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Original Research Paper

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SEROPREVALENCE OF RHEUMATOID FACTOR FOR RHEUMATOID ARTHRITIS IN TERTIARY CARE HOSPITAL, BHAVNAGAR.

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ABSTRACT

Background and Aims: Rheumatoid arthritis (RA) is an autoimmune disorder that affects the small joints and inflammatory changes that thicken the joints resulting in swelling and pain in and around the joints. The smaller joints are involved before the larger joints. The useful serological marker for Rheumatoid arthritis (RA) is Rheumatoid Factor (RF). This present study was done to find out the prevalence of Rheumatoid Factor in suspected arthritis cases in tertiary care hospital, Bhavnagar. **Material and Method:** This prospective study was carried out in the serological section in the microbiology laboratory in Sir Takhtsinhji hospital, Bhavnagar from October 2020 to September 2021. Rheumatoid factor was determined quantitatively by using RHELAX-RF (Tulip diagnostics kit). **Result:** A total of 1466 blood samples were received for Rheumatoid Factor analysis. Out of 1466 samples, 93 were positive for Rheumatoid Factor of 6.3% prevalence. A total of 65 cases were females and 28 were males. The most common age group involved was 41-50 years in females and 31-40 years in males. **Conclusion:** The result shows less prevalence hence Rheumatoid factor (RF) alone is less specific as a marker for diagnosis of Rheumatoid arthritis. For the evaluation of patients with suspected Rheumatoid arthritis, it is recommended to perform anti-cyclic citrullinated peptide antibody and Rheumatoid factor analysis to increase the specificity of the results.

KEYWORDS : Rheumatoid arthritis (RA), Rheumatoid factor (RF)

INTRODUCTION

Rheumatoid arthritis is a chronic, severe, progressive inflammatory autoimmune disease of uncertain etiology involving multiple peripheral joints (van Boekel, Vossenaar, van den Hoogen, & van Venrooij, 2022). About 1% of the world's population is affected by Rheumatoid arthritis. Women three to five times more common than men (Scott, Wolfe, & Huizinga, 2010) (Busija, et al., 2010). Rheumatoid arthritis affects smaller joints of hand and feet early and later as the disease progresses, symptoms often spread to the knees, ankles, elbows, hips, and shoulders (Fleming, Crown, & Corbett, 1976)(Bartfeld, 1960).

The present study was done to know the prevalence of Rheumatoid factor as a serological marker in a tertiary care hospital.

Rheumatoid factor (RF) is IgM antibody directed against the Fc portion of IgG. It is found in 75 to 80% of rheumatoid arthritis patients, but has a low specificity because it may be found in healthy elderly individuals and patients with other autoimmune disorder or infections like sjogren's syndrome, systemic lupus erythematosus, mixed connective tissue disease, chronic infection and in healthy elderly population. (Bartfeld, 1960) Rheumatoid factor was the first auto antibody detected in patients with Rheumatoid arthritis. Rheumatoid factor was revealed in the early twentieth century and it became the prime serological test used in the diagnosis of Rheumatoid arthritis (Renaudineau, Jamin, Saraux, & Youinou, 2005).

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MATERIALS AND METHOD

This prospective study was carried out in the serological section in the microbiology laboratory in Sir Takhtsinhji Hospital, Bhavnagar from October 2020 to September 2021. A total of 1466 blood samples were received for Rheumatoid arthritis factor analysis. Test was performed by receiving around 2-3 ml of blood using plain vacutainer and centrifuged at 3000 Rotation per minute for 1 min to separate the serum. A standard Rheumatoid factor is 18 mm circle card test, mixing 25 microlitre of patient's serum with one drop of Rheumatoid factor latex reagent, mixing on a shaker for 2 minutes.

Rheumatoid factor was determined quantitatively by using RHELAX-RF (Tulip diagnostics kit) as per tender. Rheumatoid factor kit contained latex particles coated with Human gamma globulin which reacted with Rheumatoid factor in the samples resulting in the agglutination which can observe macroscopically. (Atabonkeng, et al., 2015)

Latex particles are coated with specific antibody. The serum containing antigens is mixed with the latex reagent, resulting in agglutination of latex particles (Cheesbrough, 2006). A positive test is indicated by the presence of agglutination in the serum sample. Rheumatoid factor value above 10 IU/ml was considered significant as per W.H.O.

RESULTS

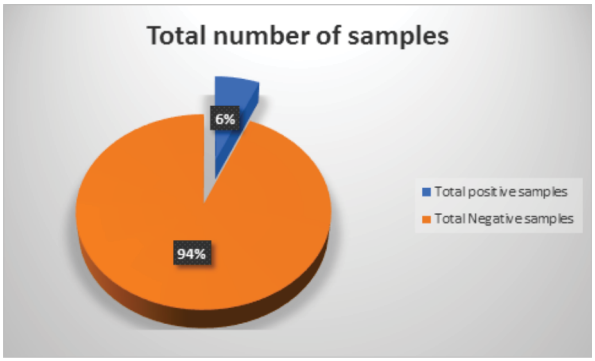
In this study out of 1466 samples, 93 were positive for Rheumatoid factor. A total of 65 cases were females and 28 were males. The prevalence rate was 6.3% (Table 1 & Graph 1)

Most positive cases in females were in the age group of 41-50 years and in males in the age group of 31-40 years (Table 2 & Graph 2). All positive samples showed result above 10 IU/ml which considered significant in Rheumatoid factor (RF).

Table 1: Total Number Of Positive And Negative Samples.

TOTAL	NUMBER
Total samples	1466

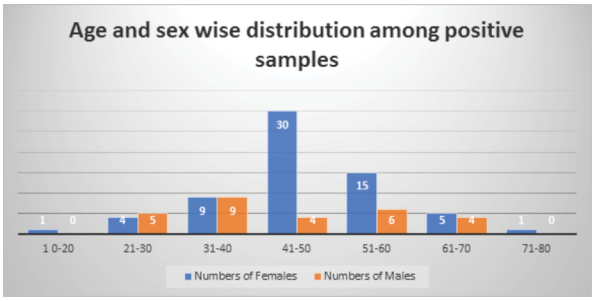
Total positive samples	93
Total Negative samples	1373



Graph: 01- Total Number Of Samples.

Table 2: Age And Sex Wise Distribution Of Positive Cases

Age group	Numbers of Females	Numbers of Males
10-20	1	0
21-30	4	5
31-40	9	9
41-50	30	4
51-60	15	6
61-70	5	4
71-80	1	0
Total	65	28



Graph: 02- Age And Sex Wise Distribution Of Positive Cases.

DISCUSSION

Out of 1466 samples, 93 were positive for Rheumatoid factor of 6.3% prevalence. (Table 1). The study done in Banda showed the prevalence of 14.3% (Bisen, 2018). Other study was done in Cameroon and showed the prevalence of 5.4% (Atabonkeng, et al., 2015), whereas a similar study in Cote d Ivoire showed the prevalence of 7% among people aged between 3–70 years (Viatte, et al., 2012). The study done by Chandrashekhar et al. (Chandrasekhar & Koripella, 2017) showed a prevalence of 7% in the age group of 21–60 years whereas study was done by Sucilathangam et al. (Sucilathangam, Smiline, Velvizhi, & Revathy, 2015) reported a 10.6% prevalence of RA factor.

Our study has shown more females produced Rheumatoid arthritis than males (Kvien, 2006). This can be explained by the influence and involvement of female sex hormones on autoimmunity. Female hormones play a role in the initiation and/or worsening of the disease as seen by the risk induced by estrogens-progestin pills, pregnancy, and the postpartum period (N. & O., 2004). Autoimmunity is under genetic control and genes in sexual chromosomes can play a role in supporting the female prevalence. (Gerosa, De Angelis, Riboldi, & Meroni, 2008)

Rheumatoid factor was present in people aged 16-80 years and absent beyond 80 years (Morel, 2005). Positivity of Rheumatoid arthritis was not seen above 80 years of age which may be due to decreased immunity and decreased alteration of co-stimulatory pathways (Menzel, 1988).

Early diagnosis and suitable therapy are therefore of great importance in determining the prognosis of Rheumatoid arthritis. The three pillars for the diagnosis of rheumatologic disease are a good medical history, clinical findings (including radiological investigations) and serological laboratory tests. Among them Serological diagnostic testing is of growing importance in the early differentiation and detection of rheumatoid arthritis (Scott, Wolfe, & Huizinga, 2010).

The early diagnosis of rheumatoid arthritis is important to prevent crippling. So it is important to diagnose Rheumatoid arthritis at a very early stage in the disease, when often not all clinical symptoms are manifest, so good serological markers are needed. (Vossenaar & Venrooij, 2004)

Rheumatoid factor lacks diagnostic specificity and may be found in association with other chronic inflammatory diseases in which arthritis figures in the clinical manifestations (Kasper, et al., 2015). Hence Anti-cyclic citrullinated peptide (CCP) antibody test is a very important test for the diagnosis of rheumatoid arthritis (RA), The method we used (agglutination technique) is not as sensitive as the ELISA method but one of the disadvantages of the existing enzyme-linked immunosorbent assay (ELISA) is that its method is labor-intensive and time-consuming (Byun, et al., 2018). Anti-CCP autoantibodies are also found in diseases other than Rheumatoid arthritis, although at a lower frequency than Rheumatoid factor (Riedemann, Muñoz, & Kavanaugh, 2005).

CONCLUSION

Prevalence of Rheumatoid factor was 6.3%, females almost 4 times more positive than males. As study shows less prevalence Rheumatoid factor (RF) alone is less specific as a marker for diagnosis of Rheumatoid arthritis; hence for early suspected Rheumatoid arthritis patients, other parameters needs to be added in testing to increase the specificity of the test like ESR, anti-CCP, ANA, CBC. This preliminary study provided insight of prevalence of Rheumatoid factor in microbiology laboratory in Sir Takhtsinhji Hospital, Bhavnagar in reference to their Age and Sex. Further study is required to correlate the prevalence of Rheumatoid arthritis with other non-rheumatic diseases and determine the impact of geographic, epidemiologic pattern to draw conclusions specifically treatment patterns for Rheumatoid arthritis.

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