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Review Article

A Review on Rheumatoid Arthritis Disease

Namrata Gutte*, Ganesh Dhere, Priya Dhole, Sonal Salve, Amol Wadhave

SDMVM Diploma in Pharmacy Institute, Chh Sambhajinagar 431001

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ABSTRACT

Rheumatoid Arthritis (RA) is a chronic autoimmune disease characterized by symmetric joint inflammation, leading to joint pain, swelling, and eventually joint damage and disability. This review aims to provide a comprehensive overview of the pathogenesis, clinical features, and management of RA. It covers the underlying mechanisms driving the disease, risk factors, and genetic predisposition. Additionally, the review explores the varied clinical manifestations of RA, from joint symptoms to systemic effects, and highlights the importance of early diagnosis and timely intervention. The various treatment approaches, including non-pharmacological strategies, conventional disease-modifying drugs, biologic agents, and targeted therapies, are discussed in detail, emphasizing their roles in symptom control, disease modification, and overall patient well-being. Moreover, recent research insights and future perspectives in the field of RA management are also explored.

INTRODUCTION

A series of inflammatory joint illnesses known as arthritis are distinguished by joint pain, stiffness, swelling, and decreased mobility. People of all ages are affected, and it is one of the top causes of disability worldwide. This article offers a thorough analysis of arthritis joint pain, covering the many forms, causes, signs and symptoms, diagnostic procedures, and treatment options. An autoimmune illness that affects the joints and maybe other bodily parts, rheumatoid arthritis (RA) is a chronic condition. The cells and proteins in our bodies that fight infections make up the immune system. When a portion of our body is attacked by our immune system as if it were an outside invader like a virus or bacteria, it is known as an autoimmune disease. The immune system attacks the synovial membrane in rheumatoid arthritis. Synovial fluid is secreted into the joint by the synovial membrane. The joint fluid that lubricates and nourishes the joint is called synovial fluid. In rheumatoid arthritis, the immune system may also target other tissues, but the synovium, or

***Corresponding Author:** Namrata Gutte
Address: *SDMVM Diploma in Pharmacy Institute, Chh Sambhajinagar 431001*
Email : salvesonal09@gmail.com
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synovial membrane, is typically the main target. Attacks on the synovial membrane cause inflammation (synovitis), which can thicken and destroy the membrane. Because it is not being secreted, synovial fluid is also eliminated along with the synovial membrane. The surrounding structures may also get affected, which might result in the joint abnormalities associated with rheumatoid arthritis.

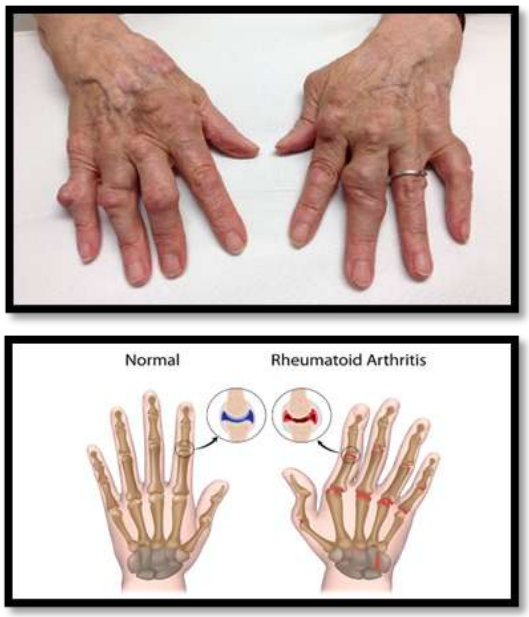


Fig.1: Rheumatoid Arthritis

II. EPIDEMIOLOGY OF RA

Rheumatoid Arthritis (RA) is a moderately prevalent chronic autoimmune disease that affects people of all ages and ethnic origins as of my most recent update in September 2021. The epidemiology of RA might range among various demographics and geographical areas, and continuing study may offer up-to-date statistics. Here are some significant RA epidemiology features:

Prevalence: Approximately 0.5% to 1% of adults globally are thought to have RA. Women are more frequently affected than men, and the prevalence tends to rise with age.

Age of Onset: Although RA can start at any age, it usually begins between the ages of 30 and 60. However, children and teenagers might be impacted by juvenile idiopathic arthritis (JIA), a group of RA-related arthritic diseases.

Gender: RA is two to three times more common in women than in men. Although the cause of this gender gap is not entirely known, hormonal and genetic variables may be at play.

Geographic Variation: variable locations and nations may have a variable prevalence of RA. In developed, temperate regions like North America, Northern Europe, and parts of Asia, higher rates are frequently seen.

III. CLINICAL FEATURES

Chronic autoimmune disease called rheumatoid arthritis (RA) primarily affects the joints but can also affect other body organs and tissues. Individuals with RA may exhibit a wide range of clinical symptoms, and the disease's progression could alternate between remissions and flare-ups. Here are a few typical rheumatoid arthritis clinical signs and symptoms.

IV. TYPES OF ARTHRITIS

Based on the causes of arthritis changes, several forms of arthritis can be named. A particular type of arthritis occurs in a particular age group and in a particular joint.

Table.1: Types of Arthritis

Sr No	Arthritis	Age Group	Site
1)	Osteoarthritis	Elderly	Knee, lower back, Fingers
2)	Juvenile Rheumatoid Arthritis	Childhood	Knee, hip
3)	Septic arthritis	Childhood	Knee, hip

4)	Ankylosing spondylitis	Young adults	Lower back, Chest
5)	Psoriatic arthritis	Young adults	Knee

V. JOINT COMPLAINTS:

On both sides of the body, various joints are frequently affected by RA. The joints that are most frequently affected include the knees, elbows, shoulders, hips, and hands (wrist, knuckle, and finger joints), foot (ankles and toes). Symptoms of the joints include:

Joint pain: Pain in the affected joints, frequently worse in the morning or following periods of inactivity.

Joint swelling: Inflammation causes swelling and a feeling of fullness in the affected joints.

Joint stiffness: Morning stiffness that lasts for over an hour, as well as stiffness that may follow extended periods of inactivity.

Reduced range of motion: As the condition worsens, damage to the joints may cause restrictions in movement and abnormalities.

Weariness: Even during times of low disease activity, many patients with RA experience weariness and an overall feeling of being sick. Rheumatoid nodules are tiny, solid lumps that can form beneath the skin, typically near pressure points or troubled joints. Although nodules do not always appear in RA patients, they are a hallmark of the condition.

VI. SYSTEMIC SYMPTOMS

Because RA is a systemic illness, the entire body may be affected. Some people may go through:

- Low-grade fever, appetite loss, and weight loss.
- Joint Damage and Deformities: Over time, persistent inflammation in the joints can cause cartilage loss, joint damage, and deformities.
- Anemia (low red blood cell count) is another factor.
- The form and alignment of the joints may alter as a result, which may influence how well the joints work.
- Rheumatoid nodules can appear in the lungs as well as other organs, as was previously described.
- Anaemia and other disorders of the blood.

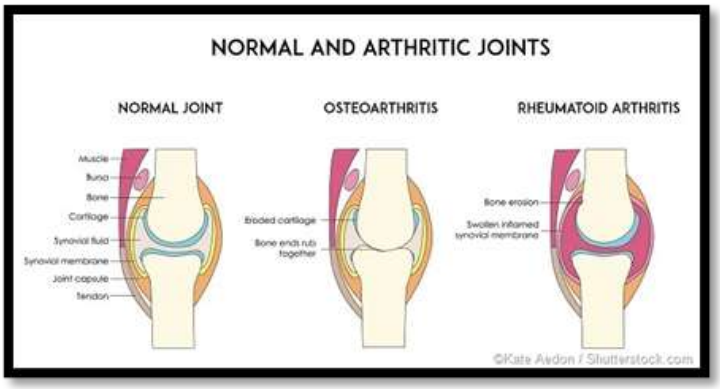
It's crucial to remember that every person with RA experiences the disease differently, both in terms of severity and specific symptoms. To control symptoms, avoid joint deterioration, and enhance overall quality of life for RA patients, early diagnosis and effective treatment are crucial. The need of getting a medical evaluation from a rheumatologist or other trained healthcare provider cannot be overstated if you think you may have rheumatoid arthritis or are experiencing joint pain and related symptoms. They are able to carry out a complete examination, offer a reliable diagnosis, and suggest a personalized treatment strategy based on your particular requirements

VII. ETIOLOGY FOR ARTHRITIS:

The exact etiology or cause of Rheumatoid Arthritis (RA) is not fully understood, but it is believed to result from a complex interplay of genetic, environmental, and immune system factors.

Here are some key factors that contribute to the development of RA:

1. **Genetic Factors:** There is a strong genetic component to RA, as it tends to run in families. Certain genetic markers, such as specific variants of the human leukocyte antigen (HLA) genes (HLADRB1), are associated with an increased risk of developing RA. However, having these genetic markers does not guarantee that someone will develop the disease, as other factors are also involved.
2. **Autoimmune Response**: RA is classified as an autoimmune disease, which means the body's immune system mistakenly attacks its tissues. In the case of RA, the immune system targets the synovium, the lining of the membranes that surround the joints. This leads to chronic inflammation and damage to the joints.
3. **Environmental Triggers:** Various environmental factors may trigger the onset of RA in individuals with a genetic predisposition. Some potential triggers include smoking, exposure to certain infections (e.g., Epstein-Barr virus), and hormonal changes, particularly in women.
4. **Inflammatory Pathways:** Inflammation plays a crucial role in the development and progression of RA. The release of pro-inflammatory cytokines, such as tumor necrosis factor-alpha (TNF-alpha) and interleukins, contributes to joint inflammation and tissue damage.
5. **Abnormal Antibody Production**: In many people with RA, there is an abnormal production of antibodies, specifically rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) antibodies. These antibodies target healthy joint tissues, leading to immune system attacks on the joints.
6. **Synovial Membrane Changes**: In RA, the synovial membrane that lines the joint becomes inflamed and thickened. This inflammation causes the release of enzymes that can break down cartilage and bone, leading to joint damage.
7. **Gut Microbiota:** Emerging research suggests a potential link between gut health and the development of autoimmune diseases like RA. Changes in the gut microbiota (the community of microorganisms living in the digestive tract) might influence the immune system and contribute to the development of RA.



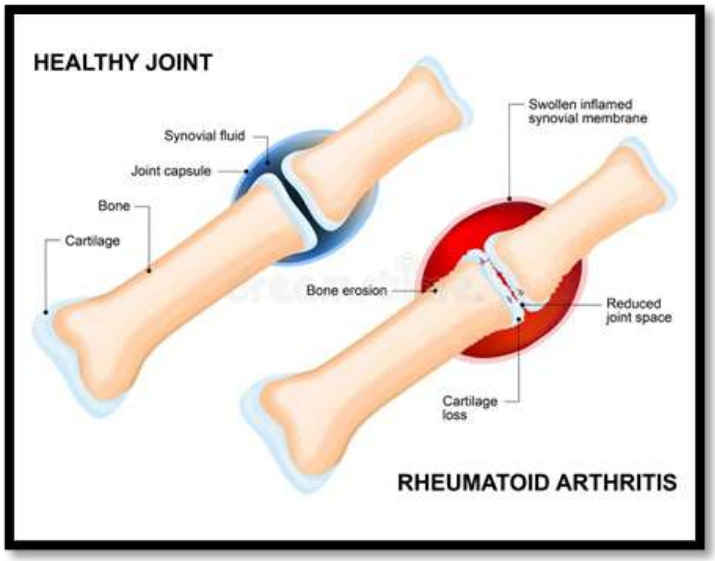


Fig. 2: Difference between Normal joints and Rheumatoid Arthritis joints

VIII. SYMPTOMS OF RHEUMATOID ARTHRITIS

Stiffness from osteoarthritis, for instance , usually clears up within half an hour).even after remaining motionless for a few moments , the body can stiffen. Movement becomes easier again after loosening up.

Fig. 3 Symptoms of Rheumatoid Arthritis

1. **Swelling and Pain:**
   Joint pain and swelling must last for at least six weeks before a RA diagnosis is made. Inflamed joints are typically swollen and frequently feel warm and "boggy" to the touch. Depending on which hand the person uses most frequently, the discomfort is frequently symmetrical but may be more intense on one side of the body.

2. **Nodules:**
   Nodules might develop at any time during the progression of the illness. Rarely, nodules may become painful and infected, especially if they are in areas that experience stress, like the ankles. Rheumatoid vasculitis, a disorder that can affect the blood vessels in the lungs, kidneys, or other organs, can occasionally be indicated by nodules.

3. **Fluid Accumulation:**
   Fluid may build up, especially in the ankles. A Baker cyst is created when fluid builds up in the joint sac behind the knee. This cyst, which occasionally stretches down the back of the calf and causes agony, feels like a tumour. Baker cysts frequently form in persons without RA.
4. **Symptoms of the flu:**
   Early RA symptoms might include exhaustion, weight loss, and fever. Some individuals compare these symptoms to those of the flu or a cold, although RA symptoms can linger for years.
5. **Children's Symptoms:**
   Juvenile RA in children, commonly known as Still's disease, is typically accompanied by a high fever, shivering chills and joint discomfort and swelling. It's possible to have a pink skin rash.

IX. MEDICATIONS OF RHEUMATOID ARTHRITIS

Many medications used to treat rheumatoid arthritis have adverse effects that could be life-threatening. Typically, drugs with the fewest side effects are first prescribed by doctors. As your illness worsens, you might require stronger medications or a mix of medications. Rheumatoid Arthritis (RA) treatment seeks to lessen inflammation, control symptoms, avoid joint damage, and enhance overall quality of life for those who have the condition. The choice of treatment for RA relies on the severity of the condition, the patient's reaction to therapy, and other medical factors. There are various categories of drugs that are used to treat RA.

The following are some typical drugs for RA

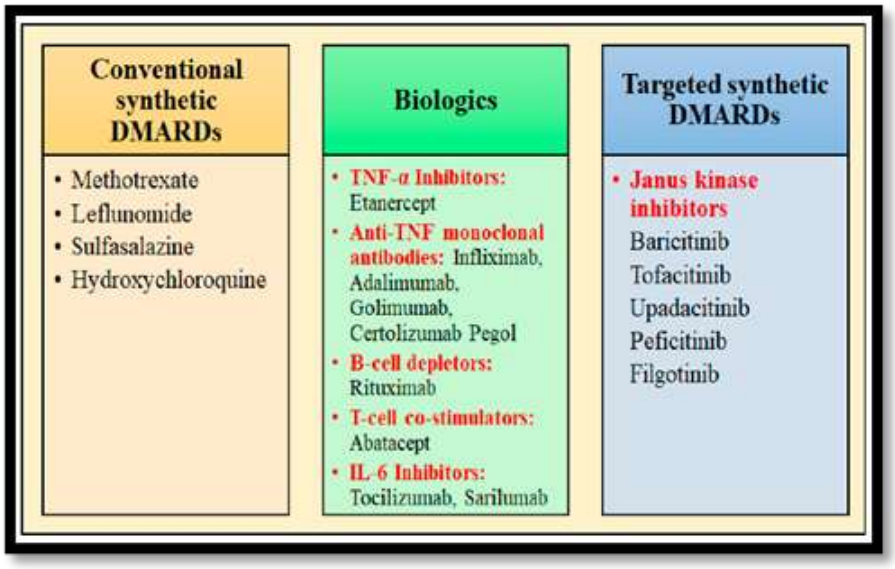


Fig 4- Medications Of Rheumatoid Arthritis

1) **Non-steroidal anti-inflammatory drugs(NSAIDs)**

NSAIDs are used to treat RA inflammation and discomfort. Although they assist in reducing joint discomfort and stiffness, they do not halt the disease's course or stop joint destruction. Ibuprofen, naproxen, and Diclofenac are among NSAIDs.

2) **Disease-Modifying Antirheumatic Drugs (DMARDs)**

DMARDs are a group of medications that help slow down the progression of RA and prevent joint damage. They work by targeting the underlying autoimmune process that causes inflammation. Some commonly used DMARDs for RA include:

- Methotrexate: One of the most commonly prescribed DMARDs for RA. It helps reduce joint inflammation and prevent joint damage.
- Sulfasalazine.
- Hydroxychloroquine.
- Leflunomide.
- Azathioprine.

3) Biologic Response Modifiers (Biologics):

Biologics are a type of DMARD that target specific components of the immune system involved in RA. They are often used when conventional DMARDs are not effective. Biologics are administered by injection or infusion and include:

Tumor Necrosis Factor (TNF) Inhibitors:

- Examples include adalimumab, etanercept, and infliximab.
- Interleukin-6 (IL-6) Inhibitors: Tocilizumab is an example.
- Interleukin-1 (IL-1) Inhibitors: Anakinra is an example.
- B-cell Inhibitors: Rituximab and ocrelizumab target B-cells involved in the immune response.

4) Janus Kinase (JAK) Inhibitors:

JAK inhibitors are a newer class of medications that target specific enzymes involved in the immune response. They help reduce inflammation and slow the progression of RA. Examples include tofacitinib and baricitinib.

5) Glucocorticoids (Steroids):

Short-term use of oral or injected Glucocorticoids, such as prednisone, can help quickly reduce inflammation and provide symptom relief during disease flares. However, their long-term use is generally avoided due to potential side effects.

6) Analgesics:

These are pain-relieving medications, such as acetaminophen, that can be used to manage pain in RA. The choice of medications and treatment approach should be individualized based on factors such as disease severity, response to therapy, presence of other medical conditions, and patient preferences. Treatment plans often involve a combination of medications to achieve optimal control of RA symptoms and prevent joint damage.

X. HOMEOPATHY TREATMENT FOR RHEUMATOID ARTHRITIS

Homeopathy treatments for rheumatoid arthritis (RA) are sometimes used to help manage symptoms like joint pain, swelling, and stiffness. These highly-diluted natural remedies may include arnica, rhus tox, Bryonia, and others. Individual homeopathic RA remedies target specific clusters of symptoms. A homeopathic provider will select a treatment based on which joints are affected and how you describe your pain.

Fig 5- Homepathy Treatment for Rheumatoid Arthritis

There are no FDA-approved homeopathic treatments specifically for rheumatoid arthritis. However, homeopathic practitioners have several remedies they prescribe off-label to relieve common RA symptoms.

1) Antimonium Crudum:

Antimonium crudum is a mixture of the elements antimony and sulfur. As a homeopathic remedy, it is typically used to treat digestive issues. However, some homeopathic practitioners say it may also be useful for treating arthritis, especially in the finger joints.

2) Apis:

Apis, also known as apis mellifica, is used by homeopathic practitioners to treat joint swelling. Made from bee venom, apis is indicated when joints are red, inflamed, burning, or stinging.
A Chinese study found RA patients who were treated with bee venom acupuncture saw improvements in their pain and stiffness with no side effects. In laboratory studies, bee venom has been shown to have anti-inflammatory properties. However, more research is needed to understand how this compound works and its dosage.

3) Arnica:

In homeopathy, arnica is indicated for RA when joints are tender to the touch. Arnica is an anti-inflammatory agent that has been shown to lower markers of inflammation in laboratory studies.
When applied topically, arnica may reduce pain and bruising. Research has found that arnica cream is as effective as an ibuprofen gel at relieving osteoarthritis pain. However, more research is needed to determine whether this therapy is effective for RA.

4) Bryonia:

Bryonia is a vine. The root is used in homeopathy to treat arthritic pain, particularly in the knees and elbows. Homeopathic providers may use bryonia when joints are red, hot, swollen, and painful. More specifically, it is indicated for tearing/throbbing pain and pain that worsens with movement.
In laboratory studies, bryonia has been shown to have anti-inflammatory and analgesic (pain relieving) properties.8 However, there isn't a lot of research in humans to support its use in treating RA.

5) Caulophyllum:

Caulophyllum is recommended by homeopathic practitioners to treat migrating pain in small joints of the hands and feet. Typically prescribed to

women, it is made from blue cohosh, which is used in folk medicine to treat joint pain, regulate menstrual periods, and induce labor**.**

In laboratory studies, caulophyllum has been shown to have anti-inflammatory and anti-rheumatic properties. Studies also show that caulophyllum lowers biomarkers associated with RA joint pain and inflammation. However, so far, the research is limited to animal studies, and human trials are needed.

6) Causticum:

Causticum is used in homeopathic medicine for RA accompanied by joint deformities and weakness. While the remedy cannot reverse joint damage or deformity, it may help relieve joint pain, stiffness, and swelling.

Homeopathic practitioners commonly prescribe causticum for nighttime pain that interferes with sleep. In studies, causticum has been shown to relieve joint pain slightly better than acetaminophen. However, the treatment was only studied in people with osteoarthritis, and its benefits for rheumatoid arthritis are unclear.

7) Colchicum:

Colchicum is used in homeopathy to relieve chronic joint pain and inflammation associated with rheumatoid arthritis. It is indicated for tearing pain that worsens with cold air and pain that migrates from one side to another.

Colchicum's anti-inflammatory properties have been widely studied, and its compounds were used in the development of colchicine, a medicine to treat gout. It has not, however, been evaluated in the treatment of RA, and more research is needed before it can be recommended.

8) Ledum Palustre:

Ledum palustre is used in homeopathic medicine to treat arthritis that starts in the feet and travels up the body to other joints. Also known as Rhododendron tomentosum or ledum pal, it is a traditional folk remedy for RA and other inflammatory diseases.

In laboratory studies, ledum palustre was found to contain anti-rheumatic compounds that may be beneficial for treating RA in a few different ways. It has anti-inflammatory and analgesic properties that relieve RA symptoms, but, more notably, its anti-proliferative effects may hinder the underlying disease process. Still, more research and human trials are needed before ledum palustre can be recommended as a treatment for RA.

9) Rhus Tox:

Rhus tox comes from the poison oak plant. Often called by its scientific name, Rhus toxicodendron, it is used in homeopathy to treat pain and stiffness. In laboratory research, rhus tox was shown to have anti-inflammatory properties

CONCLUSION:

In conclusion, Rheumatoid Arthritis (RA) is a chronic autoimmune disorder that primarily affects the joints, causing inflammation, pain, and joint damage. It is characterized by an abnormal immune response that leads to the attack of the synovial membrane, resulting in chronic joint inflammation. While the exact cause of RA remains unclear, a combination of genetic, environmental, and immune system factors is believed to contribute to its development. RA can affect people of all ages and genders, but it is more common in women and tends to start between the ages of 30 and 60. The disease often presents with symmetrical joint involvement, joint pain, swelling, stiffness, and reduced range of motion. In addition to joint symptoms, RA can have systemic effects, causing fatigue, low-grade fever,

and other systemic manifestations. If left untreated, RA can lead to joint damage, deformities, and disability, significantly impacting a person's quality of life. Early diagnosis and prompt treatment are essential to manage symptoms, slow down disease progression, and prevent joint damage.

Treatment for RA typically involves a combination of medications, including nonsteroidal anti-inflammatory drugs (NSAIDs) for symptom relief, disease-modifying Antirheumatic drugs (DMARDs) to slow down disease progression, biologics that target specific components of the immune system, and Janus Kinase (JAK) inhibitors. Glucocorticoids may also be used for short-term symptom relief during flares. In addition to medications, lifestyle changes, physical therapy, and regular exercise can play a crucial role in managing RA and maintaining joint function and mobility. Regular monitoring and follow-up with a rheumatologist or qualified healthcare professional are essential to assess the disease's progression, adjust treatment as needed, and optimize outcomes for individuals living with Rheumatoid Arthritis. Research and advancements in understanding the disease continue to improve management and treatment options available, providing hope for better outcomes and a higher quality of life for those affected by RA. Homeopathic treatments for rheumatoid arthritis help to treat joint pain, swelling, and stiffness in different ways. How you describe your pain and which joints are affected can help a homeopathic practitioner determine the best remedy for you.

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