African Journal of Biological Sciences

Journal homepage: http://www.afjbs.com

Research Paper   Open Access

OVERVIEW OF DEMOGRAPHICS ASSOCIATED WITH RHEUMATOID ARTHRITIS: A NARRATIVE REVIEW

1. Talha Rehman

Second year MBBS

Hamdard College of Medicine and Dentistry

rehmantalha454@gmail.com

2. Tayyaba Hidayat

Third year MBBS

Jinnah sindh medical university

tayyabahidayat13@gmail.com

3. Neha

Third year MBBS

Jinnah sindh medical university

nehamohan759@gmail.com

4. Bibi Samia Khan

Second year MBBS

Hamdard College of Medicine and Dentistry

bibisamiakhan@gmail.com

5. Lareb sindhu Ghanghro

Second year MBBS

Hamdard College of Medicine and Dentistry

larebsindhu89@gmail.com

6.   Muhammad Hussnain

Third year MBBS

Hamdard College of Medicine and Dentistry

husnain.khan3649@gmail.com

ABSTRACT

Rheumatoid arthritis (RA) is a chronic, systemic autoimmune disorder primarily affecting the joints, leading to inflammation, pain, and progressive joint destruction. It is characterized by synovial hyperplasia, inflammatory cell infiltration, and the production of autoantibodies such as rheumatoid factor (RF) and anti-citrullinated protein antibodies (ACPAs). The etiology of RA involves a complex interplay of genetic, environmental, and immunological factors. Genetic predisposition, particularly the presence of HLA-DRB1 alleles, significantly increases the risk of developing RA. Environmental triggers, such as smoking and infections, may initiate or exacerbate the disease in genetically susceptible individuals.

The pathogenesis of RA includes the activation of immune cells and the release of pro-inflammatory cytokines, including tumor necrosis factor-alpha (TNF-α), interleukin-1 (IL-1), and interleukin-6 (IL-6), which drive the inflammatory process and joint damage. Advances in understanding these molecular mechanisms have led to the development of targeted biological therapies, such as TNF inhibitors, IL-6 receptor antagonists, and Janus kinase (JAK) inhibitors, which have revolutionized RA management and significantly improved patient outcomes.

Despite these advancements, RA remains a major cause of disability and reduced quality of life. Early diagnosis and intervention are crucial for preventing irreversible joint damage and achieving disease remission. Diagnostic tools have evolved, with imaging techniques like ultrasound and magnetic resonance imaging (MRI) playing pivotal roles in early detection and monitoring of disease activity. Moreover, patient-centered care approaches emphasizing shared decision-making and personalized treatment plans are essential for optimal management.

Research continues to explore new therapeutic targets and strategies, including the role of the gut microbiome, novel biomarkers, and the impact of lifestyle modifications such as diet and physical activity. As our understanding of RA deepens, future directions aim to refine treatment algorithms, enhance early detection, and ultimately achieve a cure for this debilitating disease.

INTRODUCTION

Rheumatoid arthritis (RA) is an autoimmune disorder characterized by chronic inflammation of the joints and occasionally other tissues such as the skin, blood vessels, heart, lungs, and muscles (1). It leads to both joint-specific and systemic symptoms, and significantly raises the risk of cardiovascular disease (CVD), making it an independent risk factor (2). RA primarily affects the synovial membrane, cartilage, and bone, resulting in progressive disability, systemic complications, and higher mortality rates (3).

The pathophysiology of RA involves a complex interaction of genetic and environmental factors that trigger chronic synovial inflammation and joint damage (4). Beyond joint inflammation, RA patients are at heightened risk for CVD, experiencing increased cardiovascular events and

mortality despite lower circulating lipid levels, due to abnormal lipid functions (5). The patients with active RA, differently from the general population, have increased CV events and mortality, paradoxically associated with the reduced circulating lipid levels. In fact, the lipid functions are abnormal in RA (6). Interstitial lung disease (ILD) is a common extra-articular manifestation, contributing to RA morbidity and mortality (7).

RA is the most common inflammatory polyarthritis seen in outpatient settings, often associated with sleep disturbances and an increased risk of falls. Patients with RA frequently exhibit prolonged sleep latency, lower sleep efficiency, an increased number of awakenings and arousals, feelings of non-restorative sleep and daytime sleepiness (8, 9). Adults with rheumatoid arthritis (RA) have an increased risk of falls as well (10)

EPIDEMIOLOGY

Rheumatoid arthritis is a prevalent systemic autoimmune disease that leads to chronic inflammation and irreversible damage to joints and bones (11).RA can affect individuals of any age and ethnicity, with prevalence increasing with age, reaching up to 2% in older populations (12). Globally, RA affects about 1% of adults, with women being 3-5 times more likely to develop the disease than men (13). The global prevalence ranges from 0.1% to 1%, being more common in developed countries (14-16). In 2017, the prevalence was 246.6 per 100,000 people, a 7.4% increase since 1990 (17).

Prevalence varies by region, being 0.5% in Europe, 1% in North America, and 0.1% in North Africa, but up to 2.8% in Mexico (18, 19). The prevalence in India is about 0.75%, comparable to developed countries (20). RA affects approximately 1% of the population over a lifetime and is four times more prevalent in women due to hormonal and genetic factors (21, 22). Disease incidence in women peaks around menopause. The concordance rate among monozygotic twins is 12-15% (23-25).

CAUSES & RISK FACTORS

Genetic predisposition plays a significant role in RA, particularly genes within the HLA class II molecule-encoding locus. Specific HLA-DRB1 alleles are associated with increased risk for seropositive RA. Diet, body composition, and lifestyle factors also influence RA risk (26).

Obesity, increased BMI, and waist circumference are risk factors, while smoking is strongly linked to RA, likely due to its role in generating anticitrullinated peptide antibodies (ACPA) (27). RA patients are at higher risk for cardiovascular diseases, including atherosclerotic CVD, stroke, heart failure, and atrial fibrillation, with CV disease being a major cause of death in RA patients. (28-33).

LITERATURE REVIEW

A study conducted in Japan in April 2016 aimed to describe clinical features of patients with rheumatoid arthritis. The study design was large observational cohort study with the sample size of 5479 patients. Male to female ratio was 771:4708 and mean age was 61.8 . The most common clinical manifestation was observed to be involvement of foot and ankle joint. The individual with foot involvement had more severe disease symptoms with increased limitations in daily life, decreased ability to perform tasks, and overall, a decreased sense of well-being and mental health as compared to the non-foot group (34).

A prospective study from Germany on 45 patients (18 males, 27 females, mean age 54) compared RA and psoriatic arthritis (PsA). RA was associated with flexor tenosynovitis, while PsA had extracapsular inflammation at the MCP level. The most common clinical manifestation was observed to be flexor tenosynovitis was strongly associated with RA while at the MCP level, extracapsular inflammation was associated with PsA (35).

In another study conducted in Netherlands between July 2013 and March 2020 aimed to describe clinical features related to rheumatoid arthritis. The study design was a prospective study with the sample size of 577 patients. Male to female ratio was 144:433 and mean age was 44. The most common clinical manifestation was observed to be intermetatarsal bursitis especially when synovitis or tenosynovitis are present, MTP tenderness, Juxta-articular synovitis, intra-articular synovitis and joint tenderness (36).

In yet another research conducted in Netherlands from June 2013 to March 2016 aimed to describe clinical features of patients with rheumatoid arthritis. The study design was a logistic regression with the sample size of 157 patients. Male to female ratio was 48:109 and mean age was 59. The most common clinical manifestation was observed to be intermetatarsal bursitis with

strong association with tenosynovitis. Metatarsalgia and arthritis, synovitis, osteitis, joint tenderness and swelling were also observed (37).

A study conducted in Malaysia from January 2018 to june 2021 aimed to describe characteristics of rheumatoid arthritis. The study design was retrospective study with the sample size of 732 patients. Male to female ratio was 109:623 and mean age was 58.1. The most common clinical feature was observed to be interstitial lung disease as an extra-articular manifestation. Non-specific interstitial pneumonia(NSIP) was the predominant pattern (38).

In one of the study conducted in Turkey aimed to describe characteristics of rheumatoid arthritis. The study design was retrospective study with the sample size of 87 patients. Male to female ratio was 23:64 and mean age was 59. The most common clinical feature was observed to be non-specific interstitial pneumonia, five patients had usual interstitial pneumonia, and one had nodules. Subpleural fibrosis increased the probability of RA-ILD by 6.9 times. In the group with ILD, the residual volume and total capacity were decreased compared to the other group (39).

A research conducted in Turkey aimed to describe characteristics of rheumatoid arthritis. The study design was retrospective study with the sample size of 87 patients. Male to female ratio was 9:78 and mean age was 59. The study examined temporomandibular joint involvement, noting no significant difference between elderly and young-onset RA (40).

Another study conducted in china from January 2013 and June 2021 aimed to describe complications of rheumatoid arthritis. The study design was retrospective study with the sample size of 6 patients. Male to female ratio was 1:5 and mean age was 33-64. The symptoms of meningitis or meningoencephalitis occurred after the onset of arthritis in five patients and before the onset of arthritis in one patient. The most common clinical features were observed to be Headache, hyper acute focal neurological deficits and seizures (41).

Research continues to explore new therapeutic targets and strategies, including the role of the gut microbiome, novel biomarkers, and the impact of lifestyle modifications such as diet and physical activity. As our understanding of RA deepens, future directions aim to refine treatment algorithms, enhance early detection, and ultimately achieve a cure for this debilitating disease.

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