



A Review On Herbal Cream Used For Anti Rheumatoid Arthritis

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1. ABSTRACT

Arthritis remains a significant health issue in India, impacting a large portion of the population. However, the specific statistics may have shifted since January 2022 due to factors such as population growth, demographic changes, and improvements in healthcare infrastructure and awareness. For the most accurate and dependable data regarding arthritis prevalence in India, it is advisable to consult credible sources such as government health agencies, esteemed research organizations, or international bodies like the World Health Organization (WHO). Rheumatoid arthritis results from the malfunction of the body's immune system, leading to self-attack. In this immune response, there are antigens like Interleukin-2 (IL-2) and Tumor Necrosis Factor (TNF- α). Specifically, TNF- α contributes to joint inflammation by encouraging the proliferation of synovial lining cells. While arthritis isn't entirely curable without surgical interventions, it's possible to alleviate the disease's effects and associated discomfort.

Several ongoing studies are focused on developing a poly-herbal cream for managing rheumatoid arthritis. Banyan tree leaves have been recognized for their positive effects in treating this condition, attributed to their antioxidative properties and their ability to diminish inflammation by blocking the activity of inflammatory mediators associated with the ailment. From several studies ginger is found to be effective in the treatment of rheumatoid arthritis by inhibiting the production of chemical substances which are responsible for the production of inflammation. The objective of my review is to gather a range of herbs currently employed in the treatment of rheumatoid arthritis.

KEYWORDS: Rheumatoid arthritis, tumour necrosis factor, inflammatory mediators, poly-herbal cream.

Introduction -

Rheumatoid arthritis (RA) is indeed a chronic autoimmune condition that affects joints, causing inflammation, pain, and potential joint damage and disability if not treated promptly. Although its exact cause remains unclear, a combination of genetic, environmental, and hormonal factors likely plays a role in its development. RA is characterized by persistent inflammation in the synovium, the joint lining, leading to swelling, pain, stiffness, and eventual joint damage and deformities. In contrast to osteoarthritis, which primarily results from mechanical wear and tear on specific joints, RA often affects multiple joints symmetrically. It commonly begins in smaller joints such as those in the hands and feet but can progress to larger joints over time. Early diagnosis and timely treatment are essential for managing RA and reducing its impact. Medications like disease-modifying anti-rheumatic drugs (DMARDs), biologics, and

corticosteroids are used to control inflammation, alleviate symptoms, and slow down joint damage progression. Alongside medication, lifestyle adjustments such as regular exercise, physical therapy, and techniques to protect joints are crucial aspects of RA management. Regular monitoring by healthcare providers ensures that treatment plans are personalized and adjusted as needed to achieve optimal disease control. Despite being a chronic condition, advancements in treatment have greatly improved the quality of life for many RA patients, enabling them to lead fulfilling lives despite the challenges posed by the disease.(1),(7).

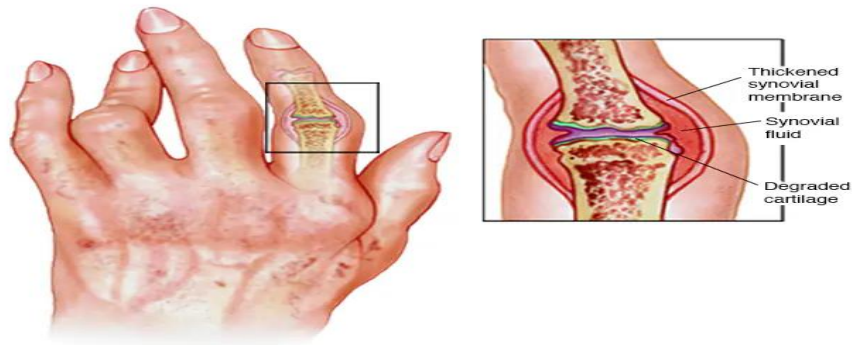
Rheumatoid arthritis (RA) is identified as a systemic autoimmune condition characterized by persistent inflammation, affecting not only joints but also various extra-articular sites such as the heart, kidneys, lungs, digestive system, eyes, skin, and nervous system. A diverse range of arthritis types has been explored and categorized, differentiating between non-inflammatory forms such as osteoarthritis, and inflammatory forms caused by crystal deposition like pseudogout, basic calcium phosphate disease, and gout. Furthermore, arthritis can arise from bacterial and viral infections including Staphylococcus aureus, Neisseria gonorrhoea, complications associated with Lyme disease, Parvovirus, and Enterovirus, or result from autoimmune processes.(2),(5).

Arthritis affects around 15% of India's population, which corresponds to over 180 million people. The World Health Organization (WHO) has documented over 100 rheumatologic disorders. Hormonal changes are acknowledged as a contributing factor to the heightened prevalence of rheumatoid arthritis. The risk of developing arthritis tends to increase with age, typically emerging between the ages of 40 and 60, though it can occur at any stage of life. Studies indicate that levels of rheumatoid factor, a marker for rheumatoid arthritis, are more elevated in women compared to men. Projections indicate that by 2030, more than a quarter of the global population will be affected by some form of arthritis, largely as a result of lifestyle changes. To manage arthritis symptoms, various analgesic and non-steroidal anti-inflammatory drugs (NSAIDs) are frequently prescribed. Analgesics such as acetaminophen and NSAIDs like aspirin or ibuprofen work by inhibiting cyclo-oxygenase enzymes, thereby diminishing prostaglandin production. However, these medications carry the risk of side effects such as stomach ulcers, gastrointestinal bleeding, and damage to organs such as the kidneys and liver. Additionally, some of these drugs can be expensive. Increased awareness of the adverse effects associated with pharmaceutical medications has driven a growing demand for natural alternatives. Inflammation is a multifaceted process often linked with pain, involving events such as heightened vascular permeability, protein denaturation, and alterations in membrane structure. Cellular damage inflicted by microbes, physical agents, or chemical agents presents as stress within the body..(3),(1).

Tissue inflammation is a response triggered by stress, acting as a defensive mechanism characterized by redness, pain, heat, swelling, and compromised function in the affected area. It serves as a fundamental component of the body's internal defense systems. Whether it's in response to a tissue injury like a cut or other forms of damage such as burns from heat, radiation, or invasion by pathogens like bacteria or viruses, the inflammatory process is initiated. Its purpose is to mitigate the effects of harmful agents by diluting, neutralizing, or isolating them within the body. Additionally, inflammation kickstarts a series of biological processes aimed at promoting tissue healing. Infections, burns, trauma, and various immune reactions are some of the primary triggers of inflammation(4).

2.1) Inflammation can be classified -

1. Acute inflammation
2. Chronic inflammation
3. Miscellaneous



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2.2)Mechanism-

The sequence initiates with T-lymphocyte dysfunction, potentially influenced by various internal and external factors. This malfunction prompts B-lymphocytes to excessively produce antibodies, notably IgG.

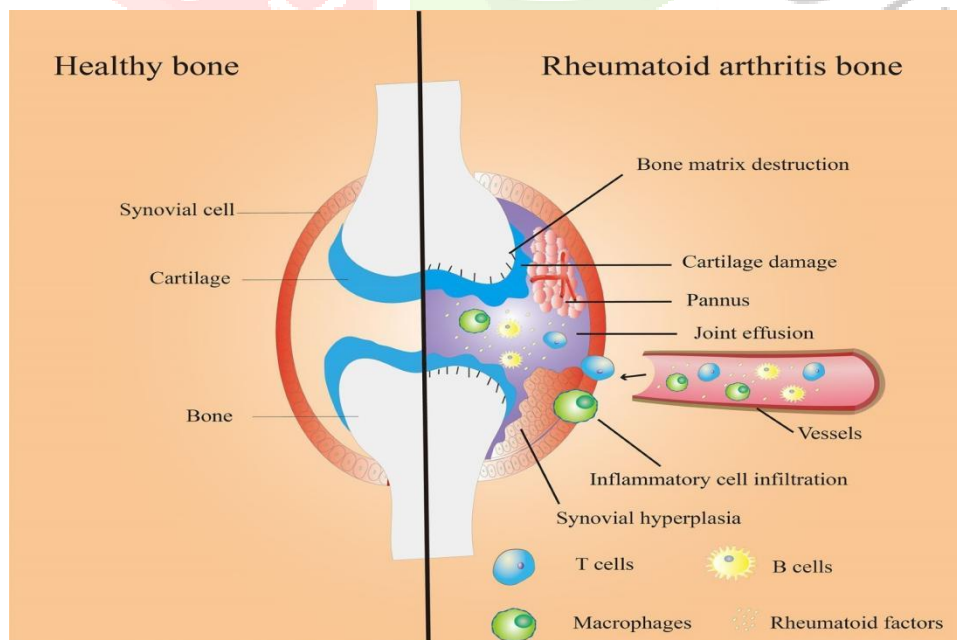
Within the synovium, plasma cells and lymphocytes identify these IgG antibodies as foreign entities and commence the production of rheumatoid factors in response.

Consequently, immune complexes form, triggering a series of reactions including activation of the complement system. This activation recruits neutrophils to the synovial fluid.

Following this, macrophages engulf the immune complexes, releasing lysosomal enzymes and other inflammatory mediators.

This entire process inflicts damage upon microcirculatory vessels and provokes inflammatory alterations within the synovium.

Sustained inflammation incites the proliferation of the synovial membrane, resulting in the development of pannus—a tissue overgrowth that harms joint cartilage. Moreover, immune complex deposition induces damage to microcirculatory vessels in visceral organs, thereby contributing to external lesions within joints.(3)



2.3) Classification of Rheumatoid Arthritis: -

Rheumatoid arthritis (RA) can be classified in various ways based on different aspects of the disease. The classification systems help in understanding the disease severity, prognosis, and guiding appropriate treatment strategies. Here are several common classifications of rheumatoid arthritis(5).

- **Clinical Classification:**
 - Early Rheumatoid Arthritis (ERA): Refers to the initial stages of the disease.
 - Established Rheumatoid Arthritis: Characterized by more advanced and persistent symptoms.
- **Seropositive vs. Seronegative:**
 - Seropositive RA: Patients who test positive for either rheumatoid factor (RF) or anti-cyclic citrullinated peptide (anti-CCP) antibodies in their blood tests.
 - Seronegative RA: Patients who test negative for RF and anti-CCP antibodies.(28)
- **Disease Activity:**
 - Mild, Moderate, Severe: Based on the degree of joint inflammation, functional impairment, and systemic involvement.
- **Duration of Symptoms:**
 - Early Onset: Symptoms present for less than six months.
 - Late Onset: Symptoms present for more than six months.
- **Joint Involvement:**
 - Monoarticular: Involvement of a single joint.
 - Oligoarticular: Involvement of a few joints.
 - Polyarticular: Involvement of multiple joints
- **Extra-Articular Manifestations:**
 - Rheumatoid Nodules: Subcutaneous nodules commonly found in patients with RA.
 - Rheumatoid Vasculitis: Inflammation of blood vessels.
- **Functional Status:**
 - Functional Class I to IV: Classifies the level of functional impairment based on the American College of Rheumatology (ACR) criteria.(33)
- **Response of Treatment:**
 - Good Responders: Patients who show a positive response to treatment.
 - Poor Responders: Patients who do not respond well to conventional therapies.
- **Systemic vs. Localized RA:**
 - Systemic RA: Involves systemic symptoms beyond joint inflammation.
 - Localized RA: Primarily affects joints without significant systemic involvement.
- **Pediatric Rheumatoid Arthritis:**
 - In children, RA is often referred to as juvenile idiopathic arthritis (JIA) and is classified into several subtypes based on clinical features.

2.4) Mechanism of action:-

Anti-Inflammatory Effects:

- Curcumin (Turmeric): Inhibits pro-inflammatory cytokines, like tumor necrosis factor-alpha (TNF-alpha) and interleukin-1 beta (IL-1 β), reducing inflammation in the joints.(18)
- Ginger (Zingiber officinale): Contains gingerol, which has anti-inflammatory properties by inhibiting inflammatory mediators.(36)

Immunomodulation:

- Ashwagandha (Withania somnifera): Exhibits immunomodulatory effects, helping to regulate the immune system and reduce autoimmunity associated with RA.
- Boswellia (Boswellia serrata): Inhibits 5-lipoxygenase, reducing leukotriene production and modulating immune responses.

Antioxidant Activity:

- Green Tea (*Camellia sinensis*): Rich in polyphenols, green tea acts as an antioxidant, scavenging free radicals that contribute to oxidative stress in RA.
- Rosehip (*Rosa canina*): Contains vitamin C and other antioxidants that help neutralize reactive oxygen species.(6)

Inhibition of Matrix Metalloproteinases (MMPs):

- Licorice Root (*Glycyrrhiza glabra*): May inhibit MMPs, enzymes responsible for cartilage and bone degradation in RA.

Pain Relief and Analgesic Effects:

- Devil's Claw (*Harpagophytum procumbens*): Known for its analgesic and anti-inflammatory properties, providing pain relief in RA.

Regulation of Prostaglandin Synthesis:

- Turmeric (Curcumin): Inhibits the enzyme cyclooxygenase-2 (COX-2), reducing the synthesis of pro-inflammatory prostaglandins.(28)

Anti-Arthritic Effects:

- Triphala: Exhibits anti-arthritic effects, possibly by modulating the immune response and reducing inflammation in joints.

Reduction of Rheumatoid Nodules:

- Triphala and Turmeric: Some herbal formulations may help reduce the formation of rheumatoid nodules, characteristic of advanced RA.

Balancing Th1 and Th2 Immune Responses:

- Ashwagandha: Has been studied for its ability to balance Th1 and Th2 immune responses, potentially preventing excessive inflammation.

Joint Protection:

- Boswellia: May protect joint tissues by inhibiting the breakdown of connective tissue and promoting the synthesis of glycosaminoglycans.(7).

2.5) Pathogenesis of Rheumatoid Arthritis:

The development of rheumatoid arthritis (RA) involves a complex interplay of genetic, environmental, and immunological factors. It progresses through several key stages:

genetic Susceptibility: Individuals with a family history of RA have an increased risk due to specific genetic G markers, such as certain HLA-DRB1 alleles.

Immune System Dysfunction: RA is characterized by an abnormal immune response, where the body mistakenly attacks its own tissues, particularly targeting the synovium around joints.

Synovial Inflammation: The autoimmune reaction triggers inflammation within the synovial membrane, leading to synovitis. This process involves the release of cytokines like TNF-alpha, IL-1, and IL-6.(9)

Pannus Formation: Prolonged inflammation leads to the development of pannus, an abnormal tissue that damages joint structures, including cartilage and bone.

Joint Degradation: Pannus formation, along with the action of enzymes such as matrix metalloproteinases, contributes to the degradation of cartilage and bone in affected joints.(9)

Systemic Effects: RA can have consequences beyond joint inflammation, impacting various organs and systems. This can result in complications like cardiovascular issues, lung problems, and widespread inflammation.

In summary, the pathogenesis of RA involves a complex cascade of events, beginning with genetic predisposition and immune system dysfunction, ultimately leading to joint inflammation, tissue damage, and systemic implications.

3)Active ingredients of herbal cream-

Banyan tree -

The banyan tree, scientifically classified as *Ficus benghalensis*, is renowned for its sprawling aerial roots and expansive canopy. It holds significant cultural and medicinal value in various regions, particularly in India. Its various parts, including fruits, leaves, roots, and bark, are utilized in ethnomedicine for their therapeutic properties.(8) In Sanskrit, it is referred to as Bahupada or Vat, while in Hindi and Urdu, it is called Bargad. In English, it goes by the names Banyan, East Indian Fig, and Indian Fig. This majestic tree, belonging to the Moraceae family, is renowned for its large size, evergreen foliage, and remarkable longevity.(9) It is deeply ingrained in Indian history and culture and holds the esteemed position of being the national tree of India. The banyan tree thrives predominantly in India, Pakistan, and Sri Lanka, exhibiting resilience across diverse climatic conditions in these regions.(10)



Fig .1 . Banyan Tree

Chemical constituents -

The banyan tree (*Ficus benghalensis*) is rich in diverse chemical constituents across its various parts:

Leaf: Abundant in flavonoids, terpenoids, phenols, and terpenes.

Bark: Rich in flavonoids, terpenoids, phenols, terpenes, quinones, and furanocoumarin.

Root: Contains sterols, amino acids, and fatty acids.

Fruits: Rich source of fatty acids. (11)

Furthermore, they contain carbohydrates, proteins, fats, dietary fiber, Vitamin C, and Vitamin E. The seeds provide a nutritional content of approximately 130 calories per 100 grams. Moreover, they include essential minerals like sodium, potassium, calcium, manganese, iron, chromium, copper, and phosphorus. These chemical constituents contribute to the medicinal properties of the banyan tree, making it a valuable resource in ethnomedicine and traditional healing practices.

Uses of banyan in arthritis:

The bark extract of the banyan tree has displayed promising prospects in alleviating arthritis symptoms in animal experiments. However, it's crucial to stress the necessity for additional research to validate its effectiveness in treating arthritis. Hence, it's advisable to steer clear of using banyan tree bark extract for arthritis treatment unless under the direct prescription and supervision of a qualified healthcare provider. banyan leaves extract through herbal cream formulate and used in arthritis.

Banyan tree has numerous health benefits attributed to its various chemical constituents and properties:

Blood Glucose Management: Derived from the banyan tree, the extract may help regulate blood glucose levels by increasing insulin secretion, owing to its antioxidant properties.

Antioxidants in banyan tree extract may have the potential to help decrease LDL cholesterol levels in the body.

Gastrointestinal Health: In Ayurvedic practice, the banyan tree is valued for its role in managing diarrhea and female health issues such as leucorrhea, thanks to its astringent properties referred to as Kashaya.

Pain and Inflammation Reduction: The banyan tree displays characteristics that might help ease arthritis-related pain and inflammation, thanks to its anti-inflammatory and pain-relieving properties. Additionally, applying banyan bark paste on gums may help reduce gum inflammation, as it possesses anti-inflammatory properties.(12-13)

Ginger -

Ginger, also referred to as *Zingiber officinale* Roscoe, is an enduring herbaceous plant belonging to the Zingiberaceae family.

It is widely recognized for its prominent role as one of the most commonly used spices in both culinary and medicinal practices across the globe. Over generations, its enchanting scent and wide-ranging biological and pharmacological qualities have firmly established its pivotal position in the foundations of traditional Chinese, Ayurvedic, and Unani medicinal practices. Having its roots in South-East Asia, notably in areas like China, India, and the USA, ginger has been widely utilized for its medicinal properties. Throughout history, ginger has been employed to address various health issues, including coughs, nausea, vomiting, diarrhea, and other medical conditions.

Ginger is available in three main forms, commonly found in the market:

Fresh Root Ginger: ginger of rhizome is commonly used like cooking and for its medicinal benefits. It is prized for its pungent flavor and aromatic qualities.

Preserved Ginger: Ginger preserved in syrup form is another popular way of consuming ginger. It is often used in culinary preparations and also for its potential health-promoting properties.

Dried Ginger Spice: Dried ginger, also known as ginger powder or ground ginger, it is used as a spice in cooking, baking. It provides a convenient way to add ginger's flavor and potential health benefits to various dishes.(14)



Fig.2. Ginger

Chemical constituents -

Ginger rhizomes (*Zingiber officinale* Roscoe) harbor a diverse range of compounds that enhance its fragrance, flavor, and medicinal attributes. Here are some of the key constituents found within ginger rhizomes:

Carbohydrates: Constituting 50–70% of the rhizome, carbohydrates serve as a primary source of energy.

Lipids: Present in quantities of 3–8%, lipids contribute to the nutritional profile of ginger.

Terpenes like zingiberene, β -bisabolene, α -farnesene, β -sesquiphellandrene, and α -curcumene are found in ginger rhizomes and contribute to the unique scent associated with ginger.

Phenolic compound- In ginger, you'll find phenolic compounds such as gingerol, paradols, and shogaol, renowned for their antioxidant and anti-inflammatory characteristics. Of these, gingerols (23–25%) and shogaol (18–25%) are present in greater abundance.

Amino acids serve as the fundamental components of proteins and play vital roles in numerous physiological processes.

Raw Fiber: Fiber aids in digestion and promotes gut health.

Ash: Represents the inorganic mineral content of ginger.(15-18)

Protein: Provides essential amino acids necessary for tissue repair and growth.

Phytosterols: These plant-derived compounds have cholesterol-lowering properties.

Vitamins: Ginger contains vitamins such as nicotinic acid (niacin) and vitamin A, which are essential for overall health.

Minerals: Ginger rhizomes contain minerals vital for various physiological processes, such as calcium, magnesium, potassium, and phosphorus.

Ginger is rich not only in its main components but also in a diverse range of aromatic and spicy compounds. Notable among these are the volatile oils, such as shogaols and gingerols. Moreover, the ginger rhizome contains various compounds related to gingerol or shogaol, including 6-paradol, 1-dehydrogingerdione, 6-gingerdione, 10-gingerdione, 4-gingerdiol, 6-gingerdiol, 8-gingerdiol, and 10-gingerdiol. Additionally, diarylheptanoids are present in ginger rhizomes.(16)

Uses -

The potential of ginger in relieving primary pain and managing conditions like musculoskeletal pain and rheumatoid arthritis has been noted. Nonetheless, further research is required to confirm its effectiveness in providing pain relief for humans. Ginger tincture used in herbal cream for the treat of artheritis.

Gingerol boosts gastrointestinal motility, controlling the rate at which food progresses from the stomach to the intestines. Consuming ginger accelerates digestion by speeding up the movement of food, thereby reducing the duration it remains in the intestines(19-21)

Nausea Relief:

Chemotherapy: Ginger has been noted to alleviate post-treatment nausea in cancer patients undergoing chemotherapy, often without the side effects associated with anti-nausea medications.

Historically, ginger has been employed to alleviate morning sickness and the nausea associated with pregnancy. Acknowledging its effectiveness, the American Academy of Obstetrics and Gynecology regards ginger as a non-pharmaceutical option for managing pregnancy-related nausea and vomiting.

Bloating and Gas: Consuming ginger can help alleviate bloating and intestinal gas by addressing factors like fermentation, constipation, and other related issues.(21-25)

Antioxidant Properties: Ginger harbors antioxidants that play a role in regulating free radicals, detrimental compounds capable of inducing cell damage when excessively abundant. These antioxidants function to mitigate cellular damage and deterioration.

Anti-Inflammatory Potential: While ginger contains over 400 natural compounds, some with anti-inflammatory properties, further research is needed to fully comprehend its effects on conditions like rheumatoid arthritis or respiratory inflammation..(26-27)

4) Conclusion -

In summary, arthritis remains a significant health issue in India, affecting a large portion of the population. Rheumatoid arthritis stems from immune system dysfunction, leading to joint inflammation. While a complete cure without surgery may not be feasible, managing symptoms and discomfort is achievable. Current research is focused on developing poly-herbal creams for treating rheumatoid arthritis. Studies have shown the effectiveness of certain herbs like Banyan tree leaves and ginger in this regard. Banyan tree leaves exhibit antioxidant and anti-inflammatory properties, inhibiting inflammatory mediators responsible for joint inflammation. Similarly, ginger has demonstrated potential by inhibiting the production of chemicals that induce inflammation. These findings highlight the promise of herbal remedies in alleviating rheumatoid arthritis symptoms. However, further research is necessary to validate their efficacy and safety in clinical settings. Hence, it's vital to include these herbs in treatment plans with the supervision of healthcare professionals to guarantee thorough care and the best results for rheumatoid arthritis patients.

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