Association of Anti-Ccp and Rheumatoid Factor in Patients with Rheumatoid Arthritis

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ABSTRACT:OBJECTIVE:To test the level of anti cyclic citrullinated antibodies (anti-CCP) and rheumatoid factor (RF) in serum samples and to correlate their association in the diagnosis of suspected rheumatoid arthritis patients.

METHODOLOGY:The cross sectional study was conducted for a period of 6 months from December,2019 in the Clinical Microbiology Laboratory, Saveetha Medical College. Serum samples from patients suspected to have rheumatoid arthritis was collected and the assay was performed for anti-cyclic citrullinated antibody (anti-CCP) by ELISA and rheumatoid factor (RF) by latex agglutination and their association in rheumatoid arthritis patients was correlated.

RESULT:The study revealed that 83.75 per cent female and 16.25 per cent male were affected with RA.

Age wise distribution indicated that more number of affected patients were found in the age group of 46 to 60 (47.50%).The sensitivity of RF and Anti-CCP antibody were 76.5 per cent and 88.75 per cent respectively.

CONCLUSION: The sensitivity of RF was 76.5 per cent and Anti-CCP antibody was 88.75 per cent indicating that detection of Anti-CCP antibody is more reliable for the prediction and early diagnosis of RA.

KEYWORD: Anti-CCP, Rheumatoid factor, rheumatoid arthritis

I. INTRODUCTION:

Rheumatoid arthritis (RA) is a chronic auto immune disorder which affects joints and the joint pain is an ongoing incendiary problem influencing numerous joints, incorporating those in the hands and feet. Rheumatoid joint pain influences joint linings, causing excruciating and growing pain due to bone disintegration and joint disfigurement[1]. The diagnosis of RA using imaging modalities can be possible only after sufficient damages to the structures of the joint. Early diagnosis of RA using biomarkers may help in early detection, adopting relevant and treatment to avoid further deterioration and degeneration of joint cartilage and associated structures. Number of biomarkers like erythrocyte sedimentation rate, C-receptive protein andrheumatoid factor (RF) are currently used for diagnosis [2]. RF is often included in the laboratory test for the diagnosis of RA. rheumatoid factor (RF) test quantifies the measure of rheumatoid factor (RF) in your blood. Rheumatoid components are proteins created by the insusceptible framework. Typically, the insusceptible framework assaults illness causing substances like viruses and bacteria.

The demerit of this test is its lack of specificity and positive results were found in other connective tissue diseases like Sjogren's disorder. Anti-cyclic citrullinated peptide (Anti-CCP) antibody test is introduced recently for the diagnosis of RA with similar sensitivity like RF, but with better specificity [3]. The recommended criteria for the diagnosis of RA is the identification of rheumatoid factor (RF) together with Anti-CCP antibody [4]. Positive Anti-CCP antibodies and positive RF, implies that the individual has RA. Positive Anti-CCP antibodies and negative RF, may mean that the individual is in the beginning phases of RA or may develop it later on [5].

The study was conducted to evaluate the predictive value of Anti-CCP antibody detection together with RF test for the early diagnosis of RA in patients reported to Saveetha Medical College and Hospital, Chennai.

II. MATERIAL AND METHODOLOGY:

The retrospective study was conducted using the data available for a period of 6 months from December, 2019 in the Clinical Microbiology Laboratory of Saveetha Medical College. Serum samples were collected from the patients suspected to have rheumatoid arthritis and were subjected to anti- cyclic citrullinated antibody assay (anti-ccp) by ELISA and rheumatoid factor (RF) by latex agglutination test.

Anti-CCP antibodies

Anti-CCP autoantibodies were detected in serum samples using ELISA test. The assay was performed according to the manufacturer's instructions. A concentration > 25 U/ml was considered positive.RF were detected in serum samples using latex agglutination test.The normal range of RF is from 0-20 IU/ml.[6]

Rheumatoid Factor

Rheumatoid factor detection was routinely tested by latex agglutination method. The results was reported quantitatively. Sera that agglutination with the latex particle were considered as positive [7].

The study was conducted on 300 patients with joint pain, suspected to have rheumatoid arthritis, referred to The Clinical Microbiology Laboratory, Saveetha Medical College Hospital, Chennai.

III. RESULT:

Among the 300 samples 80 samples were positive either one of RF or Anti-CCP antibody.

Sex wise distribution

Sex wise distribution of positive cases were presented in table 1. Among the 80 positive patients 13 (16.25 %) were male and 67 (83.75%) were female (Fig.1).

Age wise distribution

Age wise distribution revealed among the 80 patients, 11 (13.75%) were less than the age group of 30 years, 23 (28.75%) were between the age group of 31 and 45 years, 38 (47.50%) were between 46 and 60 years and 8 (10%) were Above 60 years (Fig. 2). Age wise distribution revealed that the age group between 46 and 60 years were more affected.

Positive Test Report Among Patients

Positive test samples related to patients revealed among the 80 patients 52 (65%) were positive for both RF and Anti-CCP antibody. Among the remaining 28 patients, 9 (11.25%) were positive for RF and 19 (23.75%) were positive for Anti-CCP antibody (Fig.3).

Among the 52 positive cases for both RF and Anti-CCP Antibody, 7 (13.40%) were below the age group of 30 years, 13 (25%) were between 31 and 45 years of age, 28 (53.80%) were between 46 and 60 years and 4 (7.80%) were above the age of 60 years (Fig.4). The positive samples for both

the test were more in the age group between 46 and 60 years of age.

IV. DISCUSSION:

Rheumatoid arthritis is a chronic autoimmune inflammatory disease affecting synovial joints, more frequently arises in females than males and predominantly observed in elderly causing progressive disability, pre-mature death and socio-economic burden[8]. Early diagnosis of the disease relies heavily on the clinical information gathered from the patient history, clinical examination, blood test and imaging test. Early diagnosis remains challenging. Delayed diagnosis and poor control over the disease results in extra articular manifestations such as keratitis, pulmonary granulomas, pericarditis, pleuritis, small vessel vasculitis and other non-specific extra articular symptoms[8].

In the present study female population were more affected (83.75%) and it was attributed to declining level of oestrogen in women after menopause with the peak incidence in the age group of 45 to 75 years[8].

The previous studies on the epidemiology of RA shows that the age is an important risk factor for developing RA due to the decline of the immune responses[9]. In the present studies the age group between 46 and 60 were more affected.

Rheumatoid factor is autoantibodies which develops in response to the bodies own tissue and characteristics of auto immune diseases. The normal range of RF is from 0-20 IU/ml and above 20 IU/ml is considered as positive. The other conditions which can elevate RF values included auto immune disease, certain chronic infections, diabetes, bacterial endocarditis, cancer, normal ageing, vaccinations and transfusions[9]. In the present study 11.25 per cent of the patient were positive only for RF and 65 per cent were positive for both RF and Anti-CCP revealing 76.5 percent patient were positive for RF.

Anti-CCP antibody are autoantibodies made by the immune system which is recently included in the diagnosis of rheumatoid arthritis with 97 per cent specificity for RA[9]. A concentration above 25 U/ml was considered positive. In the present study 23.75 per cent of the patients were positive for Anti-CCP antibodies alone and 65 per cent were positive for both RF and Anti-CCP revealing 88.75 per cent patients were positive for Anti-CCP.

V. CONCLUSION:

To conclude the prevalence of RA was more in the female (83.75%) and is more in the age group of 45 to 60 years(47.50%).

The sensitivity of RF was 76.5 per cent and Anti-CCP antibody was 88.75 per cent indicating that detection of Anti-CCP antibody is more reliable for the prediction and early diagnosis of RA.

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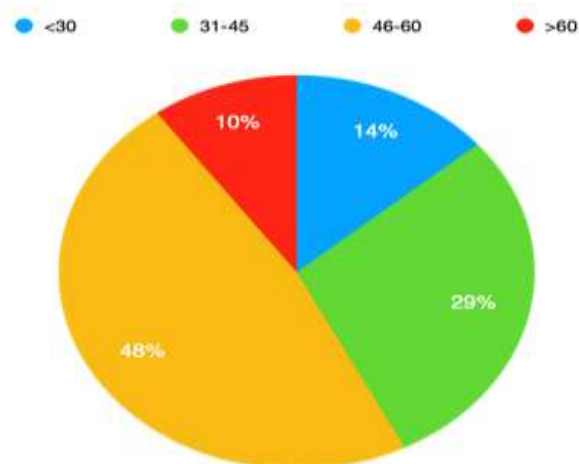
CHARTS AND FIGURES:

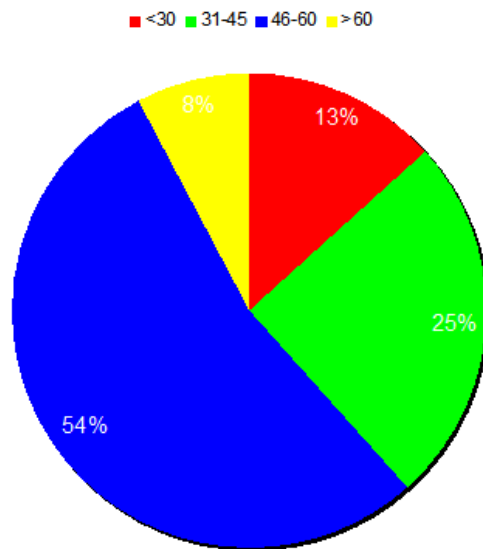**Fig 1:** sex wise distribution of Rheumatoid arthritis

Fig 2: Age wise distribution of Rheumatoid arthritis
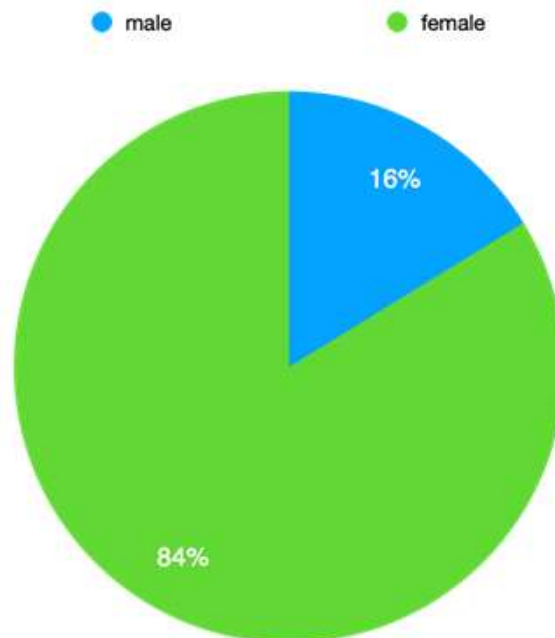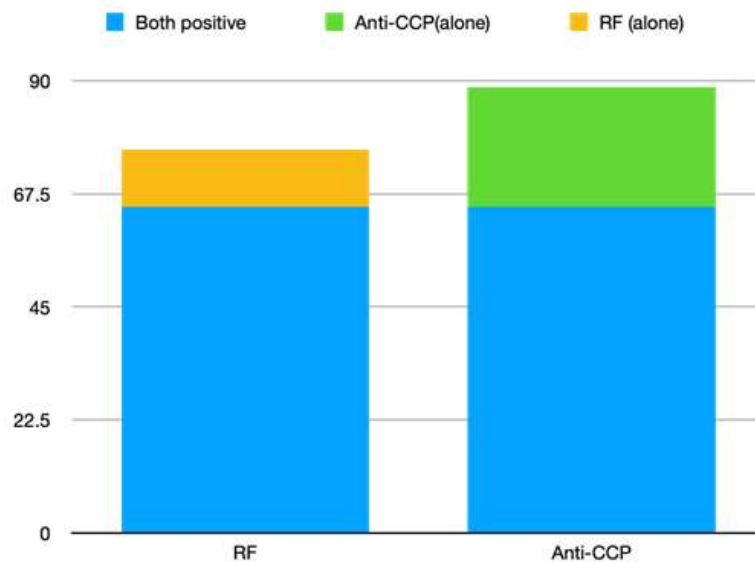

Fig 3: Positive Test Report Among Patients

Fig 4: Distribution of ages of patients with RF and Anti-CCP antibody positive

Table:

Table 1: Distribution Of Positivity among Sexes

No. Of patients	80
Males	13(16.25%)
Females	67(83.75%)

Table 2: Distribution of ages of positive patients

Age category	No. Of patients
<30	11(13.75%)
31-45	23 (28.75%)
46-60	38(47.5%)
>60	8(10%)

Table 3: Positivity of tests among the patients

Tests	No. Of patients
Anti-ccp (+ve)	19(23.75%)
RF(+ve)	9(11.25%)
Both (+ve)	52(65%)

Table 4: Distribution of ages of patients with RF and Anti-CCP antibody positive

Age category	No. Of patients
<30	7(13.4%)
31-45	13(25%)
46-60	28(53.8%)
>60	4(7.8%)