ISSN 2581-6217

World Journal of Pharmaceutical Science & Technology

Journal homepage: www.wjpst.com

Original Article

A COMPARATIVE CLINICAL STUDY OF *AGNI KARMA* AND *AABHA GUGGULU* IN THE MANAGEMENT OF *SNAYU-VIKARA* W.S.R. TO DE-QUERVAIN'S TENOSYNOVITIS

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Received: 16-10-2021, Revised: 28-10-2021, Accepted: 31-10-2021

ABSTRACT

De- Quervain's is the a stenosing tenosynovitis of the first dorsal compartment of the wrist affecting abductor pollicis longus (APL) and the extensor pollicis brevis (EPB) tendons that control the movement of the thumb. Intensity of pain in may be exacerbated by grasping, thumb abduction, and ulnar deviation of the wrist. Repetitive typing, lifting, and manipulation around wrist region are considered as risk factors.

In Ayurveda; De-Quervain's tenosynovitis can be correlated with *Snayu-Vikara (Snayugata vata***);** including the symptoms such as *sula*, *stambha*, *kampa*, *akṣhepa*, *ayama kubjatva*, and *khalli* etc. mentioned by various *Acharyas*. *Acharya Susruta* and *Vagbhaṭa* has described specific treatment for the *Snayugatavata*

i.e. *Snehana, Upanaha, Agnikarma, Bandhana and Unmardana.* Considering this, a clinical trial was planned to evaluate the efficacy of *Agnikarma* along with *Aabha guggulu* in the management of *snayu vikara*.

This clinical study was registered with CTRI/2019/03/017944 and the study was started after approval from institutional ethics committee with reference number IEC/ACA/2017/67. In this study, total 30 patients were selected and randomly divided in to 3 groups. Group A (n=10) was planned with Agni karma procedure; Group B (n=10) was planned with orally intake of *Aabha Guggulu* (500mg) twice a day with Luke warm water. Group C (n=10) was planned with combination of *Aabha guggulu* and *Agni karma* procedure. In all groups, treatment duration was 3 weeks and follow- up to 12 weeks.

Result was assessed on various subjective such as pain and objective parameters such as Finkelstein test, tenderness and Range of Motion (ROM). Overall relief in symptoms was found such as 67.53% in Group A, 23.01% in Group B and 73.93% in Group C. It concludes that *Agni karma* along with *Aabha Guggulu* is more effective in the management of *Snayu-Vikara.*

Keywords: Agni karma, De-Quervain's tenosynovitis, Snayu- vikara, Aabha Guggulu,

Introduction:

De Quervain's tenosynovitis is a common cause of hand and wrist pain. It is a condition affecting the tendon sheaths of the abductor pollicis longus and the extensor pollicis brevis muscle.[i] It often presents with a gradual onset of pain that may be exacerbated by grasping, thumb abduction, and ulnar deviation of the wrist.[ii] Repetitive abduction of thumb and ulnar deviation of the wrist creates tension on the tendon. Sustained and repeated movements can produce friction at the retinaculum sheath. Gradually this can lead to swelling or narrowing of the fibro-osseous canal. This creates resultant impairment of wrist, hand and thumb function with activities such as lifting, pushing, pulling and gripping. This tension produces a fibroblastic response, resulting in thickening and swelling of the compartment and discomfort with use of the hand and wrist. This condition occurs in middle-aged individuals and is around three times more common in women.

It is most common among women between the ages of 30 and 50 years of age including a small subset of women in the postpartum period. [iii] Risk factors for this includes repetitive typing, lifting activities. The patient presenting with mild to moderate pain that does not limit activities of daily living should be treated with rest, splinting, non-steroidal anti-inflammatory drugs (NSAIDs) and corticosteroid injection of the first dorsal compartment. [iv,v] Surgical treatment is based on release of the fibro-osseous roof of the first dorsal compartment and de compressing the stenosis of APL and EPB tendons.

In Ayurveda, as per the symptoms of De-Quervain's disease; it can be correlated with *Snayu-Vikara* or *Snayugata Vata-Vikara* affecting first dorsal compartment of the wrist. The term *Snayu* is used for fibrous structures, tendons & ligament. [vi,vii,viii] In *Sushruta Samhita* characteristics of *Snayugata Vata Vikara* is mentioned as –

''स्नायु प्राप्तः स्तम्भकम्पौ शूलमाक्षेपण तथा'' ॥ (सु. नि. 1/27)

Acharya Sushruta has described *Agni Karma* (para-surgical procedure) in the treatment guidelines of *Snayu Vikara* and explained that *Agni Karma* can be done when severe pain occurs in *Twak, Mamsa, Sira, Snayu, Sandhi* and *Asthi* due to *Vataprakopa*. [ix]

स्नेहोपनाहोग्निकर्माबन्धनोन्मर्दनानि च |

स्नायुसन्ध्यस्थिसम्प्राप्ते कुर्याद्वावतन्द्रितः || (सु. चि. 4/8)

On the basis of above mentioned classical reference, this study was planned to evaluate the efficacy of *Agni Karma* in De- Quervain's disease. *Agni Karma* is a para surgical treatment has been described to have a definite role in *Snayu Vikara*. With emphasis of the *Ayurveda* approach of the *Agni Karma* treatment, which cures the disease and does not require potent analgesics for long period was selected for trial in this study along with the *Aabha Guggulu* as internal use to prove its better outcome.

आभाफलत्रिकव्योषैः सर्वैरेभिः समिकृतैः |

तुल्यो गुग्गुलुरयोज्यो भग्नसन्धिप्रसाधकः || (चक्रदत्त 49/16)

Material & Methods:

Aims and objectives

1. Evaluate the efficacy of *Agni karma* and *Aabha Guggulu* in management of De-Quervain's tenosynovitis.
2. To explore the literature concerning *Snayugata-Vikara* in *Ayurveda.*
3. To provide safe and effective management for De Quervain's tenosynovitis by clubbing the principle of Ayurveda with contemporary science.

Trial Groups: The diagnosed cases of *Snayu Vikara /* De Quervain's tenosynovitis were selected and divided as per computer generated random allocation in three groups (10 patients in each group) with following for the intervention. **Group A:** *Agni Karma* procedure was performed in *Bindu* variety of *Agni Dagdha* in the region of radial styloid process of affected wrist joint in the linear fashion (pre-decided) on 1st, 8th, 15th, and 22nd day with subsequent sitting planned using portable therapeutic electric cautery machine used for purpose of *Agni Karma* for 3 weeks. Wrist brace with thumb was advised to all the patients.

Group B: Tablet *Aabha Guggulu* (500mg) was given orally with Luke warm water twice a day for 3 weeks duration. Wrist brace with thumb was advised for 3 weeks.

Group C: *Agni Karma* procedure was performed in *Bindu* variety. *Agni dagdha* in the region of radial styloid process of affected wrist joint in the linear fashion (pre-decided) done on 1st, 8th, 15th, and 22nd day along with *Aabha Guggulu* (500mg) orally with Luke warm water twice a day for 3 weeks duration. Wrist brace with thumb was advised for 3 weeks.

Duration of the treatment: All the patients of Group A & C were treated with total 4 sittings of *Agni karma* for three consecutive weeks, one sitting per week.

Assessment Criteria:

During the clinical trial patients were assessed on these following parameters with appropriate grading on

- Pain (Visual Analog Scale)
- Tenderness (Pressure Algometry)
- Finkelstein's test
- Range of motion(ROM)
    - Adduction
    - Flexion
    - Extension

Follow-up duration: Follow up was done regularly at 3 weeks interval for 12 weeks.

This clinical study was registered with CTRI/2019/03/017944 and the study was started after approval from institutional ethics committee with reference number IEC/ACA/2017/67.

Observation and Result:

The observations and results of the clinical study are given below in demographic profile in the tabular form.

Table No. 1: Overall distribution of the patients.

Category	Number of patients			Total
	Group-A	Group-B	Group-C	
Registered	10	12	11	33
Complete	10	10	10	30
Drop-outs	0	2	1	3

In the present study, out of total 33 patients of De Quervain's tenosynovitis registered for the study, 30 patients completed the study. Among the registered patients, 03 patients were left the trial against medical advice. The

registered patients were divided in three group (10 in each group). Hence, out of the total number of registered patients is 33 for the present study and observation of 30 patients are given.

Table No. – 2: - Age wise distribution of 30 Patients of De Quervain's tenosynovitis.

S.N.	Age group	Group – A (n=10)		Group – B (n=10)		Group – C (n=10)		Total Pt. (n=30)	Total %
		No. of Pts.	%	No. of Pts.	%	No. of Pts.	%		
1	30-39	4	40%	6	60%	6	60%	16	53.3
2	40-49	4	40%	3	30%	3	30%	10	33.3
3	50-60	2	20%	1	10%	1	10%	4	13.3

Maximum patients i.e. 53.3% were from the age group of 30-39 years followed by 33.3% were from the age group of 40-49 years, 13.3% were from the age group of 50-60 years. The data shows that out of total 30 patients 80% were from the age group ranging from 30-49 years of age. The rational explanation behind this observation may be due to the fact that during this particular age group the persons are comparatively more involved in the various strenuous activities resulting in the excessive usage of wrist joints.

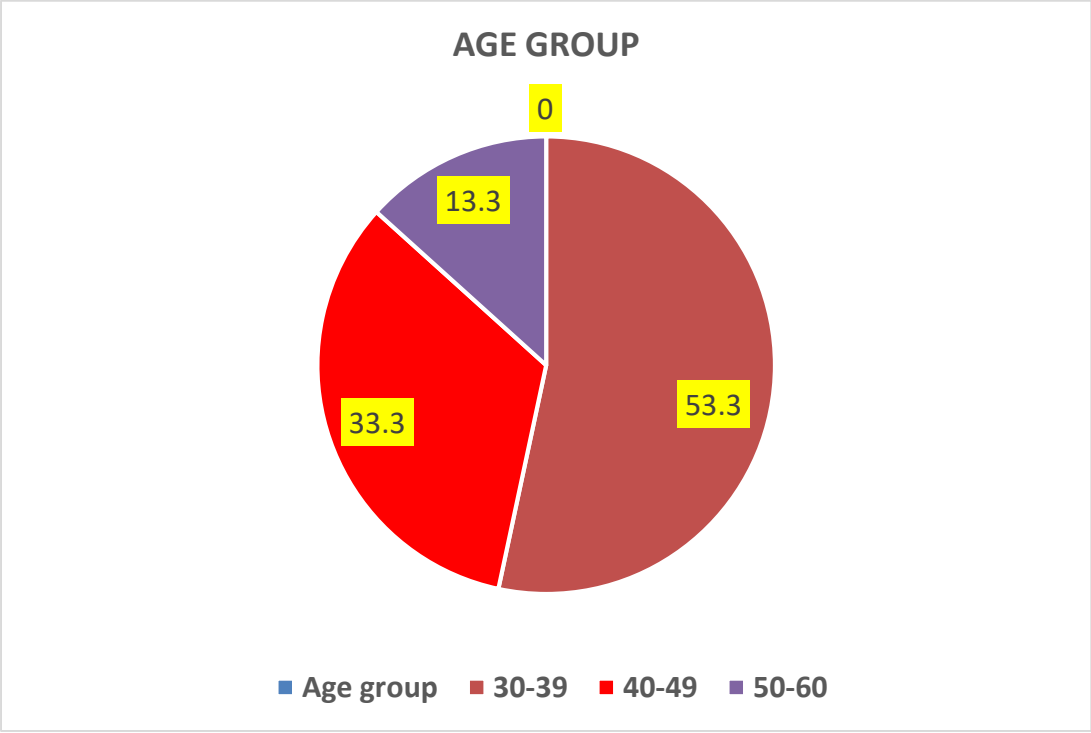

Table No. – 7: - Distribution of 30 Patients of De Quervain's tenosynovitis as per Occupation.

S.N.	Occupation	Group – A (n=10)		Group – B (n=10)		Group – C (n=10)		Total Pt. n=30	Total %
		No. of Pts.	%	No. of Pts.	%	No. of Pts.	%		
1	Labour class	0	0%	1	10%	1	10%	2	6.6%
2	Agriculture Work	0	0%	0	0%	0	0%	0	0%
3	Housewives	4	40%	3	30%	5	50%	12	40%
4	Sports persons	0	0%	0	0%	0	0%	0	0%
5	Govt. Employee	1	10%	6	60%	4	40%	11	36.6%
6	Business-men	5	50%	0	0%	0	0%	5	16.6%

Occupation wise distribution shows that maximum numbers of patients i.e. 40% were Housewives followed by 36.6% Govt. employees, 16.6% Businessmen and 6.6% from the labor class

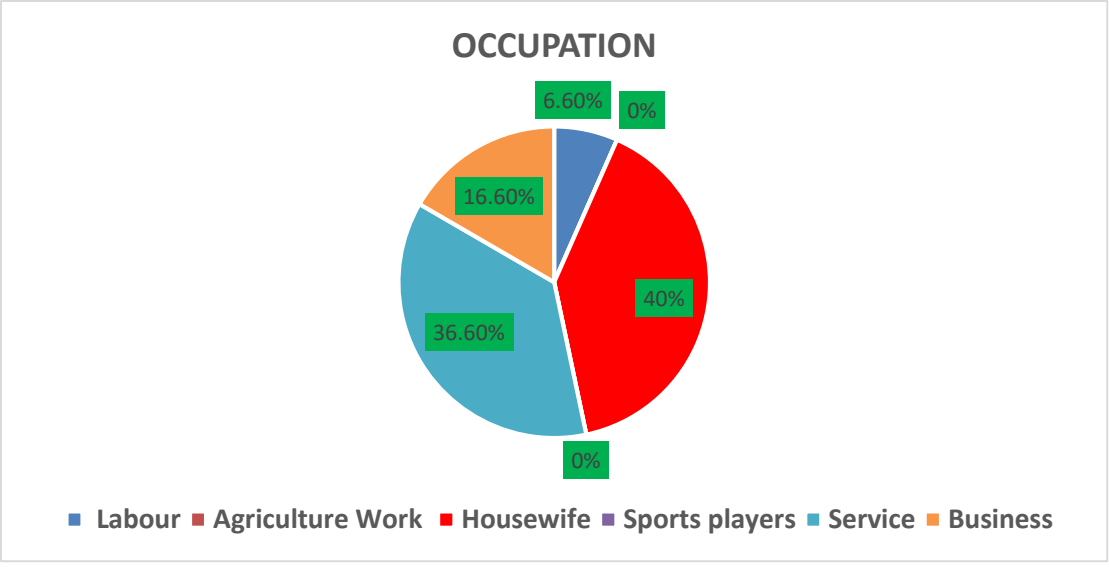

Table no.-8:- Distribution of 30 Patients of De Quervain's tenosynovitis as per Marital status.

S.N.	Marital status	Group – A (n=10)		Group – B (n=10)		Group – C (n=10)		Total Pt. (n=30)	Total %
		No. of Pts.	%	No. of Pts.	%	No. of Pts.	%		
1	Married	10	100%	9	90%	8	80%	27	90%
2	Unmarried	0	0%	1	10%	2	20%	3	10%

In this study 90% of patients were married while 10% were unmarried

Table No. – 10: Distribution of 30 Patients of De Quervain's tenosynovitis as per the Previous History of the condition.

S.N.	Previous History	Group – A (n=10)		Group – B (n=10)		Group – C (n=10)		Total Pt. (n=30)	Total %
		No. of Pts.	%	No. of Pts.	%	No. of Pts.	%		
1	Present	1	10%	0	0%	2	20%	3	10%
2	Absent	9	90%	10	100%	8	80%	27	90%

Previous history wise distribution shows that 10% patients were having previous history of De Quervain's tenosynovitis while 90% were not having any previous history of De Quervain's tenosynovitis.

Table No. – 11: Distribution of 30 Patients of De Quervain's tenosynovitis. As per the Previous History of contemporary treatment taken.

S.N.	History of allopathic Treatment	Group – A (n=10)		Group – B (n=10)		Group – C (n=10)		Total Pt. (n=30)	Total %
		No. of Pts.	%	No. of Pts.	%	No. of Pts.	%		
1	Yes	7	70%	6	60%	7	70%	20	66.66%

2	No	3	30%	4	40%	3	30%	10	33.33%

Out of total 66.66% patients were having the previous history of Allopathic Treatment Allopathic Treatment taken for the problem.

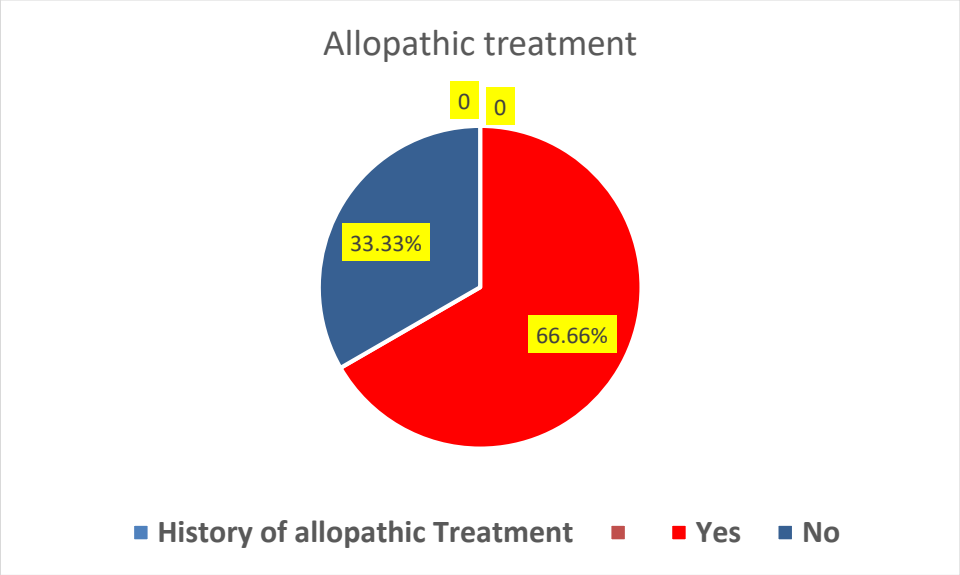

Table No. –15 Distribution of 30 Patients of De Quervain's tenosynovitis as per the *Deh Prakruti*

S.N.	*Deh Prakruti*	Group – A (n=10)		Group – B (n=10)		Group –C (n=10)		Total Pt. (n=30)	Total %
		No. of Pts.	%	No. of Pts.	%	No. of Pts.	%		
1	***Vata-Pittaj***	6	60%	7	70%	8	80	21	70%
2	***Pitta-Kaphaj***	1	10%	1	10%	2	20	4	13.3%
3	***Vata-Kaphaj***	3	30%	2	20%	0	0	5	16.6%

Prakruti wise distribution shows that maximum numbers of patients i.e. 70% were of *vata pitta Prakruti* followed by 16.6% having *vata kaphaj* and remaining 13.3% were having *pitta kaphaj Prakruti*.

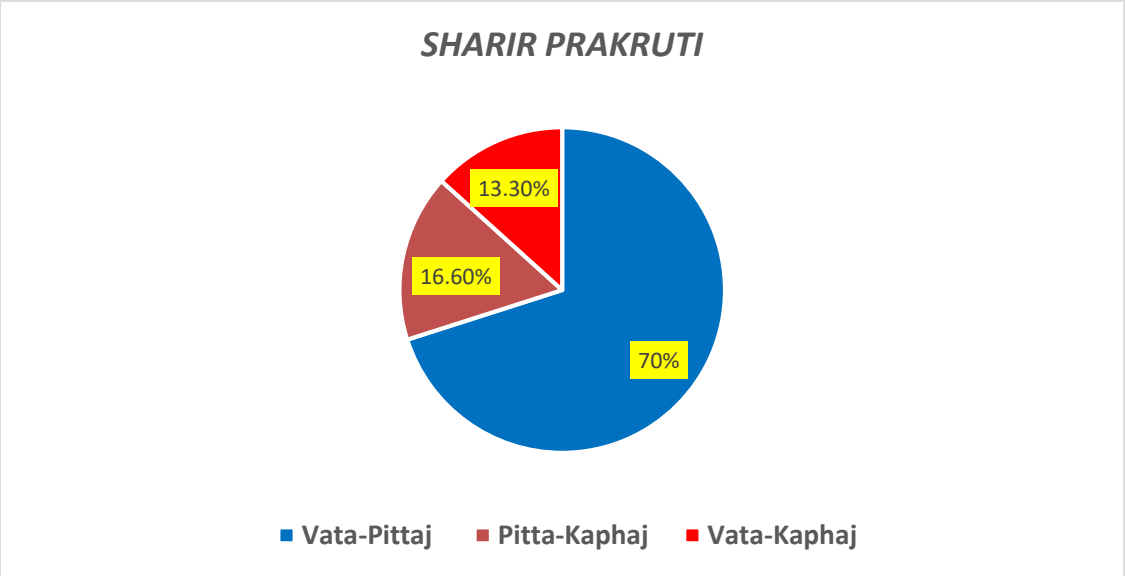

Table No. –17: - Distribution of 30 Patients of De Quervain's tenosynovitis as per the chronicity.

S.N.	History of De Quervain's tenosynovitis. (In month)	Group – A (n=10)		Group – B (n=10)		Group-C (n=10)		Total Pt. (n=30)	Total %
		No. of Pts.	%	No. of Pts.	%	No. of Pts.	%		
1	<1	1	10%	2	20%	1	10%	4	13.3%
2	1-3	6	60%	6	60%	5	50%	17	56.6%
3	>3	3	30%	2	20%	4	40%	9	30%

Present clinical study shows that majority of the patients (56.6%) were having chronicity of 1-3month, while 30% of patients were having history of chronicity more than 3 months and rest of them i.e. 13.3% were having the history of duration less than 1month.

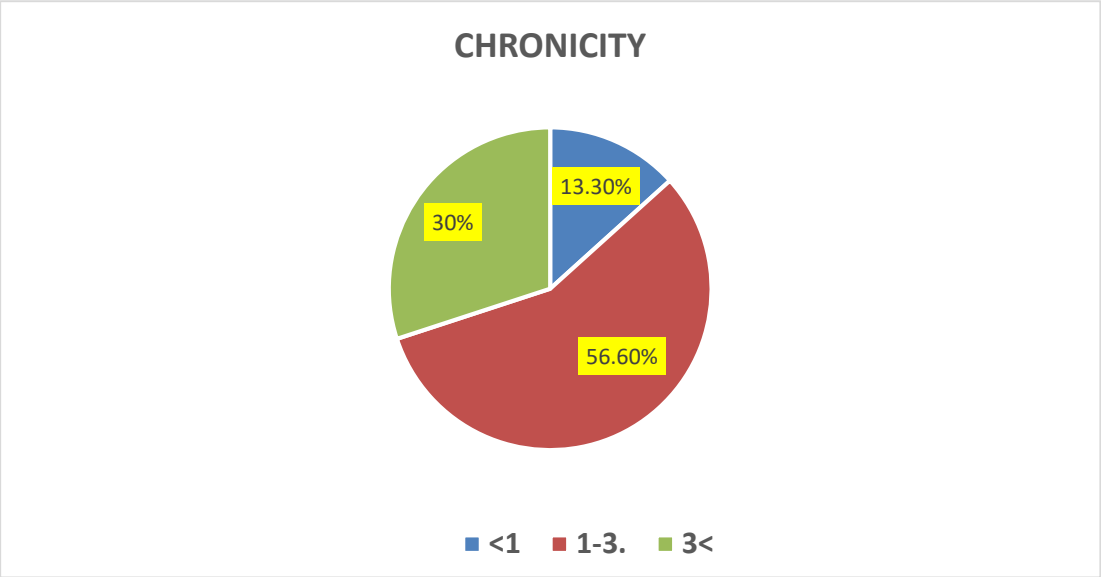

Table no- 18: Distribution of 30 Patients of De Quervain's tenosynovitis as per Pattern of onset

S.N.	Pattern of Onset	Group – A (n=10)		Group – B (n=10)		Group-C (n=10)		Total Pt. (n=30)	Total %
		No. of Pts.	%	No. of Pts.	%	No. of Pts.	%		
1	Sudden	0	0	0	0	0	0	0	0
2	Gradual	10	10	9	90	10	100	29	96.66%
3	Traumatic	0	0	1	10	0	0	0	3.33%

In the Present study, 96.66% of patients were having history regarding gradual onset of the condition whereas 3.33% having the history of onset after the trauma

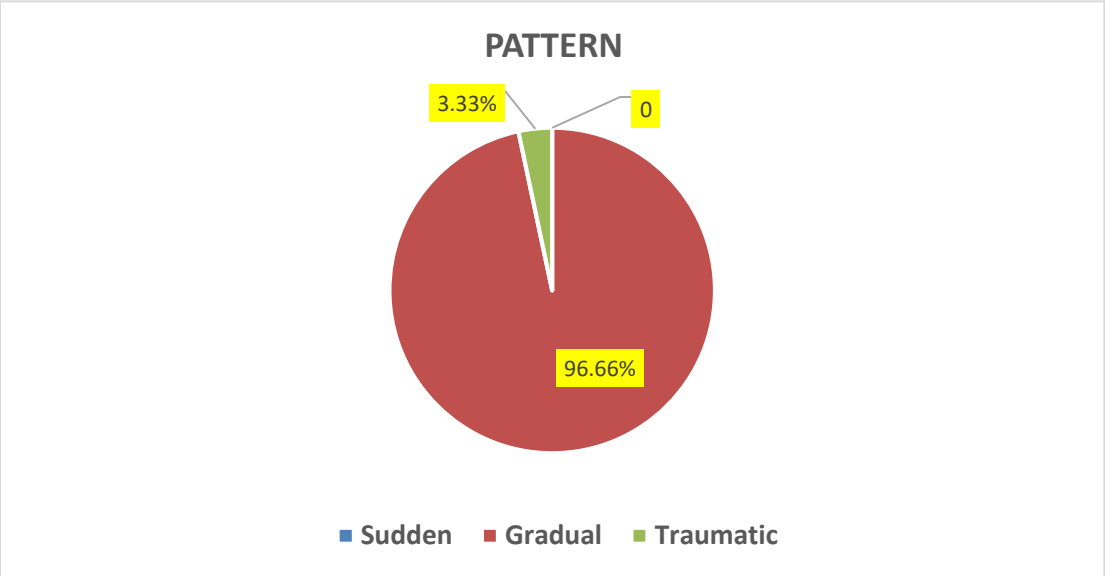

Table no- 19: Distribution of 30 Patients of De Quervain's tenosynovitis as per the presenting symptoms.

S.N.	Symptoms	Group – A (n=10)		Group – B (n=10)		Group-C (n=10)		Total Pt. (n=30)	Total %
		No. of Pts.	%	No. of Pts.	%	No. of Pts.	%		
1	Pain	10	100%	10	100%	10	100%	30	100%
2	Tenderness	10	100%	10	100%	10	100%	30	100%
4	Diminished ulnar deviation	10	100%	10	100%	10	100%	30	100%
7	Symptoms worsens with wrist activity	10	100%	10	100%	10	100%	30	100%

8	Finkelstein test	10	100%	10	100%	10	100%	30	100%
9	weak grip	10	100	10	100	9	90	29	96.66 %
11	Swelling	01	10%	03	30%	02	20%	06	20%

In this study, all of patients (100%) were having history of pain, tenderness (in the region of radial styloid process of affected wrist joint), positive Finkelstein test, diminished ulnar deviation, and history of worsening the symptoms with forearm activity. 96.66 % patients were having history regarding the weak grip, 36.66% were having feature of radiating pain while 20% were presented with the feature of swelling over wrist on lateral side.

EFFECT OF THERAPY

The effects of the therapy are observed in 30 patients that completed the trial. Subjective parameters i.e. Pain(VAS), Finkelstein test were assessed by Wilcoxon matched –pairs sign ranks test for one group therapeutic effect and for the assessment of therapeutic effect among the groups Kruskal-Wallis Test (Nonparametric ANOVA)were used.

Other parameter i.e. tenderness (Pressure Pain threshold) was assessed by paired 'T-test' for one group therapeutic effect and for the assessment of therapeutic effect among the groups Tukey-Kramer Multiple Comparisons Test (Parametric ANOVA) were used. According to that the results has been made this has been described earlier.

Effect of Therapy on Group A

A. Group A

Effect of *Agni karma* on De Quervain's tenosynovitis (*Snayu Vikara*)

(Wilcoxon matched –pairs sign ranks test and Paired T-test for Tenderness)

	MEAN							
Group A	BT	AT	Diff	Diff %	SD	SEM	P Value	Sig
PAIN (VAS)	5.4	1	4.4	81.48	1.264911	0.4	<0.0001	ES
Finkelstein test	2.7	0.5	2.2	81.48	0.632456	0.2	<0.0001	ES

Paired t test								
Tender ness	9.9	17.7	7.8	78.78	1.98	0.62	<0.0001	ES

Range of Motion

Wilcoxon matched-pairs signed rank test

Group A	BT	AT	Diff	Diff %	SD	SEM	P value	Sig
Adduction	1.7	0.5	1.2	70.59	0.632	0.200	0.0039	S
Flexion	0.7	0.4	0.3	42.86	0.483	0.153	0.2500	NS
Extension	0.5	0.3	0.2	40.0	0.632	0.200	0.6250	NS

- **Effect on Pain (VAS)**: Mean score of pain was 5.4 before treatment and Mean score of pain after completion of treatment was 1 with % difference of 81.48 .The result shows that the treatment was statistically extremely significant with $p < 0.0001$.
- **Effect on Finkelstein test grading**: Mean score of Finkelstein test grading was 2.7 before treatment and Mean score of Finkelstein test grading after completion of treatment was .5, with % difference of 81.4. The result shows that the treatment was statistically extremely significant with $p < 0.0001$.
- **Effect on Tenderness**: Mean score of tenderness was 9.9 before treatment and mean score of tenderness after completion of treatment was17.7 with % difference of 78.78. The result shows that the treatment was again statistically extremely significant with $p < 0.0001$.

- **Effect on Adduction:** Mean score of adduction was1.7 before treatment and mean score of pain after completion of treatment was 0.5 with % difference of 70.59. The result shows that the treatment was statistically significant with $P < 0.0039$.
- **Effect on Flexion:** Mean score of flexion was 0.7 before treatment and Mean score of flexion after completion of treatment was 0.4 with % difference of 42.86. The result shows that the treatment was statistically not significant with $p < 0.2500$.
- **Effect on Extension:** Mean score of Extension was 0.5 before treatment and mean score of Extension after completion of treatment was 0.3 with % difference of 40%. The result shows that the treatment was statistically not significant with $P < 0.6250$.

B. Group B

Effect of *Aabha Guggulu* on De Quervain's' tenosynovitis

Wilcoxon matched –pairs sign ranks test and Paired T-test for Tenderness

Group B	MEAN	Diff	Diff %	SD	SEM	P Value	Sig

	BT	AT						
PAIN (VAS)	5.2	3.2	2	38.4615	1.333	0.421	0.0078	S
Finkelstein test	2.6	1.7	0.9	34.6153	0.737	0.233	0.0039	S
Paired t test								
Tender ness	10.1	12.7	2.6	25.74	3.16	1.00	0.029	S

Range of Motion

Wilcoxon matched-pairs signed rank test

Group B	BT	AT	Diff	Diff %	SD	SEM	P value	Sig
Adduction	1.6	1.4	0.2	12.5	0.422	0.133	0.5000	NS
Flexion	0.8	0.7	0.1	12.5	0.316	0.100	>0.9999	NS
Extension	0.7	0.6	0.1	14.28	0.316	0.100	>0.9999	NS

- **Effect on Pain (VAS):** Mean score of pain was 5.2 before treatment and mean score of pain after completion of treatment was 3.2 with % difference of 38.46 .The result shows that the treatment was statistically significant with p <0.0078.
- **Effect on Finkelstein test grading**: Mean score of Finkelstein test grading was 2.6 before treatment and mean score of Finkelstein test grading after completion of treatment was 1.7 with % difference of 34.62. The result shows that the treatment was statistically significant with P < 0.0797.
- **Effect on Tenderness**: Mean score of tenderness was 10.1 before treatment and mean score of tenderness after completion of treatment was 12.7 with % difference of 25.74. The result shows that the treatment was statistically significant with P < 0.029.

- **Effect on Adduction:** Mean score of adduction was1.6 before treatment and mean score of pain after completion of treatment was 1.4 with % difference of 12.50. The result shows that the treatment was statistically not significant with p < 0.5000.
- **Effect on Flexion:** Mean score of flexion was 0.8 before treatment and mean score of tenderness after completion of treatment was 0.7 with % difference of 12.50. The result shows that the treatment was statistically not significant with p > 0.9999.
- **Effect on Extension:** Mean score of extension was 0.7 before treatment and mean score of extension after completion of treatment was 0.6 with % difference of 14.28. The result shows that the treatment was statistically not significant with p > 0.9999.

C. Effect of Therapy on Group C

Wilcoxon matched –pairs sign ranks test and Paired T-test for Tenderness

Group C	MEAN		Diff	Diff %	SD	SEM	P Value	Sig
	BT	AT						
PAIN	5.4	0.6	4.8	88.88	1.0327	0.326	<0.0001	ES
Finkelstein test	2.8	0.3	2.5	89.28	0.5270	0.166	<0.0001	ES
Paired t test								
Tender ness	10.7	20	9.2	85.98	1.22	0.388	<0.0001	ES

Range of Motion

Wilcoxon matched-pairs signed rank test

Group C	BT	AT	Diff	Diff %	SD	SEM	P value	Sig
Adduction	1.7	0.3	1.4	82.35	0.516	0.163	<0.0020	S
Flexion	0.7	0.3	0.4	57.14	0.516	0.163	<0.1250	NS
Extension	0.8	0.4	0.4	50.00	0.516	0.163	<0.1250	NS

- **Effect on Pain (VAS):** Mean score of pain was 5.4 before treatment and mean score of pain after completion of treatment was 0.6 with % difference of 88.89. The result shows that the treatment was statistically extremely significant with p <0.0001.
- **Effect on Finkelstein test grading**: Mean score of Finkelstein test grading was 2.8 before treatment and mean score of Finkelstein test grading after completion of treatment was 0.3 with % difference of 89.28. The result shows that the treatment was statistically extremely significant with P < 0.0001.
- **Effect on Tenderness**: Mean score of tenderness was 10.7 before treatment and mean score of tenderness after completion of treatment was 9.2 with % difference of 85.98. The result shows that the treatment was statistically extremely significant with p < 0.0001.

- **Effect on Adduction:** Mean score of adduction was1.7 before treatment and mean score of pain after completion of treatment was 0.3 with % difference of 82.35. The result shows that the treatment was statistically significant with P < 0.0020.
- **Effect on Flexion:** Mean score of flexion was 0.7 before treatment and mean score of flexion after completion of treatment was 0.3 with % difference of 57.14. The result shows that the treatment was statistically not significant with p < 0.1250

- **Effect on Extension:** Mean score of extension was 0.8 before treatment and mean score of extension after completion of treatment was 0.4 with % difference of 50.0. The result shows that the treatment was statistically not significant with p < 0.1250.

Comparison of Trial (Group A, Group B & Group C) on Various Parameters:

1. **Comparison of effects of Therapy on Pain (VAS):**

Kruskal-Wallis Test (Nonparametric ANOVA)

Comparison	Mean of Ranks	p Value	Remark
Group A	4.4	<0.0004	Considered Highly Significant
Group B	2		
Group C	4.8		

Result: Kruskal-Wallis Test (Nonparametric ANOVA) shows difference in the efficacy among interventions to be highly significant with p value< 0.0004.

Dunn's Multiple Comparisons Test

Comparison	Mean Rank differences	P Value	Remark
Group A vs Group B	11.4	<0.0058	HS
Group A vs Group C	-2.1	>0.9999	NS
Group B vs Group C	-13.5	<0.0007	HS

- The p value of Group A vs Group B is <0.058 which is statistically highly significant.
- The p value of Group A vs Group C is >0.9999 which is statistically not significant. • The p value of Group B vs Group C is <0.0007 which is again statistically highly significant.

2. Comparison of effects of Therapy on Finkelstein Test:

Kruskal-Wallis Test (Nonparametric ANOVA)

Comparison	Mean of Ranks	P Value	Remark
Group A	2.2	<0.0003	Considered Highly Significant
Group B	0.9		
Group C	2.5		

Result: Kruskal-Wallis Test (Nonparametric ANOVA) shows difference in the efficacy among interventions to be highly significant with the p value <0.0003.

Dunn's Multiple Comparisons Test

Comparison	Mean Rank differences	P Value	Remark
Group A vs Group B	11.15	<0.0081	HS
Group A vs Group C	-3.05	>0.9999	NS
Group B vs Group C	-14.2	<0.0004	HS

- The p value of Group A vs Group B is >0.0081, which is statistically highly significant.
- The p value of Group A vs Group C is >0.9999. Which is statistically non-significant.
- The p value of Group B vs Group C is <0.0004 which is again statistically highly significant

3. Comparison of effects of Therapy on Tenderness.

One-way Analysis of Variance (ANOVA)

Comparison	Mean of Ranks	P Value	Remark
Group A	7.8	<0.0001	
Group B	2.6		

Group C	9.2		Considered Extremely Significant

Result: Kruskal-Wallis Test (Nonparametric ANOVA) shows difference in the efficacy among interventions to be extremely significant with p value <0.0001.

Parametric ANOVA Multiple comparision Test

Comparison	Mean Rank differences	P Value	Remark
Group A vs Group B	5.2	<0.0001	ES
Group A vs Group C	-1.4	<0.4484	NS
Group B vs Group C	-6.6	<0.0001	ES

- The p value of Group A vs Group B is P<0.0001 which is statistically found to be extremely significant.
- The p value of Group A vs Group C is p<0.4484 which is statistically non-significant.
- The p value of Group B vs Group C is p<0.0001 which is again found to be statistically extremely significant.

4. **Comparison of effects of Therapy on Range of Motion (ROM)**

A. Adduction (Ulnar Deviation)

One-way Analysis of Variance (ANOVA)

Comparison	Mean of Ranks	P Value	Remark
Group A	1.2	<0.0004	Considered Highly Significant
Group B	0.2		
Group C	1.4		

Result: Kruskal-Wallis Test (Nonparametric ANOVA) shows that the difference in the efficacy among interventions to be highly significant with the p value of <0.0004, Variation among Group medians is statically highly significant.

Dunn's Multiple Comparisons Test

Comparison	Mean Rank differences	P Value	Remark
Group A vs Group B	11.2	<0.0065	HS
Group A vs Group C	-2.2	>0.9999	NS
Group B vs Group C	-13.4	<0.0007	HS

- The p value of Group A vs Group B is <0.0065 statistically which is highly significant.
- The p value of Group A vs Group C is p>0.9999 statistically which is non- significant.
- The p value of Group B vs Group C is p<0.0007 which is highly significant.

B. Flexion

One-way Analysis of Variance (ANOVA)

Comparison	Mean of Ranks	P Value	Remark
Group A	0.3	<0.3156	NS
Group B	0.1		
Group C	0.4		

Result: Kruskal-Wallis Test (Nonparametric ANOVA) shows that difference in the efficacy among interventions is non-significant with the p value 0.3156.

Post tests were not calculated because the P value was greater than 0.05.All groups found equally effective.

C. Extension

One-way Analysis of Variance (ANOVA)

Comparison	Mean of Ranks	P Value	Remark
Group A	0.2	0.3809	NS
Group B	0.1		
Group C	0.4		

Result: Kruskal-Wallis Test (Nonparametric ANOVA) shows that difference in the efficacy among interventions is not significant the p valve of 0.3809.

Post tests were not calculated because the p value was greater than 0.05.All groups were found to be equally effective.

Conclusion:

From the present study **"A Comparative Clinical Study of *Agni karma* and *Aabha Guggulu* in the Management of *Snayu-Vikara* w.s.r. to De-Quervain's tenosynovitis"** following conclusions could be drawn;

1. De- Quervain's is the a stenosing tenosynovitis of the first dorsal compartment of the wrist affecting abductor pollicis longus (APL) and the extensor pollicis brevis (EPB) tendons that control movement of the thumb .
2. As per the symptoms De-Quervain's disease can be correlated with *Snayu-Vikara* or *Snayugata Vata-Vikara*
3. Patients with *Vata Kaphaj prakruti* are more likely to suffer from De-Quervain's disease
4. Overall relief of 73.93% was observed in Group C, treated with ***Agni karma*** **along with** ***Aabha Guggulu.***
5. Overall relief of 67.53%, was observed in Group A, treated with ***Agni karma.***
6. Overall relief of 23.01%, was observed in Group B, treated with ***Aabha Guggulu***.
7. Maximum relief in Group C can be attributed to the synergistic effect of ***Agni karma*** **along with** ***Aabha Guggulu*** *both acting* as potent *Vata Shamaka, Shoolahara, Vedana Sthapaka,* hence alleviating the pain and other associated symptoms relieving De-Quervain's disease.
8. On statistical analyses Group A & Group C have presented much better relief in comparison to group B that could be attributed to intervention of *Agni karma*.
9. Therefore, it can be concluded that *Agni karma* along with *Aabha Guggulu*.is more effective in the management of *Snayu-Vikara* w.s.r. to De-Quervain's tenosynovitis in comparison to the *alone*

intervention of Agni karma or Aabha Guggulu in Group B & it could be a rational intervention while managing the De-Quervain's tenosynovitis.

10. No untoward effects of any intervention was reported by the patients from either group.

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