



Review Article

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CRITICAL REVIEW ON ELLUMNISHADI LEPA: AN AYURVEDIC TOPICAL APPLICANT IN KNEE JOINT SWELLINGS ASSOCIATED WITH RHEUMATOID ARTHRITIS

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ABSTRACT

'Ellumnishadi lepa' is a poly herbal topical dosage form mentioned in 'Chikitsa Manjari', which is a compilation of clinical observations and simple formulations that were used by traditional Ayurveda practitioners of Kerala. As per the textbook, the lepa (topical applicant) is indicated in knee joint swellings associated with Vatarakta (a disease condition caused due to dangerous amalgamation of vitiated Vata (bio force) and Rakta (blood)). The ingredients of the formulation are to be boiled in milk, made into a paste and applied locally over the afflicted area with quantity sufficient ghee. Rheumatoid arthritis (RA) is an autoimmune chronic inflammatory disease afflicting majority of synovial joints. Although Rheumatoid arthritis cannot be correlated to a single entity in Ayurveda, clinical protocols and medicaments prescribed for Vatarakta are used by clinicians in different stages of rheumatoid arthritis. Ingredients in the prescribed lepa are having proven anti-inflammatory, anti-rheumatic and antioxidant activities which can combat the pathology in RA. Ellumnishadi lepa application can be used as an effective complimentary treatment along with main stream management strategies in providing satisfactory relief from knee joint swellings associated with degenerative changes in Rheumatoid arthritis.

Keywords: Ellumnishadi lepa, Vatarakta, Rheumatoid arthritis

INTRODUCTION

Rheumatoid arthritis (RA) is an autoimmune chronic inflammatory disorder. It is characterised by symmetric erosive synovitis and as the disease progresses; the synovial inflamed membrane invades and damages the cartilages and bones of the associated joint. RA has a significant negative impact on the ability to perform daily activities, including work and household tasks, health related quality of life and it increases mortality.¹ Earliest possible diagnosis and treatment with disease modifying anti rheumatic agents (DMARD) to limit the degree of irreversible joint damage are recommended by conventional science in the management of RA. But each DMARD has its own side effects and unique toxicities.²

Research has indicated that people suffering from chronic diseases like RA and those dissatisfied with the current conventional treatments are very likely to seek alternative treatments and an estimated 60–90% of persons with arthritis use complementary and alternative medicine. Amongst all, the widely accepted practice is the 'Herbal medicine' due to its high safety profile.³ Ayurveda also has effective management of RA through administration of various internal medicaments and external therapies.

RA cannot be correlated to a single disease entity in Ayurveda. But treatment protocols for Vatarakta (disease condition caused due to dangerous amalgamation of vitiated Vata and Rakta) and *Amavata* (disease manifested due to association of Ama (metabolic toxins) with Vata) are used by clinicians in the management of different symptoms of RA.⁴ Hence there is a

controversy among Ayurvedic researchers in correlating both Vatarakta and Amavata to RA.

The reference of Ellumnishadi lepa is taken from Chikitsamanjari, a text book compiled by Astavaidya tradition (masters of eight branch of Ayurveda from Kerala) incorporating their observations and clinical experiences. Lepa is a semisolid topical dosage form where various herbal drugs are made into paste with suitable bases and applied locally to attain the desired therapeutic effect.⁵ Ellumnishadi lepa is one such poly herbal combination indicated for local application in swellings of knee joints associated with Vatarakta.⁶

In Ayurveda Vatarakta is a disease caused by vitiated Vata and Rakta, where aggravated Vata gets obstructed in its course by the vitiated blood and subsequently Vata vitiates the entire blood. Due to subtle pervasive nature of Vata and Rakta, it spreads all over the body and when they get obstructed in joints; arthritis like symptoms are manifested. Vatarakta is of two types based on its location - Uttana (when pathology afflicts superficial tissues) and Gambira (when deeper tissues like bone and joints are involved).⁷

When disease progresses in RA too, the bones are affected in both local and systemic manner.² Simpler treatments like lepa application are usually considered not that effective when disease pathology has entered deeper tissues but they can be used as complimentary treatments (along with main treatments) to relieve pain, swelling, catches and also to strengthen the bones, joints and other surrounding soft tissues. Ellumnishadi lepa is particularly seen beneficial in knee joint swellings associated with degenerative changes occurring in progressive stages of RA.

Although many *lepa*s are used for the management of swellings in such cases, clinician should use his *yukti* (logic) for selecting the most suitable one based upon the associated symptoms and doshas (morbid humours) involved in different stages of disease. Before application of any *lepa*, the properties of the individual drugs and role of the pharmaceutical combination in combating pathogenesis in particular stage of the disease are to be considered. The article analyses Ellumnishadi *lepa* and its mode

of action as a topical applicant in knee joint swelling associated with degenerative changes in RA.

Ingredients of Ellumnishadi *lepa*

The poly herbal mix Ellumnishadi *lepa* contains 11 ingredients which are made into paste after boiling in milk and applied locally with quantity sufficient ghee. Name of the ingredients (both Sanskrit and Latin) and part to be used are shown in table 1

Table 1: Ingredients of Ellumnishadi *lepa*

Sl. No	Ingredients (Sanskrit name)	Latin name	Part used
1.	Tila	<i>Sesamum indicum</i> L.	Seed
2.	Haridra	<i>Curcuma longa</i> L.	Rhizome
3.	Laja	<i>Oryza sativa</i> L.	Puffed rice
4.	Haritaki	<i>Terminalia chebula</i> Retz	Fruit rind
5.	Aswakatri	<i>Drynaria quercifolia</i> J.Smith	Rhizome
6.	Sariva	<i>Hemidesmus indicus</i> (L.) R.Br	Root
7.	Guduchi	<i>Tinospora cordifolia</i> (Willd.) Hook.f and Thoms.	Stem
8.	Prasarani	<i>Merremia tridentata</i> (L.) Hallier F.	Whole plant
9.	Nalikerapushpa	<i>Cocus nucifera</i> L.	Inflorescence
10.	Erandabeeja	<i>Ricinus communis</i> L.	Seed
11.	Shatapushpa	<i>Anethum graveolens</i> L.	Fruit

*Equal amount of ingredients and quantity sufficient amount of milk should be used to prepare *lepa*

Rules for Application of *Lepa*

As per Susrutha Samhita, the thickness of an ideal *lepa* should be equivalent to moist buffalo's skin which is considered approximately 4-5mm.⁸ It should be applied uniformly thick over the surface and freshly prepared *lepa* should be used each time as herbal ingredients have very less shelf period. Never allow it to get dried up in place after application because it will be difficult to remove and may sometimes hurt on forceful removal. All these rules should be strictly for proper absorption of *lepa* avoiding any ill effects.⁹

Ayurvedic Pharmacology of Ingredients

In Ayurveda, pharmacological action of any drug is explained on basis of its five main attributes namely *rasa* [taste perceived through tongue receptors – six tastes; namely *madhura* (sweet), *amla* (sour), *lavana* (salty), *tikta* (bitter), *katu* (pungent) and *Kashaya* (astringent)], *guna* (property of substance explained through 10 pairs of opposite attributes), *vipaka* [taste post digestion; *madhura* (sweet), *amla* (sour), *katu* (pungent)], *virya* [potency; mainly two types *ushna* (hot) and *sheeta* (cold)] and *prabhava* (unique effects). When morbid *dosha* get lodged in the joints, arthritis like symptoms develop. But presentations of the disease may vary according to the permutation and combination of vitiated *dosha* involved. Properties of individual drugs of Ellumnishadi *lepa* are compiled in table 2 and its role as an effective topical applicant in tackling localised morbid *dosha* and correcting associated pathology is analysed.

Table 2: Properties of ingredients in Ellumnishadi *lepa*^{10,11,12}

Sl. No	Ingredients	Rasa	Guna	Virya	Vipaka	Effect on Dosha
1.	Tila	M,Ka,T	Sn,G	Ushna	Katu	V ↓
2.	Haridra	T,Kt	Ru,L	Ushna	Katu	VK ↓
3.	Laja	M	L	Sheeta	-	KP ↓
4.	Haritaki	All rasa except lavana	L,Ru	Ushna	Madhura	VPK ↓
5.	Aswakatri	T	L,Sn	Sheeta	Katu	V ↓
6.	Sariva	M,T	G,Sn	Sheeta	Madhura	VP ↓
7.	Guduchi	T,Kt,Ka	L,Sn	Ushna	Madhura	VPK ↓
8.	Prasarani	T	G,Sa	Ushna	Katu	V ↓
9.	Nalikerapushpa	M	G,Sn	Sheeta	Madhura	VP ↓
10.	Erandabeeja	Kt	Tik	Ushna	Katu	VK ↓
11.	Shatapushpa	Kt, T	L,Tik	Ushna	Katu	VK ↓

* V- Vata, P- Pitta, K- Kapha, ↓- reducing, M- Madhura, Ka- Kashaya, T- Tikta, Kt- Katu, Sn- Snigdha, G- Guru, L- Laghu, Ru- Rooksha, Tik- Tikshna, Sa- Sara

DISCUSSION

Ellumnishadi *lepa* is useful for local application over joints where there is swelling of synovial membrane with deterioration of articular cartilage. In Vatarakta, swelling like symptoms manifest first in smaller joints of foot and gradually spreads to upper portions of body causing pain and swelling in other major joints like knee joint. In later stages morbid Vata involved in the pathology causes degenerative damage of the associated joint and

its surrounding tissues. Clinically it is a disease of two opposite factors (Vata and Rakta) and hence the medicaments used should not disrupt one while alleviating the other.⁴ When pharmacological properties like *virya* (potency), *guna* (properties), *rasa* (taste) and *vipaka* (post digestion taste) of individual drugs in Ellumnishadi *lepa* are evaluated; majority of them alleviates Vata without much disruption to Kapha, Pitta and Rakta. Thus, Ellumnishadi *lepa* can be used in Vata predominant

stage of the disease with association of peri-articular erosions and joint destruction.

In Gambira Vatarakta, deeper tissue like bone and joints are affected and vitiated Vata accelerates the process of degeneration in these parts. Similarly, in progressive stages of RA, there will be marked inhibition in the normal functions of osteoclasts and osteoblasts resulting in osteopenia, making RA a known risk factor for osteoarthritis². Since the mentioned lepa combination is antagonistic to Vata, it can be used to alleviate swelling with degenerative changes occurring in Sandhigata vata (osteoarthritis) also.

Levels of essential minerals like calcium and phosphorous which are required for the bone metabolism are also seen altered in RA due to progressive degeneration.¹³ The lepa combination contain tila (*Sesamum indicum* L.) and laja (puffed brown rice) which are rich sources of these minerals. Sesame seed is a good source of calcium (approx. 1%) and phosphorous (approx. 0.7%)¹⁴. Brown rice is also rich in minerals like phosphorous, selenium, zinc and potassium. Laja is puffed brown rice and as per researches, mineral contents increase during puffing process specifically in parboiling stage.¹⁵

In Rheumatoid arthritis, the lining of the joints becomes very thick and crowded with the white blood cells. These secrete chemical substances like interleukin-1 (IL-1) and tumour necrosis factor alpha (TNF-alpha) that produce pain, joint swelling and joint damage.¹⁶ Almost all the drugs present in the lepa have proven anti-arthritis and anti-inflammatory effects in various animal models. *Drynaria quercifolia* J.Smith,^{17,18} *Merremia tridentata* (L.) Hallier F.¹⁹ and *Sesamum indicum* L.²⁰ produce anti-arthritis and anti-inflammatory activity by inhibiting the release of pro-inflammatory cytokines and other inflammatory mediators. *Anethum graveolens* L.,²¹ *Ricinus communis* L.²² and *Curcuma longa* L.^{23,24} have shown greater anti-inflammatory activity on topical application too. An in vitro study showed anti-inflammatory/anti-arthritis effect of *Hemidesmus indicus* (L.) R.Br root in controlling the production of auto antigen through inhibition of protein denaturation in RA.²⁵ *Tinospora cordifolia* (Willd.) Hook.f and Thoms. stem extracts increased proliferation, differentiation and mineralization of bone like matrix on osteoblast model systems in vitro, suggesting its potential influence on osteogenesis along with anti-arthritis activity.²⁶

Exact reason behind bone erosion in RA is not fully understood but formation of reactive oxygen species (ROS) and lipid peroxides as a result of disease activity are considered as a major factor. Therapeutic administration of antioxidants can mop up free radicals and reduce lipid per-oxidation which exacerbates inflammation and degeneration in RA.²⁷ Potent antioxidants like flavonoids and phenolic compounds from *Cocos nucifera* L. inflorescence²⁸, *Drynaria quercifolia* J.Smith rhizome and *Hemidesmus indicus* (L.) R.Br root²⁹, curcumin in *Curcuma longa* L. rhizome³⁰, gamma tocopherols and lignins like sesaminol and sesamin from *Sesamum indicum* L. seeds¹⁴, tannins from *Terminalia chebula* Retz. fruit rind³¹ present in the combination can provide protection from the deleterious effects of excessive ROS concentrations. Application of external source of antioxidants can always assist in coping oxidative stress.³²

The main disadvantage of transdermal drug delivery is the poor penetration of most compounds into the human skin. The main barrier of the skin is located within its uppermost layer, the stratum corneum.⁹ Several newer approaches like liposome drug delivery significantly enhances the accumulation of drug at the

site of administration as a result of high substantivity of liposomes with biological membranes.^{33,34} Liposomes are even produced from milk fat globule membrane (thin membrane of 8 to 10 nm thickness covering the liquid fat globules in milk) and they can act as topical drug delivery vehicles for both water- and lipid-soluble drugs.³⁵ Thus lepa when applied in medium of milk can ensure better delivery of active principles from herbal counterparts into desired site. Addition of ghee to it not only will act as an emollient but also helps in retaining it on the site for longer duration without getting dried up.

Destruction of bone and cartilage in articular joints occurs progressively in RA with substantial joint damage and in few cases even in the first few months evidence of bone erosion are seen.³⁶ Topical application of Ellumnishadi lepa can be employed as an effective complementary treatment in such cases to reduce the swelling associated with degenerative changes.

CONCLUSION

Ellumnishadi lepa can be used as an effective topical applicant to reduce the swelling and associated degenerative changes in bones and cartilages of knee joints seen in progressive stages of Rheumatoid arthritis.

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