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A review of herbs used in polyherbal formulation for the treatment of arthritis

Saurabh Mishra**Abstract**

Arthritis is inflammatory musculoskeletal disorders mainly affecting the joints, leads to joint stiffness and loss of mobility in sever conditions. It is of various types like osteo, rheumatoid, juvenile etc. Treatment of disease utilizes many approaches from modern to traditional systems. This article reviews the treatment approach of arthritis along with the herbs use for the treatment in ploy herbal formulation.

Keywords: Musculoskeletal, rheumatism, degeneration**Introduction**

Herbal medicines and therapeutic agents are gaining popularity throughout the world in procurement and treatment of chronic diseases as a single drug and in combination as a Poly-herbal formulation. It is estimated that herbal drugs form the basis for the health care need of 64% of world population and that some of 2100 plant species are used worldwide^[1]. India has vast biodiversity and abundant plant population serving as major source for herbal treatment along with the legacy of excellent ancient literature on medicinal use of plants in different disease conditions (like Charak samhita and Sushrut samhita etc.)

One of most adversely effecting inflammatory conditions to humanity is varieties of arthritis and rheumatism which produces the inflammation of connective tissues particularly in joints or non-inflammatory degeneration of these tissues. Thought out the world herbal medicines are used for treatment of different inflammatory diseases.

Arthritis

Arthritis still a formidable disease, being capable of producing sever crippling deformities and functional disability. It is a chronic condition with multiple causation and affects the people in their most active period of life. The deformities that may develop due to the chronic forms stands as the greatestcripler of mankind^[2].

The joints are subjective to a wide variety of disorders including degenerative changes, infections, autoimmune diseases, metabolic degradation and neoplasm.

Some of the most common form of arthritis are

- Rheumatoid arthritis
- Degenerative joint diseases
- Infectious arthritis
- Gout

Rheumatoid arthritis is a chronic inflammatory illness. It is an autoimmune disease in which the immune system attacks normal tissue components as if they were invading pathogens. This illness affects about one percent of the world's population. The inflammation associated with rheumatoid arthritis primarily attacks the linings of the joints. However, the membranes lining the blood vessels, heart, and lungs may also become inflamed. The hands and feet are most often affected, but any joint lined by a membrane may be involved. The inflammation can be controlled by medication. If the inflammation is not controlled the joints may become deformed. 3 the main symptoms of arthritis are Joint swelling, especially in the small joints of the hands and feet and Joint tenderness, stiffness, and pain, especially in the morning

Arthritis is a chronic systemic disorder in which the usual dominating clinical feature is an inflammatory polyarthritis, affecting predominantly the proximal small joints of both hands (Metacarpo-phalangeal, MTP joints).

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This means the patient will present with joint pain and stiffness at multiple joints as the dominant symptom and in addition will have clinical signs of joint inflammation; that is synovial joint swelling with some warmth at the affected joints. Therefore the differential diagnosis of rheumatoid arthritis will include all conditions in which poly arthritis may be present. The destructive and deforming arthritis can be recognized by the development of typical marginal erosions on X-rays of the hand and feet.

It is additionally associated with variable systemic features including fever, weight loss, fatigue, muscle wasting and number of extra articular features, with subcutaneous nodules, ocular manifestation (dry eyes, episcleritis), cardio-pulmonary features (pleurisy, pulmonary nodules, pericarditis), cutaneous vasculitis, peripheral neuropathy and anemia of chronic disease being some more common ones^[4].

Arthritis usually manifests itself over a period of a few months. However for some, the disease may appear over-night. Rapid onset does not mean the individual is at greater risk of disease progression. It may have different effects on different people. Some individuals may experience extreme pain while others may not. Patients often suffer cycles of severe and light symptoms. Women suffer from it two to three times more than men.

Etiology and Pathophysiology of Arthritis

The exact etiology of disease is still unknown and the natural course varies considerably from person to person although immunological mechanism have been implicated in rheumatoid arthritis and systemic lupus erythematosus, their etiology and pathogenesis are still not well understood.

The focus of rheumatoid arthritis is the synovial lining virtually all patient produce rheumatoid arthritis factor which are auto-antibodies directed against IgG molecules. Rheumatoid arthritis factor containing immune complexes found in joint activate the pathological process. The earliest lesion is vasculitis, inflammation of small blood vessels. The inflammation causes edema of the synovium and infiltration with polymorphs, lymphocytes & plasma cells. There is intense local production of IgG by the plasma cells. Synovial fluid in rheumatoid arthritis contains various PGs, mainly PGE2 and leukotrine D. PGE2 comes from inflamed synovial lining cells and is responsible for the pain in rheumatoid joints.

The cartilage degranulation is now considered due to release of factors capable of stimulating chondrocytes to degrade their own extra cellular matrix. This factor form the synovial lining has characteristics similar to interleukin- I (IL-I). Interleukin- I has been shown to stimulate release of lytic enzymes and PGE2 from chondrocyte monolayer and inhibit synthesis of proteoglycans by articular cartilage. Thus IL-1 could contribute of cartilage and bone destruction, to the production and release of PGE2 and to the fibrosis. The cellular infiltration that is so conspicuous in the rheumatoid arthritis joint could be the result of local synthesis of IL4. It is now believed this that monokine is a central mediator of rheumatoid process^[5].

Diagnosis of Rheumatoid Arthritis

Most patients suffering from rheumatoid arthritis have antibodies called rheumatoid factors in their bloodstream that are part of the inflammatory process of the disease. Doctors to help confirm a diagnosis of rheumatoid arthritis use the presence of rheumatoid factor. However, rheumatoid factor may not be a definitive test for rheumatoid arthritis. Rheumatoid factor is also found in cases of chronic infection and in some other types of autoimmune disease.

High levels of rheumatoid factor are often seen in severe cases of rheumatoid arthritis^[6].

Treatment of Arthritic Diseases

Arthritis drugs have long been considered the "traditional" treatment option. Since individual response to drugs can vary and because potential side effects and adverse reactions are also a factor, finding the most effective combination of arthritis drugs can be a more difficult process than one would expect. Drug therapy can be divided in to two class's i.e.

1. To relieve pain, inflammation and muscle stiffness.
2. To modify the course of the disease or induced remission.

Drug Therapy to Relieve Pain, Inflammation and Muscle Stiffness

They act rapidly, relieve pain and control inflammation thus help to improve and maintain joint function to prevent deformities. They do not halt the underlying destructive process in joints. Drugs used in this category are NSAIDs and COX-2 Inhibitors.

NSAIDs (Nonsteroidal Anti-Inflammatory Drugs) are among the most commonly prescribed and widely used arthritis drugs. There are three types of NSAIDs, Salicylates (acetylated, such as aspirin and non-acetylated), Traditional NSAIDs and COX-2 Selective Inhibitors. NSAIDs work by blocking the activity of the enzyme cyclooxygenase, also known as COX. Research has revealed that there are two forms, known as COX-I and COX-2. NSAIDs affect both forms. COX-1 is involved in maintaining healthy tissue, while COX-2' is involved in the inflammation pathway. COX-2 selective inhibitors became a new subset of NSAIDs born of this research. E.g. Diclofenac, Sulindac, Piroxicam, Indomethacin, Mefenamic acid, COX-2 inhibitor includes-Celecoxib, Rofecoxib, Valdecoxib etc⁴

Drug therapy to modify the course of the disease or induced remission

They arrest the basic destructive process in the joints and thus modify the course of disease and may even induced remission. They act slowly and several week must pass before their beneficial effects are visible (slow acting antirheumatic drugs; SAARD), have also been labeled as DMARDs (Disease modifying Anti rheumatic drugs) and "Second line agent". Research has shown the effectiveness of DMARDs in the treatment of Rheumatic arthritis, psoriatic arthritis, and ankylosing spondylitis and the importance of early aggressive treatment with these drugs e.g.- Chloroquine, Hydroxychloroquine, gold salts, Sulfasalazine and immunosuppressants like Minocycline, Methotrexate, belong to this group. Drugs belonging to this group modify some of basic rheumatoid processes.

- They may stabilize the lysosomes in cynovium-gold salts, chloroquine.
- They may suppress immunoglobulin production by B lymphocytes-gold salts, penicillamine.
- They may interfere with complement activation-penicillamine.
- They may suppress T lymphocytes-penicillamine, immunosuppressants.
- They may suppress antibody production by B lymphocytes-immunosuppressants.

In addition, chloroquine has anti-inflammatory affect. Immunosuppressants, particularly cyclophosphamide, may be life-saving when vasculitis complicates the clinical picture and threatens life.

These drugs have potent adverse effects like in gold salts adverse effect occurs in about one third of patients. They include pruritus, dermatitis, glossitis and stomatitis most commonly and also leucopenia and thrombocytopenia (which may threaten life), hepatic and renal damage. In case of hydroxychloroquine, it may accumulate in many organs, including the eye where it can cause retinal damage that may be irreversible. The toxicity profile of methotrexate, used in long term regimen for rheumatoid disease include chronic liver diseases, pneumonitis and opportunistic infections. In case of pencillamine patient may experience gastrointestinal upset and dose related impairment of taste is common. So all these agent proves to be harmful in longterm therapy of disease as required in chronic stages [6].

Although none of the drugs available at present can confer everlasting benefits and induced permanent remission, drugs are of great value in achieving symptomatic relief and functional improvement of the affected joints [5].

Herbal Treatment of Arthritis

Herbal remedies are used or the treatment of Arthritis from long back across the globe. The plant kingdom is abundant in species that act as anti-inflammatory and anti-arthritic to animal tissue. Various plants are studied for for anti-arthritic effects like Guggal, sunth, arand, giloy, haritaki, punernava etc. Some indigenous plant investigated for anti-arthritic and anti-inflammation effects is given in table 1.

Table 1: Herbs use for anti-arthritic activities

Sr. No.	Plant Name	Botanical Name	Family	Part use	Active constituents
1.	Calamus Sweet Flag	<i>Acorus calamus</i>	Araceae	Rhizome	volatile oils containing a number of Sesquiterpenes and Asarone 7
2.	Garlic	<i>Allium sativum</i>	Liliaceae	Bulbs	Starch, mucilage, selenium, allicin, allin [8]
3.	Aloe	<i>Aloes gum</i>	Liliaceae	Gum	Glycosides and Rasins, aloin, barbaloin [9]
4.	khulinjan	<i>Alpinia officinarum</i>	Zingiberaceae	Rhizome	Volatile oils methul cinnamate, cineole n [10]
5.	Shalari Ajamoda	<i>Apium graveolens</i>	Umbelliferae	Seed	Volatile ois limonene, phthalides, choline [11]
6.	Neem	<i>Azadirachta indica</i>	Meliaceae	Whole Plant	Seed oil and leaves contains Limonoids, sterols [11]
7.	Guggul salai	<i>Boswellia serrata</i>	Burseraceae	Gum	Essential oils, mucilage, tannies, [10]
8.	Sultan campa	<i>Calophyllum inophyllum</i>	Guttiferae	Seed	Volatile oils, fixed oils, glycosides [12]
9.	Lal miirch	<i>Capsicum annum</i>	Solanaceae	Fruit	Pungent phenolic compounds, capsaicinoids [10]
10.	Myrrh	<i>Commiphora mukul</i>	Burseraceae	Gum resin	volatile oils, Rasin, Guggulsterones Guggulsterols [13]
11.	Curcuma	<i>Curcuma longa and curcumin</i>	Zingiberaceae	Rhizome	Curcumins, volatile oils [11]
12.	Nagarmotha	<i>Cyperus rotundus</i>	Cyperaceae	Tubers	Essential oils, cyperene, cyperols, cineol [14]
13.	Sheesham	<i>Dalbergia sissoo</i>	Leguminosae	Root	Dalbergenone, dalbergin, methyl dalbergin, [11]
14.	Bhangra	<i>Eclipta alba</i>	Compositae	Herb	Alkaloid, Ecliptine, thiopheneacetyne [11]
15.	Babera Baybiyannga	<i>Embelia ribes</i>	Myristicaceae	Fruit	Embalic Acid, Tannins, embeline
16.	Red gum tree	<i>Eucalyptus teriticornis</i>	Myrtaceae	Fresh flower	volatiles and essential oils
17.	Red caustic weed	<i>Euphorbia prostrata</i>	Eupharbiaceae	Whole plant	Flavonoids, luteolin glycosides [15]
18.	Pipal	<i>Fiscus religiosa</i>	Moraceae	Bark	Tannis, arabinose, mannose, glycoside [16]
19.	Liquorice Mulathi	<i>Glycyrrhiza glabra and glycyrrhizin</i>	Leguminosae	Root and stolon	Saponin glycoside, glycyrrhizine, asparagin [15]
20.	Aaraar	<i>Juniperus communis</i>	Cupressaceae	Berries	essential oils [16]
21.	Mehanti	<i>Lawsonia alba/inermis</i>	Lythraceae	Leaves	carbohydrates, phenolic, flavonoids, saponins,
22.	Asafotetida Nutmeg	<i>Myristica fragrans</i>	Myristicaceae	Seed	Volatile oils Myristicin, elemicine
23.	Tulsi	<i>Ocimum sanctum</i>	Labiatae	Leaves	Volatile oils eugenol, Methyl euginol, caryophyllin
24.	Skunkvine	<i>Paedaria foetida</i>	Rubiaceae	Whole plant	Iridoid glycoside, sitosterol, alkaloids, carbohydrates, [14]
25.	Phaar	<i>Pluchea lanceolata</i>	Compositae	Whole plant	choline, cpluchine taraxsterol,
26.	Aerand castor	<i>Ricinus communis</i>	Euphorbiaceae	Root	Triglycerides of ricinoleic, Isoricinolic acid
27.	Jasmine	<i>Nyctanthes arbortristis</i>	Oleaceac	Leaves	Mannitol, Flavanoid glycosides [15]
28.	Marking nut tree	<i>Semecarpus anacardium</i>	Anacardiaceae	Nuts	Biflavonoids, sterols and glycosides
29.	Fenugreek	<i>Trigonella foenum graecum</i>	Leguminosae	Seed	flavonoid compounds, quercetin, kaempferol
30.	Giloy	<i>Tinospora carffolia</i>	Menispermaceae	Stern	Terpenoid, alkaloid, lignans,
31.	Nirgandi	<i>Vitex negundo</i>	Verbenaceae	Leaves	Volatile ois viridiflorol p-caryophyllene 4-terpineol linalool
32.	Ashwagandha	<i>Withania somnifera</i>	Solanaceae	Root	Steroidal lactones Withanolids, alkaloidis and flavanoids
33.	Bhangra, Chota-gokhru,	<i>Xanthium strumarium</i>	Compositae	Stem	<i>Strumarium</i> oil
34.	Ginger	<i>Zingiber officinale</i>	Zingiberaceae	Rhizomes	Volatileoils, Zaingiberene, zingiberol [19]
35.	Common barberry	<i>Berberis spp.</i>	Berberidace	Root and Bark	Aromoline, Berbamine, Berlambine, Columbamine, Palmatine

The Herbal drugs are use a single drug or combination of two or more drug as poly herbal formulation for topical and oral therapy both like Triphala- A combination of equal part of Emblica officinalis, Terminalia bellerica and Terminalia chebula, Wintergreen oil- Essential oil from bark of Betula lenta & leaves of Gaultheria procumbens, Oils of Moringa oleifera seeds (moringaceae) and oil of Celastrus paniculatus, seeds (celastraceae) in combination of oil of Turpentina and other marketed formulation of herbal and Ayurvedaic as proprietary products.

Conclusion

Arthritis is chronic inflammatory disorder of joints. Swelling and deformation of joints occurs in sever conditions. Various drug

therapies are suggested for the treatment of this disease. The herbal therapy is one of the approaches which use the plant products for the treatment. The use of herbal drugs in chronic disease like arthritis is widely accepted and used throughout the world. Various indigenous plants are studied and investigated for the rheumatic and anti-inflammatory disorders. they can be used in polyherbal combinations in different ratios as per need. Herbal drug therapy utilized Poly herbal formulation along with single drug product, both can play a vital role in development of the herbal formulations for the treatment of arthritis.

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