Hormonal and Psychological Factors in The Management of Rheumatoid Arthritis in Women: Literature Review

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Abstract

Introduction. Rheumatoid arthritis (RA) is a chronic autoimmune disease that causes inflammation of the joints and can lead to systemic complications. The prevalence of RA ranges from 0.5% to 1% of the global population, with a higher incidence in women than men. This literature review aims to analyze current research related to hormonal and psychological factors that influence the management of RA in women.

Methods. A search was conducted through databases such as PubMed, Scopus, Google Scholar, and ScienceDirect with the criteria of articles published within the last five years.

Discussion. Results suggest that hormonal fluctuations, such as estrogen and progesterone, may affect RA symptoms, especially during pregnancy and menopause. In addition, psychological factors, including stress and depression, have a significant impact on quality of life and pain perception in RA patients. Thus, the management of RA requires a comprehensive approach that considers both hormonal and psychological factors.

Conclusion. This review emphasizes the importance of patient education as well as recommendations for further research into the specific role of hormones in RA pathogenesis and the development of more integrated psychological interventions.

Keywords. Rheumatoid arthritis, autoimmune disease, hormonal, psychological, quality of life

Introduction

Rheumatoid arthritis (RA) is a chronic autoimmune disease that causes inflammation of the joints, which can damage the surrounding soft tissue and bone. It can also lead to systemic complications that affect organs such as the lungs, heart and blood vessels. As a result of the joint damage and functional limitations caused, RA often has a serious impact on the quality of life of sufferers, including reducing the ability to perform daily activities and increasing the risk of disability. The prevalence of RA is estimated to range from 0.5% to 1% of the adult population worldwide, with figures varying between regions.[1]

RA is significantly more common in women than men, with an incidence ratio of approximately 3:1.[2] In women, RA tends to appear in productive age, especially between 30 to 50 years, and often develops before or during menopause. This makes RA not only an individual health issue, but also a major social and economic problem, given its impact on work productivity and the psychological burden it causes.

Understanding RA in women is significant, given not only its higher prevalence, but also the influence of biological and psychosocial factors unique to this group. Hormonal changes, particularly estrogen and progesterone, are believed to play an important role in the development and course of RA. For example, during pregnancy, many women report improvement in RA symptoms, which then recur more severely after delivery. In addition, a decrease in estrogen levels during menopause is also associated with an increased risk and severity of RA in women. Psychological factors such as stress, depression, and anxiety also have a major impact on the development and management of RA in women. This high psychological burden can exacerbate physical symptoms and reduce quality of life.[3] Therefore, the approach to managing RA in women must take into account the interaction between hormonal and psychosocial factors, so as to provide a more comprehensive and effective treatment strategy.

Thus, a focus on women in RA research and management is essential. Understanding gender differences in the development and course of RA will provide greater insight into improving the quality of care and treatment outcomes for women living with RA.

Methods

This literature review method aimed to identify and analyze current research related to Rheumatoid Arthritis (RA) in women, with a focus on hormonal and psychological factors that influence disease management. The literature search was conducted by setting search criteria, namely articles published in the last five years (2018-2023) and that focused on the prevalence,

impact, and management of RA in women. Databases used in the search included PubMed, Scopus, Google Scholar, and ScienceDirect, with keywords including “Rheumatoid Arthritis,” “women,” “hormonal factors,” “psychological factors,” “quality of life,” and “management.”

Discussion

Definition of Rheumatiod Arthritis (RA)

Rheumatoid arthritis (RA) is a chronic autoimmune disease that causes inflammation of the joints and can affect other organs of the body. In this condition, the immune system mistakenly attacks the synovial tissue lining the joints, causing chronic inflammation. If left untreated, RA can cause irreversible damage to the bone, cartilage and soft tissues surrounding the joints.[2]

The main characteristics of RA include joint inflammation, which is usually symmetrical, with joints on both sides of the body involved simultaneously. This inflammation leads to bone destruction and erosion of soft tissues such as ligaments and tendons, resulting in joint instability and deformity.[4] Common symptoms of RA include joint pain, swelling, stiffness-especially in the morning-and fatigue that can be significant. RA can also affect other organs outside the joints, such as the lungs (pleuritis, pulmonary fibrosis), eyes (uveitis, scleritis), and skin (rheumatoid nodules). The involvement of these organs indicates that RA is a systemic disease, not limited to the joints.

RA differs from osteoarthritis (OA), which is the more common form of degenerative arthritis. In OA, joint cartilage destruction occurs gradually due to age-related wear and tear or injury, while in RA, autoimmune inflammation is the main cause of joint destruction. In addition, RA tends to affect small joints such as the hands and feet, while OA more often involves large joints such as the knees and hips.[5]

Epidemiology of Rheumatiod Arthritis (RA)

Rheumatoid arthritis (RA) is a chronic autoimmune disease that affects the joints, with a global prevalence estimated between 0.5% to 1% of the population.[6] In Indonesia, the prevalence of RA is estimated to be around 0.2% to 0.3%, although this figure may not reflect the actual situation due to lack of data.[7] Women have an incidence ratio of 2:1 to 3:1 compared to men, and the age of onset generally occurs between 30 to 60 years.[8]

The global prevalence of rheumatoid arthritis (RA) is estimated to be between 0.24% and 1%, although this figure varies by country and geographic region. The disease tends to be less common in Africa and Asia compared to the United States and Europe.[8] Further research

is needed to understand the factors that influence this variation and to improve the diagnosis and effective management of RA across populations.

Etiology of Rheumatiod Arthritis (RA)

Rheumatoid arthritis (RA) is an autoimmune disease triggered by a complex interaction between genetic and environmental factors. Genetically, individuals with HLA-DRB1 gene variants have a higher risk of developing RA, because this gene regulates the body's immune response, which in RA sufferers misrecognizes the body's own tissues as a threat.[10]

Environmental factors such as viral or bacterial infections, as well as exposure to cigarette smoke, also play a role in triggering RA, especially in individuals who are already genetically susceptible. Smoking increases systemic inflammation and can trigger abnormal immune system activation. In RA, the immune system attacks the synovial membrane around the joints, causing chronic inflammation, pain and joint damage. RA also involves the production of autoantibodies that attack healthy cells in the joints, exacerbating inflammation and causing progressive joint damage.[12]

Risk Factors for Rheumatiod Arthritis (RA)

Rheumatoid arthritis (RA) is an autoimmune condition that is influenced by various risk factors. Genetic factors have a significant role in the development of RA, where individuals with a family history of the disease are at a higher risk of developing it. In addition to genetic factors, hormonal changes also contribute, especially in women. Events such as pregnancy, menopause, and the use of hormonal contraceptives can affect the risk of developing RA.

Lifestyle plays an important role in increasing the risk of RA, with smoking being one of the most significant risk factors, doubling the odds. Obesity and exposure to environmental pollution are also associated with an increased risk of RA. In addition, environmental factors such as certain infections and physical trauma to the joints can trigger an autoimmune response that leads to the development of RA. Age and gender are also key factors, with RA being more common in individuals over the age of 40 and women being more at risk than men, largely due to hormonal differences.

Effect of Sex Hormones on Rheumatiod Arthritis (RA)

Sex hormones play an important role in the development and symptoms of rheumatoid arthritis (RA). During pregnancy, elevated estrogen levels can serve as an immunosuppressant, reducing RA symptoms, and even causing remission in some women. However, after

childbirth, estrogen levels drop dramatically, often leading to a recurrence of severe RA symptoms. Menopause also affects RA, as a decrease in estrogen can worsen symptoms. Post-menopausal women tend to have increased pain and inflammation, suggesting that estrogen has a protective effect against disease progression.[13]

In addition, hormonal fluctuations throughout the menstrual cycle, especially increased progesterone in the luteal phase, may trigger RA flares in some women. Research shows that many women report increased pain and stiffness in this phase.[14] The relationship between sex hormones and regulation of immune responses explains why women are more susceptible to RA than men. Hormones such as estrogen can decrease the production of inflammatory cytokines, which contributes to the reduction of inflammation in the body.

Psychological Factors in the Management of Rheumatoid Arthritis (RA)

Psychological factors play an important role in the management of rheumatoid arthritis (RA), especially stress and its impact on inflammatory conditions. Psychological stress can worsen RA symptoms through the release of stress hormones such as cortisol, which triggers inflammatory reactions in the body. Therefore, stress management is important for RA patients to reduce flares and control symptoms. Depression is also closely associated with RA, with a higher prevalence in patients, especially women, compared to the general population. Depression can worsen patients' pain perception and quality of life, creating a cycle that is difficult to break. The quality of life of RA patients is often compromised due to this chronic disease, affecting social relationships and daily activities.

Psychological interventions, such as cognitive behavioral therapy (CBT) and stress management programs, can help patients overcome these psychological factors. These therapies support the development of better coping skills, improve medication adherence, and reduce disease-related stress. By addressing psychological aspects, patients can achieve a better quality of life.

Rheumatiod Arthritis (RA) Education and Prevention

Patient education on the early symptoms of rheumatoid arthritis (RA) is essential for early detection and treatment. Recognizing early signs, such as joint pain, swelling, and stiffness, can help patients seek medical attention sooner. The earlier treatment is started, the better results can be achieved in managing the disease and preventing further joint damage.[15] Primary and secondary prevention can also be achieved through healthy lifestyle changes. Quitting smoking, adopting an anti-inflammatory diet, and engaging in regular exercise can

help reduce the risk of developing RA. A diet rich in omega-3s, vegetables, and fruits can contribute to the reduction of inflammation, while exercise can improve flexibility and muscle strength, which are important for joint health.

Education on the importance of stress management is also an important part of preventing RA flare-ups. Stress can trigger inflammatory reactions, so relaxation techniques such as meditation, yoga, and cognitive behavioral therapy can help patients manage their stress more effectively.[16] Early intervention, such as the use of DMARDs (disease-modifying antirheumatic drugs), is also an important strategy in preventing disease progression. These drugs are designed to reduce inflammation and prevent joint damage, so more effective management can be achieved with good medical supervision. Social support and sharing experiences with other patients can provide additional motivation and knowledge to overcome the challenges faced, and improve overall quality of life. This educational program can be a platform to share information, resources, and effective coping techniques in dealing with RA.

Conclusion

The management of rheumatoid arthritis (RA) requires a deep understanding of the various factors that influence this condition, especially hormonal and psychological factors. Key findings suggest that hormonal fluctuations, particularly estrogen and progesterone, can affect RA symptoms in women, with pregnancy and menopausal periods potentially exacerbating or improving the condition. In addition, psychological factors, including stress and depression, have a significant impact on RA patients' pain perception and quality of life, emphasizing the importance of psychological support in treatment. The importance of a comprehensive and personalized approach in the treatment of RA is clear, especially for female patients. By considering the hormonal changes women experience throughout their lives, including menstrual cycles, pregnancy, and menopause, doctors can tailor more effective treatments and interventions. This will not only help in managing symptoms but also in improving patients' overall quality of life.

Recommendations for further research include the study of the specific role of hormones in the pathogenesis of RA and the development of more integrated psychological interventions to help patients manage stress and depression. This research will contribute to a better understanding of how these factors interact and influence the course of the disease. Awareness and education for female patients is crucial in the management of RA. Adequate education on how hormonal changes can affect their condition will enable patients to be more proactive in seeking care and implementing effective prevention strategies.

References

1. Venetsanopoulou AI, Alamanos Y, Voulgari PV, Drosos AA. Epidemiology and Risk Factors for Rheumatoid Arthritis Development. Mediterr J Rheumatol. 2023;34(4):404–13.
2. Smolen JS, et al. Rheumatoid arthritis. Nat Rev Dis Primers. 2018;6(1):1–20.
3. Shafiq S, Muhammad Q, Sajid Z. Psychological well-being of patients with arthritis: impact of psychological distress on quality of life, and patient satisfaction. J Univ Med Dent Coll. 2023;14(4).
4. Firestein GS, McInnes IB. Immunopathogenesis of rheumatoid arthritis. Immunity. 2017;46(2):183–96.
5. McInnes IB, Schett G. The pathogenesis of rheumatoid arthritis. N Engl J Med. 2011;365(23):2205–19.
6. Gabriel SE. The epidemiology of rheumatoid arthritis. Rheum Dis Clin North Am. 2001;27(2):269–81.
7. Indonesia PR. Diagnosis dan pengelolaan artritis reumatoid. Perhimpunan Reumatologi Indonesia; 2014.
8. Klareskog L, Padyukov L, Lorentzen J, Alfredsson L. Mechanisms of disease: genetic susceptibility and environmental triggers in the development of rheumatoid arthritis. Nat Clin Pract Rheumatol. 2006;2(8):425–33.
9. Venetsanopoulou AI, Alamanos Y, Voulgari PV, Drosos AA. Epidemiology and Risk Factors for Rheumatoid Arthritis Development. Mediterr J Rheumatol. 2023;34(4):404.
10. McInnes IB, Schett G. The pathogenesis of rheumatoid arthritis. N Engl J Med. 2011;365(23):2205–19.
11. Firestein GS, McInnes IB. Immunopathogenesis of rheumatoid arthritis. Annu Rev Immunol. 2017;35:593–629.
12. Malmström V, Catrina AI, Klareskog L. The immunopathogenesis of seropositive rheumatoid arthritis: from triggering to targeting. Nat Rev Immunol. 2017;17(1):60–75.
13. Romo-García MF, Zapata-Zuñiga M, Enciso-Moreno JA, Castañeda-Delgado JE. The role of estrogens in rheumatoid arthritis physiopathology. Rheum Arthritis—Other Perspect Towards Better Pract. 2020;27.
14. Latman NS. Relation of menstrual cycle phase to symptoms of rheumatoid arthritis.

Am J Med. 1983;74(6):957–60.

15. Singh JA. Treatment guidelines in rheumatoid arthritis. Rheum Dis Clin North Am. 2022;48(3):679–89.
16. Van Oers H. Psychological and ethical issues in the management of patients with Rheumatoid Arthritis. World News Nat Sci. 2024;56:1–10.