WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 5.990
Volume 4, Issue 7, 1761-1769. Research Article ISSN 2277– 7105

A COMPARATIVE STUDY OF AGNIKARMA AND THERAPEUTIC ULTRASOUND IN THE MANAGEMENT OF AVABAHUKA W.S.R TO FROZEN SHOULDER

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Article Received on
05 May 2015,

Revised on 30 May 2015,
Accepted on 24 June 2015

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ABSTRACT

Vata localized in the shoulder region, getting aggravated, dries up the ligaments of the shoulders, constricts the *siras* present there and produces *Avabahuka.* Frozen shoulder, the disease of shoulder region in which the capsule of shoulder joint, becomes inflamed and stiff, greatly restricting motion and causing chronic pain. The study was conducted in P.G. Department of Shalya Tantra, NIA, Jaipur. Total 30 diagnosed patients of frozen shoulder of age group 40- 60 years of either sex were registered for the study and divided in two equal groups A & B with 15 patients in each group. Group A was treated with *Agnikarama* and Group B was treated with therapeutic ultrasound therapy. Total six sittings of the either procedures were done on alternate days for two weeks. Assessments were done on 1st, 7th, and on 14th day. Duration of study was six and half months including follow up. Both the groups showed extremely significant result with $p<0.001$ in their respective groups. In group A, 4 patients got excellent improvement (>75%) and 11 patients got moderate improvement (50-75%). In group B, 3 patients got excellent improvement (>75%) and 12 patients got moderate improvement (50-75%). Both the groups showed extremely significant results by respective therapies and intergroup comparison showed non-significant result.The treatment applied in both the groups was simple, economical and required no hospitalization and done at OPD level.

KEY WORDS: *Agnikarma, Avabahuka,* Therapeutic ultrasound.

INTRODUCTION

Vata, localized in the shoulder region, getting aggravated, dries up the bindings (ligaments) of the shoulders, constricts the *siras* present there and produces *avabahuka*. It can be correlated with frozen shoulder.

अंसदेशस्थितो वायुः शोषयित्वांऽसबन्धनम् ।
सिराश्चाकुञ्चय त्तत्रस्थो जनयत्यवबाहुकम् ।।[1]

Frozen shoulder, the "Peri-arthritis" or "Adhesive capsulitis" is a disease of shoulder region in which the shoulder capsule, the connective tissue surrounding the gleno-humeral joint of the shoulder, becomes inflamed and stiff, greatly restricting motion and causing chronic pain which occurs due to micro trauma or sudden trivial injury.[2] It causes a significant loss of both, Active Range of Movements (AROM) and Passive Range of Movements (PROM). Frozen shoulder typically lasts for 12 to 18 months with a cycle of 3 stages,[3]- painful phase, stiff phase or adhesive phase and thawing phase or resolution phase. It can arise from idiopathic or post-traumatic causes.[4] In Ancient compendia's, various para-surgical procedures are mentioned in diseases of *vata* and *kapha* disorders, in which *agnikarma* is one amongst them which has been recommended in various musculoskeletal disorders.

- त्वङ्मांससिरास्नायुसन्ध्यस्थिस्थितेऽत्युग्ररुजिवायावुच्छितकठिनसुप्तमांसे व्रणे.....चाग्निकर्म कुर्यात् ।।[5]
- क्षौद्रगुड़स्नेहाः सिरास्नायुसंध्यस्थिगतानाम्।।[6]

Agnikarma is effective in *vata* and *kaphaja vyadhi*. Various *agnikarma upkarna* have been mentioned in Samhita. *avabahuka* or frozen shoulder, it is *snayu sandhigata vikara*, thus for this *gu¢a*, was selected as *dahana upkarana* for *agnikarma*.

Therapeutic ultrasound refers generally to any type of ultrasonic procedure that uses ultrasound or therapeutic benefit. It is indicated in nonspecific peri-arthritis. These changes are the result of the chemical, biologic, mechanical and thermal effects of the sound waves. Ultrasound is a deep heating modality.

AIMS AND OBJECTIVES

A. AIMS

1. The main aim was to evaluate and compare the efficacy of *agnikarma* and therapeutic ultrasound in the management of *avabahuka*.

B. OBJECTIVES

1. To explore the literature regarding *agnikarma* in *ayurvedic* and modern Text.
2. To evaluate the effect of *agnikarma* in the management of Frozen Shoulder.
3. To evaluate the effect of therapeutic ultrasound in the management of frozen Shoulder.
4. Comparison between *agnikarma* and ultrasound therapy in the management of frozen shoulder.

MATERIALS AND METHODS

MATERIALS

- *Gu¢a* (Jaggery)
- Aloe -Vera pulp
- *Madhuyashti churna*
- Container and dropper
- Thermometer
- Portable Ultrasound therapy machine with Gel
- Goniometer.

Fig. No- 1

Fig No. 2

MATHEDOLOGY

Total 30 patients having typical clinical features pertaining to the Frozen Shoulder like: Pain, Stiffness, Tenderness, Restricted Active and passive range of movements, were randomly selected for the study, with ages ranging from 40 yrs. to 60 yrs., irrespective of sex, religion etc. from OPD and IPD of Post Graduate Department of *Shalya Tantra*, National Institute of Ayurveda, Jaipur. Written informed consent were taken before starting the trial. The patients were divided in 2 equal groups having 15 patients in each group.

Group A: *Agnikarma* Group

Patients of this group received *agnikarma* therapy by *gu¢a* after Prophylactic tetanus toxoid. The trial drug was prepared by mixing *gu¢a (*Jaggery*)*, with water and heated for 5-10 minutes, maintained at a temperature of about 40^0-44^0 C and applied on the affected region of shoulder joint on the area of maximum tenderness with the help of dropper and kept for 2 min. After 2 min the *gu¢a*, was wiped out. Similarly the same procedure was repeated for 2-3 times.

The points of subsequent application were different from that of previous one which was evident owing to hyperaemia present at the site of previous application. Post procedure

application of aloe-vera pulp and *madhuyashti churna* were done over every site. Total 6 sittings were done over a period of two weeks on alternate days.

Group B: Therapeutic Ultrasound Group

The therapeutic ultrasound machine used was of 1 MHz frequency in continuous mode and Intensity (0.1- 2.5). First applied a generous amount of coupling medium to clean dry skin. Moved the transducer in either a circular or stroking pattern over the affected shoulder joint covering entire joint area. Each circle / stroke should overlap the previous by half. The procedure was continued for maximum 10 minutes. Same procedure was continued on alternate days for two weeks .Total 6 sittings were done over a period of two weeks on alternate days.

Assessment

Assessment of the patients was done on 1st, 7th and 14th days of treatment on parameters-

- Subjective parameters- Pain, stiffness.
- Objective parameters- Tenderness, Active Range of movements of shoulder (Flexion, extension, abduction, adduction, and circumduction).

TIME FRAME- Six and Half month

- **TRIAL PERIOD-** 2 Weeks
- **FOLLOW UP –** Every 3rd week for 6 months

RESULTS

Table No- 1 Effect of therapy in Group A

Sr. No	Assessment Parameters		Mean		S.D	S.E	W	P Value	% Relief	Remarks
			BT	AT						
1.	Pain		2.40	0.66	0.79	0.20	105	.0001	72.50	ES
2.	Stiffness		2.73	0.80	1.16	0.30	91	.0002	70.69	ES
3.	Tenderness		2.06	0.53	0.74	0.19	105	<.0001	74.27	ES
4.	Active Range of movements of shoulder	Abduction	3.13	1.33	1.25	0.32	91	<.0001	57.50	ES
		Adduction	2.80	0.86	0.70	0.56	120	<.0001	69.28	ES
		Flexion	2.93	0.73	0.56	0.14	120	<.0001	75.08	ES
		Extension	3.26	1.00	1.03	0.26	120	<.0001	69.32	ES
		Circumduction	2.20	0.66	0.63	0.16	120	<.0001	70.0	ES

Results based on the assessment- before treatment, (1st day), during treatment (7th day), after treatment (14th day) was obtained with statistical analysis. Effect of therapy was statistically

significant in both the groups. Variable wise improvement of patients in Group A showed 72.50% improvement in pain, 70.69% in stiffness, 74.27% in tenderness, 57.50% in abduction 69.28% in adduction, 75.08% in flexion, 69.32% in extension, 70.0% improvement in circumduction was observed which was statistically extremely significant in each parameter. (Table No. 1)

Table No- 2 Effect of therapy in Group B

Sr. No	Assessment Parameters		Mean		S.D	S.E	W	P Value	% Relief	Remarks
			BT	AT						
1.	Pain		2.53	0.86	0.72	0.18	105	.0001	66.00	ES
2.	Stiffness		3.0	1.0	1.06	0.27	105	.0001	66.67	ES
3.	Tenderness		2.13	0.66	0.74	0.19	105	.0001	69.01	ES
4.	Active range of Movements of Shoulder	Abduction	2.80	1.06	0.96	0.24	105	.0001	62.14	ES
		Adduction	2.40	0.73	0.89	0.23	105	.0001	69.58	ES
		Flexion	3.06	0.60	0.99	0.25	105	.0001	80.39	ES
		Extension	3.13	0.93	1.08	0.27	105	.0001	70.28	ES
		Circumduction	2.46	0.93	0.63	0.16	120	<.0001	62.19	ES

In group B, 66.00% improvement in pain, 66.67% in stiffness, 69.01% in tenderness, 62.14% in abduction 69.58% in adduction, 80.39% in flexion, 70.28% in extension, 62.19% improvement in circumduction was observed which was statistically extremely significant in each parameter (Table No. 2).

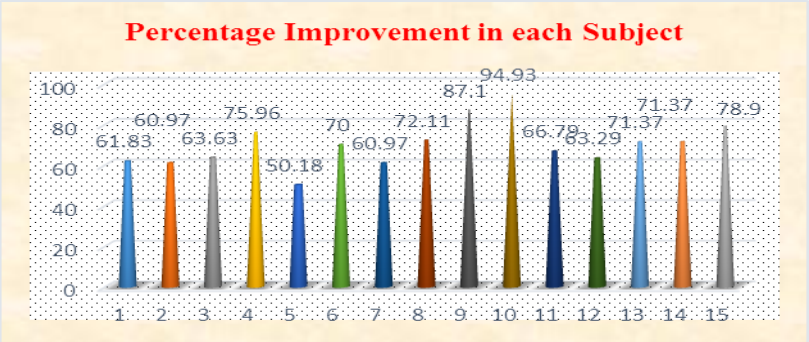
Table No- 3 Intergroup comparison of Group A and Group B

Sr. No.	Parameters		Mean of Diff		S.D	S.E	U Value	P Value	Result
			Group A	Group B					
1	Pain		0.80	1.66	0.72	0.18	49.500	0.0090	VS
2	Stiffness		2.13	2.0	1.009	0.27	99.500	0.6014	NS
3	Tenderness		1.53	1.46	0.74	0.19	106.00	0.8009	NS
4	Active Range of movements of shoulder	Abduction	2.0	1.73	0.96	0.24	97.000	0.5309	NS
		Adduction	1.93	1.66	0.89	0.23	92.500	0.4141	NS
		Flexion	2.2	2.46	0.99	0.25	81.500	0.211	NS
		Extension	2.26	2.20	1.08	0.27	109.00	0.9001	NS
		Circumduction	1.53	1.53	0.63	0.16	112.50	0.9832	NS

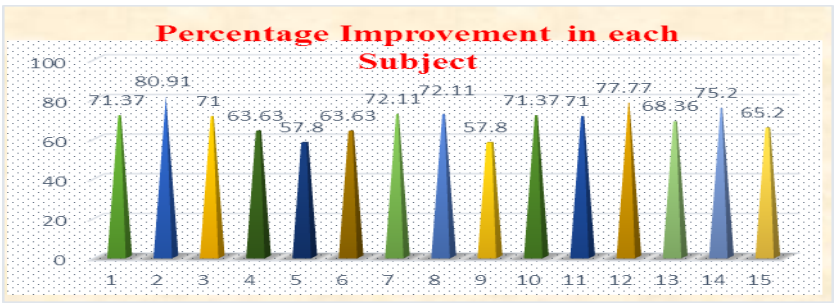
Intergroup comparison of group A & Group B shows VS result in pain with p= 0.0090 and Non-significant result in all other parameters. (Table No. 3)

Table No- 4 Overall effect of therapy

Sr. No	Improvement	No of Patients	
		Group A	Group B
1.	No Improvement (<25%)	0	0
2.	Mild improvement (25-50%)	0	0
3	Moderate improvement (50-75%)	11	12
4.	Excellent Improvement (>75%)	04	03



Graph No-1 Showing Percentage Differences of improvement in each subject in group A



Graph No-2 Showing Percentage Differences of improvement in each subject in group B

DISCUSSION

- In the present study maximum patients were found in age group of 40-50 years and males were affected more than females with maximum patients having affected right shoulder. Reason being majority of the patients being right handed in their routine works. The incidence of *avabahuka* with left shoulder could simply be accredited to the specific nature of the work done by the subjects.
- Maximum improvement by *agnikarma* was found in flexion (75.08%) followed by tenderness (74.27%) and pain (72.50%).
- Maximum improvement by Therapeutic ultrasound was found in flexion (80.39%) followed by extension (70.28%), abduction (69.58%) and tenderness (69.01%).
- Both the groups showed extremely significant results by respective therapies and intergroup comparison showed non-significant result.

Mode of action of *Agnikarma*

- *Agnikarma* alleviates all the *vataja* and *kaphaj* disorders *as ushna guna* of *Agnikarma* is opposite to *sheeta* guna of *vata* and *kapha doshas*. According to Ayurveda, every *dhatu* (tissue) have its own *dhatvagni* and when it becomes low, diseases begins to manifest.
- In this condition, *agnikarma* works by giving external heat there by increasing the *dhatvagni* which helps to digest the aggravated *doshas* and hence cures the disease.[7]
- *Snigdha dravya* like *kshaudra, gu¢a, sneha* owing to its higher latent heat (heat retention capacity of sticky liquid is high) can affect a greater variation in the temperature of the tissue surface and also that of the subsequent layers. Eventually the heat penetration will always be higher when such liquids are used for *agnikarma.*

Mode of action of therapeutic ultrasound

The mode of action of therapeutic ultrasound is as follows.

- Speeding up of healing process due to increase in blood flow in the treated area owing to improved oxygen supply and better clearance of metabolites.
- Adhesion lysis of the adhesions present there in between rotator cuff and the joint capsule.

CONCLUSION

- The treatment applied in both the groups was simple, economical and required no hospitalization and done at OPD level.
- *Agnikarma* and its uses are described in Ayurveda much earlier than its utility was discovered by surgeons of rest medicine branches. The technique and equipment's have become advance but the basic principles are still the same.
- Since the clinical study was conducted on a limited number of patients, it may not be claimed as final. Detailed study on a large sample size should be conducted to evaluate the efficacy of *agnikarma* in the management of Frozen Shoulder.

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