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A Clinical Study to Evaluate the Effect of *Pooteekatintrinyadi Taila* Bandage in Rotator Cuff Injury

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ABSTRACT

Introduction: The Rotator Cuff muscles are group of muscles and their tendons, which provides strength during motion to the shoulder complex. Acute injuries are encountered as a result of high-velocity trauma or recurrent microtrauma. Clinical signs include shoulder pain, difficulty in shoulder movements with sense of weakness, numbness, or tightness in and around the shoulder and pain while sleeping on the injured side. Measures for management can be conservative and surgical. Signs and symptoms of rotator cuff injury can be closely related with *Snayuvidhalakshana* explained in *Susruta samhita Sutrasthana*. In the present study, *Pooteekatintrinyadi taila* used for external application and then *swasthika bandha* is done. The formulation *Pooteekatintrinyadi taila* is mentioned in a manuscript compilation by Directorate of Ayurveda Medical Education, Department of Health and Family Welfare, Government of Kerala.

Methodology: A clinical trial consisting of 25 participants between 18-60 years irrespective of gender from OPD and IPD of *Shalyatantra* Department Government Ayurveda College Kannur. *Swasthika bandha* with *Pooteekatintrinyadi taila* was given for selected participants. The parameters of assessment criteria like pain, swelling, tenderness was assessed on 0th, 5th, 10th, 15th & 21st day and improvement in range of movement on 21st day.

Result and Discussion: Friedman test and Wilcoxon signed rank test was used to perform the statistical analysis. There was clinically as well as statistically significant effect on outcome variables like pain, swelling, tenderness and in the range of movements.

Conclusion: The combined effect of bandage and intervention medicine *Pooteekatintrinyadi taila* is found to be effective to reduce the pain, swelling, tenderness, improve ROM and provide stability to shoulder joint. The statistical analysis was done using Friedman test and Wilcoxon signed rank test. Statistical analysis of the variables suggests that the difference between on the 0th day and 21st day is highly significant with p value less than 0.005.

Keywords – Rotator cuff injury; *Snayu; Bandhana; Pooteekatintrinyadi taila*

INTRODUCTION

The shoulder joint is among the body's biggest and most intricate joints. Among the patients with shoulder pain, rotator cuff injury is the most common cause, being present in approximately 85% of patients1. The shoulder joint is the body's most

mobile joint due to its extensive range of motion. Activities like swimming, tennis, and weightlifting that require a lot of overhead motion over time can lead to shoulder joint issues.

The most typical cause of shoulder discomfort and impairment is damage to the rotator cuff. As people age, rotator cuff injuries become more common. The rotator cuff complex refers to the tendons of four muscles are also referred as the SITS muscle, with reference to the first letter of their names- Supraspinatus, Infraspinatus, Teres minor and Subscapularis. These muscles originate on the scapula, cross the glenohumeral joint, insert into the tuberosity of the proximal humerus as tendons. They provide the fine-tuning actions and strengthen the arm movement that stabilize the shoulder joint.2

A well-known function of the rotator cuff is to protect the humeral head, stabilize it in the glenoid socket by compressing the round head into the shallow socket, maintain muscular balance, and stabilize the glenohumeral joint when larger muscles cross the shoulder.3

The majority of rotator cuff injuries occur in people who often undertake overhead motions while working, playing sports, or as a result of an acute trauma. Injuries to the rotator cuff can be either traumatic or non-traumatic origin, often found in younger and older age group respectively. Both recurring microtrauma and high-velocity trauma can result in traumatic of rotator cuff injuries. Causes of acute type include falling on the hand or lifting/pulling with the arm. The most typical sign of a tear in a patient is pain.4 Other features include sense of weakness in the arm and shoulder, numbness or tightness in the shoulder area, pain when sleeping or lying on the affected shoulder.

The diagnosis is made based on the patient's medical history, physical examination, and additional tests, such as X-ray, USG- this is highly reliable in diagnosing rotator cuff pathology with a sensitivity of 98 percent and MRI- this is also very accurate (81%) but expensive 5. Management includes conservative and Surgical measures. The indications, symptoms, and length of the injury determine how the rotator cuff is treated. For every patient, initial conservative care without surgery should be taken into consideration. The PRICE protocol—protection, rest, ice, compression, and elevation—is a standard part of primary care. Conservative treatment consists of heat, massage, analgesics, oral NSAIDs, steroid injections, exercises both active and passive, temporary immobilization by bandage. 6

In Ayurveda rotator cuff injury closely relates to *snayuvidha lakshana* mentioned in *Susruta Samhitha sutrasthana*. Generally speaking, *snayu* is related to tendons and ligaments.

When the ligaments and tendons around the shoulder gets injured, there will be weakness or debility of body parts involving the injury *(sareera avayava avasada*), inability to perform their actions (*kriyasu ashakthi*), severe pain*(ruja*), healing takes long time *(chirath vranarohathi).* Injury to tendon of upper limb will affect the day today activities 7, so immobilization of shoulder joint will provide rest and proper healing.

The patients with rotator cuff injury will greatly benefit with low-cost management. In the current study, the subjects diagnosed with partial tear of rotator cuff tendons within one month duration are subjected for shoulder bandage for a duration of 3 weeks with *Pooteekatintrinyadi taila* [8] which contain 7 ingredients having anti-inflammatory, analgesic activities and wound healing property. Bandaging with gauze and kora cloth will helps to retain the oil at site.

Background and Rationale

Number of patients reporting rotator cuff injury are increasing in OPD and IPD of department of Shalyatantra. The surgical intervention is able to provide a satisfactory relief in complete tear of rotator cuff muscles and the cost of surgery is very expensive. So, this present study is an attempt to find a better alternative which will be cost effective and beneficial for the patients with partial tear of grade one and two rotator cuff tear.

METHODOLOGY

Methodology of this study mainly consists of:

1. Clinical study.
2. Observation and assessment

STUDY DESIGN

- Single group
- Interventional pre and post study
- Patient condition is assessed before and after treatment.

STUDY SETTING: OPD and IPD, Shalyatantra Department Government Ayurveda college, Kannur

STUDY POPULATION: Subjects between the age group of 18-60 years irrespective of gender having rotator cuff injury with partial tear of one, two, three, four or all muscles are selected in a consecutive manner on the basis of inclusion and exclusion criteria.

SELECTION AND WITHDRAWAL OF SUBJECTS

INCLUSION CRITERIA

- Participants have rotator cuff tear screened or diagnosed with U.S.G or MRI
- Participants with age group 18-60 years irrespective of gender
- Participants with rotator cuff injury within 1 month

EXCLUSION CRITERIA

- Rotator cuff tear diagnosed by using X-ray associated with fracture or wound in and around the shoulder joint.
- With known case of systemic disorders like tuberculosis, muscular dystrophy, neurological diseases
- With uncontrolled diabetes mellitus
- With complete rotator cuff tear

SAMPLE SIZE : Sample size of 25 patients in a single group.

SAMPLING TECHNIQUE

25 subjects in the age group 18-60 years having rotator cuff injury are grouped in a consecutive method on the basis of inclusion and exclusion criteria.

DATA COLLECTION

25 subjects willing to participate in the study were selected based on the inclusion and exclusion criteria. Detailed history was taken according to the proforma prepared for the study incorporating all the relevant points from both Ayurvedic and modern views. Necessary investigations were carried out and their details were recorded.

STUDY TOOL: Clinical case proforma, Goniometer.

INTERVENTION- *Pooteekatintrinyadi Taila*

INGREDIENTS

Fig 1- Pooteeka twak

Fig 2- Tintrini patra

Fig 3- Devadharu

Fig 4- Kushta

Fig 5- Shundi

Fig 6- Jeeraka

Fig 7- Tila taila

Method of Preparation of *Pooteekatintrinyadi Taila*

Tila taila is taken in a vessel and heated in low flame, then *kalka* with *drava dravya* (*Tintrini patra swarasa+ Pooteeka twak kashaya*) will be added. *Taila* is prepared till *kalka* attains *khara paka*.

Tila taila was directly heated on a mild flame, then *kalka* with *drava dravya* were added. Mixture was stirred intermittently till it attains *khara paka*. Finally, the mixture was filtered when hot through cloth and stored in bottle.

Fig 8- Preparation of Pooteekatintrinyadi taila

PROCEDURE

Subjects with diagnosed cases of partial tear of Rotator cuff muscles within one month duration will be subjected to *Pooteekatintrinyadi taila bandhana* for a duration of 3 weeks.

Symptoms like pain, swelling, tenderness will be assessed on 0th, 5th, 10th, 15th & 21st day and improvement in range of movement will be assessed on 21st day.

Bandhana will be done on every 5th day

2 follow up with 15 days gap after final assessment.

BANDAGING PROCEDURE

Fig 9- Shoulder bandage

• The participant after removing his/her upper clothes, seated in a stool comfortably.

• A 6-meter-long kora cloth with 30cm width were made to a roll.

• *Pooteekatintrinyadi taila* will be applied over the affected area and gentle massage was done for 1 minute.

• A gauze pad soaked with *Pooteekatintrinyadi taila* is kept over the shoulder. A small cotton ball is placed in the axilla.

• Together with a sling to support the injured side's upper limb, a *Swasthika* style of bandaging is applied.

• They will be given adequate (10 ml for each time) amount of the same medicated oil for applying twice a day over the bandaged area.

ASSESSMENT: Assessment will be done before and after the completion 3 weeks of bandhana.

Observation and assessment: The subjects were assessed based on the assessment criteria at the following stages

1. Before the intervention

2. On the 21st day

ASSESSMENT CRITERIA

1. PAIN

The Pain reading was graded using Visual Analogue Scale (**VAS SCALE)**

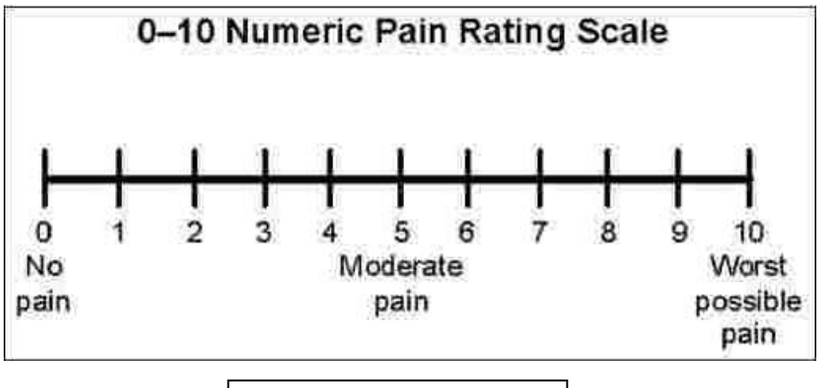

Fig 10 – VAS Scale

Table No- 16: Grading of pain

Score	Condition
0	Nil
1-3	Mild pain
4-6	Moderate pain
7 and above	Severe pain

2. SWELLING

Grade 0	No swelling
Grade 1	Mild swelling
Grade 2	Moderate swelling
Grade 3	Severe swelling

3.TENDERNESS

Grade 0	No tenderness
Grade 1	Tenderness with no physical response
Grade 2	Tenderness to palpation with grimace or flinch
Grade 3	Withdrawal (+jump sign) to non noxious stimuli

4.RANGE OF MOVEMENT

1. Range of movement is measured by Goniometer.
2. Range of movements of shoulder joint is graded as follows;

A. ABDUCTION

Grade 0	Normal abduction 180˚
Grade 1	Mild restriction: abduction possible upto 120˚
Grade 2	Moderate restriction: abduction upto 60˚
Grade 3	Severe restriction: abduction below 60˚

B. FLEXION

Grade 0	Normal flexion 150˚
Grade 1	Mild restriction, up to 105˚
Grade 2	Moderate restriction, up to 45˚
Grade 3	Severe restriction, below 45˚

C. EXTENSION

Grade 0	Normal extension 45˚

Grade 1	Mild restriction, upto 30˚
Grade 2	Moderate restriction, upto 15˚
Grade 3	Severe restriction, below 15˚

D. INTERNAL ROTATION

Grade 0	Normal internal rotation 90˚
Grade 1	Mild restriction, up to 50˚
Grade 2	Moderate restriction, up to 30˚
Grade 3	Severe restriction, below 30˚

E. EXTERNAL ROTATION

Grade 0	Normal external rotation 90˚
Grade 1	Mild restriction, upto 70˚
Grade 2	Moderate restriction, upto 40˚
Grade 3	Severe restriction, below 40˚

RESULT & DISCUSSION

Pain : Out of 25 participants, After the treatment; (Grade II) 2 (9.1%) of the participants become Grade 0 and 20 (90.9%) of the participants become Grade I. (Grade III) 3 (100%) of the participants become Grade II. On statistical analysis the p-value was found to be .000 which means that *Pooteekatintrinyadi taila* is effective in the management of pain in rotator cuff injury.

Swelling : After the treatment; (Grade 0) 6 (100%) of the participants remains as Grade 0. (Grade I) 12 (100%) of the participants become Grade 0 and (Grade 2)7 (100%) of the participants become Grade I. On statistical analysis the p-value was found to be .000 which means that significant effect for swasthika bandha with PT taila in the management of pain in rotator cuff tear.

Tenderness: Following the intervention, 7(100%) of the participants with G2 had achieved Grade 1. Out of 17 participants with G3 tenderness 14 becomes G2 and 3 become G1 after treatment. One participant with G4 become G2. On statistical analysis the p-value was found to be .025 which means that *Pooteekatintrinyadi taila* is effective in the management of tenderness in Rotator cuff injury.

Range of movements

Abduction: After the treatment; (Grade 0) 3 (100%) of the participants remains Grade 0. (Grade I) 1 (8.3%) of the participants becomes Grade 0 and 11 (91.7%) of the participants become Grade I. (Grade II) 2 (20%) of the participants become Grade 0, 6 (60%) of the participants become Grade I and 2 (20%) of the participants become Grade II. On statistical analysis the p-value was found to be .000 which means that *Pooteekatintrinyadi taila* is effective in abduction in Rotator cuff injury.

Flexion: After the treatment; (Grade 0) 4 (100%) of the participants remains as Grade 0. (Grade I) 4 (21.1%) of the participants becomes Grade 0 and 15 (78.9%) of the participants becomes Grade I. (Grade II) 2 (100%) of the participants becomes Grade I. On statistical analysis the p-value was found to be .000 which means that *Pooteekatintrinyadi taila* is effective in flexion in Rotator cuff injury.

Extension: After the treatment; all of the participants become Grade 0. On statistical analysis the p-value was found to be .000 which means there is a significant association between Effect of bandage with *PT taila* in extension before and after treatment was noted.

External Rotation: Following the intervention, five individuals (100%) remain Grade 0. Out of 18 participants with Grade 1, 17 become Grade 0 and 1 (5.6%) of the participant remain Grade I. (Grade II) 2 (100%) of the participants become Grade 0. On statistical analysis the p-value was found to be .000 which means that *Pooteekatintrinyadi taila* is effective in external rotation in Rotator cuff injury.

Internal Rotation: After the treatment; (Grade 0) 12 (100%) of the participants remains Grade 0. (Grade I) 3 (100%) of the participants having Grade 0. (Grade II) 3 (30%) of the participants become Grade 0 and 7 (70%) of the participants become Grade I. On statistical analysis the p-value was found to be .001 which means that *Pooteekatintrinyadi taila* is effective in internal rotation in Rotator cuff injury.

- *Tila taila- sookshma* and *vyavayi* properties.
- Remaining drugs- *laghu guna*, - penetrates into deeper structures easily providing strength and stability.
- There will not be any pain without *vata*. The *Ushna veerya, vataghna* property of *Tila taila* helps to alleviate *vata* and thereby shoola which is most disturbing parameter.
- The immobilization with bandage also provides enough rest to the affected limb, which also helps to reduce the pain.
- Majority of the ingredients have *kapha-vatahara* property- reduce inflammation on the joint - improving the range of movement after 3 weeks of bandaging
- One of the most common complication of rotator cuff injury is shoulder joint stiffness.
- On the 21st day assessment it was found that there is no considerable stiffness. It may be due to the *ushna veerya & vata-kaphahara property* of *Pooteekatintrinyadi taila*.

CONCLUSION

- A rotator cuff tear is among the most frequent shoulder injuries that prevent people from doing their daily activities.
- Tears in the rotator cuff progress with aging.
- When compared to females, men are impacted more.
- Those who perform strenuous overhead tasks are primarily affected.
- The disease of rotator cuff can be correlated with *Snayuvidha lakshana* mentioned in *Susrutha sutrasthanam, Ashtavidha shastrakarmiya adhyaya*.
- Due to wound healing property of *Pooteekatintrinyadi taila*, it promotes tendon healing and by the *ushna veerya & vata kaphahara* property it reduces the post traumatic stiffness.
- The combined effect of bandage and intervention medicine *Pooteekatintrinyadi taila* is found to be effective to reduce the pain, swelling, tenderness, improve ROM and provide stability to shoulder joint.
- Statistical analysis of the variables suggests that there was significant difference between the 0th day and 21st day.
- Finally, the null hypothesis was rejected.

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