

Herbal Medicine for the Treatment of Rheumatoid Arthritis

A Krishna Sailaja*, E Veena Rani and Swetha

Department of pharmaceutics, RBVRR Women's college of pharmacy, Osmania University, Hyderabad

ABSTRACT

The main aim of this article is to reduce the adverse effects associated with synthetic drugs which are used to reduce the inflammation in rheumatoid arthritis. Rheumatoid arthritis is defined as a chronic inflammatory disorders affecting many joints, including those in the hands and feet. It is an autoimmune disease in which the body's immune system (which normally protects the health from foreign substances like bacteria and viruses will mistakenly attacks the joints). The greatest disadvantage of the presently available potent synthetic drugs lies in their toxic reactions and reappearance of symptoms after discontinuation. To overcome this effects herbs/herbal based preparation are used to treat rheumatoid arthritis. Herbal medicines will act as parcels to human in order to combat disease from the dawn of civilization. Some of the natural herbs which shows anti-rheumatic action are- vatariguggul, terpenes, stem bark of ficusbengalensis, punarnava etc.,

*Corresponding author

A Krishna Sailaja, Department of pharmaceutics, RBVRR Women's college of pharmacy, Osmania University, Hyderabad,
E-Mail: shailaja1234@rediffmail.com

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Introduction

Rheumatoid arthritis is a chronic inflammatory autoimmune disorder which mainly effects the joints, hand, feet. Autoimmune diseases in which the bodys immune system will mistakenly attacks the body's own tissues reduces the defence activity and may be prone to several infections. The immune system mainly contains the cells and antibodies which play a major role in the destruction of the foreign invaders. Patients with autoimmune disorder have the cells and antibodies which will mainly target the tissues and is associated with the inflammation of the tissues around the joints [1, 2].

The characteristic features of the rheumatoid arthritis are that they can cause extra-articular inflammation and injury in other organs. Slowly the inflammation spreads to the multiple organs which is referred to as systemic illness [3, 4]

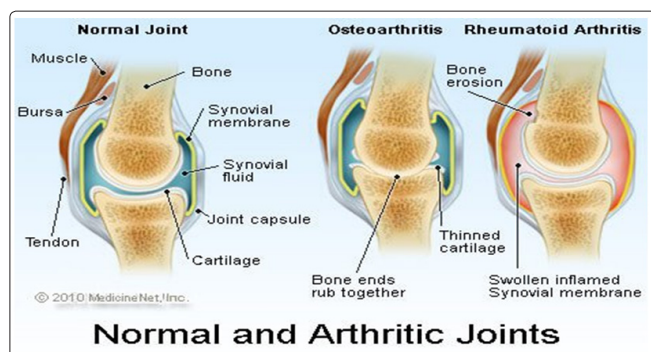


Figure 1: Normal and arthritic Joint

Signs and Symptoms of Rheumatoid Arthritis

Rheumatoid arthritis symptoms depends upon the degree of inflammation and the type of body tissue involved in inflammation. Remissions may occur upon treating with certain drugs but sometimes there are chances of relapse of disease and toxic reactions may occur due to the synthetic drugs and its severity may differ among the affected individuals [5, 6].

The most notable symptoms are muscle and joint stiffness which is mostly experienced during morning times and is referred to as morning stiffness and post-sedentary stiffness.

Generally joint stiffness occurs due to the inflammation of the synovium the tissue that lines the joint and resulting in the excess production of the synovial fluid (synovitis).

If the inflammation is chronic it may even damage the body tissues, including cartilage and bone which in turn leads to the weakness of bones resulting in joint deformity, loss of range of motion, loss of function.

Even the small joints of both the hands and wrists are also involved, the arthritis which is associated with the hands creates the difficulty in performing simple tasks like opening jars and turning doors.

Not only the joints even the vocal cords are also effected due to rheumatoid arthritis which changes the tone of voice (leads to the inflammation of the cricoarytenoid joint which causes hoarseness of voice) [7, 8].

Pathology

Rheumatoid arthritis is characterized by synovitis with thickening of the synovial lining and infiltration by inflammation cells . Generation of new synovial blood vessels is induced by angiogenic

cytokines. The synovium proliferates and grows out over the surface of cartilage, producing a tumor like mass called pannus. Pannus destroys the articular cartilage and subchondral bone producing bony erosions.

Causes

The actual cause of RA is unknown. Some of the infectious agents like the bacteria, viruses, fungi have been also responsible to cause rheumatoid arthritis.

Some research proved that, there may be some genetic reasons associated with the rheumatoid arthritis. Immune cells called lymphocytes are activated and chemical messengers (cytokines, such as tumor necrosis factor (TNF), interleukin-1 and interleukin-6) are expressed in the inflamed areas [9, 10].

Types of rheumatoid arthritis: [11, 12]

S.no	Body part	Effect
1.	Eyes	Corneal abrasion (eye dryness)
2.	Mouth	Sjogren's syndrome (dryness of mouth)
3.	Lungs	Pleuritis (creates difficulty in breathing, coughing), nodules formation
4.	Heart	Pericarditis –at an increased risk it leads to heart attack
5.	Blood vessels	Decrease the RBC and WBC levels(felty's syndrome is a condition occurs due to decreased concentration of WBC in the body)
6.	Elbows and fingers	Carpal tunnel syndrome (formation of lumps/firm bumps under the skin)
7.	Kidneys	Amyloidosis causes the nephrotic syndrome and renal failure.

Drugs used to treat rheumatoid arthritis: [13]

First-line drugs:(reduces pain and inflammation)

S.no	Drug	Brand name	Side effects
1	Acetylsalicylate	Aspirin	Ulcers
2	Naproxen	Naprosyn	Abdominal pain
3	Ibuprofen	Advil, medipren, motrin	Gastrointestinal bleeding
4	Diclofenac	Voltaren	Stomach upset
5	Corticosteroids	-	Facial puffiness,weight gain, cataracts.

Second line drugs (slow acting drugs-promotes disease remission and prevent progressive joint destruction):

S.no	Drug	Brand name	Side effects
1	Hydroxychloroquine	Plaquenil	Skin rashes, muscle weakness
2	Sulfasalazine	Azulfidine	Stomach upset, rashes
3	Methotrexate	Rheumatrex, trexall, otrexup	Bone marrow depression, cirrhosis.
4	Gold thioglucose	Solganal	Mouth sores, skin rashes
5	Gold thiomalate	Myochrysin	Kidney damage

Due the side effects associated with the synthetic drugs and a chance of relapse herbs are used to treat the rheumatoid arthritis.

List of the herbs: [14]

S.no	Biological name	Family	Part of the herb	Target	Uses
1	Boswelliaserrata	Burseraceae	Gum of the boswellia trees	COX-2, LOX-5	This herb is thought to work by blocking substances that attack healthy joints.
2	Allium cepa	Amaryllidaceae	Onions	COX-2, TNF-Alpha, LOX-5	Antioxidant and anti-inflammatory action
3	Aloe barbadensis	Aloeaceae	Leaves	TNF-a,IL-6	Anti-arthritis activity
4	Azadiractaindica	Meliaceae	Leaf	NF-KB signaling pathway	Anti-inflammatory, anti-ulcer.
5	Argemonemexicana	Papaveraceae	Whole plant latex	IL-2,IFNgamma inhibition,IL-10	Cough, asthma, pertussis, rheumatism
6	Capparisdeciduas	Capparaceae	Roots	TNF-a	Fruit powder, sugar is prescribed in rheumatism, gout.

7	Green –lipped mussel (pemacaniculus)	Mytilidae	Boiled mussel	Dual inhibitor of arachidonic acid oxygenation by both the COX and LOX pathways	Reduces the inflammation associated with arthritis
8	Rehmanniaglutinosa	Orobanchaceae	Root	COX-1 and COX-2	Treats RA, effective in reducing joint pain and swelling
9	Thunder god (tripterygium)	Celartraceae	Root	Inhibiting transcription of cytokines genes, including IL-2, gamma interferon	Treats rheumatoid arthritis
10	Borage oil (boragoofficinalis)	Boraginaceae	Seeds	Suppress the inflammation mediators	Helps to treat RA by reducing inflammation
11	Black adusa (justiciagendarussa)	Acanthaceae	Leaves	Inhibits INOS, COX-2 expression via NF-KB pathway	Anti -arthritic activity
12	Chaste tree (vitexagnus)	Lamiaceae	Roots	Inhibits inflammation mediators	Treats rheumatic disorder
13	Tinosporagulancha (tinosporacordiofolia)	Menispermaceae	Leaves	IL-1B, TNF-a	Anti-inflammatory, used in the treatment of RA
14	Anantamulindia sarsaparilla (hemidusmus)	Apocyanaceae	Leaf	NF-KB	Used in the treatment of RA
15	Bastard guilder (premnacorymbosa)	Verbenaceae	Leaves	COX-1, COX-2	Suppresses the development of chronic arthritis
16	Black pepper (piper nigrum)	Piperaceae	Seeds	COX-pathway, IL-6	Reduces arthritic symptoms
17	Turmeric root (curcuma longa)	Zingiberaceae	Rhizome	NF-KB pathway	Inhibits joint inflammation in both acute and chronic phases of arthritis
18	Clearing nut (strychnospotorum)	Loganiaceae	Seeds	NF-KB pathway	Anti –arthritic
19	Hygrophilaauriculata	Acanthaceae	Roots, leaves	TNF-a	In the treatment of jaundice, hepatic obstruction, rheumatism
20	Vatteriaindica	Dipterocarpaceae	Oil	Inhibits Lipoxygenase	Treats respiratory disorders like chronic bronchitis, diarrhea and rheumatism
21	Cat’s claw (uncariatomentosa)	Rubiaceae	Root bark	TNF	Anti-inflammatory properties, may stimulate the immune system
22	Burdock root (arctiumlappa)	Asteraceae	Root	Suppress the inflammatory mediators	Anti-inflammatory, reduces congestion
23	Devil’s claw (harpagophytumprocumbens)	Pedialaceae	Dry fruit	COX-2	Used for rheumatic pain, backache, muscle and joint pain
24	Arnica	Asteraceae	Flowers, leaves	Inhibits the production of an inflammatory substance known as NF-KB	Regulates the immune system, anti-inflammatory, relieves muscle and joint pain
25	Eucommiaulmoides	Eucommiaceae	Bark	IL-1B expression, TNF-a	Reduces hip and joint pains
26	Nettles (urticadioica)	Urticacaea	Leaves, stem	COX-1, COX-2, prostaglandin D2 synthase	Treats all types of arthritis, gout, anti-inflammatory action.
27	Punarnava (boerhaviadiffusa)	Nyctaginaceae	Leaves	Inhibits PLA2 enzyme	Anti-spasmodic, anti-inflammatoryaction, reduces joint pains.

28	Berberine	Berberidaceae	Flowers and leaves	NF-KB, COX-2, TNF-a	Reduces joint pains
29	Piper betel	Piperaceae	Whole plant	IL-1B	Reduces the inflammation in arthritis
30	Pongamapinnata	Fabaceae	Leaves	NF-KB p65 nuclear translocation	Leprous sores, painful rheumatic joints
31	Solanumnigrum	Solanaceae	Whole plant	TNF-a, IL-1	Treats pain, fever, inflammation

Conclusion

Rheumatoid arthritis is an auto immune disorder. It cannot be cured completely but the symptoms can be treated effectively. In this article a detailed discussion was made on the progression of disease, Various herbs and the formulations used for the treatment of arthritis.

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