ORIGINAL RESEARCH

Evaluation of disease activity score with respect to vitamin D in rheumatoid arthritis

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ABSTRACT

Background: Rheumatoid arthritis (RA) is a chronic autoimmune disorder that primarily affects the joints, causing inflammation, pain, swelling, and potentially leading to joint deformities and disability over time. The present study was conducted to assess disease activity score with respect to vitamin D in rheumatoid arthritis. **Materials & Methods:** 78 patients of rheumatoid arthritis of both genders were selected and measurement of vitamin D was done with ELISA in an autoanalyzer. Disease activity score 28 (DAS28) and Visual analog scale scoring system tools were used. **Results:** Out of 78 patients, males were 48 and females were 30. The mean vitamin D level and DAS- 28 score in patients with low disease activity was 10.2 ng/ml and 2.5, in moderate disease activity was 11.0 ng/ml and 4.1, in high disease activity group was 10.7 ng/ml and 5. The difference was significant ($P< 0.05$). **Conclusion:** A strong correlation between the DAS-28 score and vitamin D level has been discovered.

Key words: Rheumatoid arthritis, disease activity, vitamin D

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic autoimmune disorder that primarily affects the joints, causing inflammation, pain, swelling, and potentially leading to joint deformities and disability over time. Unlike osteoarthritis, which is primarily due to wear and tear on joints, rheumatoid arthritis is an autoimmune condition where the body's immune system mistakenly attacks its own healthy tissues, particularly the synovium (the lining of the membranes that surround the joints).[1]

RA typically affects joints symmetrically, meaning that if one joint is affected on one side of the body, the corresponding joint on the other side is also likely to be affected.People with RA often experience morning stiffness that lasts for at least 30 minutes or more. Stiffness can also occur after periods of inactivity.Inflamed synovium leads to joint swelling, pain, and tenderness.[2] The joints can become warm to the touch due to increased blood flow and inflammation.RA can also affect other parts of the body beyond the joints. This might include fatigue, fever, weight loss, and potential involvement of organs like the eyes, heart, lungs, and blood vessels.Over time, untreated or poorly managed RA can lead to joint deformities and damage. This can result in loss of joint function and reduced quality of life.[3]

Rheumatoid arthritis (RA) severity is measured using a numerical scoring system called the Disease Activity Score (DAS).[4] The number of swollen and painful joints, the degree of inflammation determined by a blood test called C-reactive protein (CRP) or erythrocyte sedimentation rate (ESR), and the patient's subjective evaluation of the severity of their disease using a visual analog scale (VAS) are all factors in the score.[5]Vitamin D has been demonstrated to have an impact on the immune system and may contribute to the onset and development of RA.[6]The present study was conducted to assess disease activity score with respect to vitamin D in rheumatoid arthritis.

MATERIALS & METHODS

The present study consisted of 78 patients of RA of both genders. Patients were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. A thorough clinical examination was carried out. Parameters such as onset of symptoms, disease progression, pattern of joint involvement, pain and swelling in joints etc. was recorded. Estimation of ESR, rheumatoid factor and C - reactive protein were done. Measurement of vitamin D was also done with ELISA. Measurement of disease activity score 28 (DAS28) and visual analog scale was done. Data thus

obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 78		
Gender	**Male**	**Female**
Number	48	30

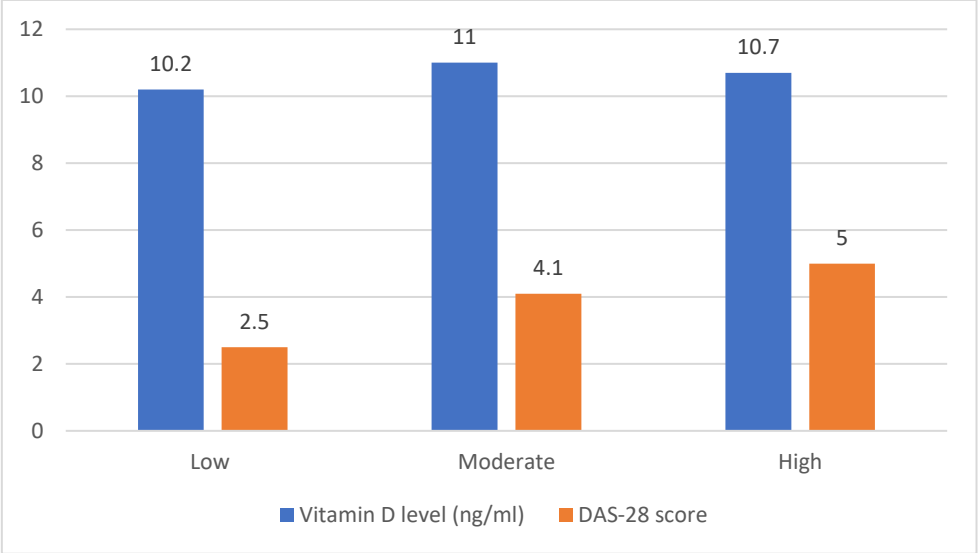
Table I shows that out of 78 patients, males were 48 and females were 30.

Table II Vitamin D level based on disease activity

Disease activity	Vitamin D level (ng/ml)	DAS-28 score
Low	10.2	2.5
Moderate	11.0	4.1
High	10.7	5.0
P value	0.75	0.03

Table II, graph I shows that mean vitamin D level and DAS- 28 score in patients with low disease activity was 10.2 ng/ml and 2.5, in moderate disease activity was 11.0 ng/ml and 4.1, in high disease activity group was 10.7 ng/ml and 5. The difference was significant (P< 0.05).

Graph I Vitamin D level based on disease activity



DISCUSSION

Rheumatoid arthritis (RA) is an autoimmune disease with a worldwide prevalence of approximately 0.5%–1% among adults.[7] RA investigators have noted that prevalence in North America and Europe may be higher than the prevalence in Asia.[8] It is 3 times more common in females as compared to male. It is a more common chronic inflammatory disease which is characterized by inflammation of synovium of the joint which gradually leads to various articular and extra-articular manifestations.[9] This eventually leads to enhanced morbidity and mortality in this subset of the population. The etiology of RA has been elusive. It could be due to either genetic or nongenetic factors such as environmental, hormonal, and infectious factors.[10,11,12]The present study was conducted to assess disease activity score with respect to vitamin D in rheumatoid arthritis.

We found that out of 78 patients, males were 48 and females were 30. Kumar et al[13] evaluated association between Vitamin D level and rheumatoid arthritis (RA); association of stages of disease activity with various parameters such as serum Vitamin D level, RA factor level, anti-cyclic citrullinated peptide (CCP), erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels; and evaluate correlation of Vitamin D with various parameters and Disease Activity Score (DAS)-28 score with various parameters. Disease activity was measured in patients of RA using DAS-28. Mean of Vitamin D level in case and control groups were measured. Association of different stage of disease activity among cases was calculated with various laboratory parameters. The mean Vitamin D level in case group was 18.726 ng/ml, while in control group, it was 42.851 ng/ml. Association of various stages of disease activity was statistically highly significant for CRP and anti-CCP levels. Vitamin D was negatively correlated with serum ESR, while DAS-28 score was positively correlated with serum ESR, CRP, RA factor, and anti-CCP values.

We found that mean vitamin D level and DAS- 28 score in patients with low disease activity was 10.2 ng/ml and 2.5, in moderate disease activity was 11.0 ng/ml and 4.1, in high disease activity group was 10.7 ng/ml and 5. In a research by Kerr et al[14], patients with RA had their levels of vitamin D (25-OH-D) evaluated using radioimmunoassay. Concentrations 30 ng/ml were deemed insufficient, whereas concentrations 20 ng/ml were deemed deficient. The mean (SD) age of the patients (850 men, 76% Caucasian) was 64 (SD 11.3) years. Insufficiency and deficit of 25-OH-D were present in 84% and 43% of people, respectively. After multivariate correction, non-Caucasian race, the absence of vitamin D supplementation, and the presence of anti-cyclic citrullinated peptide antibody were associated with higher rates of both insufficiency and deficiency. Higher levels of 25-OH-D deficiency, but not insufficiency, were independently related tohigher tender joint counts and highly sensitive C-reactive protein levels.

Sharma et al[15]on 42 patients in the age group of 18-45 years having RA, for assessing disease activity score concerning vitamin D in them. In the distribution of Disease Activity Level, the proportion of moderate activity level was found higher i.e. 66.7%. The mean vitamin D level was 10.93 ± 2.70, the minimum was 7 and the maximum was 18. The mean DAS-28 Score was 4.46 ± 0.82 with a minimum value of 2.63 and a maximum of 6.08.

The limitation of the study is small sample size.

CONCLUSION

Authors found that a strong correlation between the DAS-28 score and vitamin D level has been discovered.

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