



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 9, Issue, 4(B), pp. 25634-25637, April, 2018

**International Journal of
Recent Scientific
Research**

DOI: 10.24327/IJRSR

Research Article

EFFECT OF CAPSULAR STRETCH VERSUS SLEEPER STRETCH ON PAIN, ROM AND SHOULDER FUNCTIONS IN PATIENTS WITH ADHESIVE CAPSULITIS – A COMPARATIVE STUDY

Neeti Mishra^{1*}, Anil Mishra² and Kruti Goti¹

¹SPB Physiotherapy College, Surat

²ShriRajchandra Physiotherapy College, Bardoli

DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0904.1897>

ARTICLE INFO

Article History:

Received 8th January, 2018
Received in revised form 21st
February, 2018
Accepted 05th March, 2018
Published online 28th April, 2018

Key Words:

Adhesive Capsulitis, Sleeper stretch,
Capsular stretch, SPADI, Pain, Range of
motion.

ABSTRACT

Objective: To find out the effect of capsular stretch versus Sleeper stretch on pain, ROM and shoulder functions in Adhesive capsulitis patients. **Methodology- Study design:** Pretest-Posttest experimental group design. Thirty subjects with primary adhesive capsulitis with the age group of 40 - 65 years participated in the study. Patients in Group 1 (n=15) received capsular stretch with conventional physiotherapy treatment where as patients in Group 2 (n=15) received Sleeper stretch in addition to conventional physiotherapy treatment for 5 days a week for 4 weeks. Pain, Shoulder range of motion and function (SPADI) were used as outcome measure pre and post 4 weeks. **Results:** On comparing the pain, shoulder range of motion, and SPADI, significant improvement was noted in sleeper stretch group as compare to capsular stretch. ($p < 0.05$). However, the improvement of pain, ROM, and functional score of SPADI was found to be statistically significant within the groups ($p > 0.05$). **Conclusion:** Sleeper stretch with conventional therapy has shown to be more effective for improving pain, shoulder ROM and functions in Adhesive Capsulitis patients.

Copyright © Neeti Mishra., Anil Mishra and Kruti Goti, 2018, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Adhesive Capsulitis is a commonest musculoskeletal problem affecting middle age person characterized by shoulder pain that is aggravated by movements and limitation of range of shoulder motion and daily activities¹ Adhesive capsulitis has an incidence of 3–5% in the general population and up to 20% in those with diabetes. Adhesive capsulitis, is an idiopathic disease characterized by fibrosis, decreased volume of the glenoid capsule, and progressive pain with loss of range of motion (ROM)^{1,2} Shoulder pain and stiffness are accompanied by severe disability.

Although it is generally believed to be a self-limiting condition lasting 2–3 years, some studies have reported that up to 40% of patients have persistent symptoms and stiffness beyond 3 years³. This condition therefore is a serious pathology, which is also known as “frozen shoulder” and it has three phases: Stage 1) The painful stage is characterized by the gradual onset of diffuse shoulder pain that usually lasts one to two months; Stage 2) The frozen stage is characterized by progressive loss of motion that lasts several months to a year or longer. It also

exhibits decreased capsular volume, which can be visualized with MRI, for differential diagnosis; Stage 3) The thawing stage, the final stage, is characterized by gradual improvement of range of motion over several months to years. ROM deficits may continue to be unresolved for more than 3–5 years following the onset of Adhesive capsulitis⁴.

The treatment of Adhesive Capsulitis may be either conservative or surgical. Conservative treatment includes medications, intra-articular injections, exercise programs, and physiotherapy modalities. While, joint mobilization techniques in rehabilitation programs improve the mobility of the joint and soft tissues, researchers have reported different results with regards to pain management consisting of exercises, massage, and physiotherapy modalities^{5,6}. With respect to physiotherapy modalities, a variety of interventions are used; these include heat or ice applications, ultrasound (US), interferential therapy, Transcutaneous electrical nerve stimulation (TENS), and laser therapies. The goals of exercise programs consisting of ROM, strengthening and stretching exercises, Proprioceptive Neuromuscular Facilitation (PNF), and mobilizing techniques are to relieve pain resulting from capsular contracture and improve glenohumeral ROM^{7–11}.

*Corresponding author: Neeti Mishra
SPB Physiotherapy College, Surat

To regain normal extensibility of the shoulder capsule, passive stretching of the capsule in all planes of motion by means of end range mobilization techniques is recommended, but data to use these techniques are lacking.¹²

Recently, clinicians and athletes have adopted a new stretch technique to isolate the soft tissue of the posterior aspect of shoulder. This technique is known as “Sleeper stretch”, because it is applied in side-lying position. To perform the sleeper stretch, scapular movement is restricted, and then shoulder is internally rotated to isolate the posterior soft tissue restraints.⁵ Use of Sleeper stretch is common in athletes. Various researches have been done to check the effects of this stretch in athletes having overhead activities. It is found to be effective in improving posterior shoulder range and internal rotation in these athletes.¹³.

But less research have been done on effectiveness of sleeper stretch in case of adhesive capsulitis. So present study is intended to find out the effect of Sleeper stretch on pain, shoulder range of motion and functions in adhesive capsulitis and to compare its effectiveness with capsular stretch.

METHODOLOGY

Thirty subjects with primary adhesive capsulitis with the age group of 40 - 65 years participated in the study after the approval of institutional ethical committee. The inclusion criteria were; prediagnosed case of adhesive capsulitis, sub acute and chronic stage, both male and female having at least 90 degree of shoulder abduction and elbow flexion. Subjects were excluded if they had any history of uncontrolled diabetes, recent fracture of upper limb, elbow pathology restricting range, and cervical radiculopathy. The sampling technique was purposive.

Pretest-posttest experimental group design was selected to investigate and compare the effect of Sleeper stretch and capsular stretch. Pain (vas), Shoulder range of motion (ROM) and function (SPADI) were used as an outcome measure for this study. Shoulder range of motion (Flexion, Extension, Abduction, Internal rotation, External rotation, Horizontal adduction and abduction) was measured by half circle universal goniometer. It is a reliable and valid tool to assess range of motion of joints¹⁶. Shoulder function was assessed using Shoulder Pain and Disability index (SPADI). It is a self-report questionnaire developed to measure the pain and disability associated with shoulder pathology.¹⁵ This study had been approved by Institutional Ethical Clearance (IEC) and all the subjects gave written consent prior to participation. Study was conducted at SPB, College of physiotherapy.

The subjects were allocated to two groups by tossing a coin. Group A – capsular stretch with conventional physiotherapy and Group B – sleeper stretch with conventional physiotherapy. Pre-Vas score, Pre-shoulder ROM (flexion, extension, medial and lateral rotation and abduction) and Pre- SPADI score was taken. Patients of both the groups recieved similar Conventional physiotherapy (hot pack and Codman’s exercises)¹⁷.

Group A received capsular stretch protocol, inferior and anterior capsular Stretch was held constant at the end ROM for 30 seconds and then repeated twice with 30 seconds rest

between stretching episodes.²³ Group B received sleeper’s stretch protocol. Sleeper stretch was applied in the following way. Participant’s shoulders and elbows were positioned into 90 degrees of flexion with the lateral border of the scapula positioned firmly against the treatment table. Next, the investigator passively internally rotated each participant’s shoulder by grasping the distal forearm and moving the arm towards the treatment table. Stretch was held constant at the end ROM for 30 seconds and then repeated twice with 30 seconds rest between stretching episodes¹⁸

Treatment was given for 5 days a week to both groups for 4 weeks. Total duration of the treatment was 30 min. Post test readings of ROM, VAS score and SPADI, were taken after 4 weeks.

Statistical Analysis- Data was analyzed using Statistical software version 18. An independent t-test was used to compare the difference of VAS, Shoulder ROM and SPADI score between two groups. Paired t-test was used to see those differences in each group at the end of trial. A statistical significance level was set at $p < 0.05$.

RESULT

Thirty patients of adhesive capsulitis with mean (SD) age of 52.4 in GROUP A and 52.9 in group B, participated in the study. Table 1 and 2 details the comparison of differences of shoulder range of motion, VAS Score and SPADI score after 4 weeks between two groups.

Demographic Data

Mean Age

Table 1 Showing Mean Age in Group A and B

Group A	Group B
52.4	52.9

Table 2 Comparison of difference of Mean VAS Score between group A and group B

Group A		Group B		T Test	
Mean(S.D)	Mean(S.D)	Mean(S.D)	Mean(S.D)	T Value	P Value
PRE	POST	PRE	POST	5.266(0.79322)	<0.0001
3.66(1.799)	6.466(1.0600)	2.933(2.0197)	5.3679		

Table 2 Showing Comparision of Vas Score Between Group A And Group B

Table 3 Showing Comparision of Shoulder Rom Between Group A And Group B

Rom	Groupa Mean(S.D)		Group B Mean(S.D)		T Value	P Value
	PRE	POST	PRE	POST		
FLEX	99.66(6.672)	141.66(6.69)	104.66(9.909)	140.833(5.669)	5.3379	<0.0001
EXT	24.333(8.1940)	47.6(5.539)	24.666(4.80)	47.333(4.169)	0.8874	<0.3824
ABD	100.3(8.194)	140.669(20.656)	100.33(13.9)	119.925(20.498)	5.7068	<0.0001
INT.ROT.	22.666(6.738)	39.333(18.370)	34.777(16.47)	39.25(16.642)	4.0597	<0.0004

Table 4 Showing Comparision of Spadi Score Between Group A And Group B

Spadi	Group A Mean		Group B Mean		T Test	P Value
	pre	post	pre	post		
	79.6	61.7	80.0	39.7	4.8700	<0.0001

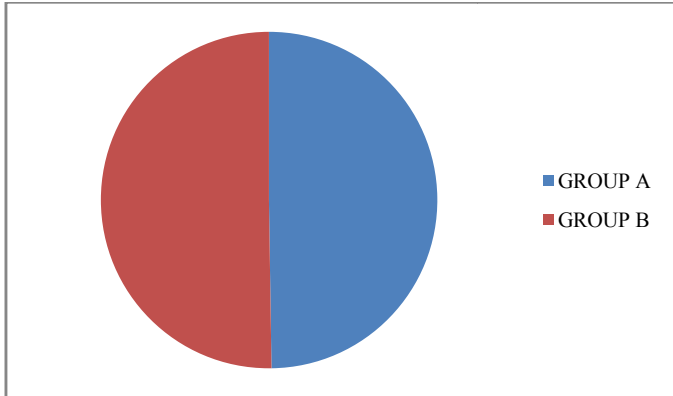


Fig 1 shows mean age values of group A and B

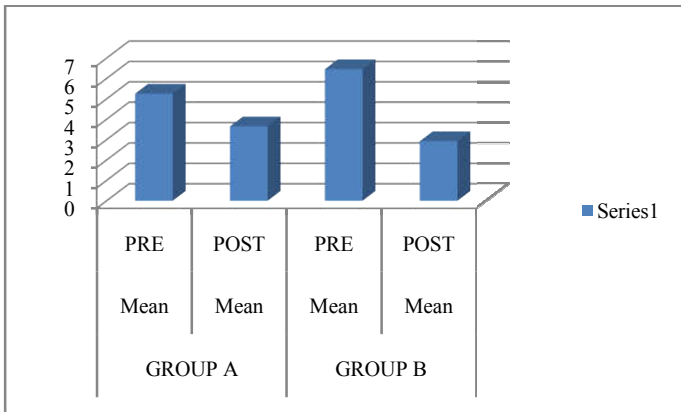


Fig 2 shows pre and post mean vas values of group A and B

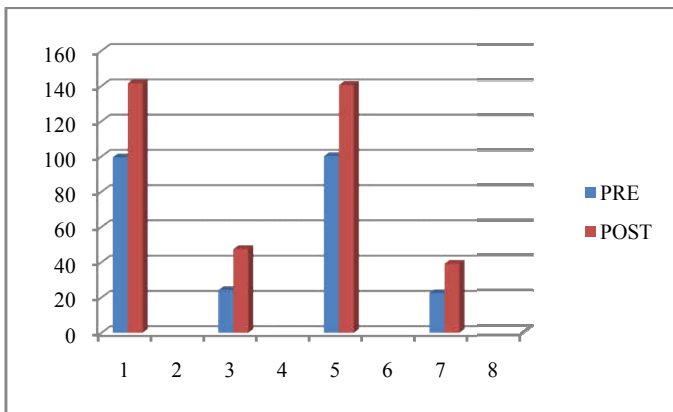


Fig 3 shows pre and post values of ROM of Flex ,Ext ,Abd and Int Rot.in group A

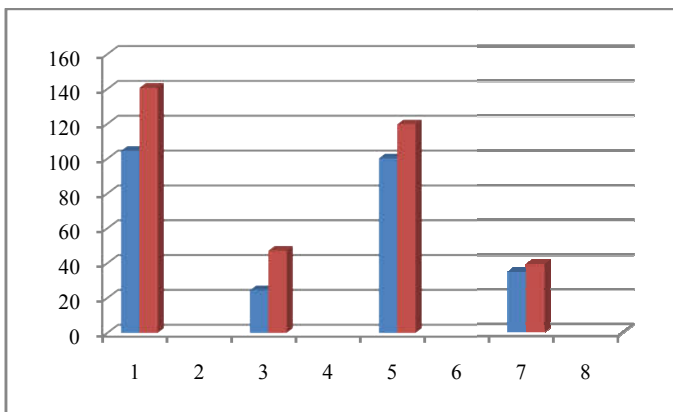


Fig 4 shows pre and post values of ROM of Flex, Ext, Abd and Int Rot.in group B

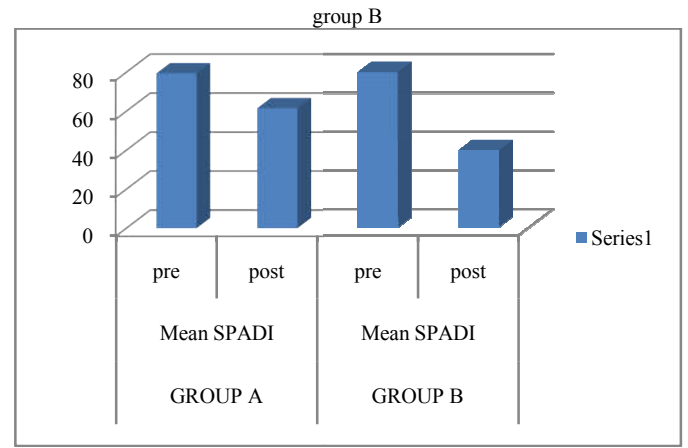


Fig 5 shows comparison of mean SPADI scores between group A and group B

DISCUSSION

The aim of present study was to compare the effect of Sleeper stretch and capsular stretch in pain, shoulder range of motion and functions in adhesive capsulitis over 4 weeks. The results of present study revealed significant improvement of flexion, extension, abduction, internal rotation, in Group B as compared to Group A ($p < 0.05$). However, both the groups showed statistically significant improvement in all the shoulder range at the end of trial ($p < 0.05$). This increase in range may be attributable to stretching of muscles and the capsule that becomes shortened because of decreased mobility and pain. Stretching gradually increase the extensibility resulting in improvement of the ranges²² When non contractile connective tissues are stretched with a low intensity prolonged stretch force, plastic deformation occurs and the length of the tissue increases. The results of study also show significant improvement in VAS Scores in both the groups but more improvement in sleeper stretch group. Codman's exercises relieve pain through gentle traction and oscillating movements and provide early motion of joint structures and synovial fluid helping improvement in ranges (Kisner C, Colby LA, 2007)¹⁹ Hot packs application to the shoulder joint helps to improve extensibility and reduce the stiffness. The viscosity of tissues may be reduced, which partly accounts for the reduction of joint stiffness that occurs with heating (Wright V *et al* 1961)²⁰ Increased collagen extensibility occurs at higher temperatures (Lehmann *et al*, 1970)²¹

There was significant difference of pre to post values of functions in SPADI in both groups, but there was more improvement in shoulder functions in group B, i.e, sleeper's stretch group. This might be attributable to reduction in pain intensity and increase in stretch ability of soft tissues. Sleeper stretch is useful in stretching the posterior tissues and is not related with pain reduction. From the above study, it is recommended to include Sleeper stretch in regular physiotherapy treatment of Adhesive capsulitis patients to improve ranges flexion, extension, internal rotation and horizontal adduction and improve shoulder functions.²²

CONCLUSION

This study concludes that Sleeper stretch with Conventional therapy was more effective than capsular stretch with conventional therapy in improving shoulder ranges of flexion,

extension, internal rotation and horizontal abduction, reducing pain and improving shoulder functions.

Limitations of the Study- Sample size was small, so its results cannot be justified over a large population and no follow up was done.

Scope of Future Research- Larger sample size can be used. Follow up of interventions can be documented after treatment is completed. Other outcome measures like overhead reach, DASH, may be used for the functional evaluation. Effect of sleeper stretch can be studied further in other shoulder conditions where posterior tightness is present. There is scope for further study in patients with uncontrolled diabetes and in patients having shoulder stiffness due to secondary reasons such as fractures.

References

1. Kingkaew Pajareya, Navaporn Chadchavalpanichaya et al Effectiveness of Physiotherapy for patients with adhesive capsulitis: *J Med Assoc Thai* 2004; 87(5):473-80
2. NeviaseerAS, HannafinJA: Adhesive capsulitis: a review of current treatment. *Am J Sports Med*, 2010, 38: 2346–2356.
3. Park SW, Lee HS, Kim JH: The effectiveness of intensive mobilization techniques combined with capsular distension for adhesive capsulitis of the shoulder. *J Phys Ther Sci*, 2014, 26: 1767–1770.
4. Dudkiewicz I, Oran A, Salai M, et al.: Idiopathic adhesive capsulitis: long-term results of conservative treatment. *IsrMed Assoc J*, 2004, 6: 524–526.
5. Jürgel J, Rannama L, Gapeyeva H, et al.: Shoulder function in patients with frozen shoulder before and after 4-weekrehabilitation. *Medicina* (Kaunas), 2005, 41: 30–38.
6. Gong WT, Park GD, Kim CS: Effects of Gong’s mobilization in the side-lying position on shoulder abduction. *J Phys Ther Sci*, 2012, 24: 307–309.
7. Bulgen DY, Binder AI, Hazleman BL, et al.: Frozen shoulder: prospective clinical study with an evaluation of three treatment regimens. *Ann Rheum Dis*, 1984, 43: 353–360.
8. Carette S, Moffet H, Tardif J, et al.: Intraarticular corticosteroids, supervised physiotherapy, or a combination of the two in the treatment of adhesive capsulitis of the shoulder: a placebo-controlled trial. *Arthritis Rheum*, 2003, 48:829–838.
9. Çelik D: Comparison of the outcomes of two different exercise programs on frozen shoulder. *Acta Orthop TraumatolTurc*, 2010, 44: 285–292.
10. Bertoft ES: Painful shoulder disorders from a physiotherapeutic view: a review of literature. *Crit Rev Phys RehabilMed*, 1999, 11: 229–277.
11. Gaspar PD, Willis FB: Adhesive capsulitis and dynamic splinting: a controlled, cohort study. *BMC Musculoskelet Disord*, 2009, 10: 111.
12. Henricus m Vermeulen, Wim R Obermann et.al. End Range Mobilization techniques in Adhesive Capsulitis of the shoulder joint: A Multiple-subject case report. *Physical Therapy*. 2000, Vol 80,no 12 ,1204-1213
13. Kevin G. Laudner , Robert C. Sipes, James T.Wilson. The Acute effect of sleeper stretch on shoulder range of motion. *Journal of athletic training* 2008:43(4); 359-363.
14. Briggs M, Closs JS: A descriptive study of the use of visual analogue scales and verbal rating scales for the assessment of postoperative pain in orthopedic patients. *J Pain Symptom Manage*, 1999, 18: 438–446.
15. Joy C MacDermid , Patty Solomon Kenneth Prkachin, The Shoulder pain and disability index demonstrates factor, construct and longitudinal validity: *BMC musculoskeletal disorders* ,2006 ,7:12
16. Cynthia C. Norkin , D.Joyce White , Measurement of joint Motion,A Guide to Goniometry, second edition,1998,54-66
17. Fusun Guler- Uysal, Erkan Kosznoglu, Comparison of the early response to two methods of rehabilitation in adhesive capsulitis: *Swiss Med Weekly* 2004 134; 353-358 .
18. Kevin G. Laudner, Robert C. Sipes, James T.Wilson. The Acute effect of sleeper stretch on shoulder range of motion. *Journal of athletic training* 2008:43(4); 359-363.
19. Kisner C, Colby LA. Therapeutic exercise: foundations and techniques. 5th Edition. F.A. Davis Co. pp282.
20. Wright V, Johns RJ. Quantitative and qualitative analysis of joint stiffness in normal subjects and in patients with connective tissue diseases. *Ann Rheum Dis* 1961; 20:36-46.
21. Lehmann JF, Masock AJ, Warren CG, Koblanski JN. Effecte of therapeutic temperatures on tendon extensibilitie. *Arch Phys Med Rehabil* 1970; 51:481-487.
22. Sule K, Rath M, Palekar TJ et al. Comparison of conventional therapy versus sleeper stretch with conventional therapy in adhesive capsulitis. *Int J Health Sci Res*. 2015; 5(11):186-192.
23. Prasanna KJ, Rajeswari R, Sivakuma VPR. Effectiveness of Scapular Proprioceptive Neuromuscular Facilitation (PNF) Techniques in Adhesive Capsulitis of the Shoulder Joint. *J Physiotherapy Res*. 2017, Vol.1 No.2:9.

How to cite this article:

Neeti Mishra et al.2018, Effect of Capsular Stretch Versus Sleeper Stretch on Pain, Rom and Shoulder Functions in Patients with Adhesive Capsulities –A comparative study. *Int J Recent Sci Res*. 9(4), pp. 25634-25637.
DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0904.1897>
