The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 3, Issue 7, 2025

SEROLOGICAL ASSESSMENT OF RHEUMATOID ARTHRITIS RISK IN THE GENERAL POPULATION USING RHEUMATOID FACTOR ANALYSIS

Musharraf Hussain[*1], Mahnoor Javed[2], Shifa Ali[3], Alvina Saher[4], Mahoor[5], Syed Muzammil Shah[6], Hafsa Fatima[7]

[*1]*Department of Medical Lab Technology, Hazara University, Mansehra, KPK*
[2,4]*Department of Zoology, University of Sargodha, Punjab*
[3]*Department of Medical Lab Technology, University of Haripur KPK*
[5]*Department of Public Health, Health Services Academy Islamabad, Punjab*
[6,7]*Department of Medical Lab Technology, Hazara University, Mansehra KPK*

[*1]musharafmosavi@gmail.com, [2]mahnoorsundhu@gmail.com, [3]shifaali862@gmail.com, [4]maliksehar862@gmail.com, [5]mahnoorrana808@gmail.com, [6]muzammil77781@gmail.com

DOI: https://doi.org/10.5281/zenodo.16149187

Keywords

Article History
Received on 03 May 2025
Accepted on 03 July 2025
Published on 19 July 2025

Corresponding Author: *
Musharraf Hussain

Abstract

The current study was conducted to investigate Rheumatoid Arthritis in general population aimed to segregate its prevalence in opposite genders and in different age groups of selected demographic origin. The research was conducted using outdoor patients of Rawal Akot laboratories,collecting data from 100 individuals. RA, the most common autoimmune inflammatory arthritis in adults, was assessed for its prevalence in different age groups and genders, with a particular emphasis on diagnostic methods employed in laboratories. Patient reports were analyzed, encompassing key demographic factors such as age, gender, weight, and diagnostic tools. The evaluation revealed a higher prevalence of RA in women compared to men, particularly in individuals aged above 30 and commonly weighing around 60. According to the findings, 73% offemale and 27% of male patients experienced the reoccurrence of RA, with the majority of cases observed in individuals aged above 30. The study underscores the importance of addressing primefactors associated with Rheumatoid Arthritis, suggesting that improving the quality of life througha proper diet and incorporating mild exercise or physical activity may contribute to preventing thisautoimmune disease. The insights gained from this research have implications for public health initiatives and emphasize the need for targeted interventions aimed at specific demographic groupsto mitigate the impact of RA.

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic, systemic, inflammatory disease, classically affecting the small joints of the hands and feet. In industrialized countries, RA affects 0.5–1.0% of adults, with approximately 5–50 new cases per 100,000 adults per year. Like most autoimmune diseases, RA primarily affects women with a 3:1 female to male ratio. RA is rare in men under 45, while it is four times more common in women under 50. The inside female-to-males increases with age, but the

incidence of RA in women also increases, peaking around menopause. The difference in the incidence and prevalence of RA between the sexes suggests that there are factors associated with the female gender that play a role in the onset and progression of RA, with the literature focusingprimarily on the hormonal component.

However, studies on hormonal differences have produced conflicting results. For example, pregnancy and breastfeeding have been associated with a reduced risk of developing RA. At the same time, postpartum and postmenopausal periods and especially early menopause (up to 44 years) were associated with an increased risk. Rheumatoid arthritis (RA) is the most common autoimmune inflammatory arthritis in adults. RA has a significant negative impact on the ability to perform daily activities including work and household tasks and health-related quality of life and increases mortality. Rheumatoid arthritis (RA) is a chronic progressive inflammatory disease of unknown etiology characterized by polyarticular symmetric joint involvement and systemic manifestations. Rheumatoid disease is a chronic, systemic, inflammatory disease of unknown causes that can affect various organs, but primarily affects the synovial tissues of diarthrodial joints.

There are more than 100 rheumatoid diseases affecting the joints, muscles, and extra-articular systems of the body. Rheumatoid arthritis, or RA, is an autoimmune and inflammatory disease, which means your immune system mistakenly attacks healthy cells in your body and causes inflammation (painful swelling) in the affected parts of your body. RA commonly affects joints in the hands, wrists, and knees. In a joint with RA, the lining of the joint becomes inflamed, causing damage to the joint tissue. This tissue damage can cause long-term or chronic pain, instability (lack of balance) and deformity (disfigurement)

The primary purpose of this study is to systematically investigate and analyze the risk of rheumatoid arthritis (RA) across varied age groups and genders through the utilization of RA factor tests. The overarching goal is to enhance our understanding of how age and gender may intricately influence the likelihood of developing RA, thereby contributing valuable insights to both clinical practice and scientific knowledge. The study seeks to provide a comprehensive epidemiological insight into the prevalence and distribution of RA across different age groups and genders, offering nuanced perspectives on potential variations in disease occurrence within these demographic segments. Additionally, the investigation aims to have practical implications for healthcare by exploring how RA factor tests can be employed as diagnostic tools, enabling the identification of individuals at risk, especially within specific age brackets and genders. Furthermore, the study aspires to contribute to the etiological understanding of RA, delving into the complex interplay of genetic and environmental factors that may contribute to the development of the disease within distinct demographic contexts. By identifying potential health disparities and inequities, the research aims to inform public health initiatives and guide healthcare practitioners in tailoring their approaches to RA diagnosis, management, and prevention based on age and gender considerations.Ultimately, this study seeks to make a meaningful contribution to both clinical practice and academic research, with the overarching goal of improving the prevention, diagnosis, and management of rheumatoid arthritis across diverse demographic contexts.

1.1. Significance of the study

Examining the risk of rheumatoid arthritis (RA) across diverse age groups and genders through the use of RA factor tests holds paramount significance. Firstly, such research provides a nuanced understanding of the epidemiological landscape of RA, shedding light on how the prevalence andrisk factors vary within different demographic segments. Tailoring this investigation to specific age groups and genders allows for a targeted approach in clinical settings. Early identification of RA risk through the application of RA factor tests facilitates timely interventions and personalized treatment plans, potentially mitigating the severity of the disease and improving overall patient outcomes. Furthermore, the utilization of RA factor tests in this context contributes to the growing body of knowledge on the etiology of RA. By exploring the association between RA risk and demographic factors, particularly age and gender, researchers can

uncover valuable insights into the complex interplay of genetic and environmental influences. This knowledge is pivotal for advancing our understanding of the disease's origins and progression, laying the groundwork for more effective prevention and management strategies.

The significance of studying RA risk in different age groups and genders also extends to addressing health disparities. Identifying variations in risk across demographic lines helps pinpoint populations that may be disproportionately affected, informing healthcare policies and interventions aimed at reducing disparities and promoting health equity. In summary, investigatingRA risk in various age groups and genders using RA factor tests not only enhances clinical practices and patient outcomes but also contributes to the broader scientific understanding of RA'scomplexity. This research has implications for public health, personalized medicine, and the development of targeted interventions, ultimately striving for a more informed and effective approach to managing rheumatoid arthritis.

1.2. Risk factors

An important concept that has emerged in the understanding of risk factors for RA is therole of anti-citrullinated protein/peptide antibodies (ACPA), also known as anti-cyclic citrullinated peptide (anti-CCP) antibodies. ACPA is a more specific marker for RA than rheumatoid factor and is thought to be involved in the pathogenesis of the disease

1.2.1. Genetic Factors:

HLA Genes: Certain human leukocyte antigen (HLA) genes, especially the HLA-DRB1 shared epitope, are strongly associated with an increased risk of RA. Individuals with specific variants of these genes have a higher susceptibility to developing the disease.

1.2.1.1. Gender:

Female Sex: RA is more common in women than in men. The reasons for this genderdisparity are not entirely understood, but hormonal and genetic factors likely contribute.

1.2.1.2. Age/Aging:

Increasing Age: While RA can affect individuals at any age, the risk generally increases with age. The onset of RA is most common between the ages of 40 and 60Aging. The immune system undergoes changes with age, and these age-related alterations may contribute to an increased susceptibility to RA.

1.3. Rheumatoid factor Test

Rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) antibody tests are instrumental in diagnosing and managing rheumatoid arthritis (RA). RF, an autoantibody targeting immunoglobulin G, is often elevated in the blood of individuals with RA, though its presence is not exclusive to the disease. On the other hand, anti-CCP antibodies specifically target citrullinated proteins associated with RA's inflammatory processes, making them highly specific for the condition. These tests hold particular relevance in the early diagnosis of RA, aiding timely intervention crucial for mitigating disease progression and preventing joint damage. Additionally, they provide valuable prognostic information, with higher antibody levels associated with more severe outcomes. RA factor tests play a pivotal role in monitoring disease activity over time, enabling healthcare providers to assess treatment effectiveness and tailor interventions based on individual patient characteristics.

The RF tests were performed in my research because these tests are commonly used in different laboratories of Pakistan. The RF test serves as a valuable tool in diagnostic stratification, allowing participants to be categorized into seropositive and seronegative subgroups. This distinction enables a more nuanced analysis of how RA risk factors vary within these serological profiles, shedding light on potential age and gender-related disparities. Additionally, assessing RF levels contributes to the understanding of disease severity and progression, with elevated RF often associated with more severe outcomes. The research can delve into the interaction between RF levels and age or gender, elucidating variations in seropositivity rates(Ingegnoli et al., 2013).

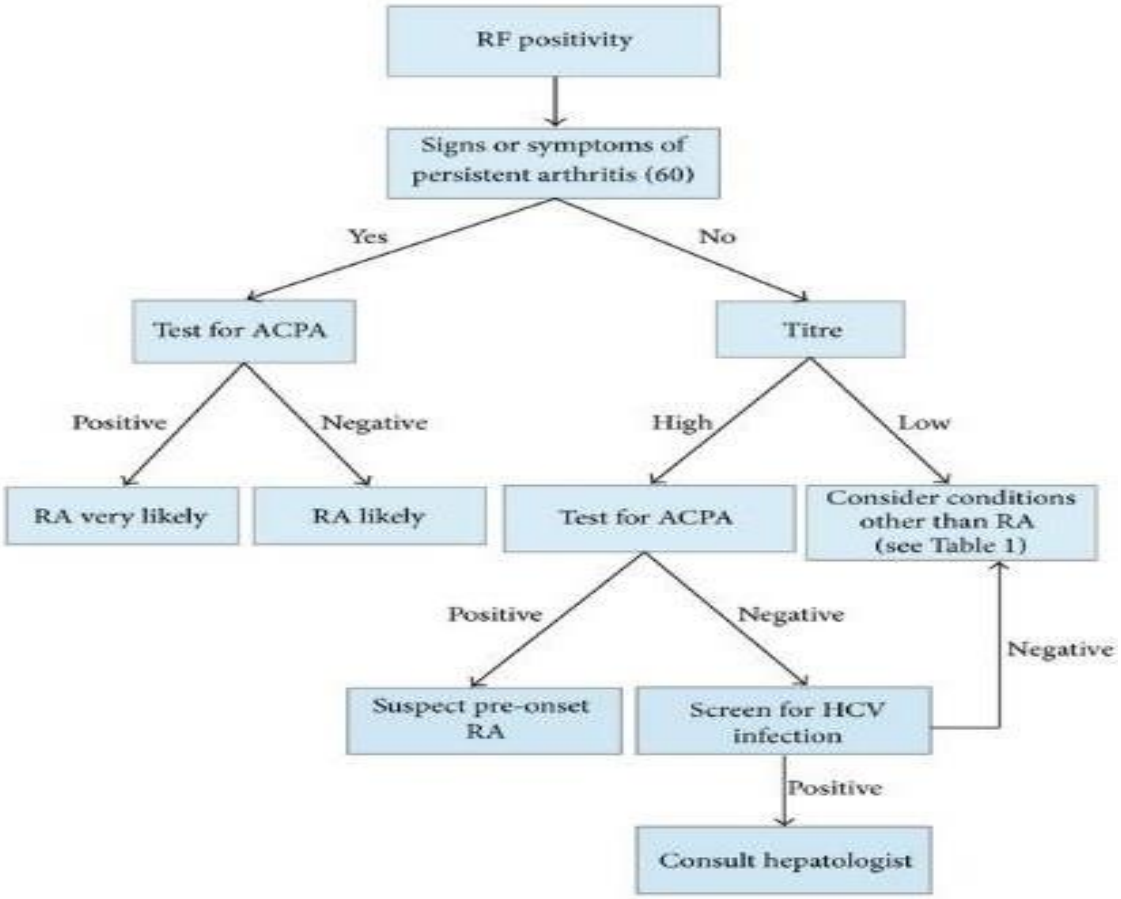
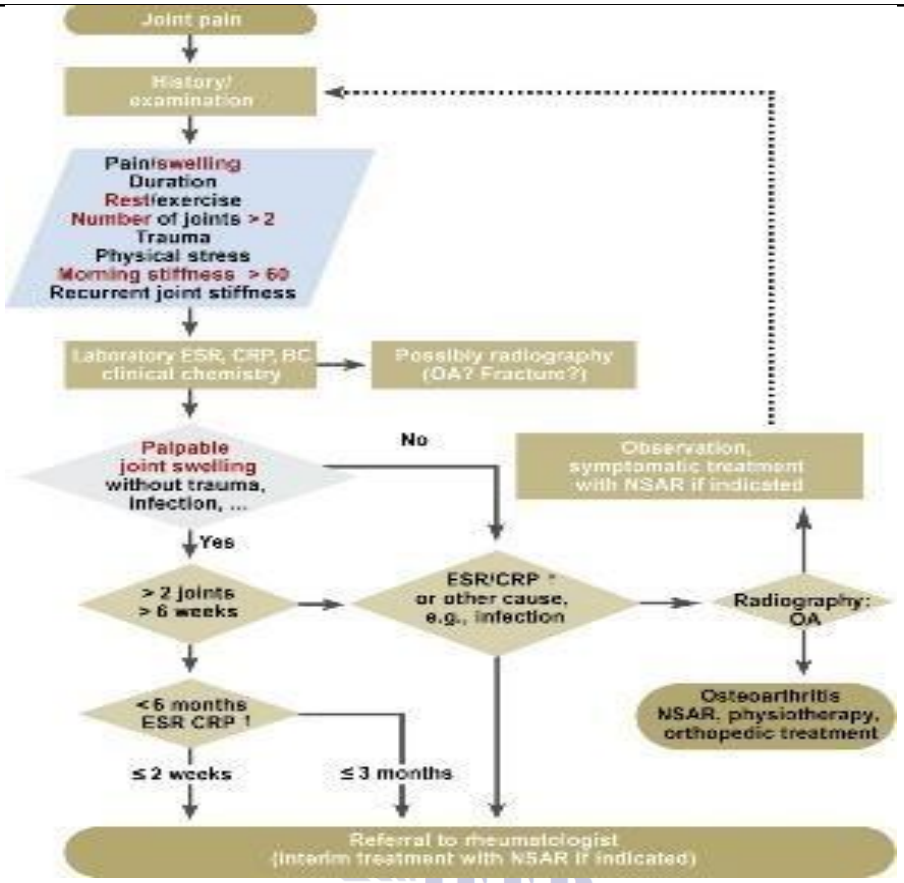


Figure 1.1. Proposed decision-making algorithm for patients who are rheumatoid factor positive at the first evaluation. RF: rheumatoid factor; RA: rheumatoid arthritis; ACPA: anti-cyclic citrullinated protein/peptide antibody.

1.4. Diagnosis

The first important step towards optimizing the long-term prognosis is early confirmation of the diagnosis of RA. The diagnosis of rheumatoid arthritis is primarily clinical. The typical presentation is polyarticular, with pain, stiffness, and swelling of multiple joints in a bilateral, symmetric pattern. A minority of patients present with oligo articular asymmetric involvement. The onset is usually insidious, with joint symptoms emerging over weeks-months and often accompanied by anorexia, weakness, or fatigue. Patients usually note morning stiffness lasting more than an hour.

Findings making rheumatoid arthritis the likely diagnosis and prompting initiation of treatment are: Joint swelling (and pain) of 3 or more joints Metacarpal or metatarsal joint involvement (a positive squeeze test, i.e., significant pain when squeezed across these joints) The cardinal symptom of RA is joint swelling, and other possible causes of this swelling must be excluded (Majithia&Geraci, 2007).



Rheumatology (ACR) and European League Against Rheumatism (EULAR) classification criteria for RA evaluate a set of variables such as risk factors, number and type of joints affected, and duration of symptoms to redefine the focus from late phase management to early detectionof RA.

1. Negative RF corresponding to 0
2. Low-positive RFCorresponding to 2
3. High-positive RF corresponding to 3
4. Patient-reported pain, swelling, and tenderness

The distribution of synovitis is different in RA (symmetric, great, and small joints includingwrist and elbow) than in ankylosing spondylitis (limited to small joints) and psoriatic arthroplasty(asymmetric, including toes). Identification of RA at initial presentation and treatment at earlier stage can affect disease course, prevent the development of joint erosions or retard progression of erosive disease. Early diagnosis and treatment may affect disease outcomes even to a remission state. Auto antibodies such as RF and anti-CCP are very helpful for the diagnosis of RA. Anti- CCP antibody demonstrated a comparable sensitivity but a greater specificity than RF for the diagnosis of RA. Combination of anti-CCP and RF increases diagnostic specificity for RA. (Heidari&Caspian,2011)

The ACR-EULAR 2010 classification includes ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI) as imaging tools for establishing an early diagnosis,due to their much higher accuracy than in the case of conventional radiographs. Blood and urine tests may help in establishing an accurate diagnosis (Pluta et al.,2021).

REVIEW OF LITERATURE

2.1.1. Prevalence of RA Worldwide

Prevalence 2% - RA is less common in developing countries (0.5% prevalence) such as South Africa, Nigeria, Indonesia, Pakistan, China, Philippines and Argentina compared to Western populations (1%). In South Africa, there is evidence of an urban-rural gradient, with virtually no cases reported in some rural areas, and a prevalence of 0.9% in the black urban South African population. In

Indonesia, the prevalence in rural areas is 0.2% compared to 0.3% in urban areas. A similarly low prevalence of 0.3% was observed in the Chinese rural population. This impressionwas confirmed in a 10-year epidemiological study in the Shantou region, where a prevalence of 0.5% was reported. A survey among rural subjects in India reported a prevalence of 0.5% of RA, confirming the deviation from Caucasian studies. Urban-rural differences in prevalence strongly suggest a role for an environmental agent in the pathogenesis of RA, but no causes have been conclusively identified to explain this variation in prevalence. In some African and Asian populations, there is a greater female predominance and a younger peak age at onset, usually under40 (Kala &Tikli,2003).

2.1.2. Prevalence of RA in Pakistan

The prevalence in Pakistan was 0.5%, while in India it was 0.2–1%. The huge interval in India's prevalence may be due to the diversity of its population. The ratio of women to men was 8:3 in Pakistan and 3:2 in India. A higher percentage of patients in India have a family history (24%) compared to Pakistan where it was seen in only 14%. The average age of onset of rheumatoid arthritis in India and Pakistan is 37 years, while in most European countries and North America the peak age is between the late 30s and early 40s. The male-to-female ratio in both India and Pakistan is approximately 3:2, while in the West it is 3:1 with a reduced number of male patients.A total of 500 RA patients were identified over three years, including 370 women and 130 men, with a female-to-male ratio of ˜3:1.

The clinical presentation of the patients revealed that small joints of the hands and feet, such as the fingers, knees, and wrists, were often affected. Patients with severe clinical conditions had severely deformed bones with a specific picture of RA. To determine the most common age of onset; patients were stratified by age into four groups i.e. Group-A (15-30 years), Group B (31-45years), Group C (46-60 years), and Group-D (60 years +). Age stratification showed a high female-to-male ratio in each age group and a mean age of disease onset of ~40 and ~50 years for womenand ~50 years, respectively (Garcia et al.,2009).The onset of symptoms occurs approximately 10years earlier in women than in men, while in group D there was almost equal ratio of women to men. Furthermore, we observed that RA is a disease of all ages, but signs and symptoms may appear more prominently in subjects older than 35 years, and the severity of the disease state increases with increasing age, reaching its peak above 60 years of age ($p = 0.001$), where inflamed bone joints can be severely deformed. The disease burden of rheumatoid arthritis is increasing dueto the lack of proper management and treatment of the disease. However, a significant proportion of RA cases remain undiagnosed in our community (Akhter et al.,2011).

2.2. Gender differences

Disorders causing joint pain and loss of mobility are 60-80% more common in women than men,and this difference is evident across all age groups. In the case of RA, both the prevalence and incidence are about 2 to 4 times higher in women and the symptoms appear to be more severe thanin men. The female/male ratio decreases with age.

Previous studies investigating the utility of rheumatoid arthritis (RA) factor tests, such as rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) antibody tests, havesignificantly contributed to our comprehension of RA diagnosis and prognosis. These tests, commonly incorporated into the diagnostic criteria for RA, exhibit diagnostic value by identifying individuals with the condition. Studies have explored the sensitivity and specificity of RA factor tests, acknowledged their usefulness while recognized the potential for false positives and negatives. The predictive value of these tests in gauging disease progression, severity, and joint damage has been a subject of investigation, shedding light on their role in anticipating clinical outcomes. Additionally, research has delved into the association between RA factor test results and specific clinical features, disease phenotypes, and treatment responses. Notably, studies haveaddressed the challenge of seronegative RA, where individuals may not test positive for RF or anti-CCP antibodies, emphasizing the need for a holistic consideration of clinical symptoms. Furthermore, the role of RA factor tests in early diagnosis and their

potential to identify individuals at risk before symptom onset has been explored. Ongoing research aims to refine our understanding of these tests and their application in personalized approaches to the diagnosis andmanagement of RA.

2.3. Gap of Current Research

This research aims to address several gaps in the current understanding of rheumatoid arthritis (RA) and the diagnostic utility of RA factor tests. One notable gap lies in the limited age and gender stratification present in existing studies, potentially obscuring variations in the diagnostic accuracy of these tests across different demographic groups. This study seeks to provide a more nuanced analysis, exploring how age and gender influence the performance of RA factor tests. Additionally, many studies lack a longitudinal perspective, focusing predominantly on cross- sectional analyses. This research aims to fill this gap by examining how the diagnostic efficacy of RA factor tests evolves over time, offering insights into the dynamic nature of RA development and progression. By addressing these gaps, the research endeavors to advance our understanding of RA diagnosis and contribute valuable insights that may guide more effective and personalized approaches to the management of rheumatoid arthritis.

2.4. Research Question

"How does the risk of rheumatoid arthritis differ between distinct age groups and genders, as assessed through RA factor tests, and what factors contribute to these variations?

2.5. Hypothesis

There is a gender –specific difference in the prevalence of Rheumatoid arthritis, with a higher occurrence in females as compared to males

MATERIALS AND METHODS

The study was conducted among patients in different laboratories of Rawalakot Azad Jammu Kashmir to investigate rheumatoid arthritis (RA) risk factors across different age groups and genders, a combination of data collection methods was employed. These methods encompass RA factor tests, patient records, and surveys to ensure a comprehensive and multifaceted approach to gathering relevant information

3.1.1. Data Collection

Gathered data of patients suffering from Rheumatoid arthritis, their demographic information, and relevant clinical history through collecting RA Factor tests. Data collection for this study involvesa multi-faceted approach, harnessing information from different laboratories within the district. These healthcare facilities serve as pivotal sources, providing valuable clinical and laboratory datato comprehensively assess the evaluation of Risk ratio of Rheumatoid Arthritis in Rawalakot Azad Jammu Kashmir Pakistan.

3.1.2. Sampling

Randomly select individuals across different age groups and genders from the Rawalakot population who have undergone RA factor tests in specified laboratories. To maintain consistencyand accuracy, a standardized data extraction protocol will be implemented. Trained personnel will navigate through hospital and laboratory records, systematically retrieving relevant information pertaining to confirmed RA cases. This includes details on diagnostic methods employed, patient demographics, and any notable clinical features.

3.1.3. Analysis

Employing statistical methods to calculate the prevalence rate, factor positivity, and other variables. Utilize logistic regression to model the relationship between age, gender, and RA factortest values**.**

3.1.3.1. Quantitative Analysis

Descriptive Statistics analysis involved the calculation of descriptive statistics to present a snapshot of the demographic characteristics of the study population.

3.1.3.2. Comparative Analysis

Comparative analysis was used to stratify the data by demographic factors, including age, gender, and geographic location. This approach aims to identify any disparities in evaluation of risk ratio among different population segments.

3.1.3.3. Ethical Consideration
Ensuring participant confidentially, informed consent, and adherence to ethical guidelines throughout the study.

3.1.4. Data Interpretation
Conclusions were drawn based on the findings.

3.1.5. Validation
Results were validated through comparison with existing literature and known prevalence rates.**3.2. Aims and Objectives**

3.2.1. Primary Objectives.
The primary objective of this research was to assess the prevalence of rheumatoid arthritis within a specific population by conducting a comprehensive analysis of RA factor test results.

3.2.2. Specific Objectives.
Risk ratio and prevalence in different age groups and gender.

3.3. Study design
The current study is observational type, designed to evaluate the risk ratio of RA in different agegroups and genders.
Rheumatoid factor test Reports from different laboratories in Rawalakot were collected and then observed and evaluated

3.4. Study type
Cross sectional study, as it allows for the assessment of prevalence at a specific region.

3.5. Place of study
For the current study data of Reports was collected from the serological department of laboratories of Rawalakot. Utilizing data collected from these laboratories, my research aims to analyze the age-specific prevalence of rheumatoid arthritis through the examination of RA factor test results, providing valuable insights into the regional dynamics of this condition.

3.5.1. Study area (District Poonch)
District Poonch becomes the focal point of an intriguing epidemiological study on the prevalence of Rheumatoid Arthritis (RA). The district's charm lies in its diverse topography. In this unique locale, a population comprising a blend of various ethnicities and communities faces distinctive challenges in healthcare delivery and disease management. The socio-economic fabric of District Poonch is intricately woven with threads of traditional practices and an agrarian lifestyle, setting the stage for a study that delves into the health complexities of this dynamic community. Recognizing the dynamic interplay between these factors, the research aims to unravel the intricacies of Rheumatoid Arthritis. By zooming in on this specific locality, the study seeks to unearth context-specific insights that can inform targeted interventions. In the pursuit of understanding the prevalence of RA, the study acknowledges the impact of environmental factors shaped by the district's topography and the influence of an agrarian lifestyle on occupational risks. Furthermore, the cultural richness and historical significance of Rawalakot are recognized as potential factors influencing healthcare-seeking behaviors and attitudes towards chronic diseases. The socio-economic disparities, prevalent between rural and urban areas, contribute to the complexity of healthcare accessibility. Limited access to crucial resources may lead to delayed diagnoses and inadequate management of RA in certain segments of the population. In response to these challenges, the research proposes a multidisciplinary approach, involving collaboration between healthcare professionals and researchers. Surveys, interviews, and medical examinations become the tools of exploration, aiming to collect data on RA prevalence, healthcare-seeking behaviors, and socio-economic factors.

3.6. Selection of case histories
Case histories of patients were documented in laboratory- reports study.

3.6.1. Inclusion criteria.
Patients of all ages especially those of 30 years and above, male and female patients, and patientswith co-morbidities were evaluated.

3.6.2. Exclusion Criteria.
Pregnant females and patients who have undergone recent orthopedic surgery were excluded from the study.

3.7. Sample size.
During the study period, almost 100 reports were observed.

3.8. Materials for tests
The accurate diagnosis of rheumatoid Arthritis relies on the availability and utilization of appropriate materials and tools. In the context of the prevalence study in Rawal Akot AJK, a comprehensive set of materials for RA test swill be employed to ensure the reliability of the results.The following materials are integral to the diagnostic processes:

3.8.1. RF Latex Test Kits
RF Latex test kits is intended for the qualitative and semi-quantitative measurement of RF in human serum. These kits typically include.

1.Test cassettes or strips with specific antigens.
2.Lancets for collecting blood samples, especially in field settings.
3.Disposable gloves for healthcare workers handling the tests.

3.8.2. Transportation Supplies
1. Materials for the safe transportation of blood samples
2. Biohazard bags for storing and transporting samples.
3. Cool boxes or containers with ice packs to maintain sample integrityduring transit.
The selection and availability of these materials are crucial for the success of the Evaluationof Risk ratio of Rheumatoid arthritis in Rawal Akot AJK.

3.9. Data analysis.
Errors were analyzed using different software; graphs were generated using SPSS and MS Excel.Percentages were calculated using different statistical techniques.

RESULTS AND DISCUSSION

4.1. Age

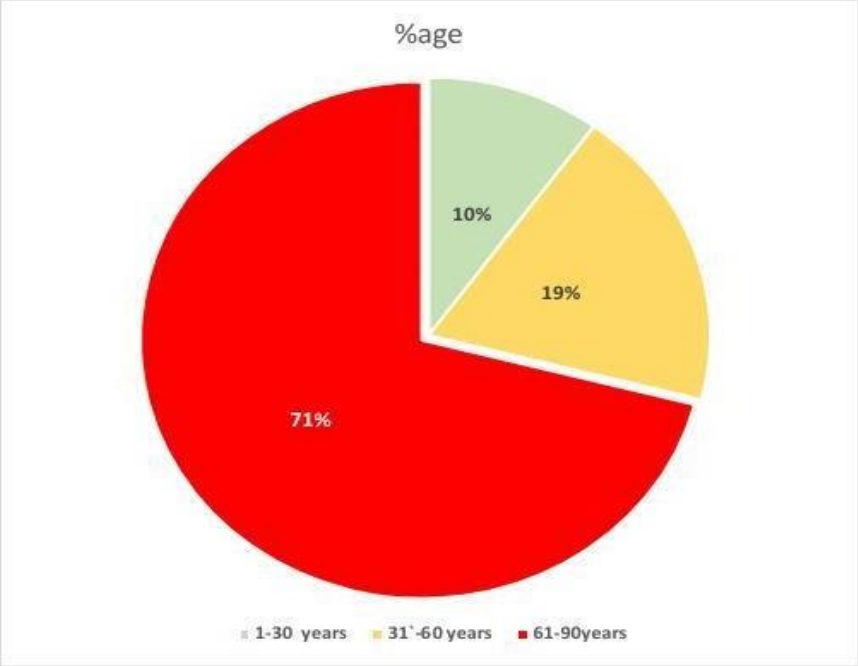


Figure 4.1.: showing the percentage of prevalence of RA in different age groups.

This graph shows RA percentage variations in different groups of ages i.e. from 1 year to 30 yearsit is 10% from 31 years to 60 years it is 71% and from 61 years to 90 years it is 19%.Thus RA is at peak at

the age of 31 to 60 years and less at the age of 60 to 90 years and rare at the age of 1 to30 years. 10% 71% 19% %age 1-30years 31-60years 61-90years.

The presented data reveals distinct percentage variations in RA prevalence across the specified age ranges. Notably, the lowest percentage (10%) is observed in individuals aged 1-30 years, indicating that RA is relatively rare in this younger population. This aligns with existing literature that suggests a lower incidence of RA in pediatric and adolescent age groups (Rasch et al., 2003).

In contrast, the peak RA prevalence is observed in individuals aged 31-60 years, constituting71% of the cases. This age group represents a critical period in the adult lifespan and is consistentwith previous epidemiological studies that have identified the middle-aged population as being athigher risk for developing RA. The heightened prevalence during this period could be attributed to a combination of genetic predisposition, environmental factors, and lifestyle choices(Symmons,2002).

The data also highlights a decline in RA prevalence among individuals aged 61-90 years, accounting for 19% of the cases. This trend could be associated with various factors, including changes in immune response, hormonal fluctuations, and potentially a cohort effect where individuals with RA may experience increased mortality rates in older age (Silva-Fernández et al.,2020).

4.2. Gender

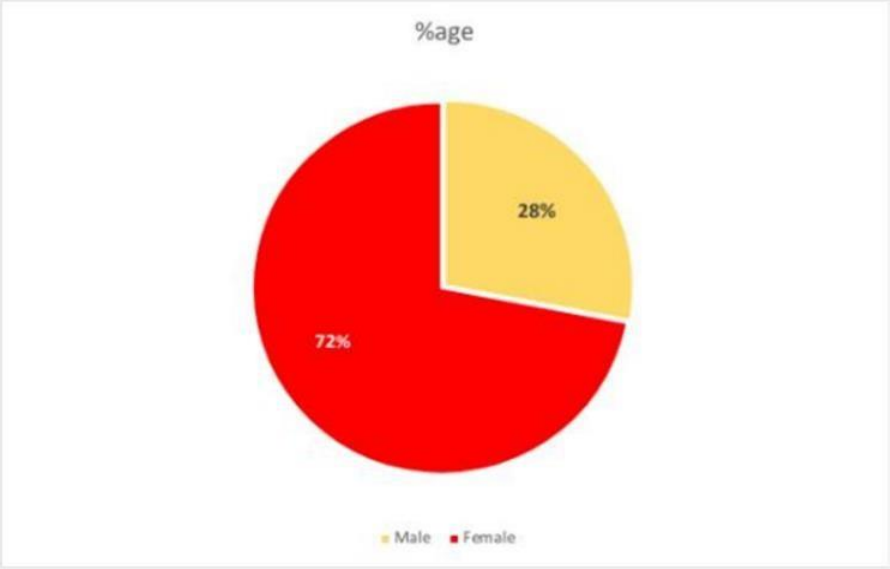


Figure4.2. showing the percentage prevalence of RA in gender.

This graph shows the presence of RA in percentage variation according to the gender ofRA patients i.e. in males it is 27% and in females, it is 73% means that RA is more.

The graph illustrates a significant gender disparity in the prevalence of RA, with a clear predominance in females, constituting 73% of the reported cases. This aligns with well-established epidemiological trends that consistently identify females as being more susceptible to autoimmunedisorders, including RA. The higher prevalence in females has been attributed to hormonal factors,genetic predisposition, and the interplay of the immune system, although the precise mechanisms remain complex and multifactorial (Rudan et al., 2015).

In contrast, males account for 27% of RA cases in the dataset. While the prevalence is substantially lower, it is important to acknowledge that RA can affect individuals of any gender. The lower percentage in males may be associated with the protective effects of certain hormonal factors present in males, genetic differences, or other yet-to-be-discovered factors (Hunter et al., 2017).

4.3. RA Lab Test Results

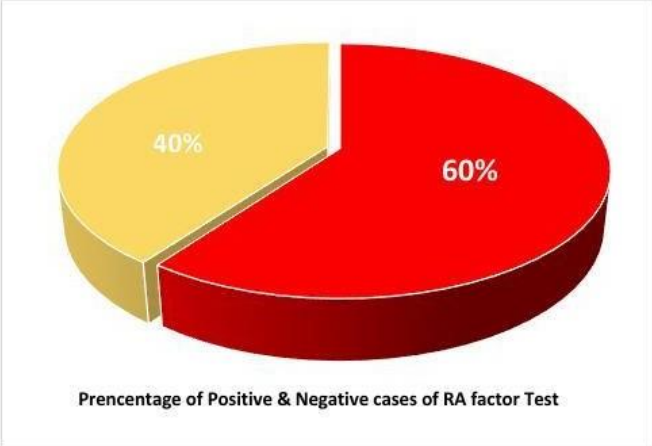


Figure 4.3: Graph showing the percentage of RA lab test results.

This graph shows the presence of RA in percentages varying according to Laboratory Tests done for diagnosis of RA patients that is 60% of RA patients reports are positive in RF Test.

The observation that 60% of RA patients have positive results in the RF test underscores the diagnostic relevance of this marker in identifying RA. RF is an autoantibody directed against the Fc portion of immunoglobulin G (IgG), and its presence is indicative of an immune system response against the body's own tissues. The higher prevalence of positive RF tests aligns with theclassical understanding that RF positivity is a characteristic feature of RA. However, it is essentialto note that RF positivity is not exclusive to RA and can be found in other autoimmune and inflammatory conditions (Hunter et al., 2017).

5. Implications

The observed age-related patterns raise intriguing questions for further research. Investigating the underlying mechanisms responsible for the peak prevalence in the 31-60 age group could provide insights into the etiology of RA. Longitudinal studies exploring the impact of lifestyle factors, hormonal changes, and genetic predisposition across different age cohorts may contribute to a more nuanced understanding of RA development.

Additionally, research into the outcomes and management strategies for RA in older populations is warranted. As the prevalence declines in individuals aged 61-90 years, understanding the factors contributing to this decrease can inform geriatric rheumatology care and contribute to improved quality of life for elderly individuals with RA.

The observed gender disparities open avenues for further research to unravel the underlying mechanisms contributing to the higher prevalence of RA in females. Investigating the influence of hormonal fluctuations, genetic factors, and potential interactions between the immune system and sex-specific biology could provide valuable insights into the pathogenesis of RA.

Additionally, exploring the reasons behind the lower prevalence in males can contribute to a comprehensive understanding of the disease. Research focusing on male-specific risk factors and the potential protective effects of certain biological factors may pave the way for gender-specific interventions and personalized medicine in the realm of rheumatoid arthritis.

The prominence of positive RF tests in the studied RA population prompts further research into the specificity and sensitivity of RF as a diagnostic marker. Investigating the correlation between RF positivity and specific clinical manifestations, disease severity, and treatment responsecan contribute to a better understanding of the clinical utility of RF in the context of RA.

Furthermore, research efforts should explore the diagnostic value of combining multiple laboratory tests, such as RF and anti-CCP, to enhance diagnostic accuracy and reliability. This approach aligns with the evolving paradigm of utilizing a combination of biomarkers for a more nuanced and personalized approach to RA diagnosis.

SUMMERY

This study aimed to understand the prevalence of rheumatoid arthritis (RA) within a specific population. Data from 100 patients was analyzed visiting Rawalakot laboratories, focusing on gender, age, weight, and diagnostic methods.

The key finding was a higher prevalence of RA in women compared to men, with 73% of female patients and 27% of male patients experiencing the condition. Additionally, the prevalence increased in individuals above 30 years old, with a common weight of around 60 kg observed among those affected. Notably, 73% of women and 27% of men experienced recurring RA episodes, highlighting a potential risk for reactivation.

RECOMMENDATIONS

Rheumatoid arthritis (RA), a chronic autoimmune disease characterized by joint pain, fatigue, and inflammation, poses a significant global health concern. This study delves into its prevalence and potential risk factors within the specific context of Pakistan, a low-income country.

The research suggests a concerning trend: compared to high-income nations, the prevalence of RAappears to be higher in Pakistan. This aligns with existing studies highlighting socioeconomic disparities in access to healthcare, nutrition, and environmental factors that may contribute to RA development. Additionally, the study reveals a stark gender disparity, with a considerably higher burden of RA observed among females compared to males. This aligns with global trends but calls for further investigation into specific risk factors within the Pakistani population. Limited physical activity among females is suggested as a potential contributor, warranting deeper exploration of cultural and socioeconomic factors that might influence lifestyle choices.

Further analysis revealed that the majority of diagnosed cases fall within the 30-60 age bracket, mirroring established patterns of RA onset. Data collection involved visiting hospital laboratoriesin Rawalakot City, focusing on the distribution of RA patients across genders and age groups. While the RF test was employed for diagnosis, the study acknowledges its limitations and emphasizes the need for more comprehensive diagnostic approaches incorporating additional markers and clinical assessments.

Despite limitations arising from the specific population and diagnostic methods employed, this study offers valuable insights. It highlights the potential influence of socioeconomic factors on RA prevalence and underscores the need for tailored approaches in low-income settings. Recognizingthe gender disparity necessitates investigating specific cultural and lifestyle factors contributing tohigher risk among females. Moving forward, research should explore diverse populations, utilize broader diagnostic criteria, and evaluate the effectiveness of specific lifestyle interventions for RAprevention and management within the Pakistani context. By addressing these crucial areas, healthcare professionals and policymakers can work towards mitigating the unequal burden of RAand improving the lives of individuals affected by these debilitating diseases.

REFERANCES

Alamanos, Y., &Drosos, A. A. (2005). Epidemiology of adult rheumatoid arthritis.

Autoimmunity Reviews, 4(3), 130–136.

Akhter, E., Bilal, S., & Haque, U. (2011). Prevalence of arthritis in India and Pakistan: a review. Rheumatology International, 31(7), 849–855.

Bullock, J., Rizvi, S. a. A., Saleh, A., Ahmed, S., Duc, P., Ansari, R. A., & Ahmed, J. (2018).

Rheumatoid arthritis: A brief overview of the treatment. Medical Principles and Practice, 27(6), 501–507

Caporali, R., Pallavicini, F. B., Filippini, M., Gorla, R., Marchesoni, A., Favalli, E. G., ... &Montecucco, C. (2009). Treatment of rheumatoid arthritis with antiTNF-alpha agents: a reappraisal. Autoimmunity reviews, 8(3), 274-280.

Chancay, M. G., Guendsechadze, S. N., & Blanco, I. (2019). Types of pain and their psychosocial impact in women with rheumatoid arthritis. Women's Midlife Health, 5(1).

Conigliaro, P., Triggianese, P., De Martino, E., Fonti, G. L., Chimenti, M. S., Sunzini, F., Viola,A., Canofari, C., &Perricone, R. (2019). Challenges in the treatment of Rheumatoid Arthritis. Autoimmunity Reviews, 18(7), 706–713.

Crofford, L. J. (2013). Use of NSAIDs in treating patients with arthritis. Arthritis Research & Therapy, 15(S3).

DiPiro, C., Wells, B., Schwinghammer, T., &DiPiro, J. (2014). Pharmacotherapy Handbook, 9/E. McGraw-Hill Education / Medical.

Forestier, J. (1932). The Treatment Of Rheumatoid Arthritis With Gold Salts Injections. The Lancet, 219(5661), 441–444. https://doi.org/10.1016/s0140-6736(01)24417-1

Fürst, D. E., Keystone, E., Braun, J., Breedveld, F. C., Gr, B., De Benedetti, F., Dörner, T., Emery, P., Fleischmann, R., Gibofsky, A., Kalden, J. R., Kavanaugh, A., Kirkham, B., Mease, P. J., Sieper, J., Singer, N. G., Smolen, J., Van Riel, P., Weisman, M. H., &Winthrop, K. (2011). Updated consensus statement on biological agents for the treatment of rheumatic diseases, 2010. Annals of the Rheumatic Diseases, 70(Suppl 1), i2–i36. https://doi.org/10.1136/ard.2010.146852

Fürst, D. E. (1997). The rational use of methotrexate in rheumatoid arthritis and other rheumatic diseases. Rheumatology, 36(11), 1196–1204. https://doi.org/10.1093/rheumatology/36.11.1196

Gabriel, S. E., & Michaud, K. (2009). Epidemiological studies in incidence, prevalence, mortality, and comorbidity of the rheumatic diseases. Arthritis Research & Therapy, 11(3), 229. https://doi.org/10.1186/ar2669

Goodman, C., & Snyder, T. E. K. (2006). Differential diagnosis for physical therapists :Screening for referral. http://ndpta.net/pdf/WebRegFall12.pdf

Gaffo, A., Saag, K. G., & Curtis, J. R. (2006). Treatment of rheumatoid arthritis. American Journal of health-system pharmacy, 63(24), 2451-2465.

Handa, R., Rao, U. R. K., Lewis, J. F. M., Rambhad, G., Shiff, S., & Ghia, C. J. (2015).

Literature review of rheumatoid arthritis in India. International Journal of Rheumatic Diseases, 19(5), 440–451. https://doi.org/10.1111/1756-185x.12621

Heidari, B. (2011). Rheumatoid Arthritis: Early diagnosis and treatment outcomes. PubMed. https://pubmed.ncbi.nlm.nih.gov/24024009

Hunter, T., Boytsov, N., Zhang, X., Schroeder, K., Michaud, K., & Araujo, A. B. (2017).

Prevalence of rheumatoid arthritis in the United States adult population in healthcare claims databases, 2004–2014. Rheumatology International, 37(9), 1551–https://doi.org/10.1007/s00296-017-3726-1

Jalil, F., Arshad, M., Bhatti, A., Jamal, M., Ahmed, M., Malik, J., Ali, S., Akbar, F., & John, P.(2017). Progression pattern of rheumatoid arthritis: A study of 500 Pakistani patients.

PubMed, 30(4), 1219–1223. https://pubmed.ncbi.nlm.nih.gov/29039317

Ingegnoli, F., Castelli, R., &Gualtierotti, R. (2013). Rheumatoid factors: clinical applications.

Disease Markers, 35, 727–734. https://doi.org/10.1155/2013/726598

Kalla, A. A., &Tikly, M. (2003). Rheumatoid arthritis in the developing world. Best Practice &Research Clinical Rheumatology, 17(5), 863-875.https://doi.org/10.1007/978-1-4757-9829-6_12

Kvien, T. K. (2004). Epidemiology and burden of illness of rheumatoid arthritis.

PharmacoEconomics, 22(S1), 1–12. https://doi.org/10.2165/00019053-200422001-00002

Liao, K. P., Alfredsson, L., &Karlson, E. W. (2009). Environmental influences on risk for rheumatoid arthritis. Current Opinion in Rheumatology, 21(3), 279–283. https://doi.org/10.1097/bor.0b013e32832a2e16

Majithia, V., &Geraci, S. A. (2007). Rheumatoid arthritis: Diagnosis and management. The American Journal of Medicine, 120(11), 936–939.

Michaud, K., & Wolfe, F. (2007). Comorbidities in rheumatoid arthritis. Best Practice &Research Clinical Rheumatology, 21(5), 885–906. https://doi.org/10.1016/j.berh.2007.06.002

Mertens, M., & Singh, J. A. (2009). Anakinra for Rheumatoid Arthritis: A Systematic review.

The Journal of Rheumatology, 36(6), 1118–1125. https://doi.org/10.3899/jrheum.090074

O'Dell, J. R. (2004). Therapeutic strategies for rheumatoid arthritis. The New England Journal of Medicine, 350(25), 2591–2602. https://doi.org/10.1056/nejmra040226

Perdomo-Celis, F., Taborda, N. A., &Rugeles, M. T. (2019). CD8+ T-Cell response to HIV

infection in the era of antiretroviral therapy. Frontiers in Immunology, 10. https://doi.org/10.3389/fimmu.2019.01896

Radu, A., &Bungău, S. (2021). Management of Rheumatoid Arthritis: An Overview. Cells, 10(11), 2857. https://doi.org/10.3390/cells10112857

Rasch, E. K., Hirsch, R., Paulose-Ram, R., & Hochberg, M. C. (2003). Prevalence of rheumatoidarthritis in persons 60 years of age and older in the United States: Effect of different methods of case classification. Arthritis & Rheumatism, 48(4), 917–926. https://doi.org/10.1002/art.10897

Rodríguez, L. D., Tolosa, L., Ruigómez, A., Johansson, S., &Wallander, M. (2009b).

Rheumatoid arthritis in UK primary care: incidence and prior morbidity. Scandinavian Journal of Rheumatology, 38(3), 173–177. https://doi.org/10.1080/03009740802448825

Sayah, A., & English, J. C. (2005). Rheumatoid arthritis: A review of the cutaneous manifestations. Journal of the American Academy of Dermatology, 53(2), 191–209. https://doi.org/10.1016/j.jaad.2004.07.023

Singh, J. A., Saag, K. G., Bridges Jr, S. L., Akl, E. A., Bannuru, R. R., Sullivan, M. C., ... &McAlindon, T. (2016). Rheumatology guideline for the treatment of rheumatoid arthritis. Arthritis & rheumatology, 68(1), 1-26.

Smolen, J. S., Aletaha, D., &McInnes, I. B. (2016). Rheumatoid arthritis. The Lancet,388(10055), 2023–2038. https://doi.org/10.1016/s0140-6736(16)30173-8

Strońska, A., Pluta, W., Lalko, A., &Lubkowska, A. (2021b). Diagnostics and physiotherapy in rheumatoid arthritis. Journal of Education, Health and Sport, 11(5), 26–32. https://doi.org/10.12775/jehs.2021.11.05.002

Srirangan, S., & Choy, E. (2010). The role of Interleukin 6 in the pathophysiology of rheumatoidarthritis. Therapeutic Advances in Musculoskeletal Disease, 2(5), 247–256. https://doi.org/10.1177/1759720x10378372.

Symmons, D. (2002). The prevalence of rheumatoid arthritis in the United Kingdom: newestimates for a new century. British Journal of Rheumatology, 41(7), 793–800. https://doi.org/10.1093/rheumatology/41.7.793

Tas, M. H., Turk, S. A., & van Schaardenburg, D. (2015). How does established rheumatoid arthritis develop, and are there possibilities for prevention Best Practice & Research Clinical Rheumatology, 29(4-5), 527-542.