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RESEARCH ARTICLE
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COMPARATIVE EFFECT OF SPENCER TECHNIQUE VS GONG MOBILIZATION ON ROM AND FUNCTIONAL DISABILITY AMONG ADHESIVE CAPSULITIS PATIENTS

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ABSTRACT

Background: Adhesive capsulitis (AC) patients experience a progressive loss of shoulder mobility and functional disability. Scientific research indicates that Gong's mobilization and spencer technique has an immediate positive impact on improving shoulder mobility and functional disability.

Objective: To determine comparative effect of Spencer technique vs Gong mobilization on Rom and functional disability among adhesive capsulitis patients.

Methods: A randomized clinical trial was conducted .Data was gathered from Allied hospital Faisalabad ,Civil hospital Faisalabad and Faisal hospital Faisalabad. Simple random sampling techniques used. 34 sample size was calculated .40-55 year male /female having adhesive capsulitis , previous episode of shoulder stiffness and pain lasting more than three months were included .Participants with shoulder subluxation , upper limb fracture and Congenital abnormalities of Shoulder were excluded.2 intervention groups were made .Group A participants undergone spencer technique and group B received gong mobilization. SPADI questionnaire utilized to find out functional disability and goniometer utilized to find ROM. Study ran Feb 2024 to June 2024 . Version 25 of SPSS was employed for statistical analysis.

Results: Revealed Post-intervention SPADI total scores significantly decreased in both groups, with Group A reporting 60.381±15.327 and Group B reporting 49.500±9.076 with p-value was .007 indicating a significant difference post-intervention. Group B generally exhibited larger mean improvements in ROM compared to Group A as evidenced by the greater magnitude of changes in most movements with significant p value <0.01.

Conclusion: Both intervention showed significant improvement on shoulder ROM and shoulder functional disability but gong mobilization showed more superior results comparatively.

Key words: Adhesive capsulitis ,Gong mobilization, ROM ,Spencer technique,

INTRODUCTION

A disorder affecting the muscles and soft tissues of the shoulder progressively limit range of motion in both passive and active , stiffness, and pain which is present in night and daytime in glenohumeral joint referred as adhesive capsulitis (1).It affects individuals of above 40 years and 70% of individuals that presents with an Adhesive Capsulitis condition are women(2). The global incidence varies, while estimates usually vary between 2% and 5%. Men and women both get effected, and the etiology is mostly unclear(3). Adhesive capsulitis prevalence data in South Asia are limited in availability. However, it is likely that the prevalence is consistent with global figures. Numerous studies have investigated the frequency of adhesive capsulitis(3). A study conducted in Pakistan found, that whole occurrence of Frozen Shoulder is 38%, with 45.70% in females and 28.07% in males. The study emphasized the link between diabetes and adhesive capsulitis(4). The first time Codman used the phrase "Frozen Shoulder" was in 1934. He reported a hurting, gradually developing shoulder disorder that was exaggerated by difficulty and stiffness sleeping on afflicted side. Adhesive Capsulitis manifestation includes glenohumeral joint restriction, stiffness, an abrupt feeling of discomfort, and a restricted range of motion. It is a disorder with an unknown cause also known as adhesive capsulitis (primary or idiopathic Adhesive Capsulitis). Secondary Adhesive Capsulitis occurs when it is linked with malignancies or systemic illnesses such as rheumatoid arthritis, type II diabetes, thyroid problems, and so on(5).

Four distinct phases of symptoms, each lasting around 24 months, are associated with FS: freezing (three to nine months), frozen (nine to fourteen months), and thawing (fifteen to twenty-four months). (6) Range of motion (ROM) gradually decreasing and chronic discomfort are the hallmarks of stage 1, often known as the freezing phase. There are significant limits to forward flexion, internal rotation, external rotation, and abduction. In stage 2, a decrease in capsular volume and excruciating synovitis are the reasons for the loss of mobility.Such limitations make it harder for people to do essential daily tasks like washing, grooming, and clothing. Patients struggle with things like reaching behind them with the other arm, brushing their hair, and putting on clothes. In addition, challenges related to personal care encompass activities such as cooking and eating, cleaning, and moving heavy things, such as groceries and cabinet contents (7).

It has been established that exercise treatment is an essential component in managing FS symptoms. Stretching, strengthening, and manual treatment methods are among the recommended physiotherapy modalities for individuals in addition to electrotherapy (transcutaneous electrical nerve stimulation and interferential therapy. Data showing joint mobilization may improve joint ROM deficiencies and reduce discomfort has led to an increase in its usage as a manual therapy approach (8). Exercise and physical therapy are frequently strongly advised in order to maintain and recover range of motion. Patients respond best to physical therapy, stretching, and other rehabilitation regimens when they present with stage 2 or above adhesive capsulitis. Reducing discomfort and inflammation as well as capsular tightness is the aim of stage 2 therapies in order to minimize loss of mobility. In order to address significant loss of mobility, the objective of physical therapy for patients with stage 3 FS is to improve range of motion with intense stretching (9).

A popular collection of standardized shoulder therapies that may be utilized for diagnosis, prognosis, and therapy is called the Spencer method. The primary objective of this well-known osteopathic manipulative therapy is the mobility of the glenohumeral and scapulothoracic joints(10). It improves other cognitive, social, and emotional dimensions and improves the function of the restricted joints (11). Shoulder limitations resulting from adhesive capsulitis are treated using the seven various therapies of the Spencer technique. This method uses smooth, rhythmic, passive motions to release contracted muscles, ligaments, and capsules. Most of the force is applied in the

last ROM. This technique enhances lymphatic flow, increases joint circulation, and stretches the tissues to enable range of motion without causing discomfort(12).
One mobilization approach that aids in keeping the shoulder in a neutral posture at theend of the range of motion is Gong's technique(13). Gong found that his mobilization method is more successful in enhancing shoulder internal rotation than anterior to posterior gliding and maintains the shoulder in a neutral position at the conclusion of its range of motion(14). During mobilization procedures, pressure is applied according to the patient's degree of pain, which is determined using Maitland grading(15). In conservative management, Codman's pendulum exercise became a traditional way to passively mobilize the glenohumeral joint without exposing recently healed or injured tissues. Various approaches, such as distraction, are used to stretch soft tissues, increasing ROM by applying pressure, gliding, and twisting procedures(16). Ask the patient to perform the limited motions as part of Gong's mobilization technique while performing anterior-posterior glide, which involves the shoulder in a dynamic position(17).

METHOD

A randomized clinical trial was conducted .Data was gathered from Allied hospital Faisalabad ,Civil hospital Faisalabad and Faisal hospital Faisalabad. Participants were randomly allocated by simple random sampling techniques in two groups. 34 sample size was calculated using open Epi Tool software. Used SPADI as variable

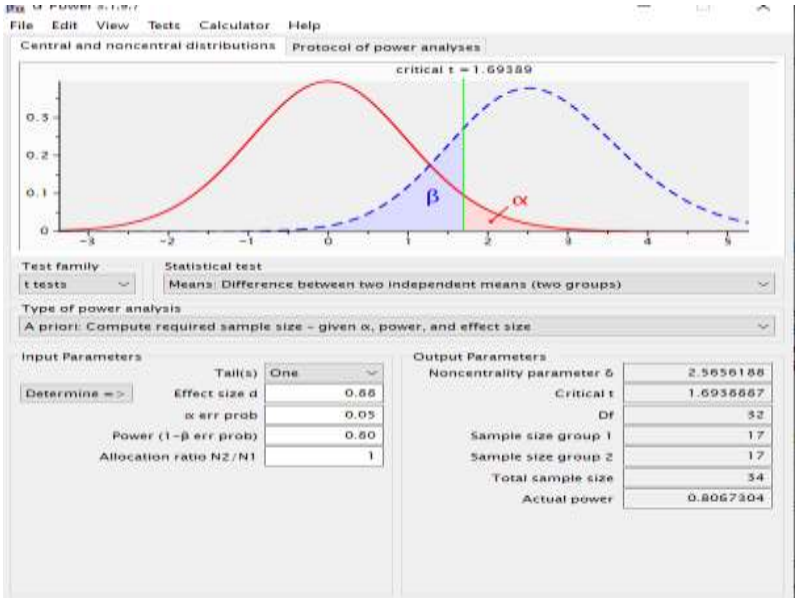

Figure 1:Sample size

40-55 male /female having adhesive capsulitis , A previous episode of shoulder stiffness and pain lasting more than three months Patients with unilateral adhesive capsulitis Person with Abduction ≥ 50º were included .Participants with shoulder subluxation , upper limb fracture Congenital abnormalities of Shoulder and Systemic inflammatory conditions (RA) were excluded.2 intervention groups were made .Group A participants undergone spencer technique and group B received gong mobilization 5 session per week up to 8 week. SPADI questionnaire utilized to find out functional disability and goniometer utilized to find ROM. and assessment were utilized as assessment tool. Study ran March 2023 September 2023 . Version 25 of SPSS was employed for statistical analysis. Independent Sample T Test between group comparison and Paired Sample T test used for within group difference.

RESULTS

Table 1: Demographic

Variables	Group A(Spencer technique) N=17	Group B(Gong mobilization) N=17	P Value
	Mean ±SD	Mean ±SD	
Gender			.127
Male	4(17.7%)	8(39.9%)	
Female	14(86.3%)	12(64.1%)	
Age (years)	45.277±6.875	55.444±6.989	.695

The study compared demographic between Group A and Group B, each consisting of 34 participants. In terms of gender distribution, Group A had a higher proportion of females 86.3% compared to Group B 64.1% while Group B had more males .The mean age of participants in Group A 45.277±6.875 and group B had 55.444±6.989

Table 2 Independent Sample T Test between group comparison of SPADI Pre and post intervention

		Treatment Groups		Independent Sample T-test	
		Group A(Spencer Technique)	Group B (Gong Mobilization)		
Outcome Measure	**Assessment**	**Mean ±SD N=17**	**Mean ±SD N=17**	**Mean Difference**	**P value**
SPADI Pain	Pre Intervention	38.510±6.769	38.944±5.986	-.434	.868
	Post Intervention	25.855±4.94	18.500±3.920	7.355	.006
SPADI Disability	Pre Intervention	59.511±11.014	56.188±10.522	3.323	.570
	Post Intervention	40.444±9.239	35.610±7.437	4.84	.033
SPADI Total	Pre Intervention	94.800±16.699	92.400±13.900	2.388	.664
	Post Intervention	60.381±15.327	49.500±9.076	10.881	.007

Pre-intervention SPADI pain scores showed no significant difference between Group (p = .868). Post-intervention SPADI pain scores significantly decreased in both groups, with(p = .006). indicating a significant difference post-intervention.

Pre-intervention SPADI disability scores showed no significant difference between Group A 59.511±11.014 and Group B56.188±10.522 (p = .570). Post-intervention SPADI disability scores significantly decreased in both groups, with mean difference was 4.84 and the p-value was .033, indicating a significant difference post-intervention.

Pre-intervention SPADI total scores showed no significant difference between Group A 94.800±16.699 and Group B (92.400±13.900) (p = .664). Post-intervention SPADI total scores significantly decreased in both groups, with Group A reporting 60.381±15.327 and Group B reporting 49.500±9.076. The mean difference was 10.881 and the p-value was .007 indicating a significant difference post-intervention.

Table 3: Paired Sample T test used within group difference of SPADI pre and post interventions

		Assessment		Paired Sample T test	
		Pre	Post		
Outcome Measure	**Treatment Group**	**Mean ±SD N=17**	**Mean ±SD N=17**	**Paired difference**	**P value**
SPADI Pain	**Group A(Spencer Technique)**	36.610±6.860	23.933±5.140	12.667±1.72	<.001
	Group A(Spencer Technique)	36.944±4.975	17.800±4.921	19.055±4.620	<.001
SPADI Disability	**Group A(Spencer Technique)**	56.500±11.014	38.444±12.339	18.055±6.448	<.001
	Group A(Spencer Technique)	55.310±10.522	31.611±8.437	23.699±8.149	<.001
SPADI Total	**Group A(Spencer Technique)**	93.888±17.699	62.388±16.327	30.500±11.939	<.001
	Group A(Spencer Technique)	92.500±14.900	49.500±9.00	43.000±5.9	<.001

In Group A, the mean SPADI pain score significantly decreased from 36.610±6.860 pre-intervention to 23.933±5.140 post-intervention, with a mean paired difference of 12.667±1.72 and a p-value of less than .001.
In Group B, the mean SPADI pain score significantly decreased from 36.944±4.975 pre-intervention to 17.800±4.921 post-intervention, with a mean paired difference of 19.055±4.620 and a p-value of less than .001.
Similarly, both Group A and Group B showed significant decreases in SPADI disability scores and SPADI total scores post-intervention, with all p-values less than .001.

Table 4: Independent Sample T Test between group comparison of Shoulder ROM Pre and post intervention

		Treatment Groups		Independent Sample T-test	
		Group A	Group B		
Outcome Measure	**Assessment**	**Mean ±SD N=17**	**Mean ±SD N=17**	**Mean Difference**	**P value**
Shoulder Flexion	Pre Intervention	87.400±8.438	86.200±6.983	1.22222	.221
	Post Intervention	96.800±6.657	125.666±10.891	-28.86	.000

Shoulder Extension	Pre Intervention	37.000±11.341	33.700±9.539	3.3	.307
	Post Intervention	56.388±3.483	59.500±1.465	-3.112	.023
Shoulder Abduction	Pre Intervention	56.600±10.341	58.000±8.170	-1.38889	.659
	Post Intervention	88.270±8.655	125.888±8.181	-38.61111	.000
Shoulder Adduction	Pre Intervention	36.700±5.536	36.501±5.680	1.27778	.489
	Post Intervention	48.888±3.562	49.660±1.188	.22222	.801
Shoulder Internal Rotation	Pre Intervention	49.944±5.460	48.833±5.382	1.11111	.543
	Post Intervention	77.111±6.479	81.277±4.267	-6.16667	.002
Shoulder External Rotation	Pre Intervention	47.660±4.432	46.833±6.099	.83333	.641
	Post Intervention	74.770±3.919	82.000±4.172	-7.22222	.000

These findings suggest that the intervention had a greater impact on improving shoulder flexion, extension, abduction, internal rotation, and external rotation in Group B compared to Group A. However, no significant differences were observed for shoulder adduction, between the groups post-intervention.

Table 5: The paired sample t-tests assessed changes in shoulder range of motion (ROM) pre- and post-intervention within each treatment group.

		Assessment		**Paired Sample T test**	
		Pre	**Post**		
Outcome Measure	**Treatment Group**	**Mean ±SD N=17**	**Mean ±SD N=17**	**Paired difference**	**P value**
Shoulder Flexion	Group A	89.444±8.438	98.944±7.657	-9.400±7.485	<.001
	Group B	845.222±6.983	129.666±11.891	-44.443±13.191	<.001
Shoulder Extension	Group A	36.000±10.341	58.388±3.483	-20.389±10.982	<.001
	Group B	32.722±8.539	59.500±1.465	-25.776±8.004	<.001
Shoulder Abduction	Group A	57.666±10.341	87.277±8.655	-31.610±14.163	<.001
	Group B	58.055±8.170	126.888±8.281	-68.832±9.942	<.001
Shoulder Adduction	Group A	36.777±5.536	50.888±3.562	-12.110±6.163	<.001
	Group B	36.500±5.680	49.666±1.188	-13.156±5.170	<.001
Shoulder Internal Rotation	Group A	50.944±5.460	76.111±6.479	-25.156±8.219	<.001
	Group B	48.833±5.382	83.277±4.267	-32.434±5.158	<.001
Shoulder External Rotation	Group A	47.666±4.432	74.777±3.919	-29.110±5.789	<.001
	Group B	46.833±6.099	82.000±4.172	-37.160±5.543	<.001

These results indicate that both treatment groups experienced significant improvements in shoulder ROM across all measured movements following the intervention. Group B generally exhibited larger mean improvements in ROM compared to Group A as evidenced by the greater magnitude of changes in most movements.

DISCUSSION

Current RCT study conducted on 34 adhesive capsulitis patients. In terms of gender distribution, Group A had a higher proportion of females 86.3% compared to Group B 64.1% .2 intervention groups were made group A received Spencer technique and Group B received gong mobilization for 8 week.esults revealed spencer technique the mean SPADI pain score significantly decreased from 36.610±6.860 pre-intervention to 23.933±5.140 post-intervention, with a mean paired difference of 12.667±1.72 and a p-value of less than .001 these results were accordance to Phansopkar et al. study suggest an improvement in the mean values of ROM, and SPADI at post-three weeks, with a sustained effect observed at the second, third, and sixth months. A statistically significant difference was noted ($P < 0.05$). (10)

Current study revealed Gong mobilization the mean SPADI pain score significantly decreased from 36.944±4.975 pre-intervention to 17.800±4.921 post-intervention, with a mean paired difference of 19.055±4.620 and a p-value of less than .001 these results were consistent to Shrestha et al. study showed significant difference in pre and post scores of pain, range of motion and disability with P value<0.05 by applying gong mobilization on adhesive capsulitis subjects but current study took 8 weeks to show significant outcome unlike Shrestha et al. study demonstrated results in 6 weeks. (18)

Similarly, both Group A and Group B showed significant decreases in SPADI disability scores and SPADI total scores post-intervention, with all p-values less than .001. these results were accordance to Prasanth et al. study revealed Gong's mobilization was found to be more effective than Spencer's technique with ultrasound therapy and CPE in treating patients with FS.Gong mobilization showed a better reduction in pain intensity (mean difference (MD) of 0.87), SPADI (MD of 7), and increase in shoulder ROM (MD: 'abduction': 15.76; 'Flexion': 15.67; 'MR': 10.33) than the spencer group at 0.05 levels of significance. (19)

Current study findings Spencer vs Gong both had significant improvement on shoulder ROM and SPADI disability scores but comparatively gong mobilization had more improved values as with significant p value <0.001 these results were accordance to GoPinath, et al. study suggest post mean value for SPADI in gong mobilization group was 25.28 and Group conventional therapy 34.80. Based on the above data analysis it is evident that gong mobilization Group showed significant improvement than conventional therapy these results were after 8 week treatment on adhesive capsulitis subjects .(20)

Present study revealed that both treatment groups experienced significant improvements in shoulder ROM across all measured movements following the intervention. Group B (gong mobilization) generally exhibited larger mean improvements in ROM compared to Group A as evidenced by the greater magnitude of changes in most movements with significant p value <0.001 these results were accordance to Ramteke et al. showed after 6 week gong mobilization treatment on adhesive capsulitis subjects showed mean value of Medial Rotation ROM pre treatment (35.33±11.96) was increased post treatment (64.17±5.74). The difference was highly significant (p value< 0.005) this study just focused on medial rotation but present study focused on all shoulder ROM.(21)

CONCLUSION

Both intervention Gong mobilization and Spencer technique showed significant improvement on shoulder ROM and shoulder functional disability but Gong mobilization showed more superior results comparatively.

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