

Rheumatoid Arthritis: Diagnosed and Treatment

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Citation: Gomaa Mahmoud RS (2022) Rheumatoid Arthritis: Diagnosed and Treatment. Acta Rheuma, Vol. 9 No. 4: 14.

Abstract

Rheumatoid arthritis (RA) is a debilitating autoimmune disease with grave physical, emotional and socioeconomic consequences [1]. Despite advances in targeted biologic and pharmacologic interventions that have recently come to market, many patients with RA continue to have inadequate response to therapies, or intolerable side effects, with resultant progression of their disease [2]. In this review, we detail multiple biomolecular pathways involved in RA disease pathogenesis to elucidate and highlight pathways that have been therapeutic targets in managing this systemic autoimmune disease. Here we present an up-to-date accounting of both emerging and approved pharmacological treatments for RA, detailing their discovery, mechanisms of action, efficacy, and limitations. Finally, we turn to the emerging fields of bioengineering and cell therapy to illuminate possible future targeted therapeutic options that combine material and biological sciences for localized therapeutic action with the potential to greatly reduce side effects seen in systemically applied treatment modalities [3].

Received: 03-Aug-2022, Manuscript No. IPAR-22-12979; **Editor assigned:** 05-Aug-2022, PreQC No IPAR-22-12979 (PQ); **Reviewed:** 19-Aug-2022, QC No. IPAR-22-12979; **Revised:** 24-Aug-2022, Manuscript No. IPAR-22-12979 (R); **Published:** 31-Aug-2022, DOI: 10.36648/ iparX.22.9.4.14

Introduction

Rheumatoid arthritis, or RA, is an autoimmune and inflammatory disease, which means that your immune system attacks healthy cells in your body by mistake, causing inflammation (painful swelling) in the affected parts of the body. RA mainly attacks the joints, usually many joints at once. RA commonly affects joints in the hands, wrists, and knees [4]. In a joint with RA, the lining of the joint becomes inflamed, causing damage to joint tissue. This tissue damage can cause long-lasting or chronic pain, unsteadiness (lack of balance), and deformity (misshapeness) [5].

RA can also affect other tissues throughout the body and cause problems in organs such as the lungs, heart, and eyes.

With RA, there are times when symptoms get worse, known as flares, and times when symptoms get better, known as remission [6].

Symptoms of RA

Signs and symptoms of RA include:

1. Pain or aching in more than one joint
2. Stiffness in more than one joint

3. Tenderness and swelling in more than one joint

The same symptoms on both sides of the body (such as in both hands or both knees)

1. Weight loss
2. Fever
3. Fatigue or tiredness
4. Weakness

RA is the result of an immune response in which the body's immune system attacks its own healthy cells. The specific causes of RA are unknown, but some factors can increase the risk of developing the disease.

Rheumatoid arthritis Diagnosed

RA is diagnosed by reviewing symptoms, conducting a physical examination, and doing X-rays and lab tests. It's best to diagnose RA early-within 6 months of the onset of symptoms so that people with the disease can begin treatment to slow or stop disease progression (for example, damage to joints) [7]. Diagnosis and effective treatments, particularly treatment to suppress or control inflammation, can help reduce the damaging effects of RA.

A doctor or a team of doctors who specialize in care of RA patients should diagnose and treat RA [8]. This is especially important because the signs and symptoms of RA are not specific and can look like signs and symptoms of other inflammatory joint diseases. Doctors who specialize in arthritis are called rheumatologists, and they can make the correct diagnosis [9]. To find a provider near you, visit the database of rheumatologistsexternal icon on the American College of Rheumatology (ACR) website. RA can be effectively treated and managed with medication(s) and self-management strategies. Treatment for RA usually includes the use of medications that slow disease and prevent joint deformity, called disease-modifying antirheumatic drugs (DMARDs); biological response modifiers (biologics) are medications that are an effective second-line treatment. In addition to medications, people can manage their RA with self-management strategies proven to reduce pain and disability, allowing them to pursue the activities important to them. People with RA can relieve pain and improve joint function by learning to use five simple and effective arthritis management strategies [10].

Complications of Rheumatoid Arthritis

Rheumatoid arthritis (RA) has many physical and social consequences and can lower quality of life. It can cause pain, disability, and premature death.

Premature heart disease

People with RA are also at a higher risk for developing other chronic diseases such as heart disease and diabetes. To prevent people with RA from developing heart disease, treatment of RA also focuses on reducing heart disease risk factors. For example, doctors will advise patients with RA to stop smoking and lose weight.

Obesity

People with RA who are obese have an increased risk of developing heart disease risk factors such as high blood pressure and high cholesterol. Being obese also increases risk of developing chronic conditions such as heart disease and diabetes. Finally, people with RA who are obese experience fewer benefits from their medical treatment compared with those with RA who are not obese.

Employment

RA can make work difficult. Adults with RA are less likely to be employed than those who do not have RA. As the disease gets worse, many people with RA find they cannot do as much as they used to. Work loss among people with RA is highest among people whose jobs are physically demanding. Work loss is lower among those in jobs with few physical demands, or in jobs where they have influence over the job pace and activities.

Treatment and Drugs

There are a variety of treatments available for rheumatoid arthritis. The earlier that intensive treatment is started, the more likely it is to work.

There are three main ways to treat rheumatoid arthritis:

1. Drugs
2. Physical therapies
3. Surgery

There are four main groups of drugs that are used to treat rheumatoid arthritis. These are:

1. Painkillers
2. Non-steroidal anti-inflammatory drugs (NSAIDs)
3. Disease-modifying anti-rheumatic drugs (DMARDs)
4. Steroids (also known as corticosteroids).

Many people with rheumatoid arthritis need to take more than one drug. This is because different drugs work in different ways. Your drug treatments may be changed from time to time. This can depend on how bad your symptoms are, or because something relating to your condition has changed. Drugs may be available under several different names. Each drug has an approved name – sometimes called a generic name. Manufacturers often give their own brand or trade name to the drug as well. For example, Nurofen is a brand name for ibuprofen. The approved name should always be on the pharmacist's label, even if a brand name appears on the packaging. Check with your doctor, rheumatology nurse specialist or pharmacist if you're not sure about anything.

Conclusion

The majority of RA cases are diagnosed and treated on an outpatient basis. Pharmacists in ambulatory care settings (e.g., clinics, community pharmacies) have pivotal opportunities to counsel patients and ensure that RA drugs are administered appropriately. An example of such a drug is MTX, which should be taken once weekly, along with folic acid supplementation. During disease flares, patients may be prescribed steroids, which have myriad side effects, including hypertension, hyperglycemia, mood changes, and insomnia; pharmacists can confirm steroid dose and duration, as well as clarify whether a taper would be required. For biological DMARDs, pharmacists can reconfirm that patients are capable of self-administration, especially if they have severe RA and possible deformities in their hands or wrists. Treatment for RA has made many advances in the decades since the approval of MTX for RA in 1988. While MTX to date remains the first line treatment for patients with RA, a new class of advanced biologics in the form of antibody therapies has made great leaps forward in precisely targeting a myriad of pathways to robustly alleviate joint inflammation. Additionally, the next generation of JAK inhibitors is gaining FDA approval, offering even more options for patients to control RA symptoms. Despite these advances, many patients still have incomplete control of their RA or face side effects that they cannot easily live with. As our understanding of RA grows and we appreciate the mechanisms that cause individual variance of RA symptoms and treatment effects in patients, RA therapies will continue to become more precise, either through improved administration methods or with individualized targeted therapies. This precision medicine approach to rheumatic diseases such as RA and other autoimmune diseases may one day resemble tailored therapy regimes now common in the field of oncology, achieving

a patient-specific standard of care to yield optimized efficacy with minimal occurrence of side effects.

RA is a chronic disease that requires interventions to modify disease progression. While initial presentations are related to joint inflammation, long-term sequelae can include extra-skeletal manifestations. The most recent RA guidelines are from ACR 2015 and EULAR 2016. There are specific differences between the guidelines, based on the respective region/population studied. A future update of the ACR guidelines may contain commentary

regarding the roles of baricitinib and sarilumab, as well as other promising therapies for RA.

Acknowledgement

None

Conflict of Interest

None

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