Treatment for Rheumatoid Arthritis to Minimize Symptoms, And Joint Damage, And Improve Performance and Quality of Life.

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***Abstract*- The severity of rheumatoid arthritis (RA), a chronic, inflammatory, and systemic autoimmune illness, on a patient's joints varies. Age, gender, genetics, and exposure to the surroundings are risk factors. (Cigarette smoking, air pollutants, and occupational). Rheumatoid arthritis not only affects the joints but can also affect internal organs, thus causing permanent disability in many instances. Currently, there is no cure for this autoimmune disease, rather, symptoms are addressed on an individual basis. Here, we succinctly summarize the classic and current treatment options available for the management of patients suffering from this complex disease. The objectives of therapy for RA are to alleviate pain and prevent/slow further damage because there is no known cure. Here, we give a succinct overview of the different past and present treatment options for RA-related complications.**

Keywords: **Swan neck malformation, Boutonnière deformity, rheumatoid arthritis**

INTRODUCTION

Arthritis means inflammation or swelling of one or more joints. It describes more than 100 conditions that affect the joints, tissues around the joint, and other connective tissues. Specific symptoms vary depending on the type of arthritis but usually include joint pain and stiffness [1].

To support high-quality clinical care, the American College of Rheumatology (ACR) regularly updates clinical practice guidelines for the management of rheumatoid arthritis (RA), with the most recent update reported in 2015. The current recommendations address treatment with the following: 1) conventional synthetic disease-modifying ant rheumatic drugs (csDMARDs), biologic DMARDs (bDMARDs), and targeted synthetic DMARDs (tsDMARDs); 2) glucocorticoids; and 3) use of these medications in certain high-risk populations. The use of vaccines and nonpharmacologic treatment approaches (although initially part of this project) will be covered in future ACR treatment guidelinepublications [2].

For recommendations regarding pretreatment screening and routine laboratory monitoring, we refer readers to 2008, 2012, and 2015 guidelines (1–3), with newly approved therapies following the screening process recommended for other medications in the same class. Recommendations for the perioperative management of patients undergoing elective orthopedic surgery are addressed in the 2017 guideline for perioperative management. For recommendations regarding reproductive health, we refer readers to the 2020 ACR Guideline for the Management of Reproductive Health in Rheumatic and Musculoskeletal Diseases. In keeping with the Grading of Recommendations Assessment, Development, and Evaluation [GRADE] methodology), the ACR panel developed recommendations for commonly encountered clinical scenarios. Both strong and conditional recommendationsrequired achieving a 70% level of agreement by the voting panel. Each recommendation is qualified as being strong or conditional. In this context, strong recommendations are those forwhich the panel is highly confident that the recommended option favorably balances the

Expected benefits and risks for most patients in clinical practice. In contrast, conditional recommendations are those for which the panel is less confident that the potential benefits outweigh the risks. A recommendation can be conditional either because of low or very low certainty in the evidence supporting one option over another or because of an expectation of substantial variations in patient preferences for the options under consideration [3].

Rheumatoid arthritis (RA) is a chronic systemic autoimmune disease. The course of the disease is variable. A substantial percentage of the population presents with persistent pain, stiffness, progressive joint destruction, functional disability, and progressive morbidity and mortality.1 Disease is characterized by persistent joint inflammation along with cartilage and bone damage with significant limitation of activity, reduction in the quality of life, and often systemic complications.2 There have been a lot of advances in diagnostic and treatment modalities available for RA in recent years with better access to tertiary care centers inthe country. The study aimed to analyze the present-day clinical profile of patients of RA reporting to a tertiary care center in the southwestern part of India [4].

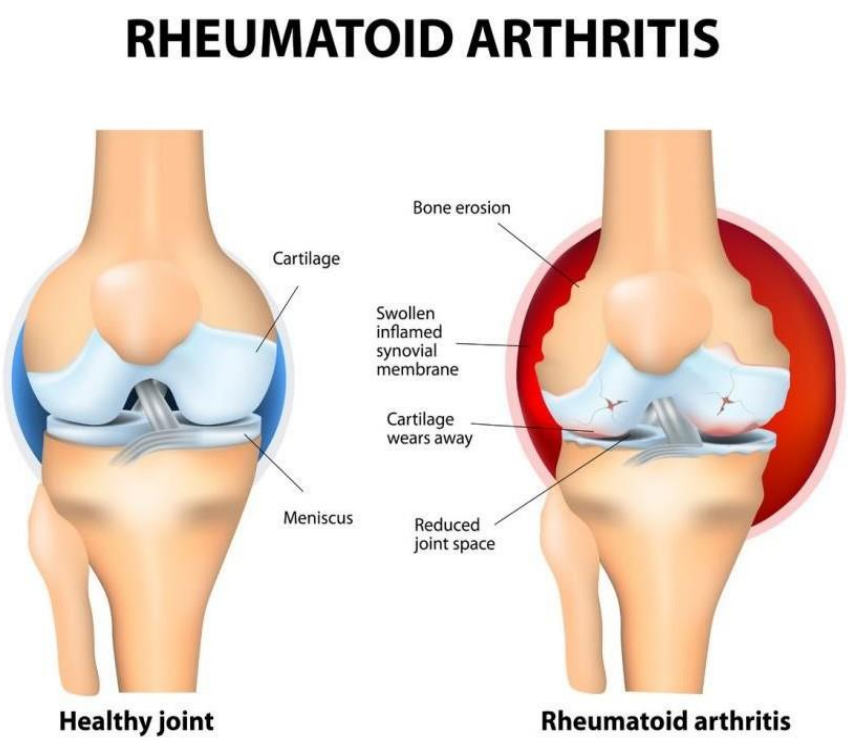

Fig. 1 Rheumatoid Arthritis Joint

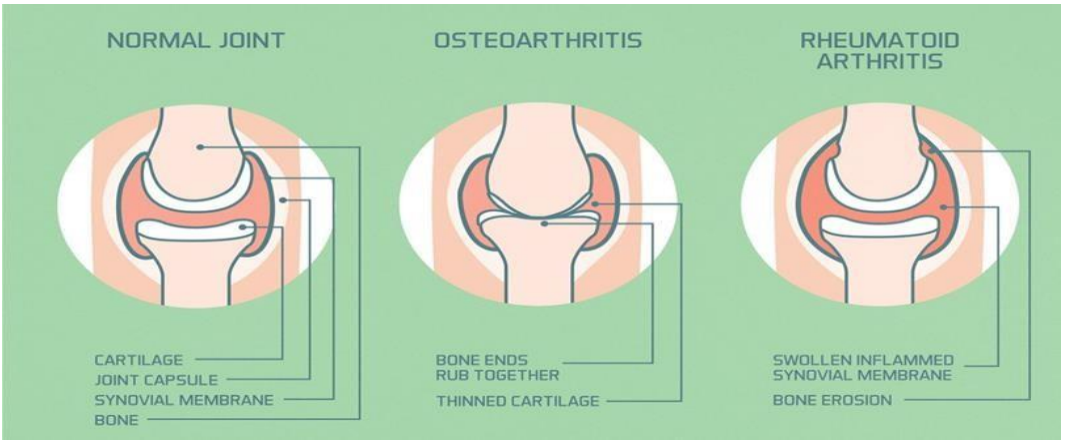

Fig. 2 Type of Joint

Rheumatoid Arthritis Joint

RA is a chronic disease with an autoimmune origin and variable course mainly presenting with joint involvement leading to considerable morbidity and systemic complications. the clinical picture of RA is mainly related to the involvement of peripheral joints with symmetrical involvement of hands, wrist, knee, and feet. Significant extra-articular involvement of organs like skin, heart, lungs, and eyes can be present. Prodromal symptoms such as fatigue, weight loss, transient pain in muscles and joints, sweating, paresthesia, and migrant swelling are oftenpresent before the onset of symptoms and signs [5].

The third COPCORD study was carried out in the urban area of Pune. They recorded a prevalence of0.28% for RA diagnosed with ACR criteria and 0.45% for RA diagnosed clinically. There was a prevalence of 3.5% of RA among those with rheumatic musculoskeletal diseases [6].In our study, the most common joint involvement was MCP joint (95.7%), wrist joint (88%),and PIP joint (84.8%) with involvement of knee and ankle in 30.4% and 21.7% of the patients respectively. The most common joint involved in patients with high disease activity was the wrist joint (100%) followed by MCP and PIP joints (94.4%). The significant difference was in the percentage of wrist involvement being 88% in our study and being 66% in a study from a similar region [7].The clinical parameters of these patients were much worse with more frequent joint Involvement, clinical symptomatology, and signs and extra Articular manifestations of the disease. The above methods Used for disease activity scoring have been widely accepted. However, there is still discordance between them. It has been proposed that the DAS28-ESR and the CDAI/SDAI weights their individual components differently, which is some time. [8].

- **SYMPTOMS**

✓ **The main symptoms of rheumatoid arthritis are:**

- Joint pain
- Joint swelling, warmth, and redness
- Stiffness, especially first thing in the morning or after sitting still for a long time.

✓ **Other symptoms can include:**

- tiredness and lack of energy – this can be known as fatigue
- not feeling hungry
- weight loss
- a high temperature, or a fever
- sweating
- dry eyes – as a result of inflammation
- Chest pain – as a result of inflammation.

Rheumatoid arthritis can affect any joint in the body, although it is often felt in the small joints in the hands and feet first. Both sides of the body are usually affected at the same time, in the same way, but this doesn't always happen. A few people develop fleshy lumps called rheumatoid nodules (roo-ma-toy-d nod-yules), which form under the skin around the affected they can sometimes be painful, but are not usually [9].

- **CAUSES:**

The following can play a part in why someone has rheumatoid arthritis:

- **Age**

Rheumatoid arthritis affects adults of any age, although most people are diagnosed between the ages of 40 and 60. Around three-quarters of people with rheumatoid arthritis are of working age when they are first diagnosed.

- **Sex**

Rheumatoid arthritis is two to three times more common among women than men.

- **Genetics**

Rheumatoid arthritis develops because of a combination of genetic and environmental factors. If you have a genetic predisposition to rheumatoid arthritis, it means you have an increased likelihood of developing the condition based on your genetic makeup. It is unclear what the genetic link is, but it is thought that having a relative with the condition increases your chance of developing the condition.

- **Weight**

If you are overweight, you have a significantly greater chance of developing rheumatoid arthritis than if you are a healthy

For most adults, an ideal BMI is in the 18.5 to 24.9 range.If your BMI is:

- Below 18.5 – you are in the underweight range.
- Between 18.5 and 24.9 – you are in the healthy weight range.
- Between 25 and 29.9 – you are in the overweight range.
- Between 30 and 39.9 – you are in the obese range.

Fig. 3 Weight Scale

To work out your BMI, use the healthy weight calculator on the NHS website.

- **Smoking**

Rheumatoid arthritis develops through a combination of genetic and environmental factors. Cigarette smoking is classed as an environmental factor and significantly increases the risk ofdeveloping the condition. If you would like to stop smoking, visit the Smoke free website for advice.

- **Diet**

There is some evidence that if you eat a lot of red meat and don't consume much vitamin C, you may have an increased risk of developing rheumatoid arthritis. Rheumatoid arthritis information booklet [10].

HOW WILL RHEUMATOID ARTHRITIS AFFECT ME?

Because rheumatoid arthritis can affect different people in different ways, we can't predict how the condition might develop for you. If you smoke, it is a very good idea to quit after a diagnosis of rheumatoid arthritis. This is because:

- Rheumatoid arthritis may be worse in smokers than non-smokers
- Smoking can weaken how well your medication works

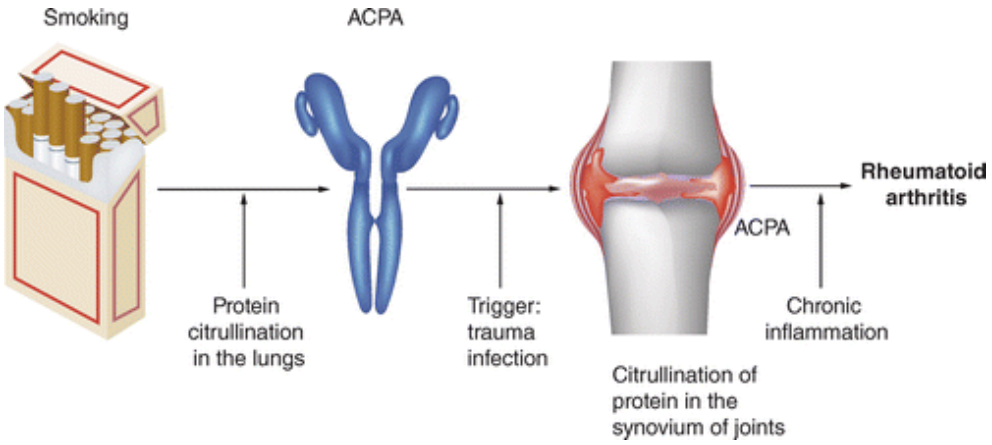

Fig. 4 Smoking in Rheumatoid Arthritis

Physical activity is also important, as it can improve your symptoms and benefit your overallhealth. The Versus Arthritis website has suitable exercises you can try. Blood tests and x-rayswill help your doctor assess how fast your arthritis is developing and what the outlook for the future may be. This will also help your doctor to decide which treatment to recommend. The outlook for people with rheumatoid arthritis is improving all the time, as new and more effective treatments become available. It is possible to lead a full and active life with the condition, but it is important to take your medication as prescribed and make necessary lifestyle changes.

- **General Facts**
  - There are more than 100 types of arthritis. (CDC 2016)
  - Currently, arthritis affects more than one in four adults.
  - In rural areas in the U.S, one in three adults has arthritis

- **Newer adjusted estimates**
  - For 2015 suggest that arthritis prevalence in the U.S. has been substantially underestimated, especially among adults younger than 65.
  - Based on adjusted estimates**,** 92.1 million adults either have doctor-diagnosed arthritis and/or report joint symptoms consistent with a diagnosis of arthritis.
  - For people aged 18 to 64, nearly one in three (both men and women) have doctor-diagnosedarthritis and/or report joint symptoms consistent with a diagnosis of arthritis.
  - For those over 65, the numbers are much worse more than one in two men may havearthritis. More than two in three women may have arthritis.
  - Even though obesity has been recognized as a risk factor for arthritis, the prevalence ofobese people with all types of arthritis decreased significantly between 1999 and 2014.

By conservative estimates, between 2002-2014, almost two-thirds (64 percent) of adultswith doctor-diagnosed arthritis were younger than 65 years old.

By conservative estimates, by 2040:

The number of adults in the U.S. with doctor-diagnosed arthritis is projected to increase 49percent to 78.4 million (25.9 percent of all adults). The number of adults reporting activity limitations due to their arthritis will increase by 52percent to 34.6 million (11.4 percent of all adults). (Hootman 2016) [15].

LIVING WITH RHEUMATOID ARTHRITIS

✓ **Occupational therapy**

Occupational therapists can help you keep doing the activities you need or want to do – at home or at work. They will work with you to find different ways of doing things. The benefits of seeing an occupational therapist include:

- improved confidence
- being able to do more things, at home or at work
- being able to live independently at home
- Allowing you to return to or stay at work.

Ask your GP about occupational therapists that are local to you. If you regularly see a social worker, nurse, or another healthcare professional, they can help you contact an occupational therapist through health or social services. Be prepared to describe any difficulties you have and how they are affecting your life or the lives of those who care for you. You may want to know how long it will be until you get an appointment, so remember to ask if there is a waiting list. You can also see an occupational therapist

privately. You will be able to get anappointment quicker, but it will cost you money.

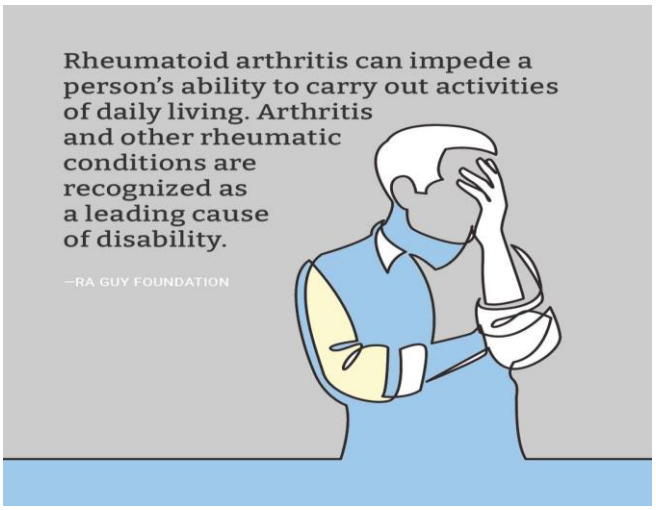

Fig. 5 Living in Depression with Rheumatoid Arthritis

Aids and adaptations

If you have trouble doing everyday tasks, you may find it useful to use certain aids and adaptations. Aids can help you manage everyday tasks such as bathing, dressing, andcooking. These can include shoe horns, rails, or handles, and shower seats. Adaptations are bigger items that can help you move around your home. These items include wheelchairs, fixed ramps, and baths with built-in handles. In England, local councils must provide aids and minor adaptations costing £1000 or less free of charge to anyone with an eligible care need. Your council may call this 'community equipment.' You can also access adaptations that cost over £1000, but you must apply for these through a Disabled Facilities Grant. Aids and minor adaptations you receive from

your local council should not be means-tested, meaning that no matter how much money you have, the local authority must give them to you. If you live in Wales, Scotland, or Northern Ireland, contact your GP or local council for information about access to these items.

Living with other conditions

If you are living with rheumatoid arthritis, you may also be living with one or more other conditions. This is not unusual – 54% of those aged over 65 in England are living with two or more long-term conditions. Depression is the most common condition among people with rheumatoid arthritis, affecting one in six people.

Who can help me

If you are feeling low, talk to your GP, who can signpost you to the right services. You can call the Versus arthritis Helpline for free on 0800 5200 520, where our trained advisors can give you help and support. We are open from 9am to 8pm, Monday to Friday, except for bank holidays. You can also join our Online Community, where you can connect with real people who share the same everyday experiences as you. You can share your own experiences of managing arthritis or learn more about the challenges and successes others have experienced.

Research and new developments

- Here, we round up some of the latest developments in rheumatoid arthritis research.Our previous research has.
- Led to the development of a new type of drug. These drugs are called biologics and have transformed the lives of people with rheumatoid arthritis over the past 20 years

Highlighted the importance of starting early, intensive treatment for inflammatory arthritis within 12 weeks of symptoms starting. It has also led to the introduction of a best practice tariff for those with rheumatoid arthritis, which means people are being diagnosed quicker. We're currently funding research projects to find out what causes rheumatoid arthritis, and to develop new and improved treatments.

For example:

- Our center for genetics and genomics is trying to understand how genetic factors determine whether certain people are at risk of developing inflammatory arthritis, and what happens when they do
- Our rheumatoid arthritis pathogenesis center of excellence is looking at why rheumatoid arthritis starts, why it attacks the joints, and why the inflammation carries on, rather than switching off .
- Investigating how the organisms that live on our skin and in our gut differ in those with rheumatoid arthritis, and how this affects a person's response to treatment [11].

COMPLICATIONS

Rheumatoid arthritis increases your risk of developing:

Osteoporosis:

Rheumatoid arthritis itself, along with some medications used for treating rheumatoid arthritis, can increase your risk of osteoporosis a condition that weakens your bones and makes them more prone to fracture.

Rheumatoid nodules: These firm bumps of tissue most commonly form around pressure points, such as the elbows. However, these nodules can form anywhere in the body, includingthe heart and lungs.

Dry eyes and mouth: People who have rheumatoid arthritis are much more likely to develop Sjogren's syndrome, a disorder that decreases the amount of moisture in the eyes and mouth.

Infections: Rheumatoid arthritis itself and many of the medications used to combat it can impair the immune system, leading to increased infections. Protect yourself with vaccinationsto prevent diseases such as influenza, pneumonia, shingles, and COVID-19.

Abnormal body composition: The proportion of fat to lean mass is often higher in people who have rheumatoid arthritis, even in those who have a normal body mass index (BMI).

Carpal tunnel syndrome: If rheumatoid arthritis affects your wrists, the inflammation can compress the nerve that serves most of your hands and fingers.

Heart problems: Rheumatoid arthritis can increase your risk of hardened and blockedarteries, as well as inflammation of the sac that encloses your heart.

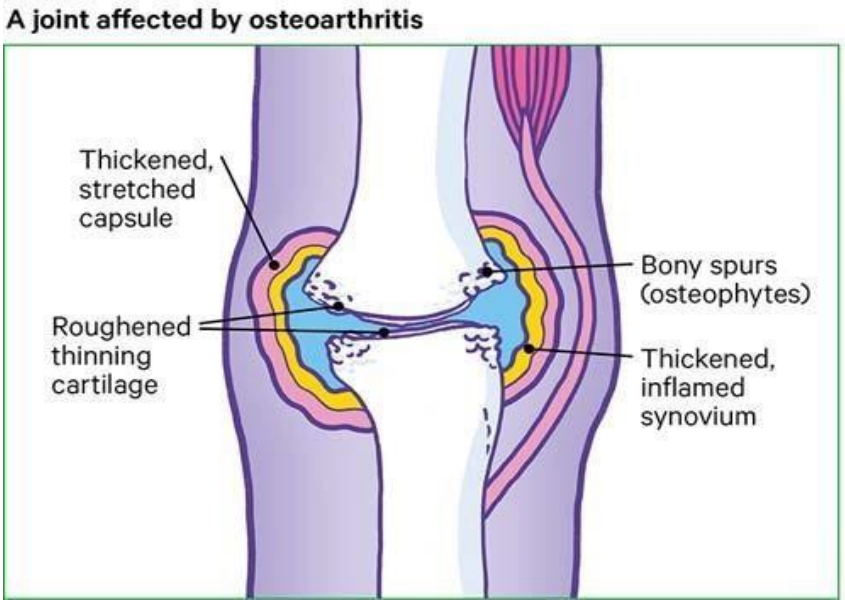

Fig. 6 A Joint Affected by Arthritis

Lung disease: People with rheumatoid arthritis have an increased risk of inflammation and scarring of the lung tissues, which can lead to progressive shortness of breath.
Lymphoma: Rheumatoid arthritis increases the risk of lymphoma, a group of blood cancers that develop in the lymph system.

Is depression common in people with rheumatoid arthritis?
Rheumatoid arthritis and depression commonly occur together. Although this is known,people with rheumatoid arthritis often are not screened for depression, so it may not bediagnosed or treated. Studies show that if depression occurring with rheumatoid arthritis is not addressed, the treatment for rheumatoid arthritis itself can be less effective. It is unclear whether depression and anxiety in people with rheumatoid arthritis are a result of their physical symptoms, or if depression is yet another symptom caused by the chronic, systemic inflammation of rheumatoid arthritis. Researchers believe that people who had depression before the onset of rheumatoid arthritis may be less responsive to their rheumatoid arthritis treatment. More research is needed to determine the exact connection between all types of arthritis and depression. Left untreated, depression in people with rheumatoid arthritis may result in.Greater pain the Greater risk of cardiovascular disease and heart attacks Loss of productivity at work Increased risk of economic hardship Deterioration of relationships with friends and family Sexual dysfunction What is known is that people who have rheumatoid arthritis and depression that occur together respond better to treatment when both conditions are addressed.
Although different medications may be prescribed to treat rheumatoid arthritis and depression, many activities can be helpful in addressing the physical and emotional effects of both conditions, such as:

1. Regular exercise
2. Stress management techniques

Friends and support groups familiar with the challenges of both conditions:
People with all types of arthritis are at high risk of depression and anxiety. If you have been diagnosed with rheumatoid arthritis and are feeling depressed or are worried about developing depression, it is important to talk to your doctor. With medication, support and a personalized plan of action, depression, and rheumatoid arthritis are treatable conditions.

Effect of Rheumatoid Arthritis on eye:
Rheumatoid arthritis is a chronic inflammatory disease that primarily affects the joints.However, rheumatoid arthritis occasionally affects other parts of the body including the eyes. The most common eye-related symptom of rheumatoid arthritis is dryness. Dry eyes are prone to infection, and if untreated, severe dry eyes can cause damage to the cornea, the clear, Dome-shaped surface of the eye that helps your eye focus. Dry eyes can also be a symptom ofSjogren's syndrome an autoimmune disorder that is often associated with rheumatoidarthritis. More rarely, rheumatoid arthritis can cause inflammation in the white part (sclera) of your eyes, which can result in redness and pain. If you have rheumatoid arthritis and experience eye pain, vision changes, or other eye problems, consult an ophthalmologist for an evaluation. Early treatment can help prevent vision-threatening complications.

Effect of Rheumatoid Arthritis on Lungs:
Although rheumatoid arthritis primarily affects joints, it sometimes also causes lung disease. Occasionally, lung problems surface before the joint inflammation and pain of rheumatoid arthritis .Men in their 50s and 60s who have more-active rheumatoid arthritis and a history of smoking been more likely to develop rheumatoid arthritis-related lung disease. The lung problems most

often linked to rheumatoid arthritis include:

Scarring within the lungs. Scarring related to long-term inflammation (interstitial lung disease) may cause shortness of breath, a chronic dry cough, fatigue, weakness, and loss of appetite. Lung nodules. Small lumps can form in the lungs (rheumatoid nodules), as well as in other parts of the body. Lung nodules usually cause no signs or symptoms, and they do not pose a risk of lung cancer. In some cases, however, a nodule can rupture and cause a collapsed lung. Pleural disease. The tissue surrounding the lungs, known as the pleura (PLOOR-uh), can become inflamed. Pleural inflammation is often accompanied by a buildup of fluid between two layers of the pleura (pleural effusion). Sometimes the fluid resolves on its own. A large pleural effusion, however, can cause shortness of breath. The pleural disease may also cause a fever and pain in breathing. Small airway obstruction. The walls of the lungs' small airways can become thickened because of chronic inflammation and infection (bronchiectasis) or inflamed or injured (bronchiolitis). This may cause mucus to build up in the lungs, as well as shortness of breath, a chronic dry cough, fatigue, and weakness. Contact your doctor promptly if you have rheumatoid arthritis and experience any unexplained breathing problems. Sometimes treatment is aimed at rheumatoid arthritis. Inother cases, treatment involves medication to suppress the immune system or a procedure to remove fluid surrounding the lungs [12].

DIAGNOSIS TEST

Rheumatoid arthritis can be difficult to diagnose in its early stages because the early signs and symptoms mimic those of many other diseases. There is no one blood test or physical finding to confirm the diagnosis. During the physical exam, your doctor will check your joints for swelling, redness and warmth. He or she may also check your reflexes and muscle strength.

Blood tests

People with rheumatoid arthritis often have an elevated erythrocyte sedimentation rate (ESR, also known as sed rate) or C-reactive protein (CRP) level, which may indicate the presence ofan inflammatory process in the body. Other common blood tests look for rheumatoid factor and anti-cyclic citrullinated peptide (anti-CCP) antibodies.

Imaging tests

Your doctor may recommend X-rays to help track the progression of rheumatoid arthritis in your joints over time. MRI and ultrasound tests can help your doctor judge the severity of the disease in your body [13].

TREATMENT

There is no cure for rheumatoid arthritis. But clinical studies indicate that remission of symptoms is more likely when treatment begins early with medications known as disease-modifying antirheumatic drugs (DMARDs).

Medications

The types of medications recommended by your doctor will depend on the severity of your symptoms and how long you have had rheumatoid arthritis. NSAIDs. Nonsteroidal anti-inflammatory drugs (NSAIDs) can relieve pain and reduce inflammation. Over-the-counter NSAIDs include ibuprofen (Advil, Motrin IB, others) and naproxen sodium (Aleve). Stronger NSAIDs are available by prescription. Side effects may include stomach irritation, heart problems, and kidney damage steroids. Corticosteroid medications, such as prednisone, reduce inflammation and pain and slow joint damage. Side effects may include thinning of bones, weight gain, and diabetes. Doctors often prescribe a corticosteroid to relieve symptoms quickly, with the goal of gradually tapering off the medication. Conventional DMARDs. These drugs can slow the progression of rheumatoid arthritis and save the joints and other tissues from permanent damage. Common DMARDs include methotrexate (Trexall, Otrexup, others), leflunomide (Arava), hydroxychloroquine(Plaquenil) and sulfasalazine (Azulfidine). Side effects vary but may include liver damage and severe lung infections. Biologic agents. Also known as biologic response modifiers, this newer class of DMARDs includes abatacept (Orencia), adalimumab (Humira), anakinra (Kineret), certolizumab (Cimzia), etanercept (Enbrel), golimumab (Simponi), infliximab (Remicade), 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 have not been effective. Higher doses of tofacitinib can increase the risk of blood clots in the lungs, serious heart-related events, and cancer [14].

THERAPY

Your doctor may refer you to a physical or occupational therapist who can teach youexercises to help keep your joints flexible. The therapist may also suggest new ways to do daily tasks that will be easier on your joints. For example, you may want to pick up an object using your forearms. Assistive devices can make it easier to avoid stressing your painful joints. For instance, a kitchen knife equipped with a hand grip helps protect your finger and wrist joints. Certain tools, such as buttonhooks, can make it easier to get dressed. Catalogs and medical supply stores are good places to look for ideas.

SURGERY

If medications fail to prevent or slow joint damage, you and your doctor may consider surgery to repair damaged joints. Surgery may help restore your ability to use your joint. It can also reduce pain and improve function. Rheumatoid arthritis surgery may involve one or more of the following procedures:

Synovectomy. Surgery to remove the inflamed lining of the joint (synovium) can help reducepain and improve the joint's flexibility.

Tendon repair. Inflammation and joint damage may cause tendons around your joint to loosen or rupture. Your surgeon may be able to repair the tendons around your joint.

Joint fusion. Surgically fusing a joint may be recommended to stabilize or realign a joint andfor pain relief when a joint

replacement is not an option.

Total joint replacement. During joint replacement surgery, your surgeon removes the damaged parts of your joint and inserts a prosthesis made of metal and plastic. Surgery carriesa risk of bleeding, infection, and pain. Discuss the benefits and risks with your doctor.

Fig. 7 Surgery

Exercise regularly. Gentle exercise can help strengthen the muscles around your joints, andit can help reduce the fatigue you might feel. Check with your doctor before you start exercising. If you're just getting started, begin by taking a walk. Avoid exercising tender, injured, or severely inflamed joints.

Apply heat or cold. Heat can help ease your pain and relax tense, painful muscles. Cold maydull the sensation of pain. Cold also has a numbing effect and can reduce swelling.

Relax. Find ways to cope with pain by reducing stress in your life. Techniques such as guided imagery, deep breathing, and muscle relaxation can all be used to control pain [15].

CONCLUSION:

RA has female preponderance with a significant proportion having a positive family history. The most common joints involved are the MCP joints and the most common deformity was an ulnar deviation of digits. There are significant proportions of patients who present with high disease activity. Anemia, thrombocytosis, and extraarticular manifestations are common. Most of the patients are on DMRDs with methotrexate being the most used drug.

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