

## Rheumatic autoimmune diseases (focus on RA) : prevalence, types, causes and diagnosis

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Received (10\02\2022), Accepted (21\03\2022)

**Abstract:**-Autoimmune rheumatic diseases (ARDs) are many conditions in which autoimmune-mediated tissue damage is caused by innate and adaptive immune responses. ARDs impact about 5% of the population and cause significant morbidity, mortality, and financial expenses. 1–5 As a result, taking steps to prevent ARDs would have a significant public health impact. Many ARDs Rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE), are two of the most common autoimmune diseases, are becoming more well-known (SLE). During the Genetic and environmental risk factors interact at the preclinical stage of disease., most likely to trigger and perpetuate autoimmunity in a stepwise manner, eventually leading to measurable Inflammation and damage to tissue Furthermore, disease-related biomarkers, particularly autoantibodies, are being studied., begin and evolve without clinical signs and symptoms of tissue harm at first. These findings suggest that In asymptomatic (or mildly symptomatic) persons, combining biomarkers and other risk factors could identify those at high risk of developing future rheumatic disease, allowing for early treatment intervention to avoid disease progression to a clinically relevant stage. The purpose of this study was to find out about the prevalence, forms, causes, and diagnosis of rheumatic diseases in a community (RA being a common example of autoimmune rheumatic disorders).

**الخلاصة:** تشمل أمراض الروماتيزم المناعية الذاتية (ARDs) مجموعة متنوعة من الأمراض التي تؤدي فيها الاستجابات المناعية الفطرية والتكيفية إلى تلف الأنسجة بواسطة المناعة الذاتية. إجمالاً، تؤثر ARDs على حوالي 5٪ من السكان وتؤدي إلى أمراض كبيرة، وزيادة معدل الوفيات وارتفاع التكاليف المالية. تشير الدلائل المتزايدة إلى أن العديد من أمراض ARD، في التهاب المفاصل الروماتويدي (RA) والذئبة الحمامية الجهازية (SLE)، تتفاعل عوامل الخطر الوراثية والبيئية، على الأرجح بالتسلسل، لبدء ونشر تطوير المناعة الذاتية، وتبلغ ذروتها في نهاية المطاف في التهاب الأنسجة وإصابتها التي يمكن اكتشافها. علاوة على ذلك، فإن المؤشرات الحيوية المتعلقة بالأمراض، وخاصة الأجسام المضادة الذاتية، تتطور وتتطور، في البداية في غياب العلامات والأعراض السريرية لإصابة الأنسجة. تشير هذه النتائج إلى أن التحليل المشترك لمثل هذه المؤشرات الحيوية وعوامل الخطر الأخرى في الأفراد الذين لا يعانون من أعراض (أو الحد الأدنى من الأعراض) يمكن أن يحدد الأفراد المعرضين لخطر كبير للإصابة بأمراض الروماتيزم في المستقبل، والتي قد تمكن في نهاية المطاف من التدخل العلاجي المبكر لمنع تطور المرض إلى حالة ذات مغزى سريريًا. كان الهدف من هذه الدراسة هو تحديد انتشار وأنواع وأسباب وتشخيص الأمراض الروماتيزمية (وتم التركيز على التهاب المفاصل الرثوي بشكل خاص كمثال على أمراض المناعة الذاتية) في السكان للحصول على معلومات عن خصائصها.

## Introduction

Rheumatic diseases are autoimmune conditions that cause chronic pain and functional limitations as joints and soft tissues become more involved. Autoimmune rheumatic diseases (ARDs) are a category of disorders affecting the bones, muscles, and connective tissue of the joints, bones, and connective tissue. Because they often present with ambiguous symptoms and indications that flare and remit, they can be difficult to diagnose in the early stages. Early detection, on the other hand, is critical for better patient outcomes. (1) The symptoms of this group of disorders typically result in varied degrees of physical handicap, resulting in a large financial cost to individuals, their families, and society. According to diagnosis, race, age, and gender, reported prevalence rates appear to vary. The most frequent kind of arthritis is osteoarthritis (OA). condition among these. (1)

An aberrant immune response to normal cells and tissues characterizes ARDs. They can cause severe, chronic pain and disease progression. Some are linked to a higher chance of dying. The abnormal immune response in rheumatoid arthritis might be directed towards a specific part of the body, such as the joints (RA). (2) In other circumstances, such as systemic lupus erythematosus, it can be more broad and systemic, affecting multiple organs and tissues (SLE). (2) Although most rheumatic diseases are triggered by an autoimmune response<sup>1</sup>, some (such as gout and osteoarthritis) have their own etiology. Autoimmunity is believed to affect between 3% and 5% of the general population. 2 Autoimmune diseases affect more than twice as many women as they do men (6.4 percent of women compared to 2.7 percent of men). 3 A number of autoimmune diseases can strike at any time during one's life. Between the ages of 14 and 44, women are more likely than males to be diagnosed with an autoimmune disease. (3) Hereditary factors cause some ARDs, such as SLE, while infections or environmental factors cause others. However, pinpointing the cause of an ARD in a particular person is frequently impossible. (2)

Knee OA affects 2.0 percent to 42.4 percent of the population, with women being affected more frequently<sup>1</sup>. The frequency of knee OA rises with age, reaching 80 percent in people over 75 years<sup>2</sup>. Inflammatory illnesses such as rheumatoid arthritis (RA; 0.3 percent –1% in the general population)(3), ankylosing spondylitis (AS; 0.15 percent –0.21 percent in the general population)(4), and systemic lupus erythematosus (SLE; 0.042 percent –0.067 percent)<sup>5</sup> have a low prevalence in adults. In general, investigations assessing the prevalence of rheumatic disorders face methodological challenges, which are exacerbated by selection bias, especially when data is gathered from hospitals. The case criteria used to diagnose each disease are another source of prejudice. (3)

### **Rheumatoid Arthritis (RA) is a disorders group can affect the**

There are over 100 rheumatic disorders, The National Institute of Arthritis and Musculoskeletal and Skin Diseases reports that (NIAMS). (4)

The following are some prevalent rheumatoid diseases:

- **Spondylitis (Ankylosing Spondylitis) (AS)** consider as kind of spondyloarthritis , according to the American College of Rheumatology (a kind of joint inflammation that affects the body spine also in some cases, the joints of all body ). (5) Non-radiographic axial spondylo-arthritis is associated ailment, according to CreakyJoints,

sickness lead to symptoms such as pain in patients lower back, usually on X-ray there are non- visible seen ,unlike ankylosing spondyloarthritis. (6)

- **Fibromyalgia** According to the Mayo Clinic, fibromyalgia is a rheumatic illness that causes widespread pain, sleep issues, exhaustion, and memory or concentration impairments. (7)
- **Gout** According to this kind of arthritis disease marked with deposition of some crystals (urate crystals) in body joint — commonly main toe joints lead to causing inflammation and edema lead to cause pain, that depending on Mayo Clinic. (8)
- **Arthritis caused by infection** :- this form of arthritis consider as sudden form and lead to severe pain because a viral or bacterial infection, this type of arthritis causes severe damage of joints and may consider as permanent form (9,10)

- **Arthritis caused by Lupus** , according to the Mayo Clinic, is consider as systemic autoimmune disease in which the immunity assaults the self Ags organs and tissues lead to damage this parts , resulting in joint and organ damage (11)

- **Osteoarthritis** is a type of arthritis that affects the joints (OA), OA is the common prevalent types because associated with age and subsequently lead to destruction cartilages and bones in body .(CDC). (12)

- **Arthritis psoriatica (PsA)** According to the Arthritis Foundation, PsA is a kind of arthritis associated with inflammation lead to affects some persons with psoriasis and mostly affects the skin and joints. (13)

**Rheumatoid-Arthritis (RA)** consider as type of arthritis that affects the joints (RA) According to the Arthritis Foundation, RA is an autoimmune and inflammatory disease that arises when your immune system assaults your own body's tissues, causing severe swelling. (14,15)

#### **Rheumatic Diseases risk factors and causes**

Most varieties of rheumatic disease are unknown to experts, however according to Johns Hopkins Medicine, one or more of the following factors may play a role: (16)

- Your ancestors' ancestors' ancestors' acne
- Triggers in the environment
- Choices of lifestyle
- Infection
- Trauma
- Metabolic issues
- Damage to a joint or joints due to wear and tear or stress

Ankylosing spondylitis, fibromyalgia, lupus, and rheumatoid arthritis are all examples of rheumatoid arthritis. are thought to have a genetic component. (5,7,11,14).

#### **Rheumatic Disease Prognosis**

Depending on the type of rheumatic disease, there are a variety of treatments available, the prognosis varies.

Treatment for ankylosing spondylitis can result in disease remission in some cases, according to CreakyJoints. (17)

Fibromyalgia has no cure, this diseases consider non-progressive disorder, meaning it non become worse during the time, and therapies can reduce and lessen inflammation and have good prognosis. (18) IA is usually have problem with short-term that may be treated. (9) Lupus consider as autoimmune diseases, in which the patients have no symptoms all of the time, 80 - 90 % of patients can expect to enjoy a good health with proper follow-up and treatment. (19)

### **Rheumatic Diseases Last a Long Time**

(Ankylosing spondylitis, osteoarthritis, psoriatic arthritis, and rheumatoid arthritis) are .examples of chronic or lifelong rheumatic disorders

Other diseases have a substantially shorter lifespan, especially if they are treated early and well. Most cases s of Lyme disease, for example, oral antibiotics can treat the (infection in three to four weeks (NIAID). (20)

It can take one to two weeks to recover from an untreated acute gout attack. According to Johns Hopkins Medicine, people who receive correct therapy few to have unpleasant flare-ups, which could occur several times a year otherwise. (21)

Rheumatoid arthritis is a chronic and progressive disease. Within the first two years, damage to the joint bones is common. The earlier you are diagnosed and treated, the better your long-term prognosis will be. In fact, according to data published in the Journal of the American Medical Association in October 2018, existing medications can avoid joint deterioration in up to 90% of persons with RA when started early. (22)

### **1-Rheumatoid arthritis**

(RA) is an autoimmune disease that mostly affects the joints over time. (23) heat in patients joints , edema , and hurting main symptoms .pain and joint un-flexible . The most commonly affected joints are the wrist and hands, with the same joints on both sides of the body. This illness may damage other parts of the body, such as the skin, eyes, lungs, heart, nerves, and blood. Low red blood cell counts, pulmonary inflammation, and cardiac inflammation are all possible effects. A fever and a lack of energy are also possible symptoms. (23) Symptoms usually develop over several weeks or months. (24th) (22)

While the specific etiology of rheumatoid arthritis is unknown, it is assumed to be caused by a association of inherited and environment conditions . As the underlying process, the body's immune system targets the joints. As a result, the joint capsule thickens and becomes inflammatory. Underneath the epidermis, it affects the bones ,cartilages. The bulk of diagnoses are depending on the signs and symptoms that a person exhibits. (24) X-rays and laboratory tests can aid in the confirmation of a diagnosis or the elimination of other illnesses that generate similar symptoms. (23) Among the illnesses that may present similarly include systemic lupus erythematosus, psoriatic arthritis, and fibromyalgia.

The goal of treatment is to relieve pain, reduce inflammation, and enhance general functionality. (27) Using a combination of rest and exercise, splints and braces, and assistive devices can all help. To treat symptoms, pain medications, steroids, and nonsteroidal anti-inflammatory medicines (NSAIDs) are commonly utilized. (23) Disease modifying anti-rheumatic drugs (DMARDs) like hydroxyl-chloroquine also methotrexate have ability to reduce the RA. (23) DMARDs made Biologically can used if other treatments fail to control the illness. (30) However, they may experience a higher rate of adverse effects. (31) Surgery to repair, replace, or fuse joints may be advantageous in some circumstances. (23)

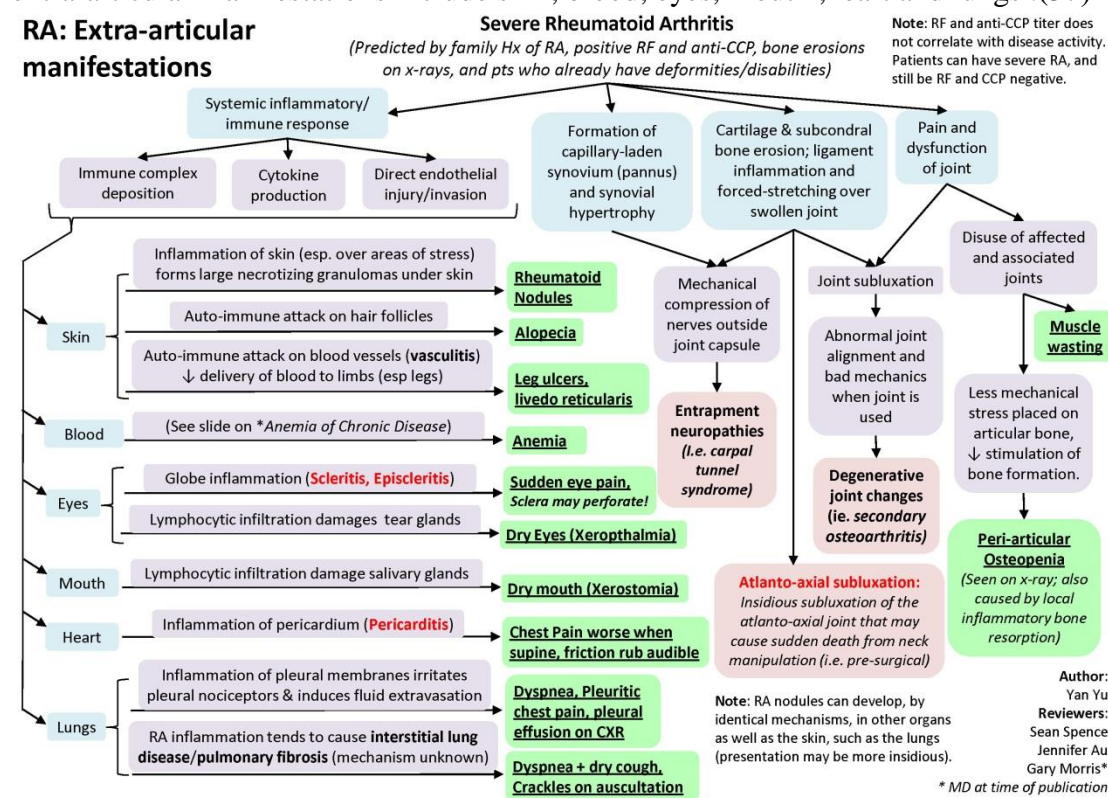
Around 24.5 million people are affected by RA as of 2015. (32), this amounts to( 0.5 to 1%) of individuals, and ( 5 to 50) people in each 100000 .(25) It usually begins in adult persons , and female are 2.5 effected than male. It took the lives of 38000 people

at 2013, up from 28,000 in 1990. (33) The first acceptable description of RA was published in 1800 by (Dr. Augustin Jacob Landré-Beauvais (1772–1840) of Paris). (34) Rheumatic arthritis gets its name from the Greek word rheumatoid, which meaning "wet and inflamed joints." (35)

### Signs and symptoms

The synovial membrane is inflamed in RA, which mostly affects joints. Joints that are swollen, painful, and hot become inflexible, restricting movement. Over time, multiple joints are damaged (polyarthritis). The hands, feet, and spine in cervical parts are the most commonly damaged joints, but larger joints like the shoulder and knee can also be impacted. (38) Synovitis can result in tissue tethering, loss of movement, and erosion of the joint surface, leading in deformity and loss of function. (24) Fibroblastic cells similar to synovio-cytes, play an active and prominent involvement in many rheumatic joint pathologic conditions. (39), about 15–25 percent of cases lead to damage other parts of body. (36) Cardiovascular disease, osteoporosis, and chronic obstructive pulmonary disease infection, malignancy, fatigue, depression, mental issues, and difficulty working are all associated disorders; extra-articular manifestations include skin, blood, eyes, mouth, heart and lungs. (37)

### RA: Extra-articular manifestations



### Factors that are at risk

RA is an autoimmune illness that affects the entire body. The risk of RA is influenced by genetic and environmental factors.

#### 1-Genetic

Genetic in patients with RA and its family increases probability in about 3-5 times; family history may be associated to 40 to 65 % with sero-positive RA, instead of about 20 percent of cases of sero-negative RA, according to estimates from 2016.

(25) RA is highly linked to genes that code for the MHC antigen, which is a hereditary tissue type antigen. The key genetic component implicated is HLA-DR4; however,

the relative relevance of HLA-DR4 differs by ethnic group. (40) Around a hundred alleles have been linked to RA risk in analyzing single nucleotide gene polymorphisms. (41) HLA alleles (particularly HLADRB1) consider danger in high percent as risk alleles than many other genes. (242) Proteins that govern self-versus-nonsel molecular recognition are encoded by the HLA gene. The regulate costimulatory immunological cascade , such as CD-28 , CD-40, as well as cytokine genes. CD-28 , CD-40, cytokine signaling, lymphocyte-receptor activation threshold (e.g., PTPN22), and innate immunological activation all appear to have less of an impact than HLA mutations. (45)

## **2-Environment factors**

Study found epigenetic factors and environment factors in patients with Rheumatoid Arthritis . (46)Smoke, with heavy smokers and those with rheumatoid factor positive having a three-fold increased risk over non-smokers. (48)Alcohol in small doses may be useful. (48)Silica poisoning has been linked to the onset of RA. (49)

## **Pathophysiology**

In the joints and other organs where it occurs, RA begins as a chronic state of cellular activity that leads to autoimmunity and immune complexes. The disease's chief clinical signs are synovium inflammation in joints degeneration, the fibroblasts cells similar to synovio-cytes have the main role in damage . (39) The 3 stages in RA progression include

- 1-First phase (induced by inflammation with non-specific form ).
- 2- Second phase (caused by T-cell activation and proliferation ).
- 3-Third phase (caused by tissue damage produced by the cytokine IL1, TNFalpha, and IL6). (42)

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## **Inflammation in non specific manner.**

Once engaged, Markers that produce immune response in abnormal form may be become persistence . These are hereditary illnesses that affect the modulation of the adaptive immune response. (25) smoking consider as most common factor for RA, also it interacts with genetic and environmental risk factors. (47,51)

Other environmental and physiological factors, such as the onset after motherhood and the use of hormonal medicines, may have a role in women's increased odds. Abnormal immunity , generally self-tolerance of self Ag, these include formation of abnormal IgM directly bound to IgG and certain protein called CCP or ACCP causes an increasing susceptibility.

For past 30 years, many study and many data deal the relative mechanism of cell mediated and humeral immunity on the level of cells include the activated of T cell have ability to active the B cell to become plasma cell and produce immunoglobulin play role in inflammation , these immunoglobulin directly against FC region of IgG also called as rheumatoid factor an about 80% RA have specificity as diagnosis . (52) patients with RA have danger inflammation like other systemic autoimmune disease . (53)

## **Mechanism in synovial membrane**

When the abnormal immune system began attack the patient Ags usually need several years to symptoms appear,the T cells activated B-cells to plasma cell produce high quantity of auto reactive antibodies directly against IgG and CCP At the synovial membrane . directly bind to the IgG at the FC site and complement systems proteins , activating macrophages also causes chronic inflammation RA. (54) N-glycans on Immunoglobulin's surface promote its interaction to Fc receptors.(53)

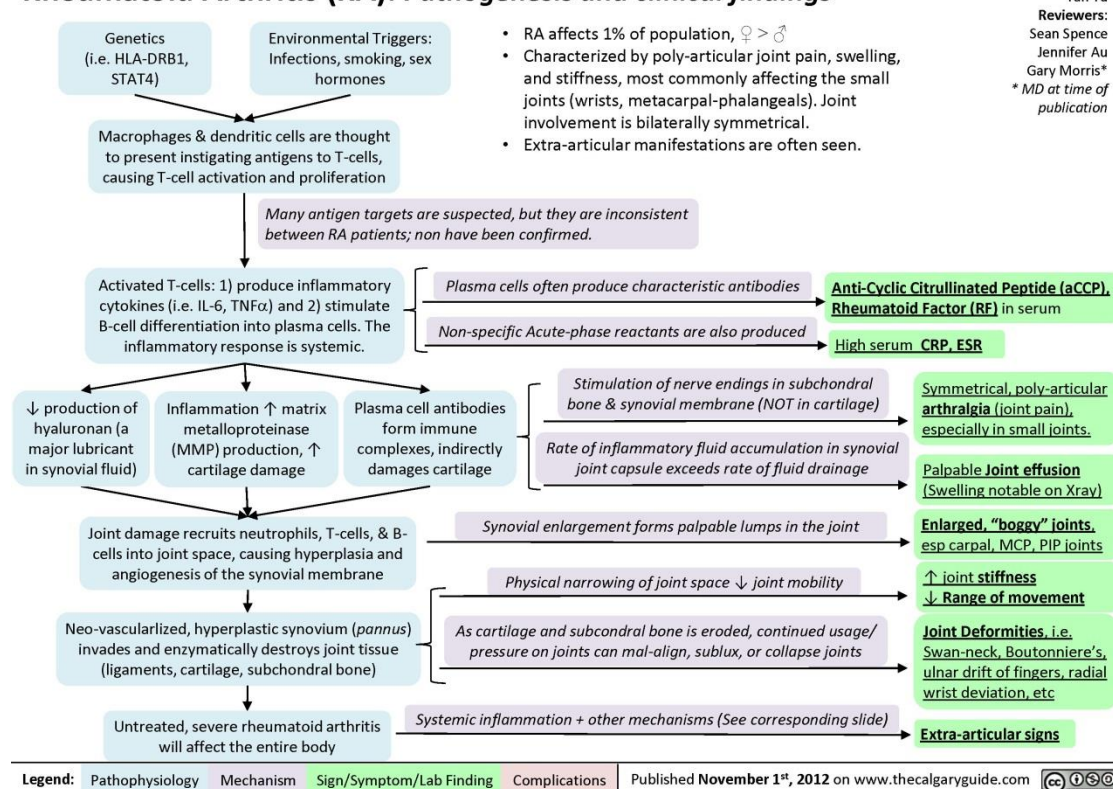
Can causes edema, vaso-dilation, infiltration of auto reactive Tcells, principally CD4-Tcells and CD8-Tcells, in a joint, notably in the synovium. Synovial macrophages and neutrophils express MHC class II molecules.

### Chronic inflammation

As the illness progresses, tissues become granulated forms at the synovium membrane, lead to form pannus and considerable blood vessel angiogenesis, release an enzymes promote tissues death. (55)the fibro-blast like synovio-cytes play a key role. (39) The synovial membrane become thick, the cartilages and underlying bones become degraded, also the calprotectin levels elevated functioning as biological markers. Importantly, inflammatory events do not appear to be limited to the synovium; evidence suggests that changes Both the memory's cells with effectors cells compartments lead to inflammation, such as IL-7 produce by Th17 cells . (56)

Immune cells such as activated fibroblast-like synoviocytes, such as( activated T and B cells, monocytes, and macrophages), are attracted to and accumulated in the joint space by cytokines and chemokines. The activate the formation of osteoclasts, which breakdown bone tissue, through signaling through RANKL and RANK. (58)In rheumatoid arthritis, The synovium's fibroblast-like synoviocytes not like the same cells in normal tissues but occur as aggressive form in its nature, the fibro-blast like synovio-cytes in RA , their impact on joint environment, can be summarized by distinguishing it's from healthy fibro-blast like synovio-cytes by a set of markers. (39)

### Rheumatoid Arthritis (RA): Pathogenesis and clinical findings



### Classification criteria

The 2010 ACR/EULAR Rheumatoid Arthritis Classification Criteria went into effect in 2010. (61) The new criterion is a classification criterion for diseases at increased risk acquiring a chronic form, rather than the diagnostic criterion. (23) However, a score of 6 or higher categorizes someone who has been diagnosed with RA.

The categorization criteriae have taken place of the "old" ACR criteria from 1987, and they have been tailored for early RA diagnosis. The American College of Rheumatology (ACR) and the European League Against Rheumatism (EULAR) jointly published "new" classification criteria that establish value at number ranged from 0 to 10. The diagnostic covers the following four areas: (67)

In 2010, the ACR/EULAR Rheumatoid Arthritis Classification Criteria were implemented. (61) Rather than being a diagnostic criterion, the new criterion is a classification criterion for disorders at high chance of becoming a persistence form. (23)

Someone who has been diagnosed with rheumatoid arthritis is classified as having a score of 6 or above.

1-Involvement of a single big joint results in a score of 0 points.

2-A point is awarded if 2–10 major joints are involved.

3-Involvement of 1–3 small joints (with or without major joint involvement) results - in 2 points

4-Involvement of 4–10 tiny joints (with or without major joint involvement) earns three points.

5-Five points are awarded if more than ten joints are involved (at least one of which is a tiny joint.)

B-serological parameters, which include the rheumatoid factor as well as ACPA (anti-citrullinated protein antibody):

1-Negative RF and negative ACPA result in a score of 0 points.

2-Points are awarded for low-positive RF or low-positive ACPA.

3-Three points are awarded for a high-positive RF or a high-positive ACPA.

1 point for an increase levels of ESR, and high levels of CRP in acute phase reactants

**D- Arthritis duration:** 1 point for six weeks or more of symptoms

Updated criteria take into account our improving understanding of RA, as well as advancements in RA diagnosis and treatment. Serology and autoimmune diagnostics are heavily weighted in the "new" criteria, as Anti-CPA consider as gold marker for diagnosing joint deterioration occurs. The ACR criteria from 1987 included the destruction of joints visible on radiological scans as a key point. (68)

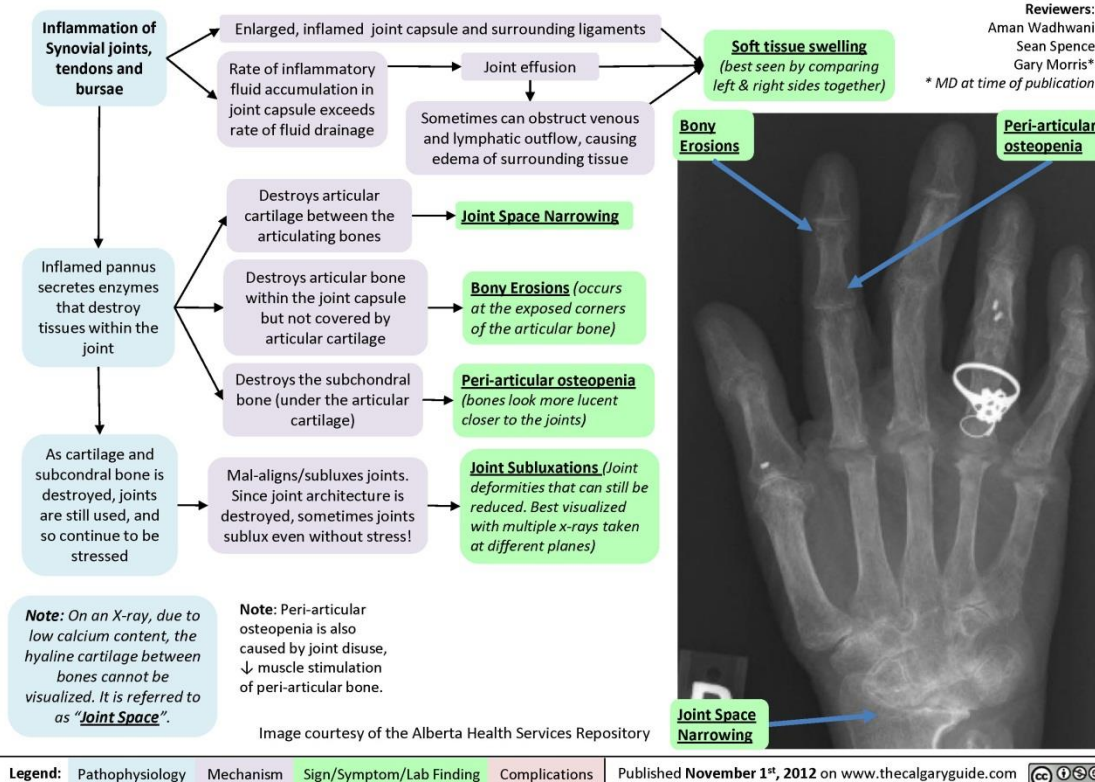
## Diagnosis

### 1-Imaging

X-rays used to determine the osteo-penia, soft-tissue swollen, and a smaller than normal joints space. bones degradation . MRI and US two more medical imaging modalities used in RA. (23,61)

Ultrasound imaging using provide a higher spatial resolution than conventional radiography, have ability to show the about 20 percent in its erosions . color Doppler and power Doppler ultrasonography are useful in evaluating the severity of synovial inflammation. Because the synovium is heavily damaged at beginning of RA , this crucial., synovial inflammation appears strongest predictor for joints destruction.

(61)

**RA: Findings on joint x-ray****2-Hematological markers**

A clinician If Rheumatoid patients is suspected clinical symptoms , RF levels and Anti-CCP may be performed (62) Although its usually occur in about 76–86% of instances, a negative-RF or Anti-CCP usually not-ruled out for RA; in fact, seronegative patients is reported in 15–25% of RA patients. (63) In initial years of sickness, RF become negative in usual , in persons becoming sero-positive during the time . RF is a non-specific antibody seen in roughly 10% of healthy people and in a variety of chronic illnesses such as hepatitis- C and persist Auto-immune condition like SS and SLE. As a result, the RF not only associated with RA only. (23)

In Fact , the citrullinated protein antibodies (Anti-CPAs) serological assays used now . its good marker for diagnosis of RF with about 95%, give positive result in 60–76 percent of all RA cases. (64) ACPAs, like RF, occur before the symptoms appear . (23)

Anticyclic citrullinated-peptide (anti-CCP) by Enzyme linked immune-sorbent assay commonly test used .In recent years other test developed include both IgM RF and antiMCV. It had a sensitive for about of 72% with a specific for about 99.7percent . (65,66)

Various hematological markers , Like ESR , C reactive protein , CBC , tests for kidney function , liver function tests , and different immune assays (e.g ANA ), used do differentiated between arthritis according to its causes . Still's disease, sero-negative, typically juvenile rheumatoid arthritis variant (67), or hemochromatosis, a RA mimic.

**Rheumatic Disease Treatment and Medication**

Options Rheumatoid arthritis is treated with a number of drugs as well as treatments that address the symptoms of the disease.

**The following treatments used for arthritis :**

- Cortico-steroids are a class of drugs help patients with arthritis .
- Diseases modify antirheumatic drugs (D M A R Ds), can alter the immune system and inflammatory processes in the body to reduce damage the tissues
- Biologic drugs , types of DMARD that targets specific phases in the body's inflammatory response.
- Janus kinase (JAK) inhibitors are DMARDs able to block the Janus-kinase (JAK) path-ways, implicated in the immunological system response.

- **The following treatments can reduce the pain**

- : Acetaminophen and other oral-analgesics, as well as prescription narcotics (opioids) for example oxycodone & hydrocodone.
- Analgesics applied to the skin
- NSAIDs (nonsteroidal anti-inflammatory medicines), such as ibuprofen and naproxen sodium, as well as prescription-only COX-2 inhibitors
- **Other treatments for rheumatic disorders may be provided in addition to drugs, such as:**
  - Specific workouts
  - Physical and occupational therapy
  - Occupational therapy services
  - Braces equipment
  - Surgical methods

Other rheumatoid disorders, like fibromyalgia, benefit from a combination of therapies. Some fibromyalgia sufferers benefit from medication, but not all.

Physical activity, (68) Medications or therapies are used to treat several rheumatic diseases.

Uric acid-lowering medications are used to treat gout. drugs like colchicine and corticosteroids like prednisone.

Bacterial infections such as Lyme-disease and arthritis caused by infection are treated with antibiotics.

According to the Mayo Clinic, NSAIDs, antimalarial medications like hydroxyl-chloroquine, cortico-steroids, immune-suppressants like azathioprine, also biological drug such as belimumab are all commonly used to treat lupus. (69) also long-established medications, investigators are discovering other types for people suffering from rheumatoid arthritis. Until recently, Cimzia, a TNF inhibitor, was the only biologic drug approved by the US Food and Drug Administration (FDA) for non-radiographic axial spondyloarthritis (Certolizumab pegol .in June 2020. (70) Alternative and Complementary Medicine According to Cedars Sinai, daily exercise helps many people maintain a healthy weight, strengthen muscles, increase joint flexibility, and promote recovery (71) Some people believe that incorporating massage therapy into their treatment regimen is beneficial. Kneading may aid in muscular relaxation and mobility.

Acupuncture, tai chi, and yoga have also helped people with RA symptoms. (72,73) Some people Patients suffering from rheumatic .

**Prevention of Rheumatic Diseases**

, Certain rheumatic disorders, like rheumatoid arthritis are most common types of arthritis, have no recognized cures.

However, avoiding or minimizing specific triggers can help prevent flare-ups in some circumstances., this entails avoiding frequent lupus triggers like stress, infections, certain drugs, and sunshine. (74)

The CDC recommends avoiding diuretics (drugs used to treat high blood pressure), alcohol, and meals or take fructose in high amounts (such as soda) or food with high quantity of purine (like a meat) if you have gout. (75)

### **Complications of Rheumatic Diseases**

You're more likely to develop other health problems if you have a rheumatic disease or condition. (2,8,76,77) Chronic inflammation can cause a variety of health issues, including:

- Alzheimer's disease
- Diabetes mellitus
- Heart complication
- Depression
- Diastolic or systolic blood pressure
- elevated level of cholesterol
- Renal disorder
- Problem in memory

According to study the people suffer from rheumatoid disorders .

Rheumatic disease affects roughly 55 million people in USA .

One out of every four persons has arthritis (NCCDPHP). In reality, arthritis is the biggest cause of job impairment, with eight million working-age persons saying that it limits their capacity to work. According to the Mayo Clinic, 24 million adults are limited in their activities due to arthritis, with more than 1 in 4 persons having significant pain in joints (3)

Gout is consider as common frequent disease type arthritis in men in USA. It is estimated that 9.2 million adults from USA affected. (81,82)

Gout affects approximately 6% of males and 2% of women in the United States. Gout consider as uncommon in begining and young live , and the majority of female get it do so after menopause. 1.5 million Lupus is a disease that affects people in the United States. Nine out of ten women are affected by lupus. The majority of adults between the ages of 15 and 44 are affected with lupus. (83) Osteoarthritis affects roughly 32.5 million persons in the USA, according to the CDC. Female appear than males to acquire OA after the age of 50, and the risk increases with age. (30,78)In the United States, roughly 1.5 million people suffer from psoriatic arthritis. The disorder is most common in those between the ages of 30 and 50, but it can strike anyone at any age. Psoriasis is associated with a 30% chance of developing psoriatic arthritis. According to the National Library of Medicine, most patients get psoriasis first, then psoriatic arthritis 10 to 20 years later. (84,85)

Rheumatoid arthritis affects roughly 1.3 million adults in the United States, according to the National Institutes of Health, and it is 2 to 3 times more common in women than in males. (86)

### **Conclusions**

Despite the fact the common , Auto immune rheumatic diseases s are predicted to show a clinical stages marked with the onset & spread of auto-immunity, we chose RA as a model ARDs with a clinical period of development. Gaining a better understanding of clinical ARDs, the genetic factors with environment condition consider as common risk factors , as well as bio-markers identify early-stages of disease, will aid in the development of predictive tools that will eventually allow for screening and preventative methods. Such screening and prevention efforts could significantly lower the public health burden that these diseases impose. Although more research is found the bio-medical organization like funding agencies), also community in public place

a greater emphasis to this, In general, we may be able to learn enough about one or more ARDs to develop prevention and intervention throughout future.

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