



**Research Article**

**A STUDY TO ANALYSE THE EFFECTIVENESS OF ULTRASOUND AND WAX THERAPY ON PERIARTHRITIS SHOULDER**

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**Key words:**

Ultrasound therapy, wax therapy, Visual analog scale, Range of motion, Periarthritis shoulder.

**ABSTRACT**

**Aim of the Study:** To evaluate the effectiveness of ultrasound and paraffin wax for the treatment of patients with periarthritis shoulder.

**Background of the Study:** Periarthritis shoulder is the most commonly referred as adhesive capsulitis. It is an idiopathic disease with two characteristics 1.Pain 2.Joint stiffness. Shoulder pain associated with periarthritis shoulder which is progressive and initially the pain is felt mostly at night, or when the shoulder is moved close to the end of range of motion. It can be caused by certain combined movements in the shoulder such as abduction and external rotation.

**Materials And Methods;** Patients are randomly allocated into two groups and informed consent was obtained from the subjects. 30 subjects were taken and 15 was allocated in each group. Group-A will be treated with ultrasound therapy and Group-B will be treated with wax therapy. 35 to 60 years old patients of both male and female were included. Treatment was given for 5sessions/week for 3 weeks. Analysis can be based on visual analog scale (VAS) and Goniometer.

**Results:** There was a significant difference between two groups in improving the ROM. Group-B (Wax therapy) was more effective than Group-A (Ultrasound therapy). This implies that wax therapy is more beneficial in improving ROM.

**Conclusion:** The present study concluded that the wax therapy is very much effective in improving the Range of Motion than ultrasound therapy in subjects with Periarthritis shoulder.

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**INTRODUCTION**

Periarthritis shoulder is a condition that leads to pain and stiffness of the shoulder. It is also known as adhesive capsulitis or shoulder contracture. Shoulder that has become so stiff that the patient usually cannot lift their arm up past shoulder height, have difficulty in combing the hair. cannot tuck in their shirt. The Non dominant shoulder is slightly more likely to be affected. In the beginning phase the pain is usually acute especially at night time and this may cause significant sleep disturbance. There is no evidence that there is any viral or infective cause for a Periarthritis shoulder and currently its classified as “idiopathic or unknown”. In many articles there is an increased tendency for people with diabetes to get a periarthritis shoulder but this doesn’t mean that the diabetes itself cause the periarthritis shoulder. The prevalence of periarthritis shoulder is estimated to be 2 to 5 percent of the general population. This condition is most common in the peak age of mid 50’s. Before the age of 35 is rare.

started particularly after an incident such as fall. Symptoms affect the activities of daily living. Early treatment of periarthritis shoulder can help to prevent long term stiffness in the joint. On palpation over the glenohumeral joint and this extends to the trapezius and inter-scapular area.

The major programme of physiotherapy is

- to reduce the pain.
- to increase extensibility of the contracted joint capsule.
- to improve mobility of the shoulder.
- to improve strength of the muscle.

Most treatment will start by heating up the capsule with moist heat and ultrasound. Continuous ultrasound has been shown to help soften the collagen within the capsule. After the tissue is heated up, mobility exercise are prepared. The risk of developing periarthritis shoulder increases if recovery from a medical condition or procedure that prevents you from moving your arm such as stroke or a mastectomy. Treatment for frozen shoulder involves range of motion exercise and sometimes corticosteroids and medications injected into the joint capsule. In a small percentage of cases, arthroscopic surgery may be

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indicated to loosen the joint capsule so that it can move freely. Its unusual for periarthritis shoulder to re-occur in the same shoulder, but some people can develop it in the opposite shoulder. The normal course of a periarthritis shoulder has been described as having three stages.

**Stage one:** Painful stage, which may last from six weeks to nine months, and in which the patient has a slow onset of pain. As the pain worsens, the shoulder loses its motion.

**Stage two:** Adhesive stage is marked by a slow improvement in pain but the stiffness remains. This stage generally lasts from four to nine months.

**Stage three:** The thawing or recovery stage when shoulder motion slowly returns toward normal. This generally lasts from 5 to 26 months.

To prevent the problem, a common recommendation is to keep the shoulder joint fully moving to prevent a periarthritis shoulder. Often shoulder will hurt when it begins to freeze. Because pain discourages movement, further development of adhesions that restrict movement will occur unless the joint continues to move full range in all the directions (adduction, abduction, flexion, rotation, and extension). People with diabetes, stroke, lung disease, rheumatoid arthritis, or heart disease are at a higher risk for periarthritis shoulder. Injury or surgery to the shoulder or arm may cause blood flow damage or the capsule to tighten from reduced use during recovery. Cases have also been reported after breast and lung surgery.

**METHODOLOGY**

Subject with Periarthritis shoulder was randomly allocated into two groups were informed and consent was obtained from the subjects. Each group was divided into 15 subjects. Group-A was treated by using ultrasound therapy and Group-B was treated by using wax therapy. 35 to 60 years old patients of both male and female were included. Treatment was given for 5 sessions/week for 3 weeks. Analysis was based on visual analog scale (VAS) and Goniometer. Goniometry is used to measure and document the amount of available active and passive joint motion. Goniometry is used to accurately describe abnormal fixed joint positions.

The visual analogue scale or visual analog scale which can be used in questionnaires. It is a measuring instrument for subjective characteristics or attitudes that cannot be directly measured. When responding to a VAS item, respondents specify their level of agreement to a statement by indicating a position along a continuous line between two end points. After collecting the details of past history, patient was assessed via physical examination. Data will be collected by using goniometer to assess the range of motion in affected shoulder joint and to reduce the stiffness along with ultrasound and wax therapy. A total of 30 subjects with peri-arthritis shoulder. Were grouped under GROUP-A and GROUP-B. Group-A consist of 15 subjects who were treated with ultrasound. Group-B consist of 15 subjects who were treated with paraffin wax. Before the treatment procedure the treatment technique are explained to the patient. The baseline measurement was taken with goniometer and VAS scale. Subjected were treated with was ultrasound. Duration of the treatment is was 8 minutes. Mode: Continuous mode is used. Frequency: 1 mHz. Subjects were treated with paraffin wax. The temperature of the paraffin wax is maintained at 40 - 44 c. Paraffin wax bath

therapy provides about six times the amount of heat. Should be changed.

**Data Analysis**

The collected data were tabulated and analyzed using both descriptive and inferential statistics. All the parameters were assessed using statistical package for social science (SPSS) version 24. Paired t-test was adopted to find statistical difference within the groups & Independent t-test (Student t-Test) was adopted to find statistical difference between the groups.

Subjects in GROUP B were explained about the treatment procedure, then the treatment area was cleaned and the subjects were positioned in a comfortable position for treatment. Before treating, the baseline measurement was taken which goniometer and VAS. Linth cloth dipped In molten parafin wax mainted at 40-44°c was wrapped around the shoulder for 5 minutes 4 times.

**Table 1** Comparison of Shoulder Abduction Rom between Group-A And Group - B In pre and post test

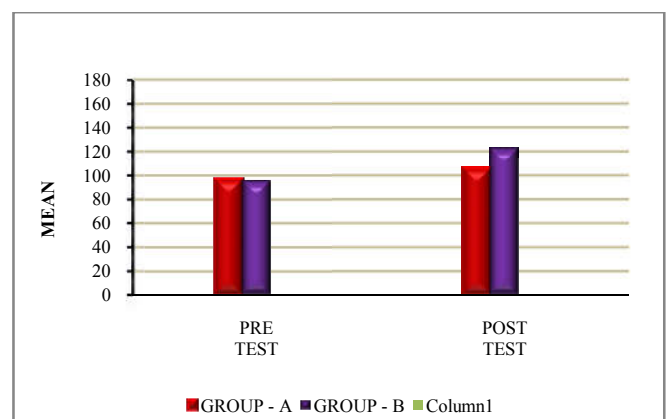
Significance	Df	t - Test	#GROUP - B		#GROUP - A		#ROM
			S.D	Mean	S.D	Mean	
.553*	28	.601	6.51	95.66	5.60	97.00	PRE TEST
.000***	28	-5.30	9.57	123.33	7.89	106.33	POST TEST

#GROUP A-, # GROUP B -  
(\*. P > 0.05)  
(\*\*\*. P ≤ 0.001)

The above table reveals the Mean, Standard Deviation (S.D), Student t-test, degree of freedom(df) and p-value of the Abduction ROM between (Group A) & (Group B) in pre test and post test weeks.

This table shows that there is no significant difference in pre test values of the Abduction ROM between Group A & Group B (\*P > 0.05). This table shows that statistically highly significant difference in post test values of the Abduction ROM between Group A& Group B (\*\*\*. P ≤ 0.001) (Graph -I)

Both the Groups shows significant increase in the post test means but (Group-B) which has the higher mean value is more effective than (Group-A)



**Graph I** Comparison of Shoulder Abduction Rom Between Group - A And Group - B In Pre And Post Test

**Table 2** Comparison of Shoulder External Rotation Rom between Group - A and Group - B In Pre And Post Test

Significance	df	t - TEST	#GROUP - B		#GROUP - A		#ROM
			S.D	MEAN	S.D	MEAN	
1.00*	28	.000	3.19	12.66	2.58	12.66	PRE TEST
.000***	28	-4.26	4.80	24.66	3.68	18.00	POST TEST

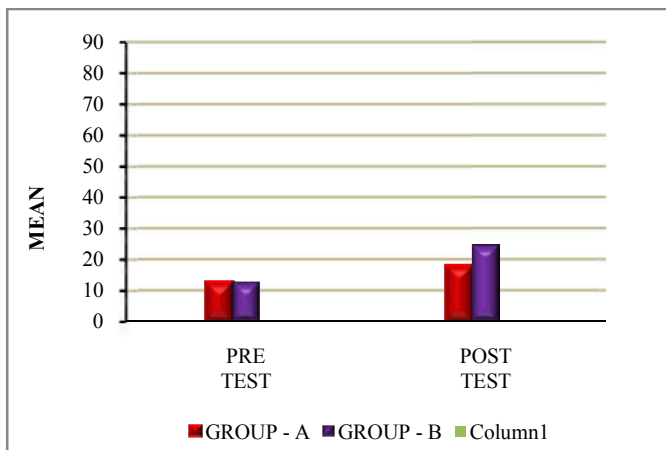
#GROUP A -, # GROUP B -  
 (\*- P > 0.05)  
 (\*\*\*- P ≤ 0.001)

The above table reveals the Mean, Standard Deviation (S.D), Student t-test, degree of freedom(df) and p-value of the Shoulder External Rotation between (Group A) & (Group B) in pre test and post test weeks.

This table shows that there is no significant difference in pre test values of the Shoulder External Rotation between Group A & Group B (\*P > 0.05).

This table shows that statistically significant difference in post test values of the Shoulder External Rotation between Group A& Group B (\*\*\*- P ≤ 0.001)<sup>(Graph -I)</sup>

Both the Groups shows significant increase in the post test means but (Group-B) which has the higher mean value is more effective than (Group-A).



**Graph II** Comparison of Shoulder External Rotation Rom Between Group - A And Group - B In Pre And Post Test

**Table 3** Comparison of Vas between Group - A and Group - B In Pre and Post Test

Significance	df	t - TEST	#GROUP - B		#GROUP - A		#VAS
			S.D	MEAN	S.D	MEAN	
.794*	28	.263	.743	5.46	.639	5.53	PRE TEST
.000***	28	-3.88	.743	3.13	.560	2.20	POST TEST

#GROUP A -, # GROUP B -

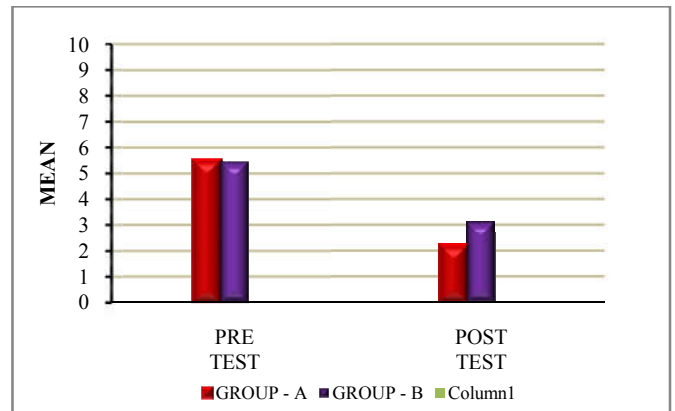
(\*- P > 0.05)  
 (\*\*\*- P ≤ 0.001)

The above table reveals the Mean, Standard Deviation (S.D), Student t-test, degree of freedom(df) and p-value of the VAS between (Group A) & (Group B) in pre test and post test weeks.

This table shows that there is no significant difference in pre test values of the VAS between Group A & Group B (\*P > 0.05).

This table shows that statistically significant difference in post test values of the VAS between Group A& Group B (\*\*\*- P ≤ 0.001)<sup>(Graph -IV)</sup>

Both the Groups shows significant decrease in the post test Means but (Group-A) which has the lower mean value is more effective than (Group-B).



**Graph 3** Comparison of Vas between Group - A and Group - B in Pre and Post Test

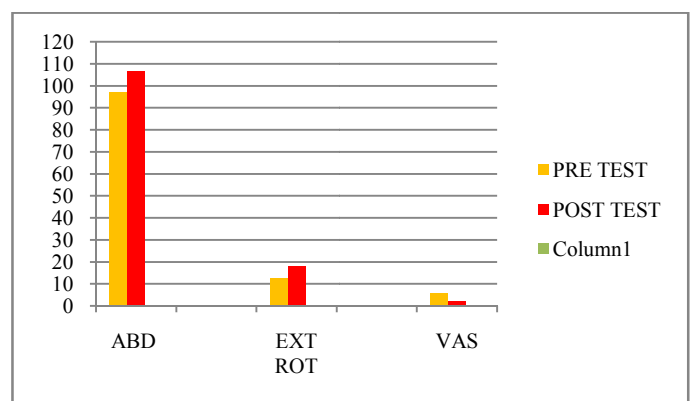
**Table 4** Comparison of Rom & Vas Within Group A Between Pre Test And Post Test

Significance	df	t - TEST	Post Test		Pre Test		Group A
			S.D	Mean	S.D	Mean	
.000***	14	-6.82	7.89	106.33	5.60	97.00	ABD
.000***	14	-6.95	3.68	18.00	2.58	12.66	EXT.ROT
.000***	14	15.81	.560	2.20	.639	5.53	VAS

#GROUP A -  
 (\*\*\*- P ≤ 0.001)

The above table reveals the Mean, Standard Deviation (S.D), t-value and p-value of the ROM & VAS between pre-test and post-test within Group - A (\*\*\*- P ≤ 0.001)

There is statistically highly significant difference between the pre test and post test values within GROUP A (\*\*\*- P ≤ 0.001).<sup>(Graph-VI)</sup>



**Graph 4** Comparison of Rom, Vas Within Group A Between Pre Test And Post Test

## RESULT

There is a significant difference in the post-test Goniometer between GROUP-A and GROUP-B. Comparing Mean values of both the groups, GROUP-B shows higher mean value which means wax is more effective than the Ultrasound (GROUP-A) at P<0.001.

## DISCUSSION

Periarthritis Shoulder is more common in 35 to 65 years of both male and female. There is a limitation of movements in the shoulder joint. The present study compares the effectiveness of ultrasound and wax therapy in Periarthritis shoulder. Ultrasound was given to 15 patients and wax therapy was given to 15 patients. Pre and Post test were taken by using goniometer and Visual Analog Scale (VAS). This study is to improve the Range of motion and to relieve the pain in shoulder joint. In this study results shows statistical significance of ultrasound and wax therapy within group analysis at the pre and post intervention of both the group shows the improvement in Range Of Motion (ROM) and also decrease in the pain level.

Between group analysis of post intervention shows there is more improvement in shoulder Range of motion. According to the result the wax therapy improves the shoulder Range of motion. The table reveals the mean, Standard Deviation, Independent t-test and p-values of GONIOMETER and VISUAL ANALOG SCALE between GROUP-A and GROUP-B ( $P > 0.05$ ) The table shows that statistically significant difference in post test values of the GONIOMETER and VISUAL ANALOG SCALE (VAS) between GROUP A and GROUP-B. ( $P < 0.001$ ). Both the group shows significant increase in the post test means but (GROUP-B) which has the higher mean value is more effective than (GROUP-A). Both the group shows significant increase in the post test means but WAX THERAPY is more effective than ULTRASOUND. Hence the alternate hypothesis is accepted and null hypothesis is rejected.

## CONCLUSION

This study reveals that there is significant difference in Ultrasound versus Wax therapy in patients with Periarthritis Shoulder. Both groups (ULTRASOUND and WAX THERAPY) improve the range of motion and reduces the pain shoulder joint. The study concluded the Range of motion gains made from wax therapy (GROUP-B) is better than the gains made by ultrasound (GROUP-B).

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