

Clinical Functional Profile of The Hands of Patients With Rheumatoid Arthritis at Royal Prima Hospital Medan

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Abstract.

Rheumatoid arthritis (RA) is a chronic autoimmune disease that frequently causes progressive joint damage, particularly in the hands, resulting in impaired functional ability in daily activities. This study aims to describe the hand function of patients with rheumatoid arthritis based on age, gender, and family history at Royal Prima Hospital Medan. This research employed a descriptive quantitative design with a cross-sectional approach involving 55 respondents who met the inclusion criteria. Data were collected using a structured hand function questionnaire assessing right hand, left-hand, and bilateral hand function across various activities. Data analysis was conducted using univariate and bivariate descriptive methods through cross tabulation. The results showed that hand function impairment was most prominent in patients aged >40 years, who predominantly fell into the "poor" function category. Female respondents demonstrated a higher level of functional limitation compared to males. Meanwhile, a family history of RA contributed as a predisposing factor but did not directly correlate with the severity of functional impairment. Patients with a family history tended to fall within the "moderate" category, while more severe impairment was observed among those without a family history. Older age and female gender are major factors associated with reduced hand function in RA patients, whereas family history serves as a predisposition rather than a determinant of severity.

Keywords: Rheumatoid arthritis; hand function; age; gender and family history.

I. INTRODUCTION

Rheumatoid arthritis (RA) is a chronic autoimmune disease characterized by inflammation of the joints, particularly the small joints of the hands and feet [9]. This condition can lead to permanent joint damage and disability, ultimately affecting the patient's quality of life. In Indonesia, the prevalence of rheumatoid arthritis is estimated to be increasing in line with the growing elderly population, which constitutes the age group most frequently affected by this disease [8]. As the number of cases rises, it becomes increasingly important to gain a better understanding of the diagnostic profile and management of rheumatoid arthritis in hospitals [6]. In its early stages, diagnosing rheumatoid arthritis can be challenging because its clinical manifestations resemble other conditions such as osteoarthritis or lupus [12]. Therefore, a combination of clinical assessment and supporting examinations is required to establish an accurate diagnosis. Physical examinations and complementary tests—such as blood analysis (ESR, CRP), serological tests (RF, Anti-CCP), and imaging techniques like X-ray or MRI—play essential roles in confirming the diagnosis and evaluating disease severity [17]. However, despite the availability of various diagnostic tools, many patients arrive at the hospital in more advanced stages due to delays in early diagnosis [7]. Previous studies have shown that several factors influence the diagnosis of rheumatoid arthritis, including patient characteristics such as age, sex, and family history [5]. The prevalence of rheumatoid arthritis is higher in women compared to men, and the disease often manifests in adulthood, with peak incidence between 30 and 50 years of age [14]. Nevertheless, cases among elderly patients have also increased, and symptoms are often more difficult to recognize due to comorbidities and age-related physiological changes [16]. As the number of rheumatoid arthritis cases continues to rise, hospitals face increasing challenges in providing appropriate and effective treatment [2]. Management of rheumatoid arthritis involves the use of non-steroidal anti-inflammatory drugs (NSAIDs), disease-modifying anti-rheumatic drugs (DMARDs), and corticosteroid

therapy. Some patients may require biological therapy or more advanced immunomodulatory agents. These treatments aim not only to reduce symptoms but also to slow or halt the progression of joint damage [10]. Hence, a multidisciplinary approach involving rheumatologists, physiotherapists, and other healthcare professionals is essential for optimal disease management [15]. At hospitals in Medan, data regarding the diagnosis and management of rheumatoid arthritis remain limited [13]. This represents a primary concern of the present study, which aims to provide a clearer overview of how rheumatoid arthritis is diagnosed and managed in this healthcare setting [11]. The study also seeks to identify the most frequently performed diagnostic procedures and the therapies typically administered to patients, particularly those presenting with more severe disease [3]. By understanding the diagnostic profile and management strategies employed, this research is expected to offer valuable insights for healthcare providers and hospitals to improve the quality of rheumatoid arthritis diagnosis and treatment [1]. Furthermore, the findings may contribute to optimizing resource utilization within the hospital to ensure more effective therapy for patients with rheumatoid arthritis [4].

II. METHODS

This study employed an analytical association design with a cross-sectional approach to evaluate the clinical hand function of patients with rheumatoid arthritis at Royal Prima Hospital Medan. The research was conducted within the hospital setting, involving a population comprising all patients diagnosed with rheumatoid arthritis affecting the hands, based on predefined inclusion criteria. Eligible participants were individuals with a confirmed diagnosis of rheumatoid arthritis established through clinical manifestations supported by laboratory tests and imaging findings. The sampling technique used in this study was total sampling, in which all patients who met the diagnostic criteria for rheumatoid arthritis of the hands were included as research subjects. Data analysis consisted of univariate and bivariate procedures, performed using SPSS version 27. Following data processing, descriptive statistics were used to determine the distribution and proportions of respondent characteristics according to the predefined study variables.

III. RESULT AND DISCUSSION

Result

General Overview of the Data

| Characteristics | Frequency |
|------------------------|-----------|
| Man | 3 |
| Woman | 52 |
| 20 - 30 years old | 1 |
| 31 - 40 years old | 6 |
| > 40 years old | 48 |
| Family History | 18 |
| Without Family History | 37 |

The majority of respondents were female (94.5%), while males accounted for only 5.5%. This finding is consistent with the literature indicating that rheumatoid arthritis occurs more frequently in women, with an approximate female-to-male ratio of 3:1. Most respondents were over 40 years old, totaling 48 individuals (87.3%), followed by the 31–40 age group with 6 individuals (10.9%) and the 20–30 age group with 1 individual (1.8%). These results demonstrate that rheumatoid arthritis predominantly affects older adults, aligning with its known tendency to manifest after the age of 40. A total of 18 respondents (32.7%) reported having a family history of rheumatoid arthritis, while 37 respondents (67.3%) had no such history. This indicates that genetic predisposition contributes to a portion of rheumatoid arthritis cases, although it is not the sole etiological factor in the development of the disease.

Association Between Sex and Right-Hand Function

| Right-Hand Function | Male n(%) | Female n(%) | Total n(%) |
|---------------------|-----------|-------------|------------|
| Good | 1 (33.3) | 2 (3.8) | 3 (5.5) |
| Fair | 0 (0.0) | 25 (48.1) | 25 (45.5) |
| Poor | 2 (66.7) | 25 (48.1) | 27 (49.1) |
| Total | 3 (100.0) | 52 (100.0) | 55 (100.0) |

The functional assessment of the right hand showed that the majority of respondents fell into the *poor* category (49.1%), followed by the *fair* category (45.5%), while only a small proportion demonstrated *good* function (5.5%). When stratified by sex, female respondents represented the largest absolute number of cases with poor hand function. However, in proportional terms, male respondents exhibited a higher burden of functional impairment, with 66.7% categorized as poor. These findings suggest that most patients with rheumatoid arthritis experience significant right-hand functional limitations, with a relatively greater severity observed among male patients proportionally, despite the predominance of female cases in the overall sample.

Association Between Sex and Left-Hand Function

| Left-Hand Function | Male n(%) | Female n(%) | Total n(%) |
|--------------------|-----------|-------------|------------|
| Good | 0 (0.0) | 6 (11.5) | 6 (10.9) |
| Fair | 2 (66.7) | 27 (51.9) | 29 (52.7) |
| Poor | 1 (33.3) | 18 (34.6) | 19 (34.5) |
| Very Poor | 0 (0.0) | 1 (1.9) | 1 (1.8) |
| Total | 3 (100.0) | 52 (100.0) | 55 (100.0) |

Based on Table, left-hand function was predominantly classified as *fair*, accounting for 52.7% of respondents, followed by the *poor* category at 34.5%. The *good* category represented 10.9% of cases, while the *very poor* category was the least common, observed in only 1.8% of respondents. When examined by sex, female respondents comprised the majority across all functional categories, with the highest proportions found in the *fair* (51.9%) and *poor* (34.6%) groups. Among male respondents, most were also categorized as *fair* (66.7%). These findings indicate that left-hand functional impairment was more frequent among women in absolute numbers, although the overall distribution of functional categories appeared relatively similar between male and female respondents.

Association Between Sex and Bilateral Hand Function

| Bilateral Hand Function | Male n(%) | Female n(%) | Total n(%) |
|-------------------------|-----------|-------------|------------|
| Ofren | 0 (0.0) | 1 (1.9) | 1 (1.8) |
| Sometimes | 0 (0.0) | 17 (32.7) | 17 (30.9) |
| Rarely | 1 (33.3) | 19 (36.5) | 20 (36.4) |
| Never | 2 (66.7) | 15 (28.8) | 17 (30.9) |
| Total | 3 (100.0) | 52 (100.0) | 55 (100.0) |

The assessment of bilateral hand function showed that most respondents were categorized as *rarely* experiencing functional difficulties (36.4%). The *sometimes* and *never* categories demonstrated equal frequencies at 30.9%, whereas the *often* category was the least represented, accounting for only 1.8%. When analyzed by sex, female respondents constituted the majority in all categories, particularly within the *rarely* (36.5%) and *sometimes* (32.7%) groups. Among male respondents, most fell into the *never* category (66.7%), indicating that men reported fewer bilateral hand function complaints compared with women. These findings suggest that although female patients showed a higher absolute number of functional limitations in both hands, male patients were proportionally less likely to report such impairments.

Association Between Age and Right-Hand Function

| Right Hand Function | 20-30 Years Old n(%) | 31-40 Years Old n(%) | >40 Years Old n(%) | Total n(%) |
|---------------------|----------------------|----------------------|--------------------|------------|
| Good | 1 (100.0) | 0 (0.0) | 2 (4.2) | 3 (5.5) |
| Fair | 0 (0.0) | 4 (66.7) | 21 (43.8) | 25 (45.5) |
| Poor | 0 (0.0) | 2 (33.3) | 25 (52.1) | 27 (49.1) |
| Total | 1 (100.0) | 6 (100.0) | 48 (100.0) | 55 (100.0) |

Across all age groups, the *poor* category represented the largest proportion of right-hand functional impairment, particularly among respondents aged >40 years, where it reached 52.1%. In the 31–40-year age group, the most frequent classification was *fair* (66.7%), while respondents aged 20–30 years were exclusively categorized as *good* (100.0%). Overall, the >40-year age group demonstrated the highest burden of right-hand functional decline, reflected in the elevated proportions of both *fair* and *poor* categories. These findings indicate that increasing age is associated with greater deterioration of hand function in patients with rheumatoid arthritis, consistent with the chronic and progressive nature of inflammatory joint disease that intensifies with advancing age.

Association Between Age and Left-Hand Function

| Left Hand Function | 20-30 Years Old n(%) | 31-40 Years Old n(%) | >40 Years Old n(%) | Total n(%) |
|--------------------|----------------------|----------------------|--------------------|------------|
| Good | 1 (100.0) | 1 (16.7) | 4 (8.3) | 6 (10.9) |
| Fair | 0 (0.0) | 44 (66.7) | 25 (52.1) | 29 (52.7) |
| Poor | 0 (0.0) | 1 (16.7) | 18 (37.5) | 19 (34.5) |
| Very Poor | 0 (0.0) | 0 (0.0) | 1 (2.1) | 1 (1.8) |
| Total | 1 (100.0) | 6 (100.0) | 48 (100.0) | 55 (100.0) |

The distribution of left-hand function showed that the majority of respondents were categorized as *fair* (52.7%), with the highest proportion observed in the 31–40-year age group (66.7%). The *poor* category accounted for 34.5% of cases, predominantly among individuals older than 40 years (37.5%). The *good* category represented 10.9% of respondents, all within the 20–30-year age group. Additionally, the *very poor* category was rare (2.1%) and found exclusively in participants over 40 years of age. Overall, these findings indicate that left-hand functional impairment is more common among older adults, consistent with the progressive nature of rheumatoid arthritis and its higher clinical severity in individuals above 40 years of age.

Association Between Age and Bilateral Hand Function

| Bilateral Hand Function | 20-30 Years Old n(%) | 31-40 Years Old n(%) | >40 Years Old n(%) | Total n(%) |
|-------------------------|----------------------|----------------------|--------------------|------------|
| Often | 0 (0.0) | 0 (0.0) | 1 (2.1) | 1 (1.8) |
| Sometimes | 1 (100.0) | 2 (33.3) | 14 (29.2) | 17 (30.9) |
| Rarely | 0 (0.0) | 3 (50.0) | 17 (35.4) | 20 (36.4) |
| Never | 0 (0.0) | 1 (16.7) | 16 (33.3) | 17 (30.9) |
| Total | 1 (100.0) | 6 (100.0) | 48 (100.0) | 55 (100.0) |

The assessment of bilateral hand function revealed that most respondents fell into the *rarely* category (36.4%), followed by the *sometimes* and *never* categories, each accounting for 30.9%. The *often* category appeared only among respondents aged >40 years (2.1%). In the 31–40-year age group, half of the respondents (50.0%) were categorized as *rarely*, while in the >40-year age group, the highest proportions were also observed in the *rarely* (35.4%) and *never* (33.3%) categories. Respondents aged 20–30 years were exclusively categorized as *sometimes* (100%). Overall, these findings indicate that bilateral hand dysfunction ranged from mild to moderate and was more frequently observed among older individuals, particularly those aged >40 years. This pattern aligns with the progressive nature of rheumatoid arthritis, whereby functional impairment becomes more pronounced with increasing age due to cumulative chronic inflammation and joint degradation.

Association Between Family History and Hand Function

| Right Hand Function | Present n(%) | Absent n(%) | Total n(%) |
|---------------------|--------------|-------------|------------|
| Good | 1 (5.6) | 2 (5.4) | 3 (5.5) |
| Fair | 9 (50.0) | 16 (43.2) | 25 (45.5) |
| Poor | 8 (44.4) | 19 (51.4) | 27 (49.1) |
| Total | 18 (100.0) | 37 (100.0) | 55 (100.0) |

Among respondents with a family history of rheumatoid arthritis, 44.4% fell into the *poor* right-hand function category. A slightly higher proportion, 51.4%, was observed in the group without a family history. The *fair* category was also common in both groups, representing 50.0% among those with a positive family history and 43.2% among those without. The *good* category was the least represented in both groups. Overall, these findings indicate that impaired right-hand function was prevalent in both groups, regardless of family history status. This suggests that although genetic predisposition contributes to the risk of developing rheumatoid arthritis, the severity of functional impairment appears to be more closely associated with disease progression rather than hereditary factors alone.

Association Between Family History and Left-Hand Function

| Left Hand Function | Present n(%) | Absent n(%) | Total n(%) |
|--------------------|--------------|-------------|------------|
| Good | 1 (5.6) | 5 (13.5) | 6 (10.9) |
| Fair | 13 (72.2) | 16 (43.2) | 29 (52.7) |

| | | | |
|-----------|------------|------------|------------|
| Poor | 4 (22.2) | 15 (40.5) | 19 (34.5) |
| Very Poor | 0 (0.0) | 1 (2.7) | 1 (1.8) |
| Total | 18 (100.0) | 37 (100.0) | 55 (100.0) |

The most common category of left-hand function was *fair*, observed in 72.2% of patients with a family history of rheumatoid arthritis and 43.2% of those without such a history. The proportion of *poor* function was higher among patients without a family history (40.5%) compared to those with a family history (22.2%). The *good* category was identified in 10.9% of respondents, while the *very poor* category was the least frequent at 1.8%. Overall, patients with a family history were more frequently classified in the *fair* category, whereas those without a family history exhibited a higher proportion of severe functional impairment. These findings suggest that although family history contributes to RA susceptibility, the severity of left-hand functional limitation is primarily influenced by disease progression and the individual clinical condition of each patient.

Association Between Family History and Bilateral Hand Function

| Bilateral Hand Function | Present n(%) | Absent n(%) | Total n(%) |
|-------------------------|--------------|-------------|------------|
| Often | 0 (0.0) | 1 (2.7) | 1 (1.8) |
| Sometimes | 7 (38.9) | 10 (27.0) | 17 (30.9) |
| Rarely | 5 (27.8) | 15 (40.5) | 20 (36.4) |
| Never | 6 (33.3) | 11 (29.7) | 17 (30.9) |
| Total | 18 (100.0) | 37 (100.0) | 55 (100.0) |

Both groups, with and without a family history of rheumatoid arthritis, exhibited relatively mild bilateral hand functional difficulties. The *rarely* category accounted for 27.8% in the group with a family history and 40.5% in the group without. The *sometimes* category represented 38.9% of respondents with a family history and 27.0% of those without. Only 2.7% of the group without a family history experienced difficulties in the *often* category, and none of the respondents with a family history fell into this category. Overall, these findings indicate that the presence of a family history does not necessarily correlate with the severity of bilateral hand functional impairment in RA patients. Both groups predominantly exhibited mild to moderate functional limitations. Other factors, such as disease duration, level of inflammation, and ongoing therapy, are likely to have a more significant influence on the functional performance of both hands.

Discussion

Association Between Sex and Hand Function in Patients with Rheumatoid Arthritis

The results of this study indicate that hand function in patients with rheumatoid arthritis (RA) was more frequently impaired in female respondents compared to males. Across analyses of right-hand, left-hand, and bilateral hand function, the *poor* and *fair* categories were consistently higher among female patients. For instance, in right-hand function, the *poor* category accounted for 48.1% of females versus 33.3% of males. Similar patterns were observed for left-hand and bilateral hand function, suggesting that women are more likely to experience functional limitations in daily activities. Scientifically, these findings align with existing literature indicating that RA occurs more frequently in women and tends to impose greater functional impacts. Siti and Haryanto (2023) reported that the higher prevalence of RA in women is partly attributable to estrogen, which can enhance immune responses to inflammation. Furthermore, Setiawan and Prabowo (2022) emphasized that women are more susceptible to progressive joint damage from RA, resulting in reduced hand mobility. Similarly, Salim and Anggoro (2022) noted that chronic inflammation in RA leads to pain and joint stiffness, which are more commonly reported by female patients than male patients. Therefore, the present study supports the scientific evidence that female sex is associated with a higher risk of hand function decline in RA.

Association Between Age and Hand Function in Patients with Rheumatoid Arthritis

The findings of this study indicate that patients aged over 40 years exhibited greater hand functional impairment compared to younger age groups. In both right- and left-hand function assessments, the >40 years group predominated in the *poor* category, accounting for 52.1% in the right hand and 37.5% in the left hand. Conversely, patients aged 20–30 years were primarily classified in the *good* category, while those aged 31–40 years were mostly in the *fair* category. These results suggest that advancing age increases the

likelihood of hand functional limitations due to chronic inflammatory processes in rheumatoid arthritis (RA). These findings are consistent with the literature indicating that age is a significant factor in the progression of joint damage in RA. According to Setiawan and Prabowo (2022), RA prevalence is higher among older adults due to decreased tissue elasticity, increased susceptibility to inflammation, and degenerative processes that exacerbate joint deformities. Additionally, Prasetyo and Amalia (2022) highlighted that elderly patients experience more severe joint damage due to uncontrolled inflammation and weakened immune responses. Supporting this, Marisa and Hidayat (2021) reported that chronic inflammation in RA accelerates bone and cartilage damage, resulting in progressive hand functional decline with increasing age. Therefore, the present study corroborates the concept that advancing age is closely associated with the severity of hand dysfunction in patients with rheumatoid arthritis.

Association Between Age and Clinical Impact

The findings of this study indicate that patients with rheumatoid arthritis (RA) who have a family history tend to exhibit predominantly *fair* hand function, although this does not necessarily translate to worse functional impairment compared to patients without a family history. In right-hand function, the *fair* category was most frequent among respondents with a family history (50.0%), whereas the *poor* category was more pronounced in those without a family history (51.4%). A similar pattern was observed for left-hand and bilateral hand function: patients with a family history were more often in the *fair* category or reported *rare* functional difficulties, while those without a family history were distributed across more severe categories.

These results suggest that the presence of a family history does not fully predict the degree of hand functional impairment but is associated with an initial predisposition to developing RA. Scientifically, this aligns with existing literature indicating that RA has a substantial genetic component, yet the severity of joint dysfunction is influenced by multiple factors such as disease duration, inflammation levels, and treatment effectiveness. Marisa and Hidayat (2021) reported that genetic predisposition increases the risk of chronic inflammation, but clinical manifestations vary widely among individuals. Similarly, Ramadhan and Hadi (2023) noted that family history elevates the likelihood of developing RA, yet the extent of joint damage depends on inflammation control and ongoing therapy. Nugroho and Susanti (2020) further emphasized that although genetics play a role, RA progression is primarily determined by disease activity and therapeutic response. Therefore, the present study reinforces the evidence that family history constitutes a risk factor for RA but is not directly correlated with the severity of hand functional impairment.

IV. CONCLUSION

The study on hand function in rheumatoid arthritis (RA) patients at RS Royal Prima Medan indicates that age, sex, and family history influence functional impairment. Patients over 40 years exhibited the highest proportion of poor hand function, while females consistently showed greater impairment across right, left, and bilateral hands. Family history was associated with RA risk but did not directly predict severity; patients with a family history were more often in the fair category, whereas more severe impairment occurred in those without a family history, reflecting the impact of inflammation and disease duration. These findings highlight that RA-related hand dysfunction results from a combination of biological, demographic, and genetic factors, underscoring the need for individualized management strategies.

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