



STUDY OF DISEASE ACTIVITY & DISABILITY INDEX IN RHEUMATOID ARTHRITIS (RA) IN A TERTIARY CARE RHEUMATOLOGY CLINIC

Rheumatology

Dr. Deepika Ravi	Senior Resident, Department of Medicine, LTMMC, SION MUMBAI.
Dr. Vrushali Badhan*	Post Graduate Resident, Department of Medicine, LTMMC, SION, MUMBAI. *Corresponding Author
Dr. Sanket Charpe	Post Graduate Resident, Department of Medicine, LTMMC, SION, MUMBAI.
Dr. Kunal Bawankar	Post Graduate Resident, Department of Medicine, LTMMC, SION, MUMBAI.
Dr. Lalana Kalekar	Associate Professor, Department of Medicine, LTMMC, SION, MUMBAI.
Dr. Amruta Digole	Assistant Professor, Department of Medicine, LTMMC, SION, MUMBAI.

ABSTRACT

The aim of RA treatment is changing from early aggressive treatment to treat-to-target, where target is remission/low disease activity (LDA). In various trials, on an average 30% (20 to 40%) patients achieved remission when defined by DAS28-ESR scores. But in actual practice, situation is unlike clinical trials, for e.g., in QUEST-RA Study, multi-centre trial performed across various countries, overall patients had average DAS28-ESR score 4.0. In this study, the aim was to measure the disease activity of patients in an Indian setting where patient compliance is a frequent problem; observe the factors affecting compliance and the effect of compliance on disease activity. Out of 78 patients, target of remission/LDA was achieved in 38.46% of patients. Average DI was 0.49 (0 to 1.92).

KEYWORDS

Rheumatoid arthritis (RA), DAS28-ESR, low disease activity (LDA), Disability Index (DI)

INTRODUCTION-

Rheumatoid arthritis (RA) is an autoimmune systemic disease that primarily affects joints. It primarily affects the small joints of the hands, is symmetric and may progress to involve the proximal joints too. It is a chronic disease with no cure and hence early diagnosis and early institution of therapy is mandatory to achieve a disease activity as low as possible. Left to time, it progresses to cause destruction and deformities of the joints. It is associated with premature deaths and significant socioeconomic burden. Besides joints, RA also has systemic manifestations of varied nature, the most significant of which are cardiac manifestations. RA is diagnosed by the EULAR ACR criteria which takes into account the joints involved and acute phase reactants - ESR, CRP. This need was recognised way back in the mid twentieth century and since then there have been developed many scoring systems, each of them have been reviewed in different settings and have been validated for clinical practice. The available tools these days are simplified to a great extent and can be done quickly on OPD basis within minutes. These scores are quite sensitive in reflecting efficacy of therapy and modulation if required. Measuring disability is also an important of assessment of functional component of the disease. With effective therapy available for the control of RA, it is not difficult to achieve remission, provided a careful monitoring is done by the provider and a good compliance is ensured by the patient. With a holistic approach, it is possible to achieve a low disease activity in majority of the patients and to limit the systemic manifestations. In this study, we aim to measure the disease activity of patients in an Indian setting where patient compliance is a frequent problem encountered. We aim to observe the factors affecting compliance and the effect of compliance on disease activity.

OBJECTIVES-

1. To find out proportion of patients who achieve target i.e. remission/LDA.
2. To find out average disease activity & disability index (DI) of RA patients who were on DMARDs for atleast 6 months.
3. To study social factors affecting disease activity/poor disease control.

METHODS-

Patients diagnosed as RA by ACR/EULAR 2010 classification criteria, on DMARDs for atleast 6 months were included. It was cross-sectional study done over 2 months in tertiary care Rheumatology clinic. Disease activity using DAS28-ESR & DI using Indian-HAQ was calculated at one visit. Additional data regarding compliance, use of alternative medicine, level of education, per capita income & distance

from hospital was also noted.

Statistical Methods-

Categorical variables like compliance, use of alternative medicine, education <10 th std, per capita income $\leq$ INR 4000, distance from hospital >40 km were analysed using Chi square test.

Sample Size- 78

RESULTS-

Out of 78 patients, females were 71 (91%), males were 7 (9%), F:M=9:1; average age was 40 years (23-68); average disease duration was 5 years (1-26). Average DAS28-ESR score was 3.74 (0.97-6.72). Remission & LDA was seen in 38.46% & high disease activity (HDA) & moderate disease activity (MDA) was seen in 61.54%. Compliance to treatment was seen in 66.7% of patients, among them remission/LDA was seen in 28 (53.8%) & MDA/HDA in 24 (46.2%). This study revealed statistically significant correlation of compliance & disease activity by DAS28-ESR ($p=0.004$). Use of alternative medicine was seen in 12 (15.4%) patients. Among them, 8.33% had remission/LDA & 91.67% had MDA/HDA ($p=0.020$). Among those who lived <10 km, all were compliant; whereas among those living >40 km, 44.4% were compliant. Patients living >40 km constituted 32 (41%) patients; out of which remission/LDA was seen in 7 (21.9%) & MDA/HDA was seen in 25 (78.1%). Association of distance from hospital >40 km with compliance ($p=0.001$) & with disease activity ($p=0.012$) was statistically significant. Out of 78 patients, 34 (43.6%) had education <10th std; out of which remission/LDA was seen in 4 (11.8%) & MDA/HDA in 30 (88.2%) patients ($p<0.001$). Eighteen (28.6%) patients had per capita income $\leq$ 4000 INR, of which none achieved target of remission/LDA & all had HDA/MDA ($p<0.001$). DI was calculated by Indian-HAQ score. 63% had DI<1, 16% had no disability & 20% had DI>1, none had DI>2. Correlation of disease activity score (DAS28-ESR) with DI was statistically significant ($p=0.020$).

Table 1: Baseline Characteristics Of Study Population

	Observation
Total no. of patients enrolled [N]	78
Age (years)	Avg. 40 years (Range-23 to 68 years)
Sex	
M [n/N (%)]	7/78 (9%)
F [n/N (%)]	71/78 (91%)

Disease duration (years)	Avg. 5 years (Range-1 to 26 years)
DAS28-ESR	3.74 (0.97-6.72)
Only RA positive [n/N (%)]	39/78 (50%)
Only Anti CCP positive [n/N (%)]	20/78 (25.6%)
Both RA & Anti CCP positive [n/N (%)]	19/78 (24.4%)
Presence of deformities [n/N (%)]	10/78 (13%)
Compliance [n/N (%)]	52/78 (66.7%)
Use of alternate medicine [n/N (%)]	12/78 (15.4%)
Educational status [n/N (%)]	
Uneducated	10/78 (12.8%)
< 10 th std	24/78 (30.8%)
10 th std	16/78 (20.5%)
12 th std	9/78 (11.5%)
Beyond 12 th std	19/78 (24.4%)
Monthly family income (INR)	Avg. INR 27296 (Range INR 6000-45000)
Per capita income (INR) [n/N (%)]	
Upto 4000	17/78 (26.98%)
4000-8000	32/78 (50.79%)
>8000	14/78 (22.22%)
Distance from hospital (n/%)	
< 10 km	21/78 (26.9%)
10-40km	25/78 (32%)
>40 km	19/78 (24.4%)
Different city	13/78 (16.7%)
Indian HAQ/Disability Index (DI)	
DI<1 (n/%)	50/63 (79.4%)
DI>1 (n/%)	13/63 (20.6%)

Table 2:- Factors Affecting Disease Control

FACTOR	DAS28-ESR Remission (<=2.6) / LDA (2.6-3.2)	DAS28-ESR MDA (>3.2-5.1)/ HDA (>5.1)	p value
Compliance with treatment n/N (%)	28/52 (53.8%)	24/52 (46.2%)	p=0.004
Use of alternative medicine n/N (%)	1/12 (8.33%)	11/12 (91.67%)	p=0.020
Education < 10 th std n/N (%)	4/34 (11.8%)	30/34 (88.2%)	p<0.001
Per capita income <=4000 INR n/N (%)	0/18 (0%)	18/18 (100%)	p<0.001
Distance from hospital >40 km n/N (%)	7/32 (21.9%)	25/32 (78.1%)	p=0.012
DI >=1 (Disability Index) n/N (%)	1/13 (7.7%)	12/13 (92.3%)	p=0.020

LDA - Low Disease Activity
MDA - Moderate Disease Activity
HDA - High Disease Activity
DI - Disability Index

DISCUSSION:

This cross sectional study aimed to calculate the disease activity in patients with seropositive Rheumatoid Arthritis (RA) as diagnosed by the EULARACR 2010 Criteria. For calculating the disease activity, in this study the DAS 28 ESR, CDAI and SDAI scores were used. The patients who reached a low disease activity or remission were noted. This study also noted the compliance in the study population, the factors affecting non-compliance and the effect of compliance on disease activity. As in other autoimmune disorders, RA more commonly affects females than males. The sex ratio is typically around 3:1, female to male. Our study showed a ratio of 9:1. The female predominance, with a similar ratio has been demonstrated in Indian studies as well. The predominant affected appear to be the middle aged, as was noted in our study where 65% population lied in the 30- 50 age bracket.

Calculated by the DAS ESR score, 13% and 26% achieved a low disease activity and remission respectively, in our study. Calculated by CDAI, 38% achieved a low disease activity and 17% achieved remission. Calculated by SDAI, 29% achieved a low disease activity and 8% achieved remission. These scores for disease activity (DAS, CDAI and SDAI) have been validated in multiple studies conducted globally. Measures of RA disease activity should also reflect the clinical perception of disease activity, meaning that a rheumatologist's identification of a severe case of RA should be matched by an equally high value of the index, which we observed in our study while calculating the disease activity with these scores. Our study has also shown a positive correlation between the DAS28, CDAI and SDAI scores (p=0.001). Multiple studies have been conducted worldwide in different settings to assess the comparability of the various scores for disease activity. These studies found a significant association and found all these scores to be almost equal in their measurement of the disease activity. It can be stated with confidence that the scores for disease activity are equally accurate and the physician can choose based on the clinical and socio-economic scenario as to which score to use.

In our study, 50% of the study population had a positive RA factor, 25% had positive ACPA and the rest 25% had both the antibodies. In clinical practice, it is recommended to measure anti-cyclic citrullinated peptide antibodies and rheumatoid factors together because anti-cyclic citrullinated peptide antibodies alone are only moderately sensitive, and the combination of the two markers improves diagnostic accuracy, especially in the case of early rheumatoid arthritis. Our study also found that those with both RA and ACPA positivity had lower rates of remission (5%).

Compliance in this study was assessed by directly asking the patients and the relatives. Patients were instructed to get the empty/consumed medication strips. Objective assessment of compliance could not be done in this study. This study showed a statistically significant correlation of compliance on disease activity calculated by all the three scores used i.e., DAS, CDAI, SDAI (p=0.004, 0.006 and 0.001 respectively). Our study found compliant people were almost two times more in remission than non-compliant. The non-compliant patients were found to have a higher disease activity as calculated by the three scores. Similar results have been observed in studies. Pasma et.al. monitored the disease activity by DAS 28 done 3 monthly, in a subset of RA patients who were non adherent to therapy. Their study also found adherent patients twice more frequently in remission. They monitored compliance by the 'medication event monitoring system' (MEMS) device. In our study, confrontation technique and interrogation of patients and relatives was used to find out the compliance. Our study identified various reasons for non-compliance in our patients. Among the patients non-compliant to conventional DMARDs in our study, which constituted 33% of our study population, the majority (46%) were non-compliant to as they were taking alternate medication from elsewhere. 39% were non-compliant due to inability to follow up and get medications because of the ongoing COVID pandemic. The other ill effects of the COVID pandemic included a significant attrition of our routine OPD follow up patients. The rest of the non-compliant patients had financial issues disabling them from buying medications. Lack of knowledge about medication was not present as a reason for non-compliance in any of our patients. Compliance and its determinants are multifactorial. There haven't been many studies which have studied the effect of distance from the hospital as a factor affecting compliance in RA. Our study found a highly significant 92 correlation in this aspect (p= 0.001) Those who stayed within 10km from the hospital were compliant to treatment (100% compliance), while those living far away were less frequent visitors to the OPD and consequently were less compliant. Further studies are required taking distance as a factor for adherence, to establish this importance. The relation of educational status and compliance was not significant in our study.

Functional assessment in this study was done by the Indian HAQ score. In our study, 71% had a disability index of less than 1. HAQ score is a subjective assessment and our study found a majority of the patients not experiencing significant disability. On a similar note, it was also observed that the Patient Global Activity (PGA), which is also a subjective measurement of assessment of the patient's overall wellbeing had overall low scores. The mean was 2.26 which corresponds to a satisfactory wellbeing. A low PGA was seen even in patients with a moderate disease activity, which raises a question as to

whether therapy should be stepped up with a consequent increase in adverse effect, or to continue the same treatment keeping the PGA as the top most priority. Our study saw a significant correlation between the disability and disease activity as calculated by DAS, CDAI and SDAI ($p=0.001$). A study by Weaver et.al showed a positive correlation between disease activity and disability.

Deformities in RA were previously quite common. The degree and variety of deformities is multifold. It is secondary to synovial destruction. In our study, 10 of 78 (13%) patients had deformities. Deformity affects functionality and quality of life.

CONCLUSION:-

Target of remission/LDA was achieved in 38.46% of patients. Average disease activity was 3.74 which was comparable to that from QUEST-RA study. Average DI was 0.49 (0 to 1.92). Significant social factors affecting disease activity adversely were compliance to treatment, use of alternative medicine, level of education, per capita income $\leq$ 4000 INR & staying far away from centre (poor access to rheumatology services). Correlation of disease activity score with DI also implies that those with low disease activity had less disability. Disease activity can be correlated with DI in our study because of short duration of disease.

Conflict Of Interest

The Authors have no conflicts of interest.

Financial Resources

There are no financial resources to fund this study.

Informed Consent

Informed Consent was obtained from the patient.

Author's Contribution

All the authors contributed equally to the case report.

Data And Materials Availability

All data associated with this study done at tertiary care centre hospital are present in the paper.

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