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Comparison of Short Wave Diathermy to Ultra-Sonic Therapy for Decreasing Pain and Increasing Range of Motion in Adhesive Capsulitis

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[1]Concept and design, Collection and Assembly of data, Drafting of article, Final Approval and Guarantor of the article
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ABSTRACT

Objective: To compare the effect of short wave diathermy to ultra-sonic therapy for decreasing pain and increasing Range of Motion (R.O.M) in Adhesive Capsulitis.

Methodology: It is a prospective non randomized comparative study conducted at a Public sector hospital from March 2016 to July 2016. It included 66 patients having adhesive capsulitis 33 were treated with short wave diathermy along with a standard protocol of treatment and 33 were treated with ultra-sonic therapy along with a standard protocol of treatment. Pain and R.O.M of shoulder joint for each patient were calculated; before and after the end of treatment sessions. Eighteen treatment sessions were given to both groups; three sessions per week. t-test was applied for comparison of the change in pain and range of motion in both groups. P = 0.05 was taken significant.

Results: A total of 66 patients of Adhesive capsulitis participated in this study; divided into two groups of 33. Among 33 patients of group A; 51.5% were males and 48.50% were females with a mean age of 46.8. The mean change in pain intensity recorded on VAS was 4.2 and mean change in R.O.M recorded on R.O.M scale was 1.5. Group B had 51.5% of females and 48.5% of males with a mean age of 49.09. The mean change in pain intensity for group B was 3.1 as recorded on VAS. Change in R.O.M on R.O.M scale was 1.2.

Conclusion: Shortwave diathermy was found more effective in decreasing pain and increasing R.O.M of the shoulder joint in adhesive capsulitis as compare to ultrasonic therapy.

Introduction

"A condition caused by prolonged immobility of the shoulder joint. The shoulder is painful, tender and has decreased passive and active Range of motion (ROM)''. "A condition in which joint becomes restricted because of inflammatory thickening of the capsule; a common cause of shoulder stiffness''. It is one of the most common musculoskeletal problem seen in orthopaedics. It has an incidence of 3-5% in the general population. Some studies described AC as self-limiting disorder that will resolve in 1-3 years. It can also occur bilaterally at the same time.[1] AC is a benign and self-limiting condition of unknown etiology, which results in global restriction of the Glenohumeral (GH) joint. Bones, ligaments, and tendons make up a joint and enclosed in a capsule of connective tissues. It becomes more painful with the formation of scar tissues around the stiffen joints when the shoulder moves. This process is gradual and then goes away slowly.[2] The first goal of Physiotherapy treatment is to decrease pain and stiffness. Before the exercise program and mobilization, modalities are the best tool. The most commonly used modalities for treatment of adhesive capsulitis; are TENS, SWD and US.[3] SWD (Short Wave Diathermy) is a therapeutic treatment that has high frequency electromagnetic energy for producing intensive heat inside the body. This heat increases blood flow to the area, thus reducing pain and stiffness.[4] US (Ultrasonic

therapy) is a technique using sound waves that exceeds the normal range of hearing capacity of humans for the treatment of musculoskeletal conditions especially inflammation. Therapeutic ultrasound can be used by physiotherapists since 1940s, and it can increase healing, local blood flow, and scar tissue breakdown. T.E.N.S is pain relieving modality works on pain gate theory.[4] In this study patients of both groups were treated with TENS, two exercises, and the use of hot water bottle at home. Exercises were the Front Wall Climb 10 times.[5] and Pendulum exercise in all axis with 10 Reps. Along with following treatment Group A was treated with SWD and Group B with US.

Methodology

This study was conducted at public sector hospital, Islamabad. It was prospective, non-randomised, comparative study from 01st October 2016 to 31st March 2017. A total of 63 (males and females) patients with Adhesive capsulitis (Age 35-60) were inducted in this study through convenient sampling. The sample was divided into two groups randomly i.e. every second patient was taken in Group B. Patients younger than 35 and older than 60 years, post traumatic and sensitive to heat were excluded from the study. Group-A received SWD and Group-B received ultra-sonic therapy; in addition to standard treatment protocols.

Pain intensity and Range of motion for shoulder joint for each patient was recorded on Visual Analogue Scale (VAS) and R.O.M scale respectively on the first visit and after completion of treatment (Eighteen sessions). The difference in pain intensity and R.O.M was recorded for analysis. Data was analysed through SPSS version 20. T test was applied to observe the decrease in pain in both groups by comparing mean.t test was applied to observe the increase in range of motion between both groups. The p-value was significant at 0.05

Results

A total of 66 patients of Adhesive capsulitis participated in this study; divided into two groups of 33. Among 33 patients of group A; 51.5% were males and 48.50% were females with a mean age of 46.8. (Table I & II)

Table II: Frequency Distribution of Age

		Frequency	(%)	Valid Percent	Cumulative Percent
Valid	30-45	28	46.7	46.7	46.7
	46-60	32	53.3	53.3	100.0
	Total	60	100.0	100.0	

Table I: Frequency Distribution of Gender

		Number	(%)	Valid Percent	Cumulative Percent
Valid	Male	30	50.0	50.0	50.0
	Female	30	50.0	50.0	100.0
	Total	60	100.0	100.0	

Mean change in pain intensity recorded on VAS was 4.2 and mean change in R.O.M recorded on R.O.M scale was 1.5. Group B had 51.5% of females and 48.5% of males with mean age of 49.09. Mean change in pain intensity for group B was 3.1 as recorded on VAS. Change in R.O.M on ROM scale was 1.2. Comparison of decrease in pain between both groups is shown in Table III and comparison in increase in range of motion between both groups is shown in Table IV

Discussion

According to outcomes of this study short wave proves to be a better option of treatment than ultrasonic

Table III: Paired Samples Test for change in pain.

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	CIP A – CIP B	.06667	.25371	.04632	-.02807	.16140	1.439	29	.016

Table IV: Paired Samples Test for change in R.O.M

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	CIROM A – CIROM B	.23333	.62606	.11430	-.00044	.46711	2.041	29	.050

therapy; in relieving from ache and increasing motion range of shoulder joint. The mean decrease in pain intensity; recorded on VAS for Group A was 4.2 and for Group B was 3.1. Mean increase on R.O.M scale; in range of shoulder joint recorded for Group A was 1.5 and for Group B was 1.2.

Hacer Dogru and colleagues suggest that Ultrasonic therapy compared with sham US gives no relevant benefit in the treatment of Adhesive capsulitis.[5] Shahbaz Nawaz Ansari; proved statistically that ultrasonic therapy with the highest degree of mobilization performed better results as compared to cryotherapy to reduce the pain with the help of stretching. Therefore, it is worthy to recommend it for the handling of adhesive capsulitis.[6] Another study by May S. F. Leung, concluded that deep heat and mobilizations can increase the Range of motion and decrease pain in adhesive capsulitis patients.[7] The meta-analysis by Laufer Y and Dar G found small, significant effects on pain and muscle performance when Short Wave Diathermy evoked a local thermal sensation.[8] According to G C Goats Continuous, shortwave diathermy is the technique of choice when a stable marked increase in temperature is obligatory in the deep in tissues, it helps reduce muscle spasm and pain, elevates the range of joints, intensifies the acquiescence of connective tissues, and diminishes the stiffness of joints. Shortwave diathermy can be as effective as ultrasound.[9] Another conclusion made by Arne Nyholm Gam and Finn Johannsen (1995) is; the pragmatic approach of experience is the foundation of using the ultrasound technique for the disorder related to musculoskeletal. However, this approach is deprived of any proof from well-organized controlled researches.[10] Daniëlle A.W.M. van der Windta made a conclusion through systematic review that; few evidences are available regarding the application of ultrasound therapy to deal with musculoskeletal ailments.[11] Another review by Kerry G Baker and colleagues; there is the scarcity of biophysical indications that can form the scientific foundation on using therapeutic ultrasound in clinical use for dealing with patients suffering from pain and injuries related to soft tissues. [12]

Conclusion

Shortwave diathermy was found more effective in decreasing pain and increasing R.O.M of the shoulder joint in adhesive capsulitis as compare to ultrasonic therapy.

Recommendations: The sample size should be large to build strong evidence. A comparison should be made with other modalities and techniques being used in the physical therapy treatment of adhesive capsulitis.

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