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Manjisthadi Lepa as Vedanasthapana in soft tissue injury with special reference to Ankle Sprain

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ABSTRACT

Background: Demanding lifestyle has boosted the incidence of trauma/soft tissue injury. One among such conditions is sprain with site predominance as Ankle accounting for 75%. Most sprains are sports related injuries and treatment for which is PRICE (pain killers, rest, icepack, compression and elevation) in allied science. In the United States it is estimated that 23,000 people per day, necessitate medical care for ankle sprains including athletes and non-athletes. *Acharya Sushruta* in the context of *Bhagna Chikitsa* explained *Manjisthadi Lepa* to combat *Vedana* (pain). **Objective of the study:** To evaluate the *Vedanasthapana* effect of *Manjisthadi Lepa* in soft tissue injuries with special reference to Ankle sprain. **Materials:** 40 patients of Ankle sprain were selected from OPD and IPD of BVVS Ayurved Medical Hospital, Bagalkot based on the inclusive criteria. **Study design:** Single group, open clinical study. **Method:** Lepa was applied at affected site twice daily for 07 days and removed before it dried. **Follow up:** on 15th, 30th and 45th day. **Observation:** Age distribution showed 40% of patients were between 20-30 years with female predominance of 67.5%. Occupation wise students ranked more. Mode of injury dominates to getting down the stairs 80% with inversion of foot 85% especially left sided majority of 82.5% having grade I injury. **Interpretation and conclusion:** The study showed 88.2% improvement in pain, 85.7% in tenderness, 71.8% in swelling and 100% in loss of function and discoloration respectively by a period of one week treatment. Ankle range of movements showed 100% improvement with p value <0.001.

Key words: Ankle Sprain, Manjisthadi Lepa, Soft Tissue Injury, Bhagna.

INTRODUCTION

The incidence of trauma began from the time, existence of the fittest. *Sushruta Samhita* is a treatise of ancient age, which assembles surgical aspects in systematic outline.^[1] The rate of trauma is rising due to aggressive and excited lifestyle. When going through the classification of trauma, acute musculo-

skeletal injuries and sprains are ranked high. In 75% of ankle injuries most common is Ankle sprain. In young athletes 10-30% of sports related injuries are acute ankle trauma. Acute ankle injuries make nearly one million people consult the doctors. More than 40% of ankle sprain have the potential to cause chronic problems.^[2]

In the United States it is estimated that 23,000 people per day, necessitate medical care for ankle sprains including athletes and non-athletes. In other form it can be said that, 1 case per 10,000 persons per day visit the physician for care.^[3]

Most common complication of repetitive ankle injuries is post-traumatic osteoarthritis. From one of the study it was noted that post traumatic osteoarthritis of the hip, knee or ankle also fall under 12% of the overall prevalence of osteoarthritis. \$3.06 billion dollars annually economic encumber is noted to solve the problem.^[4]

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On time exact and appropriate diagnosis of ankle sprain with proper treatment, raise the incidence of normal and pain-free use of the affected ankle. With appropriate history, focused physical examination and with help of the imaging techniques (X-ray, CT, MRI) the severity of injury, pathological process, acute or chronic, can be determined.^[5]

Ankle joint withstands 1.5 times of the body weight when one walks and upto eight times of the body weight when one runs.^[6] It is exposed to extreme mechanical conditions during single limb support. It has to bear the total body weight and the kinetic energy generated by the indulgence of force, during walking, running or jumping, when the foot speedily makes stroke with the floor.

Ankle joint is stable joint with tibia medially and fibula laterally. The joint is strongly bound around by tibio-fibular and interosseous ligaments. On the medial side is the strong deltoid ligament and laterally collateral ligaments with its three bands. The ankle joint is the only Syndesmosis fibrous joint which does have a synovial membrane.^[7]

The stability of ankle joint is moderately depended on the ligaments, as it unstable without ligaments. Inversion or Eversion of foot is the main cause for Ankle Sprain and pain is most common complaint. This form of injury leads to either tear or stretch of one or more ligaments in the ankle joint. When compared to the sprains at different sites in body, it is most likely Ankle ligaments sprained often.

Even though ankle sprain seems to be simple injury, but is most painful and hinder the routine activities of the sufferer. It is characterized by pain, swelling with or without deformity. Ankle sprains presents on either medial or lateral side, but most common being lateral sprain. Twist in ankle is frequent in sports leading to ankle pain. Apart from ankle sprain, other conditions which present ankle pain as a symptom are arthritis, gout, pseudogout and infections.^[8]

In allied science the treatment principle is PRICE i.e pain killers, rest, ice application, compression and elevation of foot.

On going through the literatures, we don't find direct explanation of sprain with its management. *Acharya Sushruta* while explaining *Bhagna Chikitsa* in the context of *Asthi-Bhagna* mentioned the word "*Patanabhighatadwa*" which can be considered as *Patana*, *Abhighata* or both become the main cause for sprain, where the application of *Sheeta Parisheka* or *Sheeta Pradeha* to reduce *Vedana* and *Shopha* has been emphasized.^[9] *Lepa* is considered as *Adhya Upakrama* by *Acharya Sushruta*.^[10]

Utility of *Lepa* in *Asthi-Bhagna*, *Vrana-Chikitsa*, for *Jatamatra Shopha* having *Ugra Ruja* is very well described by *Acharya Sushruta*.^[11] Importance of *Lepa* is highlighted by a simile as - To extinguish the fired house sprinkling of water is to be carried immediately, similar way to subside the pain application of *Lepa* has to be done at its earliest.^[12]

Research works on *Snayu Vikara* are very few. Efficacy of *Manjisthadi Lepa* on *Snayu Vikara* is not been conducted as per recent research review.^[13] Here an attempt is made to study the efficacy of *Sheeta Pradeha (Manjisthadi Lepa)* on Ankle Sprain.

OBJECTIVE OF THE STUDY

To evaluate the *Vedanasthapana* (analgesic) effect of *Manjisthadi Lepa* in Ankle Sprain.

MATERIALS AND METHODS

Source of Data: Patients attending OPD and IPD of BVVS Ayurved Hospital Bagalkot, Karnataka, were selected for the study irrespective of age sex, religion and occupation.

Sample size: 40 patients

Consent: Informed and written consent was taken from all patients.

Inclusion criteria

1. Patients with clinical features of Ankle Sprain.
2. Patients of first and second grade Ankle Sprain.

Grade I

- Mild pain
- Mild swelling

- Mild joint stiffness
- Little or no loss of function

Grade II

- Moderate to severe pain
- Moderate swelling
- Moderate joint stiffness
- Moderate loss of function

Exclusion criteria

1. Patients with fracture and dislocation of Ankle joint.
2. Patients with third grade Ankle Sprain

Grade III

- Severe pain
- Profuse swelling
- Complete joint stiffness
- Complete loss of function

Diagnostic criteria

1. Diagnosis was done based on the history of inversion or eversion of foot and clinical features like – pain, tenderness, swelling, loss of function, discoloration and joint stiffness.
2. Radiographically absence of fracture or dislocation

Ingredients of Manjisthadi Lepa

1. Manjistha
2. Yashtimadhu
3. Raktachandana
4. Shali Pishti
5. Shatadhauta Ghrita

Method of preparation of Lepa

Sukshma Churna of all the above mentioned ingredients were taken in equal quantity in a bowl along with half quantity of *Shatadhauta Ghrita* and *Lepa* is prepared by mixing it with cold water and this

was applied to the patients on affected site of Ankle sprain.

Intervention - Manjisthadi Lepa

Selected patients were examined as per the clinical proforma prepared for the study and subjected to radiographic examination. The patients of this group underwent following procedure.

- The patients were advised for bed rest.
- Foot elevation above heart level was given.
- Freshly prepared *Sheeta Manjisthadi Lepa* was applied over the affected Ankle in the *Pratiloma Gati* with a thickness of *Ardra Maheesha Charma* (0.25cm).
- The *Lepa* was kept in situ till cracks were noted or till the patient complained of stretching sensation, i.e. before it dried completely.
- In all the patients *Lepa* was applied twice daily and this procedure was followed for one week duration.
- Gradually rehabilitation was advised.

Follow up study

Patients were examined on initial day zero and further followed daily for one week. Then weekly once follow up for four weeks to note the changes in signs and symptoms of the patients based on the research proforma and also to note whether the relief provided by the therapy was sustained or not or whether there was any relapse.

Assessment Criteria

Daily assessment of the patient was carried out based on gradings given to subjective and objective parameters.

Subjective parameters

To assess the efficacy of the trial preparation or improvement in the clinical symptoms of the disease, different signs and symptoms were arbitrarily graded on the basis of severity.

The Clinical gradations of symptoms are as follows;

1) Pain

No pain	0
Localized feeling of pain only during movement	1
Localized feeling of pain during movement and at rest but not disturbing the sleep	2
Localized feeling of pain during movement and rest but disturbing the sleep	3

2) Tenderness

No tenderness	0
Patient winces on deep palpation	1
Patient winces on superficial palpation	2
Patient does not allow to touch the part	3

3) Loss of function

Normal function/ Normal gait	0
Can walk with effort	1
Can walk with help of support	2
Cannot walk	3

4) Discoloration

No ecchymosis/discoloration	0
Ecchymosis / discoloration present	1

Objective parameters**5) Swelling**

Swelling was directly recorded with measuring tape in centimetres and readings were noted at the level of, above the Ankle, the mid of the Ankle and below the Ankle joint, and compared with the measurements of normal limb.

Ankle movements were measured with goniometry**6) Dorsiflexion**

Angle of 25°	0
Angle above 15°	1
Angle above 5°	2

7) Plantarflexion

Angle of 35°	0
Angle above 25°	1
Angle above 15°	2
Angle above 5°	3

8) Adduction

Normal movement	0
Mild pain (movement with pain)	1
Moderate pain (movement with difficulty)	2
Severe pain (movement not possible)	3

9) Abduction

Normal movement	0
Mild pain (movement with pain)	1

Moderate pain (movement with difficulty)	2
Severe pain (movement not possible)	3

10) Inversion

Normal movement	0
Mild pain (movement with pain)	1
Moderate pain (movement with difficulty)	2
Severe pain (movement not possible)	3

11) Eversion

Normal movement	0
Mild pain (movement with pain)	1
Moderate pain (movement with difficulty)	2
Severe pain (movement not possible)	3

OBSERVATIONS**Table 1: Distribution of Ankle Sprain patients according to observations of parameters.**

Parameters	Patients predominant	Percentage
Age	20-30 years	55%
Gender	Female - 27	67.5%
Occupation	Students - 15	37.5%
Mode of injury	Getting down from stairs - 32	80%

Mechanism of injury	Inversion - 34	85%
Dominant side	Left - 33	82.5%
Grade	Grade I - 22	55%

In the series of 40 patients 55% of them belonged to age group of 20-30 years, with female predominance of 67.5%. On screening the occupation students ranked 37.5% and sustained injury mainly while getting down the steps 80% with inversion of foot 85% mainly left foot 82.5%. Taking into the Grade of injury 55% of them had Grade I and 45% with Grade II Ankle Sprain.

Table 2: Statistical analysis showing the result on Clinical features after one week treatment with Manjisthadi Lepa.

Symptom	Mean score		% of relief	S. D (±)	S.E (±)	't'	'p'
	BT	AT					
Pain	1.87	0.2	88.2%	0.67	0.15	11	<0.001**
Tenderness	1.75	0.25	85.7%	0.61	0.14	10.71	<0.001**
Swelling	24.08	22.35	71.8%	1.04	0.23	7.52	<0.001**
Loss of function	1.4	0	100%	0.50	0.11	12.73	<0.001**
Discoloration	0.4	0	100%	0.50	0.11	3.64	<0.01*

**Highly significant, *Significant, SD: Standard deviation, SE: Standard error, BT: Before treatment, AT: After treatment.

Table 2 showing the percentage of improvement in the clinical features of Ankle sprain as pain by 88.2%, tenderness by 85.7%, swelling by 71.8%, loss of function by 100% and ecchymosis by 100%.

Table 3: Statistical analysis showing results of Degrees of foot movements after one week treatment with Manjisthadi Lepa.

Foot Movements	Mean score		% of relief	S.D (±)	S.E (±)	‘t’	‘p’
	BT	AT					
Dorsiflexion	1.5	0	100%	0.44	0.09	13.33	<0.001**
Plantarflexion	2.05	0	100%	0.83	0.19	10.79	<0.001**
Adduction	1.15	0	100%	0.49	0.11	10.45	<0.001**
Abduction	0.65	0	100%	0.59	0.13	5	<0.001**
Inversion	1.15	0	100%	0.49	0.11	10.45	<0.001**
Eversion	0.7	0	100%	0.57	0.13	5.38	<0.001**

There was 100% result in all the movements of Ankle joint after one week of treatment.

Table 4: Results of follow up after Manjisthadi Lepa application in Ankle Sprain

Signs and Symptoms	Mean score		% of relief
	BT	AT	
Pain	1.87	0	100
Tenderness	1.75	0	100
Swelling	24.08	0	100
Loss of function	1.44	0	100
Discoloration	0.4	0	100
Dorsiflexion	1.5	0	100
Plantar flexion	2.05	0	100
Adduction	1.15	0	100
Abduction	0.65	0	100
Inversion	1.15	0	100

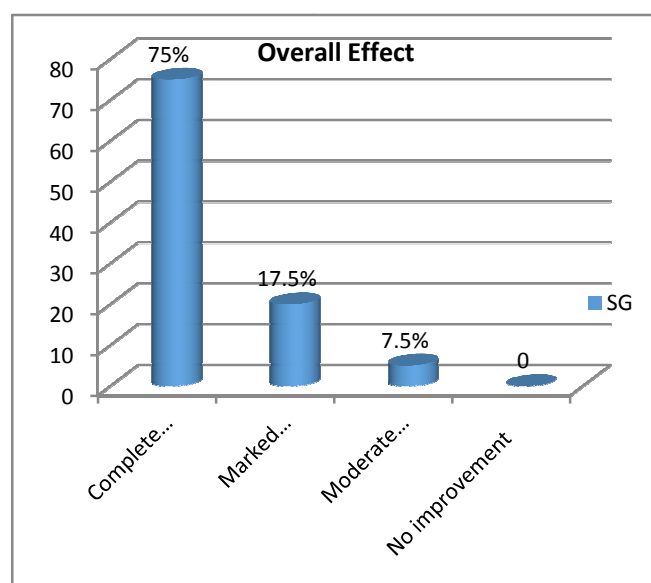
Eversion	0.7	0	100
BT: Before treatment, AT: After treatment			

Table 5: Total effect of Manjisthadi Lepa in both Groups after one week treatment for Ankle Sprain.

Total Effect	Patients in number and %	
Complete remission (100% reduction in signs and symptoms)	30	75%
Marked improvement (75-99% reduction in signs and symptoms)	07	17.5%
Moderate improvement (50-74% reduction in signs and symptoms)	03	7.5%
Mild or No improvement (1-49% reduction in signs and symptoms) Or no change in signs and symptoms)	0	0%

Total effect of the treatment in 40 patients after one week, 75% patients had complete improvement, 17.5% marked and 7.5% with moderate improvement.

Figure 1: Overall results in 20 patients after one week of treatment for Ankle Sprain.



Overall Result - The study showed 88.2% improvement in pain, 85.7% in tenderness, 71.8% in swelling and 100% in loss of function and discoloration respectively. There was marked

improvement in all the parameters of Ankle Sprain with $p < 0.001$ after one week treatment.

DISCUSSION

Gulpha Marma (vital points) is present at the junction of *Pada* (foot) and *Jangha* (ankle). It is *Rujakara Marma* (painful point) and produces the symptoms as *Ruja* (pain), *Stabdha Padata* (stiffness of joints) or *Khanjata* (limping) when injured,^[5] which are similar to the features of Ankle Sprain as pain (*Ruja*), stiffness of joint (*Stabdha Padata*), loss of function (*Khanjata*) and swelling. Generally *Ruja Sthala* is rich of nociceptive nerve endings, which are found abundantly in ligaments, tendons, periosteum and apophyseal joints. Ankle Sprain is mainly caused by inversion (85%). Most commonly anterior talo-fibular ligament followed by calcaneo-fibular ligament. Considering the *Samprapti* (pathogenesis), it is the vitiated *Rakta* (blood), which is causing *Margavarodha* (obstruction) to *Vata* (nerve conduction) producing the *Lakshanas* (symptoms) after the trauma. Hence *Vyadhi Viparita Chikitsa* (symptom opposite treatment) is followed i.e *Sheeta Pradeha* (cold anointment). In the context of benefits of *Pradeha*, Acharya Sushruta emphasizes to use *Pradeha* (cold anointment) at the site of *Marama Stitha Dasha* (vital point seated). So is the present study carried based on the same principle.

Mode of action

Manjisthadi Lepa is a combination of 5 ingredients which together are *Tridosha Shamaka*. *Manjistha* and *Yastimadhu* are *Vedanahara* while *Manjistha* and *Raktachandana* are *Raktaprasadaka*. The reduction in swelling that accompanies the application of cold therapy following acute injury can be attributed to immediate vasoconstriction of the arterioles and venules, which reduces the circulation to the area and therefore reduces the extravasations of fluid into the interstitium. The major effect of cold therapy is to relieve pain. The probable mechanism involved is the stimulation of cold receptors. These receptors are present in the epidermis and are attached to medium diameter myelinated A fibers, although few connect to small diameter unmyelinated C fibers. Temperature

of 25°C activates cold receptors, which send impulses into spinal cord through posterior root and close the pain gate. Cold also stimulates the mid brain which may release Beta Endorphins or Enkephalins into posterior horn and indirectly reduce pain by stimulation of thalamus.

CONCLUSION

Gulpha Marma Abhighata (ankle vital point injury) can be co-related with Ankle Sprain. Seven days application of *Manjisthadi Lepa* provided significant relief in the signs and symptoms of the patients of Ankle Sprain. The *Manjisthadi Lepa* provided better relief in pain, tenderness, ankle swelling, loss of function, dorsiflexion, abduction, inversion and eversion of the ankle joint. Complete remission of clinical features in 75% of patients after one week and 100% in the follow-up study. *Lepa* should be cold in potency and cold to touch when applied in acute soft tissue injury. Thus *Manjisthadi Lepa* can be used in soft tissue injury without wound to reduce the pain.

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