



Combined effect of castor oil, *ruksha sweda* and a polyherbal compound on inflammatory mediators in rheumatoid arthritis

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ABSTRACT

Ayurveda is the most ancient system of medicine practised in India. While treating a patient Ayurveda considers both the disease and diseased person too. Rheumatoid arthritis (RA) is an autoimmune and inflammatory disorder of multiple joint pain & swelling. It has also systemic effect. During the course of disease some inflammatory markers are elevated in the blood like rheumatoid factor (RF), anti cyclic citrullinated peptide antibody (anti CCPab), C-reactive protein (CRP), and erythrocyte sedimentation rate (ESR). In Ayurveda amavata is a similar disease which keeps clinical correlation with RA. Madhava Nidana, a text of 7th AD first described this disease. Present clinical trial was carried out on 17 patients selected from the Sir Sundar Lal Hospital, IMS, BHU, Varanasi. For this study Eranda Taila (castor oil), Ajmodadi churna (polyherbal compound) and dry fomentation (Ruksha sweda) were used which are mentioned in Chakradutta. There was quite improvement in clinical symptoms and elevated blood levels of inflammatory mediators of the disease.

Keywords: Amavata, Madhava Nidana, Eranda Taila, Ajmodadi churna, Chakradutta



INTRODUCTION

Ayurveda represents experimental wisdom of over 5000 years. A careful critical & unbiased study of the classical ayurvedic texts show that by the time the *samhita* (authoritative writings by the ancients) were compiled, the science and art of Ayurveda had already passed through the stage of specialisation and knowledge flowing from different specialised fields of medicine and allied sciences generalised, simplified & principles enunciated. According to Ayurveda, man is a composite whole of matter, mind and the spirit. He is a part of much larger universe in which he lives (called as an epitome of universe) & a creature of a relatively smaller environment that surrounds him. The larger universe and his immediate local environment- the physical, biological & psychological- act on him as stressor and he reacts to them with suitable responses engendered by internal stresses. He is constantly called upon to adapt and condition his internal environment suitable, in keeping with the everchanging vicissitudes of his external environment & maintain steady-state equilibrium. Inability of a man to

achieve and maintain his internal steady state equilibrium initiates the process of disease. A unique feature of Ayurveda is its emphasis on the promotion of positive health - physical, mental, social and spiritual.

The universe is governed by properties of- solar, lunar and air through sun, moon and air, which is represented as *pitta*, *kapha* and *vata* in all living being.^[1] These three dynamic forces of the nature & body (*dosha*) determine health and disease, and the medicinal value of any substance (plant and mineral). The *agni* (fire), represented by *pitta* in the body, carried out metabolic function like digestion and assimilation of food at gross & subtle level. The digestive or gastric fire plays main role in digestion of food. Its malfunctioning causes improper metabolism of taken food which results in production of unripe and unprocessed substance called as *ama*. This *ama* has toxic effect on the body whether in large or scanty amount. When it takes seat of joints it creates inflammation thereby. This disease is called as Amavata. Its pathogenesis & symptoms are very well described in medieval literatures of Ayurveda. Amavata as a clinical

syndrome was 1st described in Madhava Nidanam.^[2] Rheumatoid arthritis is correlated with amavata. However there is only similarity between clinical symptoms of the disease but it has also been found that in patients of amavata rheumatoid disease markers like RF, anti-CCPab are raised during the course of the disease.^[3] Swelling in all big and small joints, inflammation, loss of functioning and joint stiffness are the main clinical symptoms. In this disease ama is the main pathogenic factor, a metabolic by product which act as auto-antigen. Unwholesome food, lack of physical activity and malfunctioning of digestive fire are aetiological factors of amavata.^[4] There are physical, mental & environmental factors which cause formation of ama.^[5] So amavata has psychoneuroimmunological relation along with gastro-intestinal affection.

The object of treatment in Ayurveda is first preservative, conservative and preventive & second curative which is to be achieved by *samshodhana* or bio-purificatory measures and *samshamana* or pacifying therapy. There are 6 modalities of treatments well described in Chakradutta^[6], and Bhaishjyarnavali.^[7] These line of treatment mainly aim to remove ama from the body by *samshodhana* and checking formation of ama by *samshamana* therapy. For the present study both therapies *samshamana* & *samshodhana* are taken in accounts which are carried out by *eranda* oil and *ajmodadi churna* respectively.

MATERIAL AND METHOD

The patients were selected after their fulfilment of diagnostic criteria of amavata (RA) and thoroughly examined and questioned on both subjective & objective parameters. Ethical clearance and informed consent was obtained before conducting the clinical trial (Dean/2011-12/169 on 14/18-5-2011).

Selection of Drug: For this study eranda oil (castor oil), ruksha sweda (dry fomentation) and ajmodadi churna were used. These have been described well in Chakradutta, a book written by Chakrapanidutta in 11th century.^[8]

Preparation of Drugs: Ajmodadi churna- all the ingredients were identified and triturated to make fine powder. Ruksha sweda was prepared by using sand. Sand was heated & put in a cloth bag and then it was applied on joints. Eranda oil was purchased from the market (Dabur Company). All ingredients are mentioned in table 1.

Dose: Ajmodadi churna- 5 g of churna twice daily with luke warm water for 3 months. Ruksha sweda-

cloth bag filled with heated sand was applied on affected joints intermittently for 5-10 minutes in a day. Eranda oil- 10 ml twice daily

Selection of Cases: A total 20 patients of RA were randomly selected for this study from the Kayachikitsa OPD & IPD, Sir Sunder Lal Hospital, BHU, Varanasi, India of which 17 patients completed 3 month follow-up at 1 month interval. The case selection was regardless of sex, occupation, socio-economic, seropositive & seronegative condition. Both acute & chronic cases of RA were taken under consideration following the EULAR-2010^[9] criteria & the clinical feature of amavata described in Madhava Nidana.^[10]

Inclusion Criteria

- Diagnosed cases of Amavata and RA.
- Age between 20 & 60 yr.
- Patients willing to participate in the above trial.

Exclusion Criteria

- Patients with deformities and systemic complications.
- Patients suffering from diabetes, hypertension, tuberculosis, asthma or other systemic disease.
- Pregnant and lactating women.
- Patients discontinuing the trial drug and non-willing patients.

Calculation of Data: Statistical calculation was done by using Wilcoxon signed rank test.

Investigations: All patients were allowed for the following blood investigations- haemoglobin, total leucocyte count, blood sugar, liver function test, renal function test, anti-streptolysin O titre (to exclude rheumatic disease), HLA B-27 & ANA to exclude other auto-immune disease. Only patients having normal levels were included in the study. CRP, ESR, RF, anti-CCPab were done before initiation of treatment & after completion of the therapy.

OBSERVATION AND RESULT

Selected patients were allowed to take medicines. There was significant relief in symptoms of RA along with marked improvement in blood titre of biochemical mediators as shown in the table 2.

DISCUSSION

As shown in the observation table there is significant improvement in CRP, ESR, RF & anti-CCP ab values. Mean decrease in CRP was 23.76 being highly significant (p<0.01) likewise 17.35, 10.06 & 16.59 in ESR, RF & anti-CCP ab

respectively also being highly significant. Here is a possible explanation of the mode of action of the drugs used:

Castor Oil: Castor oil is, also called Eranda in Sanskrit, prepared from the seeds of castor plant (*Ricinus communis* Linn.), of Euphorbiaceae. By virtue of its different pharmacological property it overcomes the pathology of amavata like ushna (hot) & vata pacifying property helps in improving pain and inflammation. Ushna property also acts as deepana and potentiates digestive fire and thus checking ama formation. Castor oil is very effective natural anti-inflammatory agent. High vitamin E content contributes significantly to the anti-inflammatory properties of castor oil. The natural vitamin E present in castor oil has a number of tocopherol specific moisturizing, anti-inflammatory & anti-oxidant property. Also vitamin E contributes to improved microcirculation and UV protection. Castor beans have a total tocopherol 291µg/g.^[11] Vitamin E found in castor oil has anti-inflammatory effect. γ -tocopherol & γ -CEHC {2,7,8-trimethyl-2- (β - carboxy ethyl) -6-hydroxyl chroman}, inhibit cyclooxygenase activity & thus possess anti-inflammatory properties.^{[12],[13]} Pharmacological characterisation has shown similarities between the effects of ricinoleic acid & those of capsaicin (a potent analgesic), suggesting a potential interaction of this drug on sensory neuro-peptide mediated neurogenic inflammation.^[14]

Ruksha Sweda: Swedana (fomentation) is the process by which the sweat or perspiration is produced in the body by using various methods. It is the procedure which relieves stiffness, heaviness & coldness of the body and produces sweat.^[15] Baluka sweda is a dry sweda used in *kaphaja* disorders as well as in the disease originated from ama especially indicated in amavata by almost all the authors who had dealt with it. Being dry in nature it does *pachana kriya* i.e. digestion of ama and also cleans the micro-channels. It also removes stiffness of joints and alleviates the pain. Amavata affects the whole body and has an *upadrava* (complications) like sankocha (contraction), khanja (limpness), supti (numbness) etc. Swedana is very helpful in relieving these symptoms of amavata.

Ajmodadi Churna: (On the basis of ayurvedic pharmacological properties): In disease amavata, kapha and vata dosha are the main culprits. The

combination shows main action against kapha and vata doshas by virtue of its virya (about 81% of total drugs have ushna virya). From the samprapti (pathogenesis) of amavata, it is clear that the main dushya (tissue) involved is rasa. The combination shows, about 61% of total drugs have a katu rasa (pungent). Katu rasa improves the digestion and makes first dhatu in proper form, so the combination will act on the rasa dhatu. In the combination, maximum percentage of the drugs like *Shunthi*, *Pippali*, *Pippalimula*, *Chitraka* etc. have deepana, pachana property which improves the function of agni. The preparation will stop the further ama production and help to break the basic pathology. Ama means unripe and undigested annarasa. It needs proper digestion. By the virtue of ushna virya (81% of total drugs) and deepana-pachana property, ama pachana will take place. Drugs like Sunthi, Pippali, Pippalimula, Chitraka etc. are proved to be good for digesting ama. So the formulation will act on the ama which is the main pathogenic factor of the disease.

Ajmodadi churna has been proved to be a good anti-inflammatory poly herbal compound.^[16]

CONCLUSION

Ayurveda is a science of life. Its holistic principles based on the cosmos and vast varieties of *materia-medica* are boon for humanity. Despite great range of NSAIDs, potent immunosuppressive agents and corticosteroids, modern system of medicine fails to cure completely the disease RA. In this Ayurveda is proving to be a better option for the physicians to treat this disease. Ayurvedic drugs have no or minimal side effects. Other than drug therapy there is also indication of life style modifications based on physical, mental, social and spiritual behaviour. These non-pharmacological therapies are proving to be helpful in treating life style borne disorders. Rheumatoid arthritis (Amavata) is also a life style disorder. In present trial patients have shown a good symptomatic relief and there was also significant improvement in blood titre of haematological mediators. There was not any side effect observed. However some patients complained of burning sensation in upper gastrointestinal tract at the initiation of therapy. So eranda oil along with Ruksha sweda and ajmodadi churna has been proved effective in the management of rheumatoid arthritis.

Table 1: SELECTED DRUGS WITH BOTANICAL & FAMILY NAMES:

Sanskrit Name	Botanical Name	Family
Ajmoda	<i>Carum roxburghianum</i> (DC) Craib.	Umbellifereae
Maricha	<i>Piper nigrum</i> Linn.	Piperaceae
Pippali/Pippalimula	<i>Piper longum</i> Linn.	Piperaceae
Vidanga	<i>Embelia ribes</i> Burm.	Myrsinaceae
Devadaru	<i>Cedrus deodara</i> Roxb.	Pinaceae
Shatahwa	<i>Foeniculum vulgare</i> Mill.	Umbellifereae
Chitraka	<i>Plumbago zeylanica</i> Linn.	Plumbaginaceae
Haritaki	<i>Terminalia chebula</i> Retz.	Combretaceae
Shunthi	<i>Zingiber officinale</i> Rosc	Zingiberaceae
Vridhadaru	<i>Argyria speciosa</i> Sweet	Convolvulaceae
Eranda	<i>Ricinus communis</i> Linn	Euphorbiaceae
Saindhava lavana	Rock salt	

(Source: Dravyaguna-vijnana-2 by Sharma PV)

Table 2: CHANGES IN INFLAMMATORY MEDIATORS

	Mean ± S.D.		Wilcoxon signed rank test
	BT	AT	
CRP	50.55±39.04	32.12±30.76	23.76±20.56 z=3.29: p<0.01
ESR	30.31±16.01	16.65±9.10	17.35±12.25 z=3.52: <0.001
RF	65.25±38.26	61.12±26.75	10.06±14.24 z=3.30: p<0.01
Anti CCPab	42.45±32.08	26.18±18.06	16.59±19.92 z=2.86: p<0.01

BT- Before treatment; **AT-** After treatment

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