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Role of Herbs in the Treatment of Rheumatoid Arthritis

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ABSTRACT

Rheumatoid Arthritis is an autoimmune inflammatory disease where the immune system of the body which normally protects the body by fighting against infection and diseases instead targets the body. The immune system attacks the tissue that lines the joints causing pain, swelling and stiffness in the joint and affecting the ability to work properly. Early treatment to avoid permanent joint damage is the key for preventing disability and progression. The treatment for Rheumatoid Arthritis combines many approaches with drug, exercise, change in lifestyle etc. It also includes alternative methods i.e with herbal medicines. Many plants and plant products have been proven and many are under scientific exploration to develop a novel therapeutic agent for Rheumatoid Arthritis.

Keywords: Herbs, Rheumatoid Arthritis, Medicine, Immunity, Inflammation.

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INTRODUCTION

Rheumatoid Arthritis is a chronic inflammatory condition which affects not only the joints but also other connective tissues in the body[1]. Arthritis is a leading cause of disability in most of the adults in the world. This limits the day to day activities for billon of people. About 2-5% of the world population is affected by arthritis has been reported by WHO.

Generally for the treatment of Rheumatoid Arthritis, NSAIDS are prescribed which on long term use leads to hepatic or renal failure and also may cause others adverse effects. These drugs get accumulated in the tissues and produce toxic effect like retinal damage, rashes, irritable bowel syndrome, corneal opacity, myopathy, neuropathy, etc[2].

When the treatment profile includes just the synthetic medicine all these previous effects are possible but if the treatment becomes prevention as it is said prevention is better than cure their effects can be minimised[3].

Prevention can be done by using natural ingredients. India is a rich source of herbal plants. The knowledge of plants traditionally is the main reason for most of the medicine & food used in modern society. Herbs are being used since long time as food and as a primary tool for maintaining health and aiding in recovery of disease. The treatment modality for many chronic ailments like diabetes, arthritis etc. includes long term consumption of both ayurvedic and allopathic system of medicine. Modern science and technology can be used to make herbal medicines into patient compliant dosage forms. Consumers now a days are highly attracted towards natural ingredient in food, drug and cosmetics because it is believed that anything natural will be devoid of side effects and safe[4].

Rheumatoid Arthritis: Signs and Symptoms

Rheumatoid Arthritis is a chronic, autoimmune, systemic inflammatory disorder or disease targeting the synovial joints.

The clear idea of the pathogenesis is not yet well understood. Even then it has been reported that proinflammatory cytokines like Tumour Necrosis Factor-α (TNF-α), Interleukin-(1L)-1β and IL6 are important mediators of the disease. It is also reported that free radical generation makes the disease worse and leads to damage of bones and cartilages. The destruction of joints that occurs with severe Rheumatoid Arthritis results from inflammation of the synovial membrane. Recurrent or persistent inflammation leads to permanent damage of the cartilage joint, bones, ligaments and tendons. The inflammatory process also includes other tissues like blood vessels, skin, nerves, muscles, heart and lungs. This results in painful joints, loss of mobility, generalised

soreness and depression[5].

Various Signs and Symptoms of Rheumatoid Arthritis are

1) Gradual increase in joint pain, ache and stiffness.
2) Followed by joint swelling, redness and warmth.
3) Initially single joint may be inflamed.
4) Symptoms worst in morning and decrease later.
5) Distressing fatigue.
6) Sleeplessness.
7) Vasculitis.
8) Inflammation of blood vessels, skin rashes, ulcers, gangrenes.
9) Pericarditis, Pleurisy, nerve damage, dry eyes and mouth.
10) Enlargement of spleen and lymph modes.

Treatment of Rheumatoid Arthritis

The treatment modality for Rheumatoid Arthritis usually combines various approaches and the ultimate aim is to relieve pain, reduce joint swelling, prevent or slow down joint damage and improve physical function and well-being[6]. It includes use of

- Conventional medicines
- Biological response modifiers
- Gene therapy
- Alternative approaches

Conventional medicines

Previous treatment strategies involved initial management of Rheumatoid Arthritis by using NSAIDS. These drugs elicit their effect by decreasing COX activity, blocking the downstream production of prostanoids and eicosanoids. The next step was to use DMARDS [Disease Modifying Anti Rheumatoid Drugs]. The therapy with DMARDs showed decrease in inflammatory markers like Erythrocyte Sedimentation Rate and swollen joint counts. DMARDs and immunosuppressives were given as combination therapy[7].

These drugs or the combination therapy may lead to hepatic enzyme disturbances and many other adverse effects like weight loss, diarrhoea, rashes, alopecia, etc.

Biological response modifiers

Researchers have brought much new information in the recent years but the complete treatment for Rheumatoid Arthritis yet remains a challenge. The research on cytokines led to the concept

on introduction of anticytokine therapy for the treatment of Rheumatoid Arthritis. In the year 1992, the first Biological response modifiers, Etanercept and Infliximab were approved. Etanercept is the recombinant form of the p75TNFR-II. Infliximab is a monoclonal antibody directed against TNF-α. Both the drugs are designed to bind with TNFα and thereby decrease bioavailability[8].

Gene therapy

Apart from the other treatment strategies, researchers are now trying to cure Rheumatoid Arthritis using gene therapy but it has not been fully explored.

Alternative approach

There are many limitations and risks in the conventional therapy of Rheumatoid Arthritis. The drugs show many adverse effects.

The alternative approach commonly used in the treatment of Rheumatoid Arthritis involves

* Exercise and physiotherapy
* Dietary modification
* Nutritional supplements
* Natural remedies or Botanicals

The response to the treatment varies from patient to patient. These alternative approaches are used as adjunct with the main therapy or alternative to the conventional therapy and most of these treatments are free of adverse effects.

HERBS IN TREATMENT OF RHEUMATOID ARTHRITIS

Decades of years before, when the synthetic drugs were not discovered, man completely depended on the natural source. A few examples for plants which possess anti Rheumatoid Arthritis potential are listed here in the article.

- **Aloe vera**

  Commonly known as curacao aloe or lily of the desert, is obtained from Aloe barbadensis of the family Liliaceae. Aloe vera contains Anthraquinone, anthracene, cinnamic acid, anthranillic acid which are responsible for this activity and mainly anthraquinone supports for arthritis activity[9]. Complete Freund's adjuvant induced arthritis has been reduced in Sprague Dawley rats by topical application of Aloe Vera extract[10].

- **Cardiospermum halicacabum**

  This plant is commonly called as Balloon vine, mudakattan. The folklore claims tells that it is used in arthritis. It is used as a food to prevent from arthritis. Even now it is used to

prepare dosas. It is proven that it decreases the Complete Freund's adjuvant induced arthritis in Sprague Dawley rats[11].

- **Pepper**

  It is cultivated mostly in South India. It is obtained from *Piper Nigrum* of Piperaceae family. The main constituent of pepper is piperine and is found that when it is administrated orally at a dose of 20,100 mg/kg/day, decreases the arthritis symptoms in carrageenan include paw arthritis[12,13].

- **Ginger**

  Ginger is obtained from *Zingiber officinale* belonging to the family Zingiberaceae. The oil of ginger contains monoterpine hydrocarbon, sesquiterpine hydrocarbons, and oxygenated monoterpine. Ginger is recommended by most of the physicians as one of effective pain remedy for arthritis[14-17].

- **Turmeric**

  It is obtain from *Curcuma longa* of the family Zingiberaceae. It is commonly called as Indian saffron. Curcumin, a main constituent of turmeric is proved to possess anti-inflammatory potential. It is also found to possess wound healing, hepatoprotective and neuroprotective property. A research has been reported that 4mg total curcuminoids per kg per day inhibited inflammation of joints in both acute and chronic arthritis[18-21].

- **Green Tea**

  Camellia Sinensis belonging to the family Theaceae is the source of green tea. The active constituents responsible for its activity are catechins and flavanols. The most important catechin is epigallocatechin. Inflammatory mediators like COX2, IFNγ and TNFα was reported to decrease in collagen induced arthritis in mice when fed with green tea and there was decreased level of total immunoglobulin and type II collagen specific IgG in the arthritic joints of mice[22,23].

- **Ashwagandha**

  It is also known as Indian Ginseng obtained from *Withania somnifera* of the family Solanaceae. It is used in Indian traditional system of medicine. It contains withanine, tropine, somniferine, somnine, etc. In Complete Freund's adjuvant induced arthritis, oral administration of root powders of *Withania somnifera* showed anti-arthritic activity[24-26].

- ***Terminalia paniculata***

  It belongs to family Combretaceae. It is reported to contain alkaloids, triterpenes,

flavonoids, saponins, tannins, etc. In rats with Complete Freund's adjuvant induced arthritis, 200mg/kg aqueous extract of *Terminalia Paniculata* showed anti-arthritic activity[27-29].

- ***Terminalia chebula***

  It is also called as Haritaki, Myrobalan of the family Combretaceae. It contains tannic acid, chebulinic acid, anthraquinone, sennosides. Anti-arthritic activity in Complete Freund's adjuvant or formaldehyde induced arthritis has been found significant with hydro alcoholic extract. The anti-arthritic activity was found due to the immunomodulatory effect on proinflammatory cytokine expression in the synovium[30-32].

- **Mango**

  Mangifera indica belongs to the family Anacardiaceae is a species of mango. The constituents present are mangiferin, isomangiferin, gallic acid, polyphenols, etc. The methanolic extract of *Mangifera indica* showed anti-inflammatory activity and reported to show significant decrease in arthritic index, paw edema, rheumatoid factor[33-35].

- ***Ficus bengalenisis***

  Commonly called as Banyan tree belongs to the family Moraceae. It contains flavonoids, tannins, saponins, steroids, alkaloids, glycosides etc. The methanolic extract produce significant decrease on edema in Complete Freund's adjuvant induced arthritis in rats[36,37].

- ***Tinospora cordifolia***

  It is commonly called as Guduchi belonging to the family Menispermaceae. The main constituents are tinosporine, tinosporide, tinosporaside, cordifolide, cordifol, heptacosanol, clerodane furanoditerpene, columbin, β-sitosterol. The plant is proven to increase the immune system and body's resistance to infections. A decrease in paw volume in collagen induced arthritic rats was found with a dose of 100mg/kg of the plant extract[38,39].

- ***Cedrus deodara***

  Commonly called as Devadaru, Cedar belongs to the family Pinaceae. It has markedly decreased the polyarthritic phase as measured by the paw swelling on Complete Freund's adjuvant induced arthritic rats. In ayurvedic medical practice it is being used for the treatment of inflammation and Rheumatoid Arthritis[40].

- ***Vitex negundo***

  It is a large aromatic shrub belonging to the family Verbanaceae. A tincture of fresh

berries are used for treatment of paralysis, pain in limbs, rheumatic disorder, weakness etc. In carrageenan induced hind paw edema, inhibition of paw edema is found with petroleum ether extract[41,42].

- ***Barringtonia racemosa***

  It belongs to the family Lecythidaceae. It is commonly called as powder puff tree. Main constituents present in this plant are stigmasterol, bartogenic acid, dihydromyticetin etc. of which bartogenic acid is responsible for Rheumatoid Arthritis activity[43,44].

- ***Leucas aspera*:**

  Thumbai of the family Lamiaceae has got many pharmacological activities. It is proved that the ethanolic extract of *Leucas aspera* shows anti-rheumatoid activity in Complete Freund's adjuvant induced arthritic in rats[45, 46].

- ***Hemidesmus indicus***

  Commonly known as Indian sarsaparilla belongs to the family Asclepiadaceae. The principle constituents are coumarin, triterpinoid, saponin. Traditionally it is used in the treatment of Rheumatoid Arthritis. Reduction in paw volume and paw thickness was reported with oral treatment of ethanolic extract of *Hemidesmus indicus* compared with standard diclofenac sodium[47,48].

- ***Strychnos potatorum***

  It belongs to the family Loganiaceae. It is commonly called as Tettrankottai. It contains a major alkaloid called diaboline. The extract of *Strychnos Potatorum* showed decrease in paw volume in Complete Freund's adjuvant induced arthritis in rats at a dose of 200mg/kg p.o. Traditionally, this plant is used in treatment of Rheumatoid Arthritis[49].

- ***Cleome gynandra***

  This plant has a folklore claim of being used in the treatment of Rheumatoid Arthritis. It is commonly called as spider flower, cat's whiskers of the family Capparaceae. Ethanolic extract of the plant is found to possess both acute and chronic anti- inflammatory potential with Complete Freund's adjuvant induced arthritis in rats[50].

- ***Saraca osaka***

  This plant belongs to the family Caesalpiniaceae usually found in hill regions. It is used in treatment of Rheumatoid Arthritis and many other diseases. The paw thickness in Complete Freund's adjuvant induced arthritis in rats reduced with the methanolic extract of *Saraca osaka*[51,52].

CONCLUSION

The present article has been aimed to reveal few plants with anti-arthritic potential. There are many plants widely spread all over our country and many are found to possess Anti arthritic potential and researches are exploring it. As the synthetic counterparts have many adverse effects, it is always good to use plant based formulations for the treatment of Rheumatoid Arthritis which will be devoid of side effects. This review article was focused to explore the plants with anti arthritic activity from the folklore claims.

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