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Correlation Between Disease Activity and Disability in Patients with Rheumatoid Arthritis: Insights from a North-East India Cohort.

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ABSTRACT

Rheumatoid arthritis (RA) is a chronic inflammatory disorder leading to joint damage and disability. This study aimed to evaluate the correlation between disease activity (DAS28) and disability (MHAQ-DI) among RA patients in a tertiary care setting. A hospital-based observational study was conducted among 96 RA patients at Gauhati Medical College & Hospital over one year. Disease activity was assessed using DAS28 scores, and disability was evaluated using the Modified Health Assessment Questionnaire Disability Index (MHAQ-DI). Patients were categorized based on DAS28 and MHAQ-DI scores. Correlation analysis was performed using Pearson's correlation coefficient. High disease activity (DAS28 >5.1) was observed in 53.13% of patients, and high disability (MHAQ-DI ≥0.3) was reported in 66.67%. Among patients with high disease activity, 80.39% exhibited high disability. A strong positive correlation was found between DAS28 and MHAQ-DI scores ($r = +0.69$, $p < 0.01$). Disease activity strongly correlates with functional disability in RA patients. Early and aggressive control of disease activity is essential to minimize disability and improve quality of life. Routine assessment of both DAS28 and MHAQ-DI is recommended in RA management.

Keywords: Rheumatoid arthritis, Disease activity, Disability

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INTRODUCTION

Rheumatoid arthritis (RA) is a chronic inflammatory disease characterized by progressive joint destruction, systemic inflammation, and significant disability.(1) Beyond joint involvement, RA profoundly impacts patients' quality of life, functional capacity, and participation in daily activities. Quantifying disease activity and disability is critical for guiding therapeutic decisions and evaluating treatment outcomes. (2,3,4)

The Disease Activity Score in 28 joints (DAS28) is a validated tool widely used to assess RA activity by incorporating tender joint count, swollen joint count, ESR, and patient's global health assessment. The Modified Health Assessment Questionnaire Disability Index (MHAQ-DI) provides a patient-reported measure of functional ability and disability. Understanding the relationship between disease activity and disability is essential for optimizing patient-centered care. (5)

Although effective therapies can reduce disease activity and slow disability progression, in resource-limited settings like India, many patients continue to present with high disease activity and significant disability. (6) Data on the correlation between DAS28 scores and MHAQ-DI in Indian RA cohorts remains limited. This study aimed to evaluate the correlation between RA disease activity and disability and to identify the proportion of patients with high disease activity and corresponding functional impairment in a tertiary care setting in Northeast India.

STUDY METHODOLOGY

This hospital-based observational study was conducted over one year (July 2015 to June 2016) in the Department of Medicine, Gauhati Medical College & Hospital, Guwahati. Ninety-six consecutive RA patients, diagnosed according to the 2010 ACR/EULAR classification criteria, were enrolled. Ethical clearance was obtained from the institutional review board, and written informed consent was secured from all participants.

All patients underwent comprehensive clinical evaluation, including demographic data, disease duration, and presenting symptoms. Disease activity was assessed using the DAS28 scoring system, which incorporates 28 tender joint count (TJC), 28 swollen joint count (SJC), ESR, and patient's global health assessment. DAS28 scores were interpreted as high (>5.1), moderate (3.2–5.1), or low (<3.2) disease activity.

Disability was evaluated using the Modified Health Assessment Questionnaire Disability Index (MHAQ-DI). MHAQ-DI scores were categorized as normal (<0.3) or high disability (≥0.3). Data were analyzed to assess the distribution of DAS28 scores and MHAQ-DI scores across the cohort and to explore the correlation between disease activity and disability.

Statistical analysis was performed using Microsoft Excel and GraphPad InStat. Pearson correlation coefficient was calculated to assess the relationship between DAS28 and MHAQ-DI. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Distribution of Disease Activity (DAS28 Score) Among RA Patients

DAS28 Score Category	Number of Patients	Percentage (%)	Mean ± SD
High Disease Activity (>5.1)	51	53.13	5.02 ± 0.94
Moderate Disease Activity (3.2–5.1)	36	37.50	
Low Disease Activity (<3.2)	9	9.37	
Total	96	100	

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Table 2: Distribution of Disability (MHAQ-DI Score) Among RA Patients

MHAQ-DI Category	Number of Patients	Percentage (%)	Mean ± SD
Normal (<0.3)	32	33.33	1.09 ± 0.77
High Disability (≥0.3)	64	66.67	
Total	96	100	

Table 3: Correlation Between Disease Activity (DAS28) and Disability (MHAQ-DI)

DAS28 Category	% Patients with High MHAQ-DI (≥0.3)	% Patients with Normal MHAQ-DI (<0.3)
High Disease Activity (>5.1)	80.39% (41/51)	19.61% (10/51)
Moderate Disease Activity (3.2–5.1)	61.11% (22/36)	38.89% (14/36)
Low Disease Activity (<3.2)	11.11% (1/9)	88.89% (8/9)

Correlation coefficient (r): +0.69
p-value: <0.01 (Statistically significant)

DISCUSSION

The present study highlights a strong positive correlation between disease activity and disability in RA patients, as evidenced by the significant relationship between DAS28 scores and MHAQ-DI scores ($r = +0.69$, $p < 0.01$). This finding underscores that higher disease activity is associated with greater functional impairment, which aligns with the established understanding of RA pathophysiology. (7)

In our cohort, 53.13% of patients exhibited high disease activity (DAS28 >5.1), and 66.67% reported high disability (MHAQ-DI ≥0.3). These proportions reflect the substantial disease burden in this population, likely influenced by delayed diagnosis, suboptimal access to biologic therapies, and socioeconomic factors prevalent in resource-limited settings.

When stratified by DAS28 category, a striking pattern emerged: 80.39% of patients with high disease activity had corresponding high disability, whereas only 11.11% of those in remission/low disease activity reported significant disability. This gradient highlights the direct impact of active inflammation on functional outcomes and reinforces the importance of early and aggressive control of disease activity.

The association between joint inflammation (as measured by TJC and SJC) and functional capacity is biologically plausible, as pain, stiffness, and joint damage progressively impair mobility and daily activities. Moreover, systemic symptoms such as fatigue, which correlate with inflammation, may further exacerbate disability.

Our findings align with international literature. Previous studies (e.g., Aletaha et al., 2005; Smolen et al., 2016) have consistently demonstrated that effective suppression of disease activity leads to improvements in patient-reported outcomes, including disability measures. This underscores the role of tight disease control in RA management—not only to prevent joint damage but also to enhance quality of life. (8,9,10,11)

Notably, while MHAQ-DI captures functional ability, it may also reflect psychosocial factors, comorbidities, and cumulative joint damage, which were not separately quantified in our study. Therefore, some residual disability observed in patients with low DAS28 scores may stem from irreversible joint deformities or other factors.

Our study also points to a care gap in the study setting: the high proportion of patients with both high disease activity and high disability suggests that many patients remain undertreated or are treated late. This emphasizes the need for improved awareness, timely referral to rheumatology services, and access to effective DMARDs and biologics.

Limitations of our study include its cross-sectional design, which precludes assessment of causality or longitudinal changes. Moreover, MHAQ-DI, though validated, may not capture the full spectrum of disability experienced by Indian RA patients due to cultural and occupational differences.

In conclusion, this study reinforces that disease activity is a major driver of disability in RA. Monitoring both DAS28 and MHAQ-DI should be an integral part of RA management. Prioritizing early diagnosis, tight disease control, and rehabilitation strategies is crucial to minimizing disability and enhancing patient outcomes in RA.

CONCLUSIONS

Disease activity strongly correlates with functional disability in RA patients. Early and aggressive control of disease activity is essential to minimize disability and improve quality of life. Routine assessment of both DAS28 and MHAQ-DI is recommended in RA management.

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