subjects in group-B.

**GROUP-B**

S.No.	Variable group-B	Improvement			Un Paired t-value
		Mean	Mean difference	Standard deviation	
1.	Pain (post)	5.5	7.4	1.173	6.055
2.	FIQ( post)	8.1			

Table -5 and Table-6 explains that there is significant reduction in pain and improvement in function in group-A subjects than group-B subjects with shoulder impingement syndrome.

## Discussion

Based on the above study showed that combination of daily scapular taping with ultrasound therapy, which occur as a result of the breakdown of adhesions of joint space, flexibility of ligaments, and other joint structures.

Scapular taping potential to improvement of function and reduce the pain that provided a strong inhibitory stimulus through large afferent fibres at the dorsal horn of the spinal cord to block the small, diameter nociceptor input through a pain gate type mechanism by Bockrath et.al, Gifford et.al,(1995).The use of this strategy to reduce pain is supported by empirical research, and according to LEHMANN et.al, maxwell ,et.al(1992) proved that ultrasound therapy is considerably permeability of membrane in increased by

ultrasound which enhances the transfer of fluids and nutrients to the tissues and increases the extensibility of the tendons and decrease the joint stiffness.

The results of the study done on were supported by the significant reduction in pain and improvement in function brought on by scapular taping with ultrasound therapy conducted a research with 20 individuals who had shoulder impingement syndrome. The researcher aimed to change the progression of disease and shorten the length of time needed for recovery. The Findings of this study show that following the initial physiotherapy treatment, almost 90 percent of patients saw a significant improvement.

### Conclusion

According to the study findings, both groups pain and function activities of the shoulder significantly improved between pre and post measurements. Based on the findings, this study came to the conclusion that scapular taping with ultrasound therapy both repositioning the scapula will take off the pressure on the impinged structures, provide a low load, prolonged duration stretch, promotes proximal scapular stability lessen the discomfort of the shoulder. While analysing the data, we can conclude that, daily scapular taping with ultrasound therapy was superior to regime of ultrasound therapy alone in improving pain and function in shoulder impingement syndrome.

**Source of funding:** No funding was obtained for the study.

**Conflict of interest :** Nil

### REFERENCES

- 1) Bonald jose “Taping techniques principles and practice”, 3<sup>rd</sup> Ed., S.A. North pub., New York,1975
- 2) Bristol “ Rotator cuff injuries- keeping it taped”, British medical journal,2000, pp:306
- 3) Mc Connie Jenny, “Management of Shoulder pain”, Jounal of sports medicine,1998
- 4) Michael Lee “ Effects of scapular taping on scapular position and perceived pain”, journal of medicine and sciences in sports and Exercise, 2001, pp:978-993
- 5) Robert .A .donatelli, “physiotherapy of the shoulder”, Churchill Livingstone, USA, 1997
- 6) Reid David. c., “sports injury Assessment and Rehabilitation” 1<sup>st</sup> edition., Churchill Livingstone pub., New York,1992.
- 7) Merianne Bibler, “ Examining the mc Connell taping technique with respect to reliability and evaluation of scapular position, muscle activity and pain”, The university of Puget sound student physical Therapy Journal,2001
- 8) Bruckner. F.E., “ A prospective study of shoulder impingement syndrome in a high risk population”, Journal of medicine , queens land,1981.
- 9) Natarajan. M.N., “ orthopedics and traumatology” 4<sup>th</sup> Ed.,



- 10) Rose sgarletmyers “saunders., “manual of physical therapy practice” 1<sup>st</sup> Ed  
p.No : 823-825
- 11) Brain.j.Tovin, “Evaluation and treatment of shoulder”, FA Davis, London,1999
- 12) Kothari. C.R., “ Research Methodology: Methods and technique”, 2<sup>nd</sup> Ed, New  
age International (P) Ltd., New delhi,1999

