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THE SCIENTIFIC EVALUATION OF *AJAMODADYA VATAKA* IN *AMAVATA* W.S.R TO RHEUMATOID ARTHRITIS: A REVIEW ARTICLE

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ABSTRACT

Background: Rheumatoid arthritis (RA) is the most common inflammatory arthritis in women and hence an important cause of potentially preventable disability.[1] The typical clinical phenotype of RA is a Symmetrical, deforming, small and large joint polyarthritis, often associated with systemic disturbance and extra-articular disease. Rheumatoid arthritis (RA) is characterized by a chronic inflammatory process that targets the synovial lining of diarthrodial joints.[2] As the disease advances, there is evidence of progressive destruction of the structural components of the joints. This inflammatory process targets the articular cartilage, the bone at the joint margins, as well as periarticular and subchondral bone.[3] Ayurveda is one of the oldest systems of healthcare in the world. The peculiarity of the Ayurvedic treatment is its potential to cure and prevent the relapse of several diseases. In Ayurveda, '*Amavata*' was mentioned for the first time by Acharya Madhavakara as a special disease entity in which both '*Ama*' as well as '*Vata*' play a predominant role in the pathogenesis of the disease.[4] **Aim:** The article is written to analyze the mode of action of the ingredients of *Ajamodadya Vataka* and explore its importance in relieving the symptoms of *Amavata* w.s.r Rheumatoid arthritis. **Methodology:** *Ajamodadya Vataka* is described in *Amavata Rogadhikara* in Chakradatta.[5] Various peer-reviewed articles, Ayurvedic classical textbooks, Modern Rheumatologic textbooks as well as online

databases were analyzed under the relevant keywords in understanding the importance of the above-mentioned formulation in treating the symptoms of *Amavata* w.s.r Rheumatoid arthritis. Conclusion: It can be concluded through the literary review that *Ajamodaya Vataka* is efficient in relieving the symptoms of *Amavata* but to establish the conclusion clinical trial of this drug should be conducted so that this drug can be used for therapeutic purposes in general patients of *Amavata.*

KEYWORDS: *Amavata, Ajamodadya Vataka*

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic inflammatory disease of unknown etiology marked by symmetric, peripheral polyarthritis. It is the most common form of chronic inflammatory arthritis and often leads to joint injury and disability. Because it is a systemic disease, RA may lead to the distinct manifestation of other systems with symptoms including fatigue, underlying skin lesions, lung involvement, pericarditis, peripheral neuropathy, vasculitis, and hematologic abnormalities.[6]

The science of RA has made great strides in identifying disease-related genes and in advancing the molecular mechanisms of infectious diseases. The limited significance of these different procedures is highlighted by the perceived benefits of a new class of highly targeted therapies. Apart from these benefits, an incomplete understanding of the early stages of RA is always a major obstacle to its treatment and prevention.

The condition of RA increases between 25 and 55 years of age, after which it becomes flat until it is 75 years old and then decreases. Symptoms of RA are usually caused by inflammation of the joints, muscles, and bursae. Patients often complain of joint stiffness in the morning lasting for more than 1 hour and gradually decrease of stiffness after some physical activity. The first affected joints are usually small. The first pattern of joint involvement may be monoarticular, oligoarticular (joints4 joints), or polyarticular (> 5 joints), usually in parallel distribution.[7]

Acharya Gananatha Sena (1943) has coined the term *Rasavata* for *Amavata*. The clinician of the modern era Prof. *YadunandanUpadhayaya* (1953) and other eminent scholars have equated the *Amavata* with Rheumatoid arthritis. Thus, in short, it can be concluded that critical analysis of the medical importance of *Ama* begins from *the Samhita* period, thereafter

Madhava Kara has established it as an independent disease after having understood the specialty of the disease. *Acharya Chakra Datta*, later on, described the line of treatment and *BhavaPrakasha* elaborated it further, which can be seen fully developed in *BhaisajyaRatnavali*.

Comparison between *Amavata* and Rheumatoid arthritis

Most of the symptoms of *Amavata* are directly co-related with Rheumatoid Arthritis which are as follows[8]

- *Sandhishoola* - Joint pain.
- *Sandhishotha* - Swelling of joints.
- *Sparshasahyata* - Tenderness at the joints.
- *GatraStabdhata* - Stiffness of joints and whole body.
- *Raga* - erythema of the joints.
- *Jwara* - Low-grade fever.
- *Daha* - Burning of fingers & toes.
- *Aruchi* - Anorexia.
- *Daurbalya* - Weakness due to anemia.
- *Gaurava* - Heaviness in body parts.
- *shoonataanganama* - Numbness at joints.
- *Utsahahani* - Loss of enthusiasm
- *Bhrama* - Vertigo
- *Murchha* - Loss of motor function.
- *Hritgraha* - Pericarditis, myocarditis, conduction defect.
- *Angavaikalyata* - Deformities.
- *Jadya* - Inability to act due to stiffness.
- *Mamsa-shosha* - Muscle wasting.
- *Granthi* - Rhumatoid nodule.
- *Anyaniupdravani* - Carpel tunnel syndrome, Felty's syndrome, loss of bladder control.

OBJECTIVES

- To explore the mode of action of Ayurvedic formulation *Ajamodadya vataka* in *Amavata* w.s.r Rheumatoid arthritis.

- To explore the classical method of preparation of *Ajamodadya vataka*.

METHODOLOGY

- Ayurvedic classical textbooks and various peer-reviewed articles were searched to explore the mode of action of *Ajamodadya Vataka* in *Amavata* w.s.r Rheumatoid arthritis

Contents of '*Ajamodadya Vataka*'[9]

Table No 1: The ingredients of Ajamodadya Vataka.

S.No	Drugs	Botanical name	Part used Available in N.I.A. Pharmacy	Quantity in ratio
1.	*Ajamoda*	*Carum roxburhianum(DC) Craib*	*Phala* (Fruit)	1 *Pala* (48gm)
2.	*Maricha*	*Piper nigrum Linn*	*Phala* (Fruit)	1 *Pala* (48gm)
3.	*Pippali*	*Piper longum Linn*	*Phala* (Fruit)	1 *Pala* (48gm)
4.	*Vidanga*	*Embelia ribes Burm*	*Phala* (Fruit)	1 *Pala* (48gm)
5.	*Suradaru*	*Cedrus deodara(Roxb,) Loud,*	*Kaandasara* (Heartwood)	1 *Pala* (48gm)
6.	*Chitraka*	*Plumbago zeylanica Muell Arg*	*Phala* (Fruit)	1 *Pala* (48gm)
7.	*Satahawa*	*Anethum sowa Kurz.*	*Phala* (Fruit)	1 *Pala* (48gm)
8.	*Saindhawa*	Rock salt	Salt	1 *Pala* (48gm)
9.	*Pippalimoola*	*Piper longumLinn*	*Moola* (Root)	1 *Pala* (48gm)
10.	*Shunthi*	*Zingiber officinale Roxb*	*Kanda* (Rhizome)	10 *Pala* (480gm)
11.	*Vridhdaru*	*Argyreria speciosa Sweet*	*Moola* (Root)	10 *Pala* (480gm)
12.	*Pathya*	*Terminalia chebula Retz*	*Phala* (Fruit)	5 *Pala* (240gm)
13.	*Guda*	Jaggery	Jaggery	34 *Pala* (1632gm)
Jaggery is taken an equal amount of all the above 12 drugs mentioned in the chart according to the reference of the textbook.[10]				

METHOD OF PREPARATION: Each content of the *Ajamodadya Vataka* is to be taken in the above ratio & prepared *Vataka* according to the classical method of *Ayurveda* in the pharmacy of NIA, Jaipur.

The dose of *Ajamodadya Vataka* : 2 Tab (each Tab 1gm) three times a day with lukewarm water.

Table No 2: Ayurvedic Pharmacology of the Drugs of Ajamodadya Vataka.[11]

Sl no	Drug	Rasa	Guna	Veerya	Vipaka	Karma	Doshaghnata
1	Ajamoda	Katu	Teekshna, Ushna, Laghu	Ushna	Katu	Deepana, Hridya, Balakara, Netramayahara, Krimi hara, Bastirujahara	Kaapha Vatanut
2	Maricha	Katu	Teekshna, Ruksha	Ushna	Katu	Deepana, Shulahara, Krimihara, Shvasahara	KaphaVatajit
3	Pippali	Katu	Snigdha, Laghu	Anushna	Madhura	Rechani, shulahara, Amavatahara	Vatashleshmahari
4	Vidanga	Katu	Teekshna, Ruksha, Laghu	Ushna	Katu	Krimighna, Shulahara, Vahnikara	VataShleshma hara
5	Suradaru	Tikta	Laghu, Snigdha	Ushna	Katu	Shotha, Ama hara, Kanduhara,	Vatashleshmahara
6	Chitraka	Katu	Laghu, Ruksha	Ushna	Katu	Grahi.Pachana, Deepana, Krimihara	Shleshmapittahrit, Vatashleshmahari
7	Satahwa	Katu	Laghu, Teekshna	Ushna	Katu	, Deepan, Akshi roganut, Shulaharai	Pittakrit, Vatakapha hara
8	Saindhava	Lavana, Madhura	Snigdha, Tikshna, Sukshma	Sheeta	Madhura	Deepana, Vrishna, Vedanahara, Rochaka	Tridosha hara
9	Pippalimoola	Katu	Snigdha, Laghu	Anushna	Madhura	Rechani, shulahara, Amavatahara	Vatashleshmahari
10	Shunti	Katu	Laghu, Snigdha	Ushna	Madhura	Amavataghni, Pachani,	Kaphavatanut, Sangrahi, Vibandhabhedini
11	Vridhadaru	Kashaya, Katu, Tikta	Snigdha	Ushna	Madhura	Rasayana, Vrishya, Amavata hara, Medhya, Agni-Varnya-Kanti kara	Vatahara
12	Pathya	Lavana varjita Pancha rasa	Ruksha, Laghu	Ushna	Madhura	Rasayana, Medhya, Anulomana.Ayushya, Chaksushya	Tridosha hara, Vatahara
13	Guda	Madhura	Snigdha, Ushna	Ushna	Madhura	Deepana, Pachana, Anulomana, Vrsihya, Raktashodhaka	Tridoshahara

SCIENTIFIC EVALUATION OF EACH CONTENT OF AJAMODADYA VATAKA

AJAMODA (Trachyspermum ammi.)

Medically, it has been proven to have a wide range of chemical reactions such as antifungal, antioxidant, antimicrobial, antinociceptive, cytotoxic, hypolipidemic, antihypertensive, antispasmodic, broncho-dilating, antilithiasis, diuretic, abortifacient, antitussive, and ammaticidal, Besides, research has revealed the presence of various phytochemical

compounds, especially carbohydrates, glycosides, saponins, phenolic compounds, trans fats (thymol, γ-terpinene, para-cymene, and α- and β-pinene), proteins, fats, fiber and mineral content containing calcium, phosphorus, iron and nicotinic acid. These studies suggest that T. Ammi is a source of active medicinal chemicals and has various therapeutic effects; therefore, it is encouraging to discover its new medical uses.[12]

***MARICHA* (Piper nigrum)**

Piperine has been shown to have fundamental effects on p-glycoprotein and many enzyme systems, leading to biotransformative effects including chemoprevention, detoxification, and improved access to and availability of generic drugs. Based on modern, animal, and human studies, piperine is immunomodulatory, anti-oxidant, anti-asthmatic, anti-carcinogenic, anti-inflammatory, anti-ulcer, and anti-amoebic.[13]

***PIPPALI* (Piper longum)**

Many phytochemical chemicals have been identified to date, including alkaloids as their major metabolites (piperine and piperlongumine), essential oils, flavonoids, and steroids. These show various activities including anti-inflammatory, analgesic, anti-oxidant, anti-microbial, anti-cancer, anti-parkinsonian, anti-stress, nootropic, anti-epileptic, anti-hyperglycemic, hepatoprotective, anti-hyperlipidemic, antiplatelet, anti-angiogenic, immunomodulatory, anti-arthritic, anti-ulcer, anti-asthmatic, anthelmintic, anti-amebic, anti-fungal, larvicidal mosquito, and anti-snake venom.

Piper longum commonly referred to as 'Pippali', has found its traditional use in India, Malaysia, Singapore, and other South Asian countries such as analgesic, carminative, anti-diarrhoeic, immunostimulant, postnatal baby to check postnatal bleeding and treat asthma, insomnia, dementia, epilepsy, diabetes, rheumatoid arthritis, asthma, tuberculosis, puerperal fever, leprosy, etc.[14]

***VIDANGA* (Embelia ribes)**

The results of many researches provide clear evidence that fluid-induced extraction of Embelia ribs improves antioxidant defenses against methionine induced by hyperhomocysteinemia, hyperlipidemia, and oxidative stress in the brain.

Pre-treatment of Embelin significantly prevented apomorphine-induced proliferation and mouse-induced behavior, respectively. Besides, embelin also alters high levels of dopamine,

noradrenaline, and serotonin neurotransmitters in the brains of rats and mice. Embelin showed more significant results in high doses (10 mg/kg) than low doses (5 mg/kg) in both experiments.[15]

Pre-treatment with embelin (5, 10, and 20 mg/kg, IP) reduced pulmonary edema, cell intrusion, nitrate/nitrite, protein content, albumin concentration, TNF-α in bronchoalveolar lavage fluid, and myeloperoxidase activity on lung homogenate. Embelin significantly inhibited pO2 down-regulation and pco2 augmentation. Besides, it reduced lung histopathological changes in an acute respiratory disease model.[16]

Its berries are the main ingredient in '*Vidanga* ' or '*Baibidanga* '- part of the ayurvedic composition and have medicinal properties such as antihelmintic, anticancer, neuroprotective, and antidiabetic.[17] (Shirole RL, Shirole NL, Saraf MN. Embelia ribes ameliorates lipopolysaccharide-induced acute respiratory distress syndrome. Journal of ethnopharmacology, 2015 Jun 20; 168: 356-63.

***DEVADARU* (Cedrus Deodara)**

The extracted use of benzene solvent has shown strong anti-inflammatory activity within a culture of a dose of 25-200 µg / ml with non-essential hemolytic activities and vital immune functions in the host cells. Linalool was found to be 1.29 percent in the active release of C. Deodara. The current review provides an overview of ethnobotany, phytochemistry, and Cedrus-type chemistry, e.g. cytotoxic, spasmolytic immunomodulatory, antiallergic, anti-inflammatory, and analgesic activities.[18]

***CHITRAKA* (Plumbago zeylanica)**

The diluted liquor extract of Amalakyadi Gana was used in a study. The antipyretic activity of dosage forms was performed against pyrexia that caused the yeast in Wistar albino mice. Analgesic activity was tested using a glowing temperature model and a light paw licking on Wistar albino mice.[19]

***SHATAHVA* (Anethum sowa)**

The results of many researches showed that the Anethum sowa root extracts are the important source of the antioxidant, antimicrobial and cytotoxic agent.[20]

Anethum graveolens L. (dill) has been used in Ayurvedic medicines since ancient times and it is a popular herb widely used as a spice and also yields essential oil. It is an aromatic and

annual herb of apiaceae family. The Ayurvedic uses of dill seeds are carminative, stomachic, and diuretic. There are various volatile components of dill seeds and herb; carvone being the predominant odorant of dill seed and α-phellandrene, limonene, dill ether, myristicin are the most important odorants of dill herb. Other compounds isolated from seeds are coumarins, flavonoids, phenolic acids, and steroids. The main purpose of this review is to understand the significance of Anethum graveolens in Ayurvedic medicines and non-medicinal purposes and emphasis can also be administered to the enhancement of secondary metabolites of this medicinal plant.[21]

***SAINDHAVA* (Rock salt)**

It helps in disposing of toxic minerals and refined salt stores by invigorating circulation system and mineral equalization. Rock salt is utilized as a home solution for fix numerous issues and illnesses. It treats numerous sorts of skin issues and different afflictions, for example, rheumatic torments and herpes.[22]

***SHUNTHI* (Zingiber officinale)**

The main actions of ginger drugs and chemicals are divided into those that include immuno-modulatory, anti-tumorigenic, anti-inflammatory, anti-apoptotic, anti-hyperglycemic, anti-lipidemic, and anti-emetic. Ginger is a strong anti-oxidant and can reduce or inhibit the production of free radicals. It is considered a safe herb with few side effects and side effects.[23]

***VRIDHDHARU* (Argyreia speciosa)**

Argyreia speciosa (Linn. f.) Sweet is a popular Indian medicinal plant, which has long been used in traditional Ayurvedic Indian medicine for various diseases. This plant is pharmacologically studied for nootropic, aphrodisiac, immunomodulatory, hepatoprotective, antioxidant, antiinflammatory, antihyperglycemic, antidiarrheal, antimicrobial, antiviral, nematicidal, antiulcer, anticonvulsant, analgesic and central nervous depressant activities. A wide range of phytochemical constituents have been isolated from this plant. A comprehensive account of the morphology, phytochemical constituents and pharmacological activities reported are included in view of the many recent findings of importance on this plant.[24]

***PATHYA (*Terminalia chebula)**

The plant has been demonstrated to possess multiple pharmacological and medicinal activities, such as antioxidant, antimicrobial, antidiabetic, hepatoprotective, anti-inflammatory, antimutagenic, antiproliferative, radioprotective, cardioprotective, antiarthritic, anticaries, gastrointestinal motility and wound healing activity.[25]

***GUDA* (Jaggery)**

The level of hepatic and renal lipid peroxidation (LPO) levels increased significantly, and a significant decrease was observed in the reduced glutathione (GSH) level after intoxication. Significant reductions were observed in the activities of adenosine triphosphatase (ATPase) and glucose-6-phosphatase (G-6-Pase) after toxicity. Treatment taken at three different locations changed all chemical dosages performed, but greater hepatic-renal protection was observed in higher doses (750 mg/kg bwt) than in lower doses (250 and 500 mg/kg bwt). Jaggery also reversed the evolution of physical research. Therefore, it can be concluded that jaggery can be used to reduce hepatic and renal injuries and may serve as an alternative treatment for hepatic and renal etiology.[26]

CONCLUSION

RA results in more than 9 million physician visits and more than 250,000 hospitalizations per year.[27] Disability from RA causes major economic loss and can have a profound impact on families. Since DMARDs control rather than treat RA, RA management is a repetitive process, and patients should be screened periodically for evidence of disease progression or progression and toxic effects of the drug. Repetitive flares, unacceptable disease activity (e.g., ongoing disease activity after 3 months of intensive treatment), or ongoing joint injury requires consideration of significant changes in DMARD type.[28]

Active joint disease can interfere with physical activity and can also be aggravated by physical activity.

While the main purpose of treating RA is to include complete remission, this often happens. Complete remission is defined as the absence of the following: 1) symptoms of active joint pain (unlike mechanical joint pain), 2) morning stiffness, 3) fatigue, 4) synovitis in joint examination, 5) continuous radiographic damage on radiographs consecutive, and 6) elevated levels of erythrocyte sedimentation (ESR) or C-reactive proteins (CRP).[29]

Ama and *Vata* are the two chief pathognomic factors in the production of *Amavata*. *Ama* is *Guru, Snigdha, Sthira, Sthula*, and *Pichhila* while the *Vata*have the properties like *Laghu, Ruksha, Chala, Sukshama*, and *Vishada*.[30] The properties of both are on the opposite pole of each other. The only *Sheeta Guna* is common to both. These are the things, which come in across while treating the *Amavata* because any measure adopted will principally oppose one another. So, a very careful approach can only benefit the patient. The line of treatment laid down by *Chakrapani* denotes firstly the *Pachana*of *Ama*, then the restoration of *Agni*, and finally control of *Vata dosha*. Here an attempt is being made to substantiate these principles.[31]

- *Tikta Dravyas* are *Ama* and *Pitta pachaka* and *Srotomukhvishodhaka* and having *Vishaghna* and *Lekhana* properties.[32]
- *Katu rasa* is *Chedaka, Margavivaraka* and *Kapha Shamaka*.[33]
- *Tikta* & *Katu Rasa* is *Laghu, Ushna*, and *Tikshna* and having *Kleda* and *Meda Nashaka* properties, which are very useful for *Ama Pachana*. These are also *Deepana* and *Pachana*, so employing these properties digestion of *Ama*, restoration of *Agni* (*Deepana*) removal of excessive *Kledaka Kapha*, and bringing of the *Pakva Dosha* to the *Kostha* from the *Shakha* takes place.
- They bring about *Deepana, Pachana, Rochana*, and *Laghuta*in the body. *Katu Dravya* like *Ajamoda, Trikatu, etc* & *Tikta Dravya* like *Vriddadaru*, etc.

- But care should be taken in monitoring the extent of vitiation of *VataDosha* because the *Tikta-Katu rasa dravya* increases the *Vata Dosha*. The drugs selected with *Tikta* and *Katu Rasa* should also possess the *Vataghna* properties above. All the contents of Ajamodadya Vataka have such properties.

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