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Effect of End Range Mobilizations Versus Gong's Mobilizations of Acromioclavicular and Glenohumeral Mobilizations on Pain and Range of Motion in Subjects with Periarthritis Shoulder

P. Bhavitha[1], Dr. K. Senthil Kumar [2], Dr. C. Shanthi[3], Dr S. Raghava Krishna[4], Dr. K. Madhavi[5]

[1]MPT(Orthopaedics), College of Physiotherapy, Sri Venkateswara Institute of Medical Sciences, Tirupati 517501, Andhra Pradesh, India
Email: *bunnybhavitha42[at]gmail.com*

[2]MPT(Orthopaedics), Ph.D., Assistant professor, College of Physiotherapy, Sri Venkateswara Institute of Medical Sciences, Tirupati 517501, Andhra Pradesh, India
Email: *drkskpt9495[at]gmail.com*

[3]MPT(Orthopaedics), Ph.D., Assistant Professor, College of Physiotherapy, Sri Venkateswara Institute of Medical Sciences, Tirupati 517501, Andhra Pradesh, India
Email: *csabhisheksvims[at]gmail.com*

[4]MPT(Orthopaedics), Ph.D., Faculty, College of Physiotherapy, Sri Venkateswara Institute of Medical Sciences, Tirupati 517501, Andhra Pradesh, India
Email: *raghavasvims[at]gmail.com*

[5]MPT (Cardiovascular & Pulmonary), College of Physiotherapy, Sri Venkateswara Institute of Medical Sciences, Tirupati 517501, Andhra Pradesh, India
Email: *svimscopprincipal[at]gmail.com*

Abstract: ***Background**: Periarthritis shoulder is characterized by a slow onset of pain and a restricted range of motion (ROM) in both the active and passive movements as a result of adhesions in the Glenohumeral (GH) joint capsule. **Objective**: To find out the effect of end range mobilizations versus gongs mobilizations of acromioclavicular and glenohumeral joints on shoulder range of motion (goniometry)and shoulder pain numerical pain rating scale (NPRS scale) in subjects with periarthritis shoulder Methodology: Forty subjects [30-60 years] in two groups group A and Group B with periarthritis shoulder underwent a 4-week intervention of glenohumeral and acromioclavicular joint mobilizations [Group A] and Gongs mobilizations[Group B],ultrasound. Pain [NPRS]), and Range of motion [Goniometry], Apley's scratch test [using tape] were assessed pre- and post-treatment. **Results**: Pre- and post-intervention analysis revealed statistically significant improvements in pain, and range of motion of shoulder (P < 0.001). **Conclusion**: End range mobilizations of Acromioclavicular and glenohumeral mobilizations was more effective in reducing pain, improving shoulder range of motion and Apley's scratch test in subjects with periarthritis shoulder.*

Keywords: Periarthritis shoulder, Acromioclavicular, Glenohumeral, Gong's mobilizations, Rotator cuff muscles, NPRS, UST

1. Introduction

Periarthritis shoulder is characterized by a slow onset of pain and a restricted range of motion (ROM) in both the active and passive movements as a result of adhesions in the Glenohumeral (GH) joint capsule. Incidence shows Approximately 2% to 5% of the general population and 10% to 15% of population with diabetes are affected by periarthritis of shoulder. Prevalence, in this condition most often affects the people between 40-60 years old. Periarthritis of shoulder is categorized into primary and secondary types based on etiology. Primary periarthritis of shoulder though the exact cause is unknown, it is frequently associated with systemic conditions such as diabetes mellitus and thyroid disorders, suggesting an underlying systemic inflammatory or autoimmune component.[1] Secondary periarthritis shoulder results from trauma, surgery like Postoperative complications, especially shoulder or chest wall surgeries, can lead to the development of adhesive capsulitis. Periarthritis shoulder is characterized by three distinct stages.[2] The first stage is the freezing stage, shoulder pain during rest and activity. In the frozen stage, stiffness is the most common complaint among the patients. The final stage is the thawing stage, that presents with absence of pain and gradual return of normal ROM lasting from five to twenty-four months.[2] Periarthritis of shoulder has a clinical diagnosis which is fairly based on patient's history and examination. A limitation in capsular pattern is also observed, firstly limiting external rotation (ER), then abduction (Abd) and lastly internal rotation (IR). [3] Multiple treatment options are available for the patients of periarthritis shoulder oral medications for pain modulation with NSAIDs and corticosteroid injections, for an effective physical therapy treatment of periarthritis shoulder, movement with mobilization (MWM) Electrotherapy usually includes hot pack, ultrasound therapy, and short-wave diathermy. Ultrasound therapy is a deep heating modality that is frequently used to treat periarthritis shoulder, it produces molecular vibration, which aids in the breakdown of dense collagenous tissues inside the capsule. [4]

2. Materials

Materials used for this study: High Couch, Goniometry, ultrasound

Methods

This study was conducted at SVIMS college of physiotherapy, BIRRD HOSPITAL Tirupathi, over 6 months of period. The participants were selected through convenience sampling method with randomization into two groups Group A receive [Glenohumeral and acromioclavicular mobilizations] Group B receive [Gong's mobilizations]. The study duration was four weeks.

Inclusion Criteria and Exclusion Criteria

Study comprised male and female with age group 30-60 years and who were diagnosed with periarthritis shoulder by an orthopaedician and subjects who are willing to participate and provide written informed consent are included and Subjects with any history of trauma around the shoulder joint. Post-traumatic shoulder stiffness. Neurological disorders affecting the upper limb. Musculoskeletal conditions involving the cervical spine or shoulder joint other than periarthritis shoulder were excluded.

Treatment Procedure:

Study Design and Participant Details Forty both male and female subjects meeting the inclusion criteria, were enrolled after providing informed consent. pain was Assessed using NPRS scale and Range of motion was assessed with goniometry and Apley's scratch test using a tape method. Group A receive Acromioclavicular mobilizations participant was positioned in supine lying on the treatment couch with the affected upper limb resting comfortably by the side. A small towel was placed beneath the scapula to ensure proper positioning and relaxation of the shoulder girdle. Acromioclavicular joint. Mobilizations were performed according to Maitland Grade III and Grade IV techniques at the end of the available range of motion for 30–60 seconds, with 3 sets for each glide and a 30 seconds rest interval between sets along with Group A receives Glenohumeral joint mobilizations were performed at the end of the available physiological range using Grade III and Grade IV oscillatory movements. Oscillation duration: 30–60 seconds 3 sets for each mobilization with rest interval 30 seconds between sets in 3 sessions per week in 4 weeks (12 treatment sessions) whereas Group B receive Gong's mobilizations subject positioned in a side-lying position with the affected shoulder joint upward and shoulder abducted at 90 degrees The therapist supported the elbow with the other hand and performed shoulder medial rotation. Then, to increase ROM, oscillation at Maitland's grades 3 and 4 was served, followed by sustained stretching at grade 4 for about 7 seconds. The technique is given as two sets of 15 repetitions in each set with 5 min of rest period between the sets followed by conventional physiotherapy. The technique was applied 3 days a week for 4weeks.ultrasound therapy, before manual therapy therapeutic ultrasound was administered to both groups to reduce pain, increase soft tissue extensibility, and prepare the shoulder for mobilization. Ultrasound was delivered in continuous mode at a frequency of 1 MHz and an intensity of 1.5 W/cm² for 8 minutes using a water-soluble coupling gel over the anterior, lateral and posterior aspects of affected shoulder. [5,6,7]

Outcome Measures:

Shoulder range of motion using universal goniometry [shoulder flexion, abduction, external rotation and Apley's scratch test for functional shoulder mobility and flexibility involves touching the opposite scapula by superior and inferior movement and pain intensity was performed using NPRS scale. After completing 4 weeks of treatment pre and post-test values measurement were taken in all the subjects and data was sent for statistical analysis.

3. Statistical Analysis and Results

Statistical analysis was performed using SPSS 26, with data tabulated in Excel and evaluated using mean, standard deviation, and paired t-tests. A P value < 0.001 was considered statistically significant for pre- and post-test comparisons.

Independent Samples t-test for Difference in NPRS Score

	Group A	Group B	t-stat	P-value
Mean	4.65	2.95	7.5	0.001
SD	0.67	0.76		

Inde pendent Samples t-test for Difference in FLEXION Score

	Group A	Group B	t-stat	P-value
Mean	55.80	34.00	10.76	0.001
SD	6.65	6.16		

Independent Samples t-test for Difference in SHOULDER ABDUCTION Score

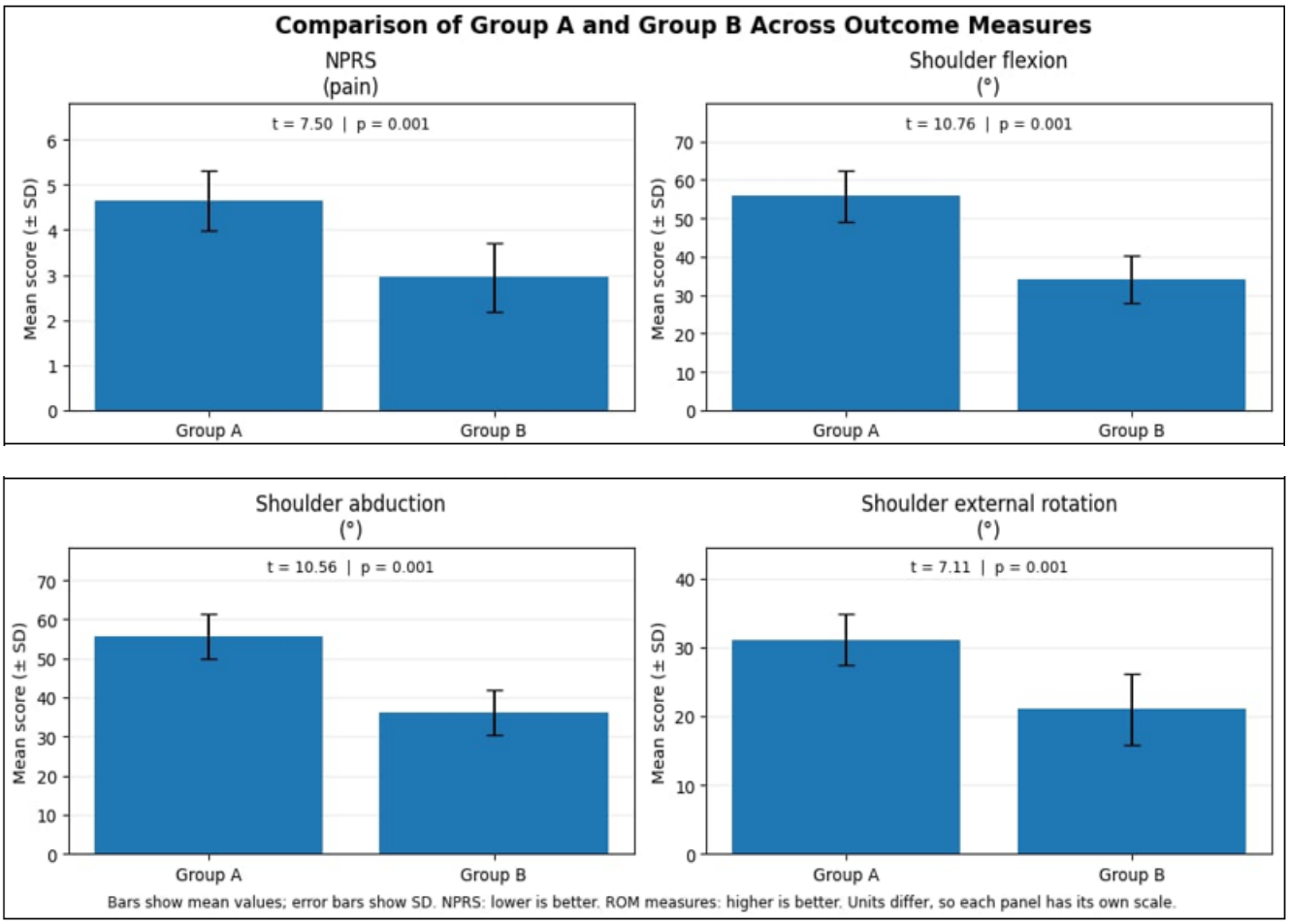
	Group A	Group B	t-stat	P-value
Mean	55.55	36.20	10.56	0.001
SD	5.72	5.87		

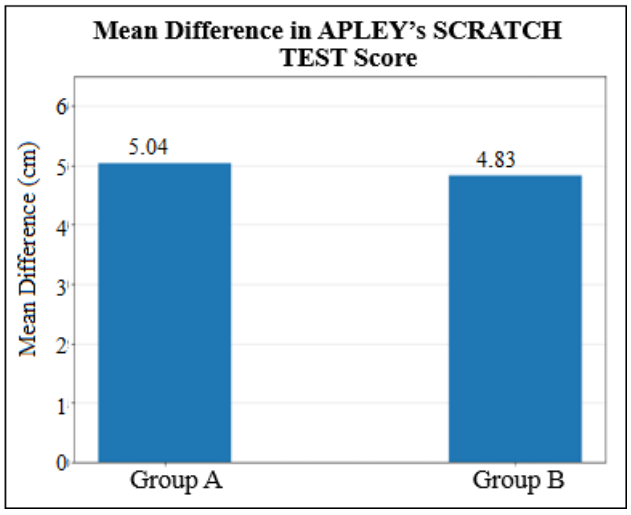
Mean Difference in SHOULDER EXTERNAL ROTATION Score

	Group A	Group B	t-stat	P-value
Mean	31.10	21.05	7.11	0.001
SD	3.67	5.15		

Mean and Standard Deviation for Apley's Scratch Test in Both Groups

Group	N	Pre-test Mean ± SD (cm	post-test Mean ± SD (cm)	Mean Improvement	Paired t	p-value
Group A	20	18.33 ± 5.75	13.29 ± 6.37	5.04 ± 1.76	12.82	<0.001
Group B	20	19.68 ± 4.94	14.85 ± 4.98	4.83 ± 1.66	13.03	<0.001
Total	40	19.00 ± 5.33	14.07 ± 5.70	4.9383 ± 1.69	18.47	<0.001





All three parameters showed **statistically significant improvements in** post-intervention. Pain levels (NPRS) dropped, shoulder range of motion improved and Apley's scratch test increased.

End range mobilizations of glenohumeral and acromioclavicular mobilizations are significantly reduced pain levels, as shown by the drop in NPRS scores and improved range of motion of shoulder and Apley's scratch test in post treatment than Gong's mobilizations

4. Discussion

Periarthritis shoulder is commonly associated with pain and limited range of motion. A 4-week program combining glenohumeral and acromioclavicular mobilizations with ultrasound therapy showed significant improvements in pain, range of motion, and Apley's scratch test than Gong's mobilizations with ultrasound therapy. Post-intervention results revealed reduced pain and improve range of motion, Apley's scratch test role in recovery. supported study **Gutiérrez Espinoza HJ, et al. (2015)** conducted a randomized clinical trial titled *Glenohumeral posterior mobilization versus conventional physiotherapy for primary adhesive capsulitis*. The study evaluated patients with primary adhesive capsulitis and compared glenohumeral posterior mobilization with conventional physiotherapy.

Rahbar M, et al. (2022) conducted a single-blind randomized clinical trial titled *Effectiveness of acromioclavicular joint mobilization and physical therapy versus physical therapy alone in patients with frozen shoulder*. The results demonstrated greater improvement following the addition of acromioclavicular joint mobilization, particularly in pain, disability and shoulder abduction ROM.

Amjad F, Asghar H. (2025) conducted a triple-blinded randomized clinical trial titled *Comparative effects of Gong's mobilization and mobilization with movement in patients with adhesive capsulitis*

The study provides recent evidence supporting Gong's mobilization as an effective manual therapy technique for periarthritis shoulder, particularly for improving shoulder ROM and functional disability.[94]

5. Conclusion

Comparison between the two treatment groups demonstrated that **End-Range Mobilizations of the Acromioclavicular and Glenohumeral joints (Group A)** produced significantly greater improvements in pain reduction and shoulder range of motion, Apley's scratch test scores than **Gong's Mobilizations (Group B)**.

6. Limitations

The Sample size was small. It was a short duration study. In this group A received two types of mobilization techniques, whereas group B received only one type. group A demonstrated significantly better improvement, use of two mobilization techniques there might be contributed to the observed difference in outcomes. Longer follow-up periods are needed to confirm the effect of end range mobilizations versus gong's mobilizations of acromioclavicular and glenohumeral joints on pain and range of motion in subjects with periarthritis shoulder

7. Recommendations

Further studies with larger sample sizes. The future study is recommended for more than 6 weeks of duration**.** Future studies can be planned in other age groups.

References

[1] Carette S, Moffet H, Tardif J, Bessette L, Morin F, Frémont P, 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(3):829-838.
[2] Neviaser AS, Hannafin JA. Adhesive capsulitis: A review of current treatment. Am J Sports Med. 2010;38(11):2346-2356.
[3] Van der Zwaal P, Van de Laar S. Management of the frozen shoulder. Orthop Res Rev. 2013; 5:1-7.
[4] Trivedi N, Ladani M. Effectiveness of therapeutic protocol for physiotherapy management of adhesive capsulitis. Int J Physiotherapy Occup Ther. 2021; 15:93-98.
[5] Filardi V. Stress distribution in the humerus during elevation of the arm and external abduction. J Orthop. 2020; 19:218-222. doi: 10.1016/j.jor.2020.01.021.
[6] Li X, Ma R, Bedi A, Dines DM, Altchek DW, Dines JS. Management of acromioclavicular joint injuries. J Bone Joint Surg Am. 2014;96(1):73-84. doi:10.2106/JBJS.M.00649.
[7] Keough N, Lorke DE. The humeral head: A review of the blood supply and possible link to osteonecrosis following rotator cuff repair. J Anat. 2021;239(5):973-982. doi:10.1111/joa.13466.