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A CLINICAL EVALUATION OF MARMAGULIKA LEPAM (MG LEPAM) IN THE MANAGEMENT OF ACUTE PAIN AND INFLAMMATION IN MUSCULOSKELETAL DISORDERS: AN OPEN-LABEL INTERVENTIONAL STUDY

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Abstract

Background

Musculoskeletal disorders cause significant pain and functional limitation. NSAIDs, though effective, are associated with adverse effects, necessitating safer alternatives.

Objective

To assess the efficacy of *Marmagulika Lepam* (MG Lepam), an Ayurvedic external formulation, in inflammatory joint conditions.

Results

In this open-label study, 20 patients with acute or chronic joint inflammation received topical MG Lepam for 2–7 days. Pain (VAS), swelling, and tenderness were assessed before and after treatment. Mean VAS pain scores significantly reduced from 7.35 ± 1.27 to 2.38 ± 1.12 ($p < 0.001$). Swelling decreased from 2.45 ± 0.60 to 0.45 ± 0.51 ($p < 0.001$), and tenderness from 2.50 ± 0.51 to 0.25 ± 0.55 ($p < 0.001$).

Discussion

MG Lepam demonstrated rapid anti-inflammatory and analgesic effects, offering symptomatic relief without systemic drug exposure.

Conclusion

Marmagulika Lepam is effective in reducing pain and inflammation in joint disorders and may serve as a safe natural alternative for musculoskeletal conditions.

Keywords: Marmagulika Lepam, joint inflammation, pain, swelling, tenderness, musculoskeletal disorders

1. Introduction

Joint inflammation is a hallmark of various musculoskeletal disorders, including osteoarthritis, traumatic injuries, sprains, and low back pain, manifesting as pain, swelling, tenderness, and restricted mobility.[1] These conditions affect millions worldwide, contributing to reduced quality of life and economic burden.[2] Modern management predominantly involves NSAIDs and analgesics, which, while effective, carry risks of gastrointestinal, cardiovascular, and renal complications with prolonged use.[3,4]

Ayurveda, the ancient Indian system of medicine, offers holistic approaches emphasizing dosha balance, particularly vitiation of Vata and Kapha in joints (*Sandhigata Vata*).[5,6] External therapies (*Bahya Chikitsa*), such as Lepam (medicated pastes), are recommended for localized *Shotha* (inflammation) and *Shoola* (pain) by pacifying aggravated doshas and reducing local *Ama* (toxins).[7]

Marma Gulika Lepam is a classical Kerala Ayurvedic formulation referenced in *Sahasrayogam*, a compendium of over 1000 formulations from the Kerala tradition.[8]It is traditionally indicated for traumatic injuries, edema, and inflammatory pain at *Marma* (vital points).The paste comprises multiple herbs with documented anti-inflammatory, analgesic, and coolant properties, such as *Glycyrrhiza glabra* (anti-inflammatory glycyrrhizin),[9] *Tinospora cordifolia* (immunomodulatory and anti-arthritic),[10] *Emblica officinalis* (antioxidant vitamin C-rich),[11] *Asparagus racemosus* (soothing),[12] and *Pueraria tuberosa* (tubers with puerarin, known for anti-inflammatory effects).[13]

This study provides preliminary clinical evidence for MG Lepam's role in managing acute inflammatory joint symptoms

2.Materials and Methods

2.1Preparation of MG Lepam

MG Lepam was prepared according to classical guidelines in Sahasrayogam. Fine powders of authenticated raw drugs were triturated with appropriate liquids , ie decoctions to form a homogeneous paste suitable for external application.

Table 1: Composition of MG Lepam

Sl. No	Ingredients	Botanical name	Parts used
1.	Vidari	*Pueraria tuberosa*	Tuber
2.	Jeevanthi	*Leptadenia reticulata*	Tuber
3.	Satavari	*Asparagus racemosus*	Root
4.	Mustha	*Cyperus rotundus*	Rhizome
5.	Varahi	*Tacca aspera*	Tuber
6.	Tavaksheeri	*Maranta arundinacea*	Rhizome
7.	Amantamool	*Melothria heterophylla*	Tuber
8.	Amalaki	*Emblica officinalis*	Fruit
9.	Sariba	*Hemidesmus indicus*	Root
10.	Guduchi	*Tinospora cordifolia*	Stem
11.	Durva	*Cynodon dactylon*	Whole part
12.	Yashti	*Glycyrrhiza glabra*	Rhizome
13.	Chandana	*Santalum album*	Heart wood
14.	Raktachandana	*Pterocarpus santalinus*	Heart wood
15.	Sahasravedhi	Magnatrite	As such
16.	Kumari	*Aloe barbadensis*	Leaf
17.	Shilajith	*Asphaltum punjabianum*	Exudate
18.	Kashmir larkspur	*Delphinium cashmerianum*	Flower
19.	Sanjeevani	*Selaginella rupestris*	Whole plant
20.	Prasarini	*Merremia tridentata*	Whole plant
21.	Lonika	*Portulaca oleracea*	Whole plant
22.	Matsyakshi	*Alternanthera sessilis*	Whole plant
23.	Murva	*Chonemorpha macrophylla*	Root
24.	Udumbara	*Ficus racemosa*	Flower bud
25.	Plaksha	*Ficus microcarpa*	Flower bud
26.	Aswatha	*Ficus religiosa*	Flower bud
27.	Vata	*Ficus bengalensis*	Flower bud
28.	Kathakam	*Strichnous potatorum*	Fruit

29.	Gokshura	*Tribulus terrestris*	Fruit
30.	Hribera	*Coleus vettiveroides*	Leaf
31.	Usira	*Vetiveria zizanioides*	Root
32.	Udumbara	*Ficus racemosa*	Bark
33.	Plaksha	*Ficus microcarpa*	Bark
34.	Aswatha	*Ficus religiosa*	Bark
35.	Vata	*Ficus bengalensis*	Bark
36.	Lodhra	*Symploccus racemosus*	Bark
37.	Jambu	*Syzygium cumini*	seed
38.	Sushavi	*Calycopteris floribunda*	Stem
39.	Katabhi	*Careya arborea*	Bark
40.	Kantabohul	*Xantolis tomentosa*	Bark
41.	Daruharidra	*Coccineum fenestratum*	Bark
42.	Pashanabheda	*Rotula aquatica*	Whole plant
43.	Mudga	*Vigna radiata*	Seed
44.	Masha	*Vigna mungo*	Seed
45.	Sookshmela	*Elettaria cardomomum*	Seed

2.2Study Design and Participants

This open-label interventional study included 20 patients (ages 25–75 years; 8 males, 12 females) presenting with symptoms of joint inflammation, including low back ache, knee pain, ankle sprain, shoulder pain, neck pain, and toe pain.

Inclusion Criteria:

Patients eligible for MG Lepam should meet the following conditions:

1. Acute Pain & Inflammation – Patients experiencing mild to moderate pain and inflammation due to:

Musculoskeletal injuries (sprains, strains), Arthritis flare-ups, Post-traumatic swelling

2. Age Consideration – Typically, adults and adolescents (10-75 years) unless otherwise specified.

3. Intact Skin – Can be applied only to unbroken, healthy skin.

4. No History of Allergies to Ingredients – No known hypersensitivity to active or inactive components.

5. Non-Systemic Conditions – Used for localized pain relief, not for systemic inflammatory conditions.

Exclusion Criteria:

Patients who should not use MG Lepam:

1. Open Wounds or Broken Skin – Avoid application on cuts, ulcers, or infected areas.

2. Known Allergies – Hypersensitivity to active ingredients (e.g., NSAIDs, menthol, capsaicin, or other components).

3. Severe Skin Conditions – Eczema, psoriasis, or dermatitis in the application area.

4. Concurrent Use of Similar Medications – Avoid excessive application with other topical NSAIDs or irritants.

5. History of Skin Reactions – If previous use caused redness, irritation, or rash.

2.3 Intervention

MG Lepam paste was applied thickly to affected areas, 1–3 times daily based on severity, for 2–7 days. No concomitant internal medications were administered.

2.4 Outcome Measures

- Pain: VAS (0 = no pain, 10 = worst pain).
- Swelling and Tenderness: Graded 0 (absent) to 3 (severe). Assessments: Baseline and post-treatment.

2.5 Statistical Analysis

Paired t-test for VAS;

Wilcoxon signed-rank test for ordinal data. Significance: $p < 0.05$.

3.Results

Patient demographics and individual outcomes are summarized in Table 2.

Table 2: Patient Data and Outcomes

The patient data are summarized in the following table:

Sl.No	Name	Age	Gender	Symptoms	VAS Before	VAS After	Result	Swelling (Before-After)	Tenderness (Before-After)
1	Patient 1	57	M	Great toe Left – Foot – Pain & Swelling	6	1	Swelling Reduced Fully within 2 days of Application	2-0	2-0
2	Patient 2	55	F	LBA Presenting with Swelling (L4 – L5). Can't sit long. Radiating pain while standing.	9	3	Given thrice. Only applying during severe pain. Relieved next day.	3-1	2-0
3	Patient 3	32	M	LBA Radiating to Right lower Back. Pain while waking	8	0	Pain Reduced Fully within 2 days of Application	3-0	3-0
4	Patient 4	25	F	Ankle joint – Sprain - Left	8	3	Pain & Tenderness Reduced by using 1 week	3-1	3-0
5	Patient 5	28	F	Pain neck radiating to both hands & LBA	9	4	Again the same condition repeated and continued the same procedure	3-1	3-1
6	Patient 6	64	F	LBA	8	3	Pain & Tenderness Reduced	2-1	2-0
7	Patient 7	55	F	Pain mainly over all joints especially fingers. Pain neck radiating to left shoulder	9	4.5	Swelling & Tenderness Reduced	3-1	3-1
8	Patient 8	75	F	LBA	8	4	Tenderness Reduced completely	2-1	2-0
9	Patient 9	64	F	Shoulder pain & LBA (Severe)	7	3	Immediate relief during	2-0	3-0

Sl.No	Name	Age	Gender	Symptoms	VAS Before	VAS After	Result	Swelling (Before-After)	Tenderness (Before-After)
				H/O Disc prolapse			local application		
10	Patient 10	26	F	Lower limb - Swelling	7	2	Swelling & Tenderness Reduced completely	2-0	3-0
11	Patient 11	32	F	Pain neck. Severe pain radiating to both shoulders	6	2	Find Relief within 2 days of application	2-0	2-0
12	Patient 12	63	M	Knee joint pain Right	6	1	Swelling Reduced completely	2-0	2-1
13	Patient 13	55	F	Knee joint pain	7	3	Tenderness Reduced completely	3-1	3-0
14	Patient 14	29	F	Big toe - Pain & Swelling	5	2	Swelling & Tenderness Reduced completely	2-0	2-0
15	Patient 15	55	F	Knee joint pain	7	3	Immediate relief during local application	3-0	3-0
16	Patient 16	45	M	Neck pain	8	3	Tenderness Reduced completely	3-1	3-0
17	Patient 17	52	F	Shoulder pain	7	2	Immediate relief during local application	2-0	2-1
18	Patient 18	46	F	LBA	9	2	Swelling & Tenderness Reduced completely	3-0	3-0
19	Patient 19	61	M	Knee joint Pain Left	7	1	Swelling & Tenderness Reduced completely	2-0	2-0
20	Patient 20	58	M	Ankle joint Pain Right	6	1	Swelling Reduced completely	2-0	2-1

Statistical Results:

- VAS: Mean before 7.35 ± 1.27; after 2.38 ± 1.12; $p < 0.001$.

- Swelling: Mean before 2.45 ± 0.60; after 0.45 ± 0.51; $p < 0.001$.
- Tenderness: Mean before 2.50 ± 0.51; after 0.25 ± 0.55; $p < 0.001$.

Rapid relief (often within 2 days) was reported in most cases, with complete resolution in several.

Mean VAS Score Comparison, Mean Swelling Score Comparison & Mean Tenderness Score Comparison given in figure 1, 2 &3

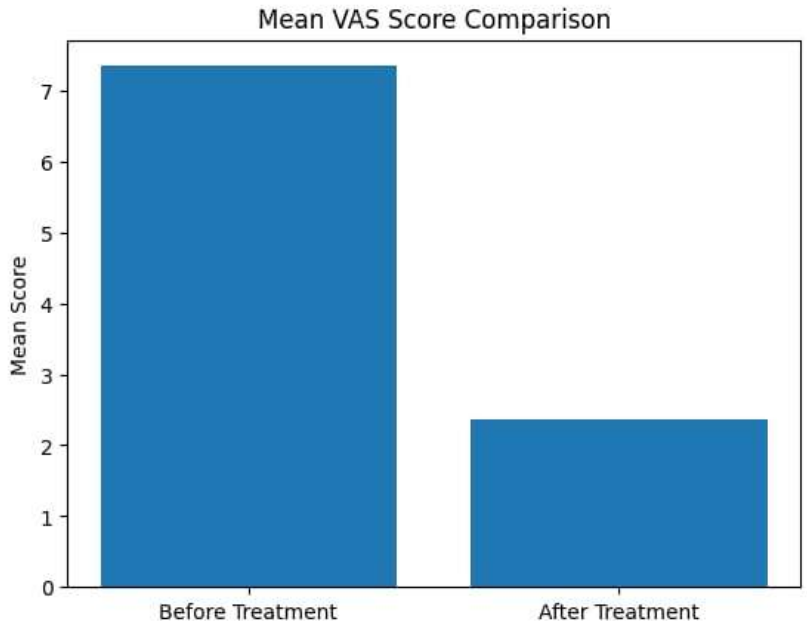

Figure 1: Mean VAS Score Comparison Before and After Treatment

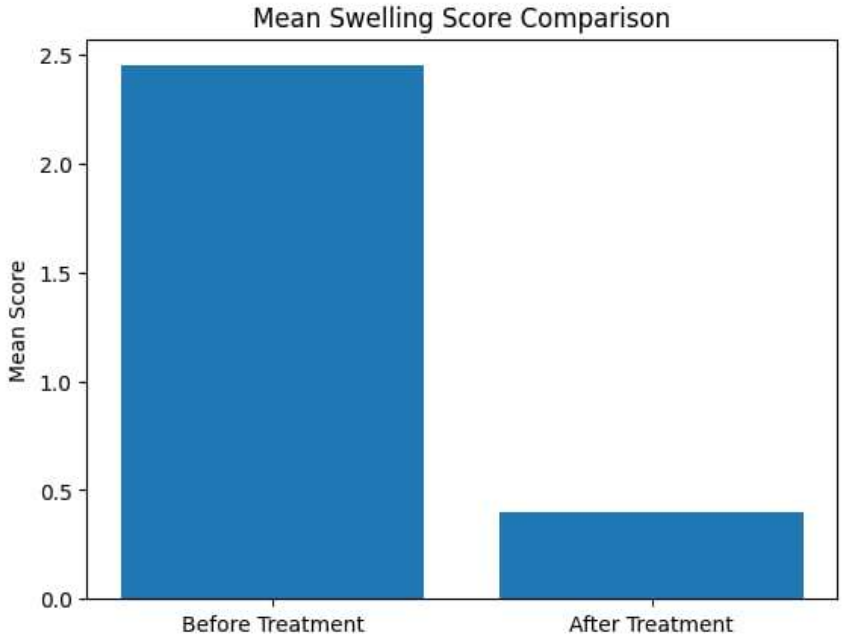

Figure 2: Mean Swelling Score Comparison Before and After Treatment

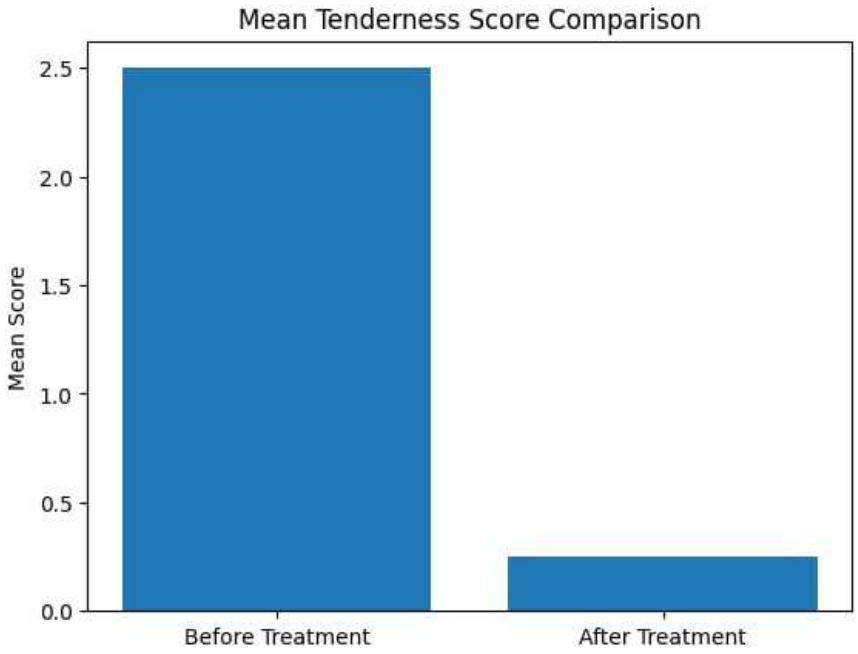

Figure 3: Mean Tenderness Score Comparison Before and After Treatment

4.Discussion

The present open-label interventional study demonstrates that **Marmagulika Lepam** (MG Lepam) produces significant and rapid reduction in pain, swelling, and tenderness in patients with acute and subacute musculoskeletal inflammatory conditions. The statistically significant improvement in VAS pain scores and inflammatory parameters within a short treatment duration of 2–7 days suggests a strong topical anti-inflammatory and analgesic effect of the formulation. The rapid onset of action, with many patients reporting relief within one to two days, highlights its clinical utility in acute presentations such as sprains, traumatic swelling, and flare-ups of degenerative joint disorders.

From an Ayurvedic perspective, joint pain and inflammation are commonly attributed to vitiation of Vata and Kapha doshas along with the accumulation of *Ama*, leading to conditions described under *Sandhigata Vata, Shotha,* and *Shoola*. Lepana is a well-established *Bahya Chikitsa* indicated for localized inflammation, pain, and swelling, as it directly pacifies aggravated doshas at the site of pathology without imposing systemic burden. MG Lepam, described in **S***ahasrayogam*, is traditionally indicated for Marma-related injuries, edema, and inflammatory pain, and its observed clinical effects in this study align well with these classical indications

The therapeutic response seen in this study can be correlated with the pharmacological actions of the constituent drugs. *Tinospora cordifolia* is known for its anti-inflammatory, immunomodulatory, and anti-arthritic properties, which may contribute to downregulation of inflammatory mediators in affected joints . *Glycyrrhiza glabra* possesses analgesic and anti-inflammatory effects through inhibition of prostaglandin synthesis, while *Emblica officinalis*, rich in antioxidants, may help reduce oxidative stress and tissue inflammation.Drugs such as *Asparagus racemosus* and *Pueraria tuberosa* provide tissue-soothing and nourishing effects, supporting recovery in inflamed and injured structures.The presence of cooling and anti-edematous herbs like Chandana (*Santalum album*), Raktachandana, Vetiveria zizanioides, Cynodon dactylon, and Aloe barbadensis may explain the rapid reduction in swelling and local burning sensation reported by patients.

The synergistic polyherbal composition of MG Lepam likely enhances local microcirculation, reduces inflammatory exudation, and soothes peripheral nerve endings, resulting in effective pain relief. The inclusion of mineral and herbo-mineral components such as **Shilajith** and Sahasravedhi may further aid deeper tissue penetration and potentiation of therapeutic effects. The external route of administration allows targeted action at the site of inflammation, minimizing systemic absorption and adverse effects commonly associated with oral NSAIDs.

Overall, the results validate the traditional use of Marmagulika Lepam in inflammatory musculoskeletal conditions and suggest that it is an effective, safe, and rapidly acting topical Ayurvedic formulation.

5. Conclusion

The findings of the present open-label interventional study indicate that Marmagulika Lepam (MG Lepam) is an effective topical Ayurvedic formulation for the management of acute and subacute pain and inflammation associated with musculoskeletal disorders. Application of MG Lepam resulted in statistically significant reductions in pain intensity, swelling, and tenderness, with many patients experiencing rapid symptomatic relief within a short duration of treatment. The formulation demonstrated consistent efficacy across various clinical presentations, including low back pain, knee joint pain, sprains, shoulder and neck pain, suggesting its broad applicability in inflammatory joint and soft tissue conditions.

The external mode of administration allows targeted local action, minimizing systemic exposure and thereby reducing the risk of adverse effects commonly associated with conventional analgesics and NSAIDs. The absence of reported local adverse reactions further supports the safety and tolerability of MG Lepam when applied over intact skin. These attributes make it particularly suitable for elderly patients, individuals with comorbidities, and those requiring repeated or short-term pain relief.

The observed clinical benefits appear to be attributable to the synergistic action of the polyherbal ingredients, which possess anti-inflammatory, analgesic, antioxidant, and tissue-soothing properties, in accordance with both Ayurvedic principles and contemporary pharmacological understanding. By addressing localized inflammation and pain through Dosha pacification and reduction of Ama, MG Lepam aligns well with the Ayurvedic approach to musculoskeletal disorders.

In conclusion, Marmagulika Lepam represents a safe, effective, and rapidly acting natural topical intervention for musculoskeletal pain and inflammation, with potential utility as a standalone therapy in mild to moderate cases or as an adjunct in integrative pain management strategies.

6. Acknowledgments

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7. Conflicts of interest

The authors declare no conflicts of interest. The funder had no role in study design, data collection, analysis, or manuscript preparation.

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