Journal of Ayurvedic and Herbal Medicine 2021; 7(2): 155-160

Review Article

ISSN: 2454-5023
J. Ayu. Herb. Med.
2021; 7(2): 155-160
Received: 05-06-2021
Accepted: 30-06-2021

www.ayurvedjournal.com
DOI: 10.31254/jahm.2021.7215

Antirheumatic Properties of Medicinal Plants: A Review

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ABSTRACT

Medicinal plants are widely used for the treatment of rheumatism. Around 80% of world are depends on traditional medicine. Rheumatism is a chronic, autoimmune diseases, that affects own immune system and healthy tissue which are caused inflammation. Rheumatism risk factors include hormonal, genetic, environmental, and nutritional, and socio-economic factors, ethnicity, infections, smoking, and so on. In this review use of some traditional medicine plants against rheumatism such as *Aerva lanata*, *Mahuca longifolia*, *Acetaea spicata*, *Aesculus indica*, *Hemidesmus ndicus*, has been discussed. This review includes the mechanism of rheumatism including inhibition of cartilage degradation. Various active compounds such as lignans, flavonols, terpenes and sterols have been found in medicinal plants, which has been found to be beneficial for the treatment of rheumatism.

Keywords: Rheumatism, Medicinal plants, Antirheumatic activity.

INTRODUCTION

Medicinal plants are widely used for the treatment of rheumatism and many types of diseases [1-7]. Most of the people are depends on these plant and trees for their survival and good health. Forest people are believed in the system of traditional medicine for their primary purposes and health [8-9]. Treatment of various inflammatory diseases are cured by use of some medicinal herbs. According to World Health Organization (WHO), 80% of world are rely on traditional medicines for common ailments. The dependence of People's on traditional medicines is increasing day by day and it also helps to reduce the side effects of modern drug. Rheumatism is a common autoimmune disease that occurs in immune system of the body which, attacking healthy tissue and caused inflammation. Rheumatism is a chronic and serious problem, which cause joints pain, swollen, stiffness, redness and tender to touch. It is estimated that nearly 180 million of people are suffering from rheumatic pains in India [9-10]. In India, traditional knowledge of medicine is passing from generation to generation. Many of known plants is used for antirheumatic pain by indigenous peoples such as Naikpods, Koyas, Gonds. The primary symptoms of rheumatoid arthritis including develop inability to move and pain, basically in morning. The diseases is diagnosed, then the treatment is prescribed by Doctor or consultant. There is no exact cure for rheumatism but some therapies are useful to stop diseases progression or to slow them. The person suffering from rheumatism, loose the ability to do work and care for themselves [11].

Rheumatism is not designated any type of specific disorders, but it covers more than 100 types of conditions. Rheumatism also known as 'regional pain syndrome 'or 'soft tissue rheumatism'(used to describe the condition).Rheumatic diseases affect our joints, tendons, ligaments, bones, and muscles. Sometimes it is also called musculoskeletal diseases. The most common symptoms are: joints pain, loss of motion in a joints, inflammation (swelling, redness, and warmth in a joint or affected area) [12-15].

Various rheumatic diseases are formed, which are usually painful, chronic and progressive and sometimes it get worse condition. The most common rheumatic diseases are:

Osteoarthritis: These is a common form of arthritis, and also a age related diseases which destroyed the bone and cartilage, in some cases causes disability. It mostly affect the knees,hips,lower back, neck, fingers, feet. Joints are unstable due to muscles and bones weakness [16].

Rheumatoid arthritis: It is an autoimmune and inflammatory diseases which affect our immune system or tissues and cause joint pain, stiffness, swelling. It affects multiple joints at a time and usually affect wrist, knees, hands. people are loses joints function and it is a systematic disease which affects other organs of body such as eyes, lungs, skin, heart, kidney, gastrointestinal system and nervous system. Sometimes it

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also causes anemia [17-18].

Lupus-Lupus is a chronic autoimmune disease which cause inflammation throughout the body. The immune system attacked organs and own tissues of the body such as eyes, hairs, joints, heart, kidney, blood, liver, lungs, brain [19-20].

Spondyloarthropathies-Ankylosing spondylitis (AS) is a inflammatory arthritis.It gradually starts from lower back pain and attack in spine which attach to the pelvis, known as sacroiliac joints. If the condition is worsened spine becomes stiffer and hard to bends for everyday activity. It also causes inflammation in other organs such as hips, shoulders, ribs and some time in eyes [21].

Sjogren's syndrome-It is an autoimmune condition, the immune system attack on glands which produce saliva and tears. The main symptoms are dry mouth and dry eyes but, in some cases, it also affects other organs such as joints (pain in joints and muscles), nerves, skin (rashes). It is more common in women than men.

Gout-It occurs when uric acid is built up in body and large amount of crystals are formed in joints and skin. Mostly found in big toe and another part of foot but it also affects in ankles, knees, elbows, wrists, or fingers. These pains are coming quickly in body [22].

Scleroderma-It attacks on the skin and other connective tissues which becomes hard. Localized scleroderma is most common in children's and its mostly effect on skin. Systemic scleroderma affected other body parts such as skin, blood vessels to organs, muscles and joints. The basic symptoms are calcium lumps under the skin, heart kidney lungs problem, dry mouth and skin, stiffness, swollen, warmth, redness, tightening of skin [23].

Infectious arthritis-It is septic and infectious arthritis which is caused by bacterial, viral or fungal infections. If the infection is spread in joints, it reacts against the immune system and fight with it. Inflammation cause pain and swelling. It mostly affect the knees but in serious cases it also damages other parts of body such as ankles, hips, wrists [24].

Juvenile idiopathic arthritis-It is most commonly found in children, caused by immune system attacked own tissue and joint. Mild cases caused warmth, joints pain, stiffness and swelling but in severe cases it caused joint damage, stunted growth, long term pain, uneven limbs, eye inflammation and anemia [25].

Polymyalgia rheumatic-The cause of condition is unknown but it is an inflammatory condition which affects the neck, shoulder, knees, hips and caused pain and stiffness. In some cases, it shows flu-like symptoms fever and weakness. It is most common in older adults [26].

Some Important Antirheumatic Plants Used for Treatment Are:

- *Madhuca longifolia*
- *Actaea spicata*
- *Aerva lanata*
- *Aesculus indica*
- *Hemidesmus indicus*

Madhuca longifolia

Madhuca longifolia is a tropical tree, largely found in central and north plains and forest in India. The common name of *Madhuca longifolia* is Madhuka, Mahuwa, Mahua,Mahwa,Mhulo and lluppai or vippa chettu. It belongs to the family of Sapotaceae, which is growing very fast approximately 20 meters in height. It is a tropical tree mixed deciduous forest in India in the states of Madhya Pradesh, Kerala, Gujrat, West Bengal, Bihar, Maharashtra, Jharkhand, UttarPradesh, Odisha, Chhattisgarh, Tamil Nadu, Telangana. It is also called 'tree of life of tribal India'. Almost every part of the plants is utilized contains active compounds which gives higher medicinal and therapeutic [27-33].

Madhuca longifolia have multiple medicinal properties, which is used to treat a large number of diseases. The bark of the tree is used for rheumatism, chronic bronchitis etc. The leaves of the plant are also used as a medicine to treat rheumatism The seed oil is used as a ointment to relief in joint pains and inflammation which is caused by rheumatoid arthritis [34-36].

Actaea spicata

Actaea spicata is a traditional medicinal plant which is belongs to Ranunculaceae (buttercup) family. It is also known as baneberry or herb Christopher, mostly found in Temperate Himalaya 6,000—10,000 ft. Shimla. It is an herbaceous perennial plant growing upto 62- 65 cm. The flower is white with 3- 6 petaloid sepals and basal leaves are biternate and bipinnate, the fruits are berry change in black after ripening. The roots are mostly using as a medicinal purpose [37-40].

Actaea spicata is mostly use for the treatment of rheumatism and some other diseases, the roots are used to treat rheumatic pain, because it contains higher medicinal properties.

It is used as rheumatic remedy such as tearing pains in loins, Rheumatic pains in small joints, pain in (fingers, toes, wrist, and ankles), swelling in joints, swollen wrist. Lame feelings in arms. Pain in knees and weakness in hands [41-42].

Aerva lanata

Aerva lanata is a common weed which grows wild everywhere in the plains of India. In India, it is commonly known as mountain knot grass. The camphor like aroma is present in the roots. It belongs the family of Amaranthaceae*, A.lanata* is a woody, succulent or prostrate, perennial herb. Stems are straggling and sprawling and widely spread (6 feet in length) [43-47]. *Aerva lanata* is used for rheumatism and some other diseases, the roots are most affected for rheumatism. The juice of crushed root are work against the rheumatism and it is traditional method [48-50].

Aesculus indica

Aesculus indica is commonly known as Indian horse chestnut or Himalayan horse chest nut, and it belongs to the family of Sapindaceae. It is a attractive tree grow 9 to 12 meters and spread 11 to 15 meters. It leaves are large and ornamental and the mature tree is beautiful round canopy. It mostly found in Himalayan lawlands, between Kashmir and Western Nepal [51-54].

The seed contains astringent, acrid and necrotic which are used for the treatment of rheumatism. An oil from the seed is applied externally on the affected area of body. The juice of bark is also used to treat rheumatism [55-56].

Hemidesmus indicus

Hemidesmus indicus is commonly known as Indian sarsaparilla(anantmool). It belongs to the family of periplocaceae. These is a climbing vine plant found in upper Gangetic plain east wards to Bengal. It is a slender, laticiferous and semi-erect shrub. Roots are woody and aromatic in nature. These are mostly found in India such as Assam and south India [57-60].

H.indicus roots have been protective activity against rheumatism and arthritis which contains various compounds such as terpenes, sterols and phenolic compound [61-62].

Mechanism of Rheumatism

The exact cause of rheumatism is not known, the rheumatism hastendency to be genetically inherited. Certain factors and environment might trigger the immune system to attacked own tissue and cells, which caused inflammation in various organs such as eyes, wrists, hips, ankles, lungs. Environmental factors have seemed to play a role in causing rheumatism example smoking of tobacco increases the risk of developing rheumatism [63].

Genetic Factor

About 60% -70% of rheumatism patients in world, which carry a split epitope of the human leucocyte antigen (HLA)DR4 cluster, and which is composed one of the peptide-binding sites of a specific HLA-DR molecules affiliated with rheumatism also carries this shared epitope and confers risk [64]. Major histocompatibility complex and some other genes are also involved, and they are shows result from sequencing genes of families with rheumatism suggest the presence of various unacceptable genes and susceptibility genes, accept with PTPN22 and TRAF5 [65-66]. Juvenile rheumatoid arthritis (JRA), is a heterogeneous group of diseases, and it is also known as juvenile idiopathic arthritis (JIA) which is differ from adult's rheumatism. JIA is genetically complex traits in which multiples genes are important for diseases [67-68]. The IL2RA/CD25 gene has been implicated as a JIA susceptibilitylocus, as has the VTCNI gene. The future of treatment and understanding of rheumatism is based on imprinting and epigenetics. Rheumatism mostly seems to be in female than in male which shows the genomic imprinting from parents to the expressed participates [69-74]. Imprinting is distinguished by different way of methylation of chromosomes by the parent of origin resulting in differential expression of maternal over paternal genes. Epigenetics is occurs to change in DNA expression because of the enviroment which induce methylation, but it is not change the structure of DNA. The scientist are focused on environment and immune genetics [74-76].

Infectious Agents

Various infectious agents have been responsible to caused rheumatism, including *Mycoplasma*organisms Epstein-Barr virus, rubellavirus [77-78]. In some cases, flu-like symptoms appear in rheumatism. The inducibility of rheumatism in experimental animals with different bacteria or bacterial products. Various bacterial products are found, including bacterial RNA, in patient's joints. Various antimicrobial agents are present, which shows various activity against the diseases such as modifying drugs (antimalarial agents,gold salt) [79-80].

Pathogenesis

Rheumatism is caused inflammation and attack different joints of body, both in small and medium sized joints as local inflammation and it also caused systemic inflammation. Variable activity are processed by different autoimmune and inflammation in rheumatism and makes entire diseases pathobiologically and clinically heterogeneous [81].

Synovial Immunologic Processes and Inflammation

Synovitis occurs when leukocytes infiltrate the synovial compartment.Leukocyte's accumulation primarily reflects migration rather than local proliferation. Cell migration is able by endothelial activation in synovial micro vessels, which are responsible to increases the expression of adhesion molecules (integrins, selectins, cadherins and other members of immunoglobulin superfamily) and chemokines [82]. Accordingly, neoangiogenesis, which is activated by local hypoxic conditions and cytokines, and insufficient lymphangiogenesis, which limits cellular agrees, and these features are early and established synovitis. These micro-environmental changes, combined with profound synovial architectural reorganization and local fibroblast activation, which permit the buildup of synovial inflammatory tissue in rheumatism [83].

CONCLUSION

Study of medicinal plants gives a good research work, not only for rheumatism but various other diseases are treated [84-89]. The effects of medicinal plants are depends on their bioactive compounds. The compounds are specifically act on a specific disease [90-94]. These plants have beneficial pharmaceuticals values and used for the treatment of rheumatism, since a long time ago [94-98]. Medicinal plant is safe and no side effects rather than synthetic drug [99-103]. It is noted that rheumatism is caused inflammation and pain and the presented plants have shown various anti-inflammatory activities [104-108]. These anti-inflammatory plants are also effective some other inflammation causing diseases [109-113]. Consequently, effective natural compounds are found to treat rheumatism which proves their beneficial value.

Conflict of Interest

None declared.

Financial support and sponsorship

Nil.

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HOW TO CITE THIS ARTICLE
Shaheen S, Raveena, Mathur R, Jha AK. Antirheumatic Properties of Medicinal Plants: A Review. J Ayu Herb Med 2021;7(2):155-160. DOI: 10.31254/jahm.2021.7215