



A RETROSPECTIVE OBSERVATIONAL STUDY TO CORRELATE BODY MASS INDEX AND DISEASE SEVERITY IN RHEUMATOID ARTHRITIS PATIENTS

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ABSTRACT

Background: Rheumatoid arthritis is chronic, inflammatory, autoimmune, debilitating disorder which is characterized by symmetrical polyarthritis. Altered body composition occurs in RA due to metabolic alterations triggered by nuclear factor kappa-beta pathway causing Rheumatoid cachexia. [1]. This study is done to evaluate risk of disease severity measured by Simplified Disease Activity Index (SDAI) & Clinical Disease Activity Index (CDAI) scores, in association with obesity based on BMI. **Methods:** Total 58 rheumatoid arthritis patients were included in study. Acute phase reactants ESR & CRP of each patient recorded. BMI, CDAI & SDAI scores were calculated for each patient. **Results:** Correlation between BMI and CDAI showed moderate negative correlation with p value of 0.006 & between BMI and SDAI showed moderate negative correlation with p value of 0.009. **Conclusion:** Obesity is protective in Rheumatoid Arthritis patients.

KEYWORDS : Rheumatoid Arthritis, CDAI score, SDAI score, BMI

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic inflammatory disease of unknown etiology characterized by symmetrical polyarthritis. Since persistently active RA results in articular cartilage & bony destruction & functional disability, it is vital to diagnose & treat it early & aggressively.

Disability May Result From Both

- Disease activity related component that is potentially reversible with therapy
- Joint damage related component which is irreversible

The amount of clinical disease activity reflects overall burden of inflammation.[2]

Indices used for assessing disease severity include: Disease Activity Score (DAS), Simplified Disease Activity Index (SDAI), Clinical Disease Activity Index (CDAI), ACR improvement criteria.

Acute phase reactants (APRs), such as serum C-reactive protein (CRP), Erythrocytic Sedimentation Rate (ESR), are common biomarkers used to monitor the status of inflammatory diseases.[3]

BMI is the most common anthropometric assessment for obesity at whole body level & can be readily used in studies as it's an easy, quick & cheap method.

METHODOLOGY

This is a cross sectional observational study on correlation of BMI and disease severity of Rheumatoid Arthritis.

Data of patients in past 6 months was collected. Study was carried out by filling an offline questionnaire after informed consent from the participants.

The collected data was entered into a MS Excel file. A total sample size of n=50 (n=58 included) was calculated. The data on categorical variables is shown as n (% of cases) and continuous variables is shown as Mean \pm Standard deviation (SD). The association between continuous variables is done using Pearson's correlation analysis. The entire data is statistically analyzed using JASP ver. 0.16.3 for MS Windows.

Primary Objective: To study correlation between BMI and severity of disease in rheumatoid arthritis patients.

Secondary Objective: To study correlation between acute

phase reactants (ESR, CRP) with BMI in Rheumatoid Arthritis Patients.

Inclusion Criteria

- 1) Age > 18 years and < 65 years
- 2) Patients with RA Factor Positive report

Exclusion Criteria

- 1) Age < 18 year & > 65 years
- 2) Those who didn't give consent.
- 3) With comorbidities like Diabetes, Thyroid disease, Chronic kidney disease, Hypertension etc.
- 4) Chronic Infections like Tuberculosis, HIV AIDS, Hepatitis B, C

RESULTS

Out of 58 patients, 10 were males & 48 were females. The mean age of the patients was 46.086 ± 13.293 years. Range = 18-65 years.

The mean height of the patients was 152.3 ± 6.3 cm. Range 140 to 177 cm. The mean weight of the patients was 53.345 ± 11.234 kg. Range 30 to 80 kg. The mean BMI of the patients was 22.916 ± 4.268 kg/m². Range 12.980 to 31.530 kg/m².

The mean CDAI score in the patients is 38.672 ± 18.244 . Range 7.000 to 74.000. On univariate linear regression analysis, for every 1 kg/m² decrease in the patient's BMI, the CDAI score increased by 1.537 points. As BMI decreases, CDAI increases (p = 0.006).

The mean SDAI score in the patients was 43.502 ± 18.479 . Range 13.760 to 78.690. There was a moderate negative correlation between the two variables, $r(56) = -0.340$ (95% CI: -0.550 to -0.090). As BMI decreases, SDAI increases (p = 0.009). The mean DAS28-ESR in the patients was 6.022 ± 1.822 . (Range 2.570 to 9.440). There was a strong negative correlation between the two variables, $r(56) = -0.548$ (95% CI: -0.706 to -0.337), p < .001. On univariate linear regression analysis, for every 1 kg/m² decrease in the patient's BMI, the DAS28-ESR score increased by 0.234 points. As BMI decreases, DAS28-ESR increases.

The mean DAS28-CRP in the patients was 4.433 ± 2.298 . (Range 1.190 to 9.210). On univariate linear regression analysis, for every 1 kg/m² decrease in the patient's BMI, the DAS28-CRP score increased by 0.234 points, p = 0.005. As BMI decreases, DAS28-CRP increases.

There was a moderate positive correlation between the two

variables, $r(56) = 0.292$ (95% CI: 0.036 to 0.511). On univariate linear regression analysis, for every year increase in the duration of RA, the CDAI score increased by 3.538 points. As duration of RA increases, CDAI increases.

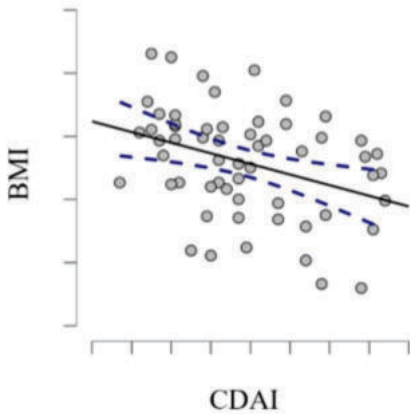


Figure 1: Correlation Between BMI & CDAI Score.

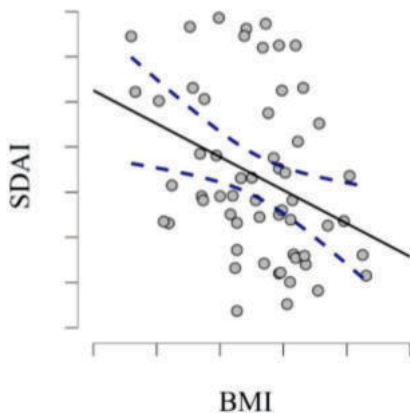


Figure 2: Correlation Between BMI & SDAI Score.

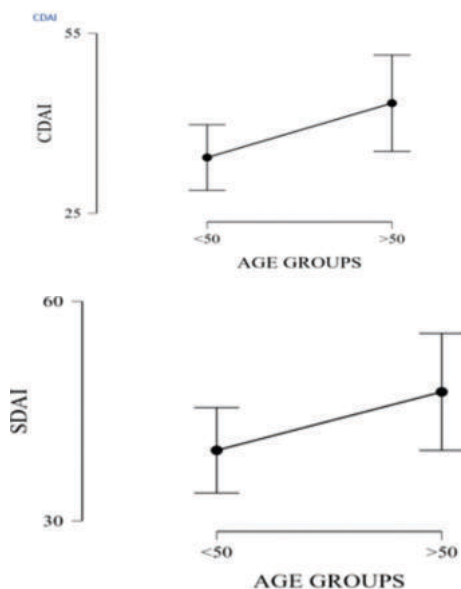


Figure 3: Disease Activity Score & Age.

CONCLUSION

Negative correlation between disease severity as assessed by CDAI & SDAI Scores & BMI was established in our study.

In our study we got mean BMI as 22 kg/m², which does not lie

in the overweight/ obese criteria of WHO indicating patients of RA have lower BMI & therefore cutoffs in these patients should be lowered.

Acute phase reactants also have negative correlation with BMI. Hence, they are raised in more severe disease.

DISCUSSION

Since Obesity is a pro-inflammatory state, it was expected that obese patients would have more severe disease but from our study both have negative correlation so obesity might protect patients from joint damage. [4] Higher adiponectin levels in lean may induce disease activity in joints resulting in more active disease as compared to obese patients. [5] Rheumatoid cachexia is Muscle wasting in RA. [1] Altered body composition occurs in RA due to metabolic alterations triggered by nuclear factor kappa-beta pathway causing Rheumatoid cachexia. Loss of body cell mass > 40% from baseline is associated with death. Hence to prevent this complication, we should counsel patient on high protein & low-calorie diet, increased physical activity along with medical management.

A Study was published in 2012 that determined association of obesity with disease severity & comorbidities in Rheumatoid Arthritis patients that included 1596 patients & it concluded that obesity as associated with worse RA disease outcomes & higher prevalence of comorbidities. [6] But in this study, BMI > 30 kg/m² was considered as obese & from our study we observed that mean BMI was 22 & not a single patient had BMI > 30. So results can't be compared.

Declaration

Funding For Our Study: Nil

Conflict Of Interest: No

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