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A Brief Overview Of Rheumatoid Arthritis & Treatment

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ABSTRACT:

One common autoimmune illness that causes changes in joint integrity is rheumatoid arthritis, which first presents as persistence synovitis. In individuals with rheumatoid arthritis, early, vigorous, and guided immunosuppressive therapy is necessary to elicit clinical remission and preserve function and health. Antirheumatic medication is sometime known as "disease-modifying antirhematic drugs" (dmards) since they have the ability to reduce synovial inflammation. This article attempts to bridge the gap between the era of kinas inhibitor and biological therapies, and the introduction of dmard therapy with medicine like methotrexate, leflinomide, sulfasalazine, injectable gold and (hydroxyl) chloroquine.

Key words: Arthritis, Antirhematic Drugs, Diagnosis, Gout Arthritis, Rheumatoid

Introduction: Arthritis derived from the Greek words: "arthrons" meaning a joint and it's meaning inflammation (1).

The term arthritis is frequently used to refer to any condition that affects the joints, even though joint inflammation is a symptom or sign rather than a specific diagnosis(2) .

These conditions are included in the more general group of rheumatic diseases. These illnesses are characterized by inflammation (which manifests as redness or heat, swelling, and pain) and loss of function in one or more of the body's connecting structures.

They impact bones, muscles, tendons, ligaments, and joints. Pain, edema, and stiffness are common indications and symptoms. A chronic degenerative condition of the joint is arthritis. Severe joint pain and inflammation are caused by these diseases.

A number of factors contribute to its cause, including genetics, prior joint injuries, physically demanding jobs involving repetitive motion, obesity, which puts additional weight on the joint, and severe blows or strains. The most common autoimmune condition that causes disability is arthritis (3).
Micro-organism such as bacterial or viral infection invasion at the knee and ankle often times triggers the inflammation.

Figure 01: Arthritis.

Micro-organism such as bacterial or viral infection invasion at the knee and ankle often times triggers the inflammation.

There are several types of arthritis include; rheumatoid arthritis, osteoarthritis and juvenile arthritis. Diagnostic of the disease includes history taking, physical examination and observation of the joint to establish swelling, stiffness and limitation of movement.

There are unknown treatments for most types of arthritis. Consequently occupational and physical therapy is part of management. Joint pain can be prevented and relieved with exercise and a diet rich in nutrients.

While therapeutic treatment is mostly used for paint relief, other form of therapy include the application of heat in the form of wax baths. Arthritis and musculoskeletal conditions are contributors to illness, pain disability highly prevalent, in the community.

It accounts for high death toll among adults especially the aged and those with sedentary lifestyle. Despite effort made by relevant professional rheumatologists, nutritionists, occupational therapists and physicians to curb the occurrence of arthritis, higher incidence of arthritis are continuously observed.

It becomes pertinent to ask if arthritis is obviously not avoidable or controllable. The high incidence of arthritis can be related to poor knowledge of the value of exercise or inadequate nutrition? Arthritis deforms adults and impedes movement due to severe pains and swollen joints.

Rheumatoid arthritis:

It is a systemic inflammatory disease.

It causes pain and disfigurement in peripheral joints. rheumatoid arthritis (RA) is maintained a common chronic inflammatory disorder of the joint resulting in severe pains and deformation.

Example. Affected joints are swollen, warm, and painful and stiffen. The severity of symptoms typically worsens in the morning hours. At the onset of the disease process, symptoms are severe and movement is impaired.There symptoms present in form of symmetrical way. when the right hand joints are affected, there is a corresponding same occurrence in the left hand. Other sites of joint inflammation include lips, ankles, knees, feet, elbows, lips, shoulders e.t.c.

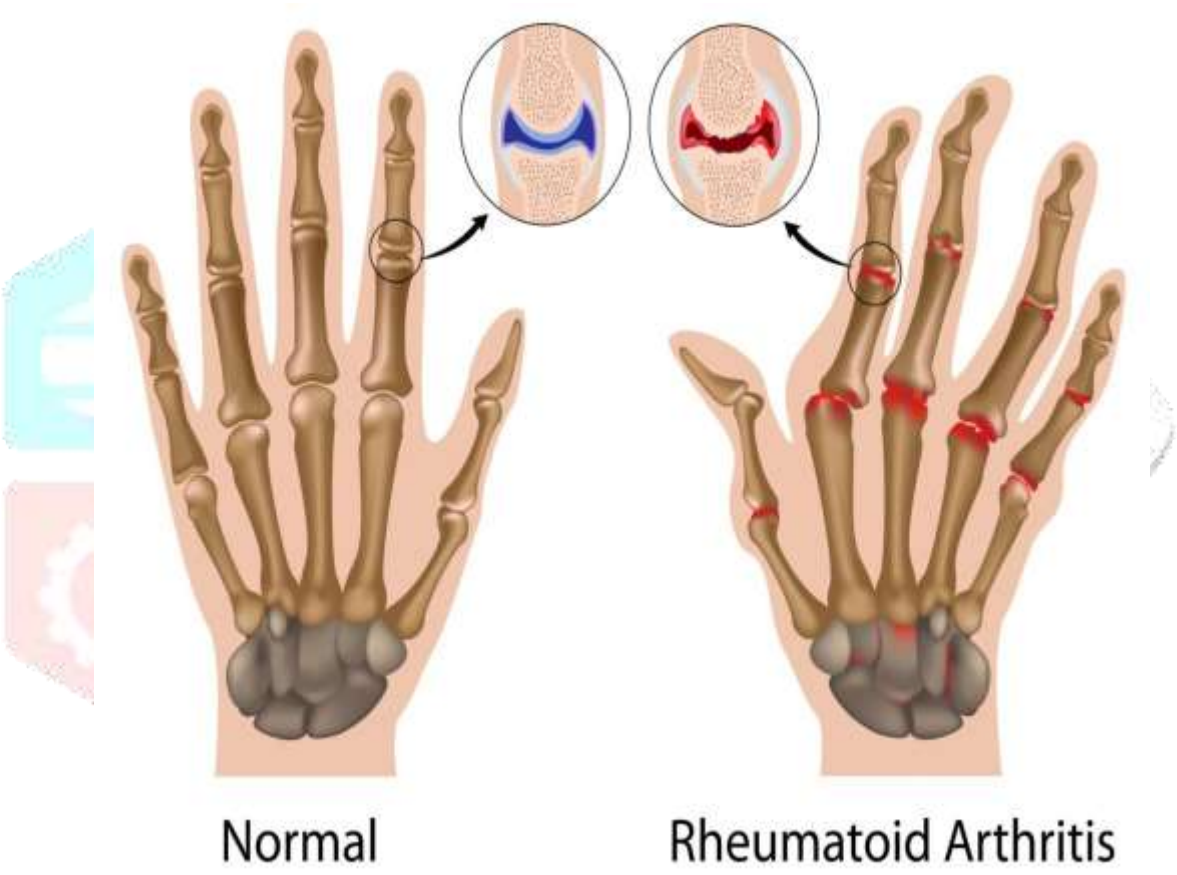

Figure 02: Rheumatoid arthritis.

Less than 10% of patients experience the eventual disappearance of their rheumatoid arthritis symptoms.

This finding is observed in a patient whose blood test is negative for rheumatoid factor(RF) protein, and autoimmune mediator. Another presentation is relapse or disease.

In this case, the patient experiences very severe symptoms, called flare which consist of periods of mild or minimal symptoms.

The immune system mistakenly targets healthy cells and tissue in rheumatoid arthritis, primarily the synovial membrane, which is the soft tissue that lies between the joint capsules and the synovial cavity of the joint.

Killer T-cells and antibodies are two immune system components that cause rheumatoid arthritis. Proteins called antibodies are released by β-cells and are capable of identifying and attaching to invasive microorganisms, including viruses, bacteria, and other microbes.
These antibodies activate other component of the immune system to lunch an inflammatory response which is destroys the cells.

The antibodies are attached to synovial cells in the joint they attract a variety of immune cells that lunch a devastating inflammatory attack(4).

The rheumatic is divided into five steps:

(1) Acute Rheumatism,
(2) Chronic Rheumatism,
(3) Gout,
(4) Osteoarthritis,
(5) Rheumatoid Arthritis. (5)

Acute rheumatism:

It is also known as acute rheumatic fever (ARF), is an inflammatory autoimmune disease that can develop as a complication of untreated or inadequately treated streptococcal throat infection, it is caused by group A streptococcus bacteria.

Here are some key points about acute rheumatism:

Symptoms:

It is typically presents with symptoms such as fever, joint pain, swelling and stiffness particularly affecting larger joints like knees, ankles and elbows.

Complication:

Acute rheumatic fever can cause major complications that impact the skin, brain, joints, heart, and joints if it is not treated. Rheumatic heart disease is a condition that can result from damage to the heart valves within the heart.

Diagnosis:

Diagnosis is based on a combination of clinical symptoms, a history of recent streptococcal infection, blood tests to check for evidence of inflammation and immune response, as well as an electrocardiogram and echocardiogram to assess any cardiac involvement.

Treatment:

Treatment involves managing symptoms with anti- inflammatory medications like aspirin or ibuprofen, antibiotics to eradicate residual streptococcal infection, and in some cases, long-term antibiotics to prevent recurrence of the infection.

Prevention:

Prompt antibiotic treatment of streptococcal infections is necessary to prevent acute rheumatic fever. Acute rheumatism can be avoided with proper streptococcal infection management.

Prognosis:

With appropriate treatment and monitoring, most individuals recover from acute rheumatic fever without long-term complications. However, individuals with significant heart valve damage may require ongoing monitoring and potential interventions to manage cardiac issues (6).

Chronic rheumatism:

Chronic rheumatism is a complex condition that can affect multiple joints in the body, leading to persistent discomfort and reduced function. Rheumatism encompasses a wide range of conditions, including rheumatoid arthritis, osteoarthritis, ankylosing spondylitis, lupus, and gout, among others. These conditions can cause varying degrees of inflammation, pain, and joint damage over time.

Managing chronic rheumatism often requires a multi-faceted approach involving different healthcare professionals such as rheumatologists, physiotherapists, and occupational therapists. Medications like non-steroidal anti-inflammatory drugs (NSAIDs), disease-modifying anti-rheumatic drugs (DMARDs), and biologics are commonly prescribed to reduce inflammation and control symptoms.

In addition to medication, physical therapy and regular exercise play a crucial role in managing chronic rheumatism. Strengthening exercises can help improve joint stability and mobility, while flexibility exercises can maintain range of motion. It's essential for individuals with chronic rheumatism to strike a balance between rest and activity to prevent further joint damage while maintaining overall physical fitness.

Diet and lifestyle modifications are also important aspects of managing chronic rheumatism. A healthy diet rich in anti-inflammatory foods such as fruits, vegetables, fish, and nuts can help reduce inflammation and improve overall health. Weight management is another important consideration, as excess weight can put extra strain on joints and exacerbate symptoms(7).

Gout:

Gout is caused by hyperuricemia.

Hyperuricemia means that there is too much uric acid present in the body

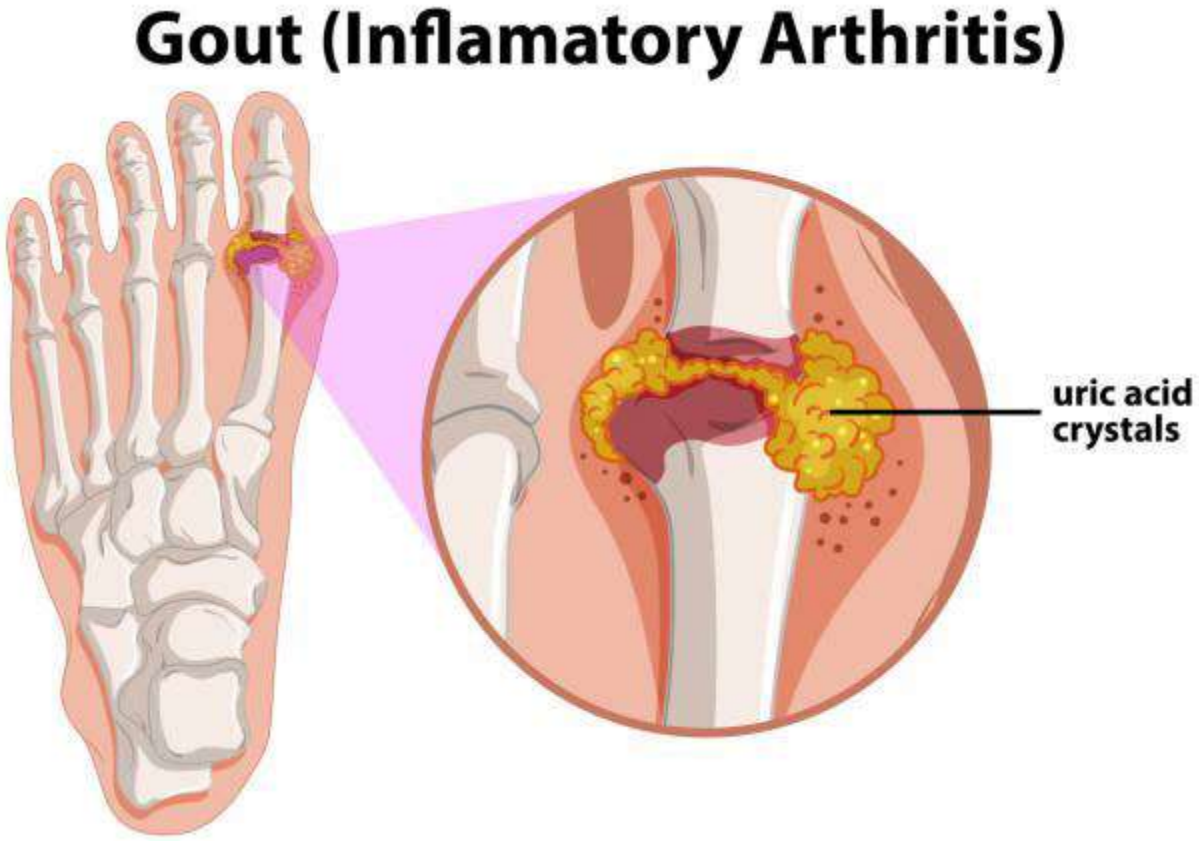

Figure 03: Gout.

When a person has hyperuricemia, uric acid crystals can collect in joints and cause swelling, pain, and other gout symptoms.

Uric acid is produced when purines, a natural substance found in some foods, are broken down in the body.

Due to this process, a few factors can lead to an increase in uric acid. Uric acid is processed by the kidneys, and if someone is having kidney issues, such as chronic kidney disease, they may not be properly processing uric acid.

Environmental factors like a diet high in purines (found in certain foods like red meat or alcohol) can also lead to increased uric acid and gout.

Additionally, certain genes and medications (most often diuretics) can affect how a person processes uric acid, which leads to gout.

Symptoms of gout can include:

- Asymmetry of symptoms (swelling and pain may occur on only one side of the body)
- Pain often, but not always, starts in one of the big toes
- Trophy (uric acid crystals which create taut bumps around joints)
- sudden onset of pain (flares), especially at night, with periods of remission
- Fever

Diagnosis:

- Magnetic resonance imaging
- X-ray
- Ultrasound
- Uric acid blood test
- Creatine and urea blood test
- Urinalysis (8).

Osteoarthritis:

Osteoarthritis is a long- lasting joint condition that primarily occurs when the cartilage were and tears away, which in turn causes the bones within the joint to rub together.

The cartilage cushions and shields the tips of the bones. It is commonly seen in older people. Clinical features of osteoarthritis include joint pains, swelling stiffness and loss of mobility.

Osteoarthritis is commonly seen in the hands knees, hips, neck and lower back. There is no permanent cure for osteoarthritis except pain management, physical exercise, and lifestyle modifications.

Figure 04: Osteoarthritis.

Causes:

Osteoarthritis is a condition where the cartilage in your joints that cushions the ends of your bones gradually deteriorates.

A smooth, firm tissue called cartilage makes joint motion almost frictionless. Bone will eventually rub against bone if the cartilage wears down completely. The term "wear and tear disease" is frequently used to describe

osteoarthritis. However, osteoarthritis affects the entire joint in addition to the cartilage deterioration. It results in alterations to the skeletal structure as well as degradation of the connective tissues that stabilize the joint and bind muscle to bone. Another effect of it is inflammation of the lining of the joints.

Risk factors:

Factors that can increase your risk of osteoarthritis include:

Older age:

The risk of osteoarthritis increases with age.

Sex:

Women are more likely to develop osteoarthritis, though it isn't clear why
Obesity:

Osteoarthritis is exacerbated by excess body weight in multiple ways; the higher your weight, the higher the risk.

Your hips and knees, which are weight-bearing joints, experience increased stress when you gain weight. Additionally, the proteins produced by fat tissue have the potential to seriously inflame the area around your joints.

Joint injuries:

Osteoarthritis risk can be raised by injuries, such as those sustained in sports or accidents. Osteoarthritis can develop from injuries, even if they happened a long time ago and seemed to heal.

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Your hips and knees, which are weight-bearing joints, experience increased stress when you gain weight. Additionally, the proteins produced by fat tissue have the potential to seriously inflame the area around your

joints together and prevents the bones from moving too far. This produces synovial fluid, a viscous fluid that coats the joint and provides protection.

A thin layer of slick tissue called cartilage covers the ends of the bones. By acting as a cushion, this prevents the bones from rubbing against one another. Tendons are strong cords that connect the muscles to the bone
.
Our tendons are pulled in specific directions by our muscles when we move. The body's response to inflammation (10).

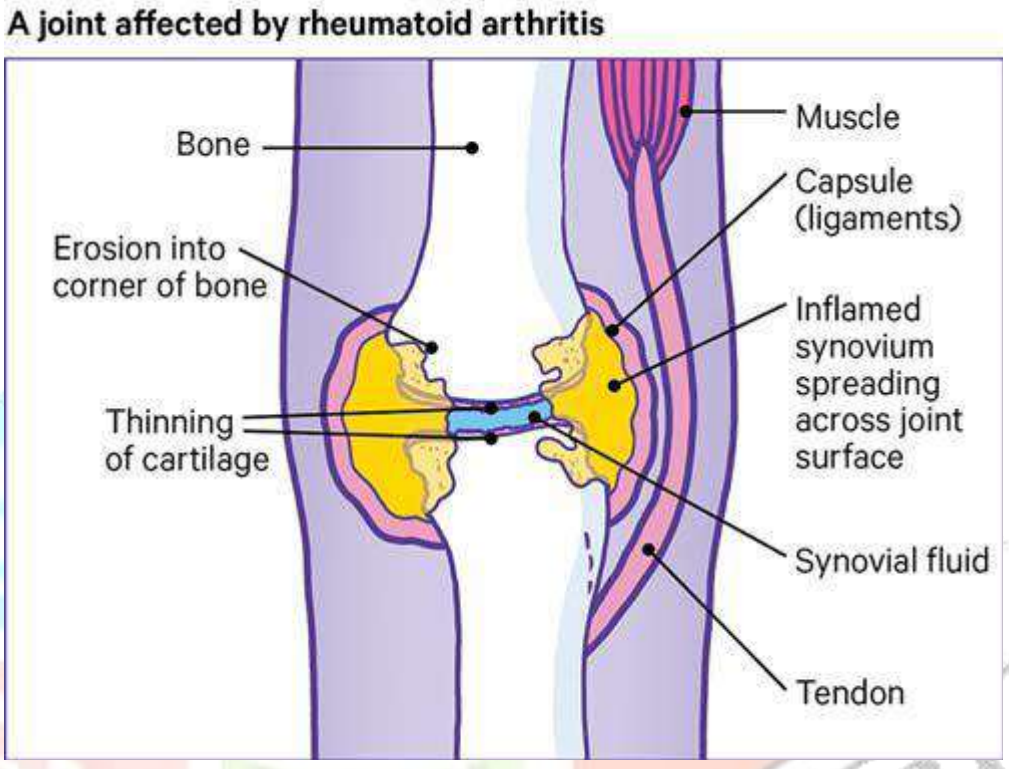

Figure 05: Rheumatoid arthritis.

Symptoms of rheumatoid arthritis

People with RA may not see redness or swelling in their joints in the early stages, but they may feel pain and tenderness.

RA symptoms include the following:

- Soreness, stiffness, edema, or joint pain that persists for at least six weeks.
- Stiffness in the morning that persists for at least thirty minutes.
- Multiple joints are impacted.
- Small joints are usually affected first, such as the wrists and some of the hands' and feet's joints.
- Affected joints are the same on both sides of the body.

Many RA patients experience extreme fatigue, and some may even have a low-grade fever.
The signs of RA may come and go. A flare-up is characterized by severe inflammation along with additional symptoms. Flare durations range from days to months (11).

Causes of rheumatoid arthritis:

It is unknown what specifically causes rheumatoid arthritis. Scientists believe that hormones, the environment, and heredity all play a role.

Your immune system typically defends your body against illness. Something causes your immune system to target your joints when you have rheumatoid arthritis. A trigger could be an infection, smoking, or mental or physical stress.
Factors that may increase your risk of rheumatoid arthritis include:

Your sex:

It is more common for women than for men to get rheumatoid arthritis.

Age:

Although it can strike at any age, middle age is when rheumatoid arthritis typically first manifests.

Family history:

You might be more susceptible to developing rheumatoid arthritis if someone in your family already has the condition.

Smoking:

Smoking increases your chance of getting rheumatoid arthritis, especially if you are genetically predisposed to the condition. Additionally, there seems to be a link between smoking and more severe disease.

Excess weight:

Overweight individuals seem to have a slightly increased chance of developing rheumatoid arthritis.(12).

Diagnosis of Rheumatoid Arthritis:

Medical history:

Joint symptoms (pain, tenderness, stiffness, and difficulty moving) will be discussed with the doctor, along with information about when they started, whether they are persistent, how severe they are, what activities make them better or worse, and whether any family members suffer from RA or another autoimmune disease.

Physical examination:

The physician will check for low-grade fever, bumps under the skin, painful or restricted

Movement, swelling, warm and joint tenderness.

Blood tests:

The blood tests search for blood proteins (antibodies) and inflammation associated with RA:

Inflammation markers include C-reactive protein (CRP) levels and erythrocyte sedimentation rate (ESR, sometimes known as "sed rate"). When paired with other indicators of RA, a high ESR or CRP aids in the diagnosis.

Erythrocyte sedimentation rate, also known as the "sed rate," is a test used to track the progression of a disease and how well it is responding to treatment. It also measures inflammation in the body.

C-type reactive protein. This is an additional popular test for inflammation that can be used to monitor the course of the disease and how well a treatment is working for rheumatoid arthritis.

Rheumatoid factor (RF) is antibodies that approximately 80% of RA patients eventually have approximately 60 to 70 percent of individuals with CCP have antibodies

Imaging tests:

Erosion is the term used to describe the weakening of a joint's bone ends brought on by RA.
To search for erosions, one can use an MRI, ultrasound, or X-ray. However, if they are absent from the initial tests, it may indicate that RA is still in its early stages and has not yet caused bone damage.
Imaging results can also demonstrate the effectiveness of a treatment (13).

Treatment history for rheumatoid arthritis:

Leeching and bloodletting were two of the more traditional methods of treating rheumatoid arthritis. Advanced techniques such as acupressure, cupping, and moxibustion (the application of heat) were practiced in the Far East.

The use of heavy metals in the treatment of various illnesses, including rheumatoid arthritis, emerged after a number of ineffective therapies that did not help the patients' circumstances.

Salts of copper, gold, bismuth, and arsenic were used, with differing degrees of success. Nonetheless, gold has proven effective over many years of use, and it is still included in disease-modifying antirheumatic medications (DMARDs).

Rheumatoid arthritis is commonly treated with DMARDs.

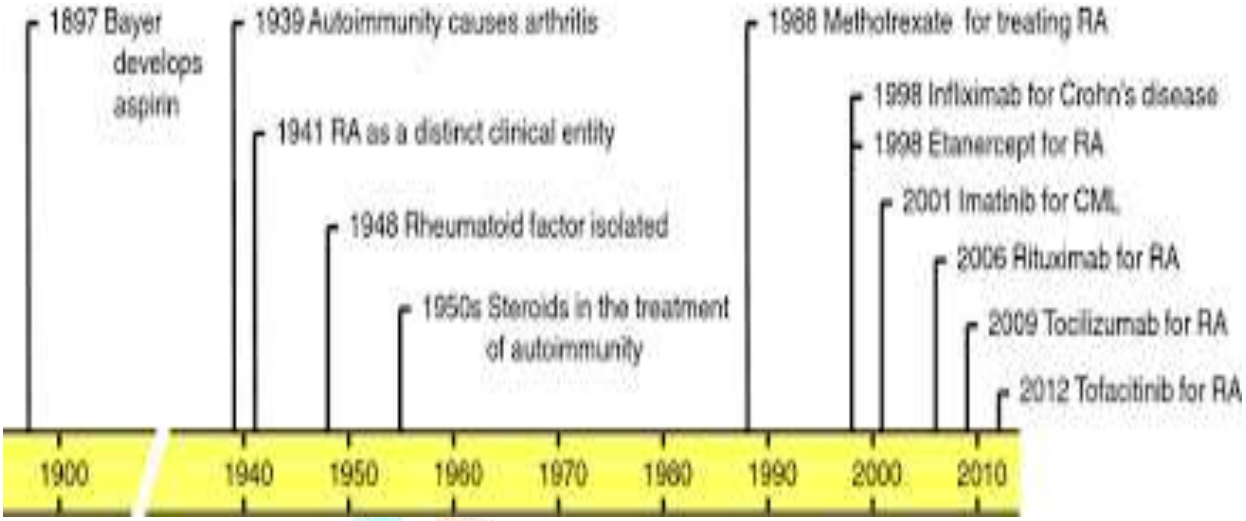

Figure 06: A chronology of research and treatment for rheumatoid arthritis. Rheumatoid arthritis (RA) and chronic myelogenous leukemia (CML)(14).

MEDICATIONS:

The types of medications:

NSAIDs:

NSAIDs, or nonsteroidal anti-inflammatory drugs, have the ability to lessen inflammation and relieve pain. Naproxen sodium (Aleve) and ibuprofen (Advil, Motrin IB, and other brands) are examples of over-the-counter NSAIDs. Prescriptions are available for stronger NSAIDs.

Of the medications prescribed for arthritis, non-steroidal anti-inflammatory drugs, or NSAIDs, are the most widely used and prescribed.

An NSAID inhibits the activity of COX (cyclooxygenase), which comes in two varieties: COX-1 and COX-2. NSAIDs affect both types of COXs: COX-2 targets the inflammatory pathway, while COX-1 works on maintaining healthy tissue.

Although aspirin is the oldest medication in the non-steroidal class, other NSAIDs have largely replaced it as the first choice for drug therapy due to its high rate of gastrointestinal toxicity, limited window between toxic and anti-inflammatory serum levels, and inconvenience of multiple daily doses.

There are many different NSAIDs available, and all of them have the potential to be equally effective when taken at recommended dosages.

The toxicities of the NSAIDs that are currently on the market are comparable as well. On the other hand, tolerance and reaction to a specific NSAID can vary widely.

Examples:

Include, Diclofenac, Piroxicam, Indomethacin, Sulindac, and Mefenamic acid, while COX-2 inhibitors comprise Celecoxib, Rofecoxib, Valdecoxib, etc.

By stopping the basic destructive processes that occur in joints, this medication therapy seeks to change the course of the disease or even induce remission. All of these outcomes are possible by modifying the disease's trajectory.
Frequent use of NSAIDs may result in a variety of adverse effects, some of which may be serious.The development of stomach and duodenal ulcers, the inhibition of uterine contractions, hypersensitivity reactions, headaches, nausea, vomiting, digestive disorders, heartburn, diarrhea, weight gain, and respiratory problems are among the most common adverse reactions.

Side Effects:

The most frequent NSAID toxicity is gastrointestinal disturbance, which can manifest clinically as burning, belching, or irritation but can also indicate erosions, ulcerations, or irritation of the stomach lining that can cause bleeding.

Methotrexate:

For the majority of RA patients, methotrexate is now thought to be the first-line DMARD medication. It is easy to administer, has a favorable toxicity profile, good efficacy, and a relatively quick onset of action at therapeutic doses (6–8 weeks). It is also reasonably priced.
When examining patient groups on various DMARDS, the majority of patients—far more than those on other therapies—remain on methotrexate after five years, indicating both its effectiveness and tolerability.

Methotrexate is effective in reducing the signs and symptoms of RA, as well as slowing or halting radiographic damage. It was as effective as leflunomide and sulfasalazine in one study, and its effectiveness given early and in higher doses approached the efficacy of etanercept and adalimumab as single therapies in terms of signs and symptom improvement.

Methotrexate is also used to treat many other autoimmune diseases and is effective in treating psoriatic arthritis and other spondyloarthopathies as well as many other types of inflammatory arthritis.

Steroids:

Steroids are sometimes known by their full name: corticosteroids.

They can be used as:

A Tablet
A Straight Injection into A Sore Joint
An Intramuscular Injection.

Usually, they're used to relieve pain temporarily. This may occur during a flare-up or while you are awaiting the DMARD drug to take effect.

Prednisone is one example of a corticosteroid medication that reduces pain and inflammation while slowing joint damage. Diabetes, weight gain, and bone thinning are possible side effects.

In order to quickly alleviate symptoms, doctors frequently prescribe corticosteroids with the intention of tapering off the medication gradually.

Disease modifying anti-rheumatic drugs (DMARDs):

There are three types of DMARD:

Conventional DMARDs:

These medications can prevent irreversible damage to the joints and other tissues by slowing the course of rheumatoid arthritis.

Methotrexate (Trexall, Otrexup, and similar brands), leflunomide (Arava), hydroxychloroquine (Plaquenil), and sulfasalazine (Azulfidine) are examples of common DMARDs.

Although they vary, side effects can include serious lung infections and liver damage.

Biologic agents:

It is also known as biologic response modifiers, this newer class of DMARDs includes Certolizumab (Cimzia), golimumab (Simponi), etanercept (Enbrel), abatacept (Orencia), adalimumab (Humira), anakinra (Kineret), rituximab (Rituxan), sarilumab (Kevzara), and tocilizumab (Actemra).

Biologic DMARDs are usually most effective when paired with a conventional DMARD, such as methotrexate.

This type of drug also increases the risk of infections

.

Targeted synthetic DMARDs:

Baricitinib (Olumiant), tofacitinib (Xeljanz) and upadacitinib (Rinvoq) may be used if conventional DMARDs and biologics haven't been effective.

Increased tofacitinib dosages may raise the risk of lung blood clots, major heart problems, and cancer (15).

Name	Type of DMARD
Azathioprine	Conventional synthetic DMARD
Gold injections	Conventional synthetic DMARD
Hydroxychloroquine	Conventional synthetic DMARD
Leflunomide	Conventional synthetic DMARD
Methotrexate	Conventional synthetic DMARD
Sulfasalazine	Conventional synthetic DMARD
Etanercept	Biologic; Anti-TNF
Infliximab	Biologic; Anti-TNF
Rituximab	Biologic; Anti lymphocyte monoclonal antibody
Baricitinib	Targeted synthetic DMARD
Tofacitinib	Targeted synthetic DMARD
Sarilumab	Biologic: Anti IL6
Certolizumab pegol	Biologic; Anti-TNF
Adalimumab	Biologic; Anti-TNF
Golimumab	Biologic; Anti-TNF
Abatacept	Biologic T cell co-stimulator
Tocilizumab	Biologic; Anti IL6

Table 01: Disease-modifying anti-rheumatic drugs.

Review Literature

The majority of RA management guidelines were created by rheumatologists, with varying degrees of patient and expert participation.

 Guidelines suggest conducting routine evaluations using the Rheumatology core dataset's Outcome Measures.

 the disease activity score for 28 joints (DAS28) is advised by the majority of guidelines.

 Twenty guidelines called for remission as the goal, while sixteen recommended low disease activity as a substitute.

 thirteen guidelines addressed moderate disease; all guidelines advocate treating active RA.

 The recommendations for treating early RA suggested DMARDs be started as soon as possible.

 The majority of patients were advised to take methotrexate.

 When patients did not respond completely to monotherapy, combination DMARDs were advised; biologics were not always necessary.

 Twenty guidelines recommended the use of biologics, especially methotrexate, in cases where conventional DMARDs were ineffective.

These are the five general principles:

 DMARDs should be started as soon as possible after diagnosis

 The most effective first treatment is methotrexate.

 Disease activity needs to be observed on a regular basis.

 Patients with persistently active disease who have previously received methotrexate should be administered biologics.

 Treatment goals that are ideally achieved include remission or low disease active

Aim and Objective:

Manage inflammation: lessen inflammatory responses in the joints to stop additional harm

Reduce symptoms: Control weariness, stiffness, and pain to enhance day-to-day functioning.
Preserve joint mobility and range of motion to maintain joint function.

Prevent joint damage: Deformity and joint damage should be stopped or their progression slowed down.

Boost overall wellbeing, mental and physical health, and physical function to improve quality of life.

Material and Method:

Therapy:

A physical or occupational therapist can prescribe exercises to help maintain joint flexibility, so ask your doctor about it.

Your therapist might also recommend new, less-stressful ways for you to perform everyday tasks. For instance, you might wish to use your forearms to pick up an object.

Using assistive technology can help you avoid putting undue strain on your aching joints. A kitchen knife with a hand grip, for example, can help shield your wrist and finger joints.

There are some tools that can make dressing easier, like buttonhooks. Ideas can be found in medical supply stores and catalogs (16).

Surgery:

Your doctor and you may discuss surgery to repair the damaged joints if medication is unable to prevent or reduce joint pain.

Types of surgery:

Foot Surgery:

Examples:

 Removal of inflamed tissues around the joints of the foot

 Removal of small joints in football.

 Straightening of toes.

 Fixation of joints.

Finger, hand and wrist surgery:

Examples:

- carpal tunnel release
- removal of inflamed tissue from finger joints.
- release of tendons in the fingers (this is used to treat unusual bending)(17).

Arthroscopy:

Arthroscopy is used to remove inflamed joint tissue.

During the operation, an arthroscope is inserted into the joint through a small skin incision so that the surgeon can see the affected joint.

Damaged tissue is then removed. You usually don't have to stay overnight in hospital for this type of surgery, but the joint will need to be rested at home for several days.

Arthroplasty:

An arthroplasty, sometimes called joint replacement, is necessary for some rheumatoid arthritis patients in order to replace all or a portion of a joint.

Shoulder, knee, and hip replacements are common joint replacements.

These joints must be replaced, which is a major procedure that requires several days in the hospital and several months of rehabilitation.

There is no assurance that the newly installed joint will be completely functioning, and the most recent joints typically survive for 10 to 20 years.

A surgical technique called an arthroplasty replaces a joint partially or completely. Physicians may also refer to it as joint replacement surgery or joint replacement. The surgeon removes the worn or damaged parts of the natural joint and replaces them with an artificial joint (prosthesis) made of metal, plastic or ceramic (18).

What are the different types of joint implants?

There are three main types of joint implant materials

Metal-on-metal bearings
Metal-on-polyethylene bearings
Ceramic bearings

Metal-on-metal bearings:

There is some measurable wear, but the effects of wear degradation of metal-bonded polyethylene are mostly localized phenomena that are easy to observe radio graphically **.**(19).

Figure 07: Metal-on-metal bearings:

Metal-on-polyethylene bearings:

Most commonly used combinations of bearing surfaces in joint replacement is metal with polyethylene, a form of plastic that offers considerable durability.

The two groups most traditionally considered for this material are:

Older adults in their 70s and 80s who are relatively quiet Younger, active patients who may subject their joints to repetitive high-impact activities.

From a clinical perspective, metal-on-polyethylene has the longest record for hip replacement.

There is some measurable wear, but the effects of wear degradation of metal-bonded polyethylene are mostly localized phenomena that are easy to observe radio graphically.

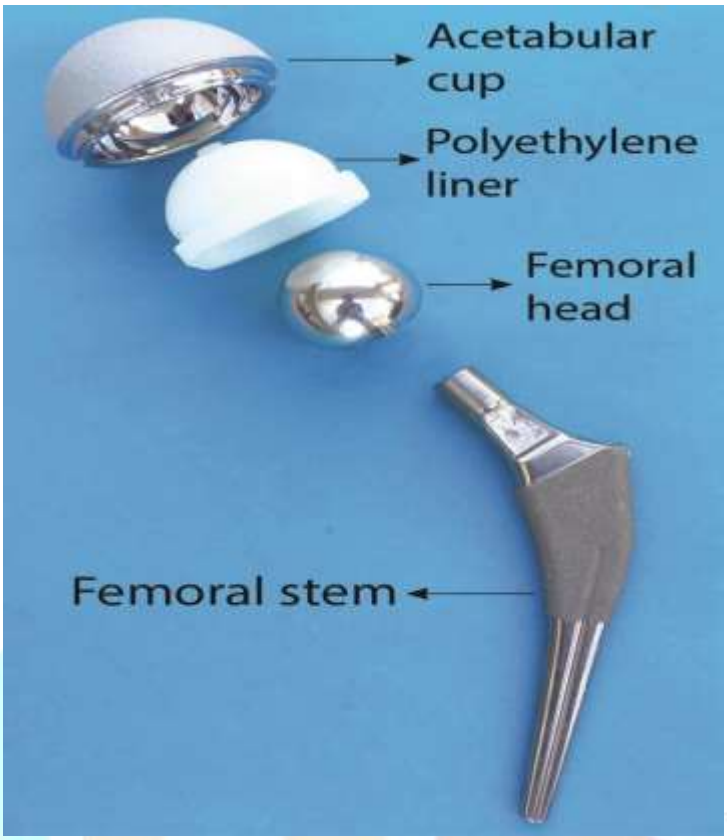

Figure 08: Metal-on-polyethylene bearings.

Ceramic bearings:

Ceramic bearings can be more expensive than steel, but these bearings reduce friction, reduce weight and can last much longer than traditional stainless steel in many harsh environments.

Types of ceramic bearing materials

Zirconia-toughened alumina

Oxidized zirconium material.

Zirconia-toughened alumina-on-polyethylene:

Long-term experience with the use of alumina ceramics for hip reconstruction with conventional polyethylene bearings has shown lower wear compared to conventional metal-surprised polyethylene bearings with a reduction in osteolysis.

A newer zirconia-hardened aluminum bearing versus highly cross-linked polyethylene showed wear rates comparable to metallic highly cross-linked polyethylene bearings.

Concerns that the zirconium oxide in these materials would adversely transform into a less suitable crystalline phase, increasing wear and reducing strength, were not confirmed by measurements of components removed from patients during revision surgery and artificially aged laboratory samples.

Therefore, ceramic hardened with zirconium oxide has become the support material used in hip prostheses.

Figure 09: Ceramic bearings.

(oxidized zirconium) on polyethylene:

Oxidized zirconium is a metal-ceramic hybrid technology that goes by the name Oxinium (a brand name used by the orthopedic device maker Smith & Nephew).

The metallic surface of the implant is changed from metallic to ceramic by applying high pressure and heat to zirconium alloy in the presence of oxygen.

This results in an implant with the surface properties of ceramic, which is harder, smoother and less abrasive than metal..

Oxinium is used for the ends of the femur in hip replacements and the femoral component in knee replacements.

Although the clinical experience has been promising, further trials are needed.
Clinical data to date on implant survival and complete knee use have been positive, but longer-term studies are needed to demonstrate that the improved load-bearing capacity of oxidized zirconia results in longer implant life(20).

Synovectomy:

The inflammatory synovial tissue surrounding the joint is removed by the surgeon during this surgery.
The surgeon wants to minimize of the patient's symptoms by cutting out the damaged tissue.
It is not possible to remove all of the tissue, so pain, edema, and inflammation may recure (21).

Result

The course of Rheumatoid Arthritis (RA) can change based on the patient's general health, the disease's severity, and the efficacy of treatment. Among the outcomes of RA are:

1. Joint damage: When joints are permanently damaged, deformity and disability result.

2. Chronic pain: Persistent discomfort and pain in the afflicted joints.

3. Limited mobility: Affected joints have a reduced range of motion and flexibility.

4. Fatigue: A chronic state of exhaustion and low vitality.

5. Systemic complications: The heart, lungs, and eyes are just a few of the systems in the body that RA can impact.

6. Cognitive impairment: Memory loss and concentration issues are among the cognitive challenges that some RA patients may face.

7. Mental health problems: Anxiety, depression, and other mental health conditions can be exacerbated by RA.

8. Social seclusion: RA

Discussion:

Here are some discussions and facts about Rheumatoid Arthritis (RA)

RA is a chronic disease that causes inflammation around the body, especially in the joints.
If left untreated, RA can cause severe damage to the joints and their surrounding tissue, leading to heart, lung, or nervous system problems.

The specific causes of RA are still unknown, but lifestyle-associated risk factors include smoking, obesity, and exposure to air pollution.

Symptoms include chronic pain, stiffness, tenderness, heat, and swelling in the joints. RA can make it hard to move and perform daily activities.

RA usually develops in middle age, and women are two to three times more likely to develop RA than men.

In addition to joint pain, people with RA may experience fatigue, fever, and loss of appetite.
RA can cause problems in other parts of the body, such as the eyes, heart, and circulatory system, and/or the lungs.

Early diagnosis and management can reduce symptoms, slow the disease, and prevent disability.

Summary and Conclusion:

Summary:

Rheumatoid arthritis (RA) is a long-term autoimmune condition that causes pain, stiffness, and inflammation in the joints. If treatment is not received, it may result in joint damage, disability, and systemic complications. Reduced symptoms, slowed disease progression, and enhanced quality of life are all possible with early diagnosis and treatment. Biologic agents, corticosteroids, and disease-modifying anti-rheumatic drugs (DMARDs) are available treatment options. Exercise and physical therapy are two more lifestyle changes that can aid in symptom management.

Conclusion:

Since rheumatoid arthritis is a complicated and multidimensional condition, management must be all-encompassing. Although there isn't a cure, results can be greatly enhanced by early diagnosis and treatment. RA awareness must be increased, early detection must be encouraged, and research into novel and cutting-edge treatments must be supported. Patients with RA can have active, satisfying lives if their condition is properly managed.

Important points:

-Early detection and intervention are essential.

-A comprehensive management strategy is required

-Modifications to lifestyle can aid in symptom management

-New treatment research is ongoing; raising awareness and getting support are crucial for better results.

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