



“A STUDY OF ASSOCIATION OF RHEUMATOID FACTOR POSITIVITY IN PATIENTS WITH CHRONIC TONSILLITIS”

Otorhinolaryngology

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ABSTRACT

Chronic Tonsillitis is one of the most common chronic inflammatory conditions occurring as a result of bacterial and environmental factors with CD4+ cells predominance, which is also characteristically seen Rheumatoid Arthritis, although the exact pathogenesis remain unknown. Delayed diagnosis and prompt treatment of Rheumatoid arthritis is a significant factor leading to morbidity in elderly population. **Aim:** To find association between Rheumatoid Factor positivity in patients with Chronic Tonsillitis **Materials and Methods:** A total of 50 patients were selected who were diagnosed with Chronic Tonsillitis after fulfilment of inclusion and exclusion criteria, in whom Rheumatoid Factor serology was evaluated and studied. **Results:** A statistically significant Rheumatoid Factor positivity were obtained - 13 out of 50 patients (26%) with a $p < 0.001$. No statistical significance was obtained when Rheumatoid Factor positivity and negativity was compared with age and gender distribution of the patients. **Conclusion:** Early evaluation of Rheumatoid Factor helps ensure better outcome on patient's quality of life by early adequate and effective treatment.

KEYWORDS

Chronic tonsillitis; Rheumatoid factor; CD4 cells; Inflammation

INTRODUCTION

Chronic Tonsillitis is a common condition characterised by persistent inflammation of the palatine tonsils, with mostly bacterial aetiology and is defined as five or more episodes of true tonsillitis occurring in a year, with disabling symptoms that prevent the normal functioning of one's being⁽¹⁾. This chronicity impacts by affecting the quality of life for the patient. It commonly affects both children and adult population. The most common isolate from chronic tonsillitis is Group A beta-haemolytic Streptococcus, which adheres firmly to the tonsillar crypts. Firm bacterial adhesions and secretion of various toxin are the definitive cause of biofilm formation leading to anti-microbial resistance and further chronicity of the disease resulting in microscopic cellular changes and altered immune response that is seen as hyperactive immune cells (B cells, T cells and dendritic cells) through Toll-like receptor 9. These activated cells further produce Interferon-gamma and tumour necrosis factor-alpha leading to damage of the target tissue at local and distant sites⁽³⁾.

Chronic inflammation is more appropriately described as a process rather than a term, in which ongoing inflammation and attempted tissue healing occurs hand-in-hand and simultaneously with variable pattern of cellular changes and responses occurring over a period of 6 weeks⁽²⁾. One such typical example of ongoing chronic inflammation is Rheumatoid Arthritis, which is microscopically characterised by accumulation of CD4+ T- lymphocytes and plasma cells in the synovium of the affected joints which are recruited in response to the inflammatory markers such as various cytokines and interleukins⁽²⁾. One such inflammatory marker – Rheumatoid Factor, holds a designated role in the diagnosis of Rheumatoid Arthritis till date.

The presence, absence, titres of rheumatoid factor have various implications and outcomes on the diagnosis and prognosis of rheumatoid arthritis. Sero-positive patients may experience more aggressive and erosive joint disease along with extra-articular manifestations as compared to sero-negative patients, thus prompting early diagnosis and appropriate interventions⁽⁴⁾. The onset of RF positivity also signifies the risk of more severe disease.

Various old literatures have hypothesized the presence the bacterial antigens and superantigens leading to T-cell activation and alterations in the host susceptibility which further contributed to the development of various chronic inflammatory conditions such as Rheumatism and Rheumatoid Arthritis.

Thus, by keeping in mind the basic pathology of accumulation of the chronic cellular infiltrates seen during microscopy and histology, chronic tonsillitis may act as possible trigger for various autoimmune conditions including rheumatoid arthritis.

Vast research is required in this area since not many studies have

equated the association between Chronic Tonsillitis and Rheumatoid Factor positivity, an attempt was made to correlate the association between Chronic Tonsillitis and Rheumatoid Factor, thus signifying the need of this study.

Methodology

Source of data:

Patients of either sex in age group of 8-40 years diagnosed as Chronic Tonsillitis presenting to ENT OPD at Babuji hospital and Chigateri district hospital, teaching hospitals attached to J.J.M. Medical College, Davangere were selected.

Sampling Procedure:

50 Patients who were diagnosed as Chronic Tonsillitis on basis of history and clinical examination and also who fulfilled the inclusion and exclusion criteria were selected

Study of design: Prospective comparative follow-up study

Study duration: May 2023 to February 2024.

Sampling Criteria

Inclusion criteria:

1. Age group between 8 to 40 years
2. Either sex
3. Patients willing to participate in the study

Exclusion criteria:

1. Patients below 8 and above 40 years of age
2. Patients with co morbid condition (hepatic, cardiac, endocrine) and prior history of rheumatoid arthritis
3. Patients taking prior treatment for Rheumatoid arthritis
4. Patients with a prior history of tonsillectomy
5. Patients not willing to participate in the study

Data Collection Method

Patients who presented to ENT OPD and who were diagnosed through history and complete clinical examination as chronic tonsillitis were included in the study.

All patients under-went routine haematological investigations along with additional rheumatoid factor serology. The collected data was analysed and evaluated at the end of the study period.

A value of Rheumatoid factor (RF) < 20 Miu/ml was considered as negative.

RESULTS

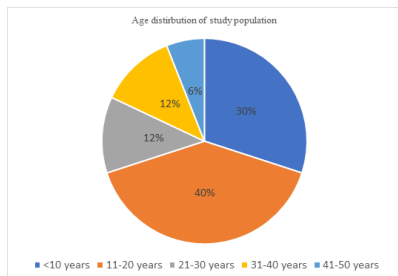
A total of 50 patients were included in the study, out of which 16 (32%) patients were males and 34 (68%) patients were females as shown in Table 1.

Table 1. Gender Distribution

Gender	No of Cases	Percent
Male	16	32.0
Female	34	68.0
Total	50	100.0

Inference: Majority of females participated in both the groups with no statistical significance.

Figure 1 shows the age wise distribution of the patients and majority of them are in the age group of 11-20 years(40%).



Positivity and negativity of Rheumatoid Factor did not show any statistical significance when compared to the age of the study patients (p=0.939),also nor when related to the gender of the patients (p=0.912) as seen in Table 2 and Table 3 respectively.

Table 2. Age Distribution

Age	Rheumatoid Factor		Chi Square test P Value
	Present	Absent	
≤ 10	4	11	0.939, Not Sig
11 - 20	4	16	
21 -30	2	4	
31-40	2	4	
41-50	1	2	
Total	13	37	

Inference: No statistically significant comparison between Rheumatoid Factor positivity and age distribution

Table 3. Gender Distribution

Gender	Rheumatoid Factor		Chi Square test P Value
	Present	Absent	
Male	4	12	0.912, Not Sig
Female	9	25	
Total	13	37	

Inference: No statistically significant comparison between Rheumatoid Factor positivity and gender distribution

When compared the positivity and negativity of the Rheumatoid Factor in the group as shown in Table 4, 13 out of 50 patients (26%) showed RF factor positivity with a mean of 25.63, while 37 had negative results, that was statistically significant (p<0.001) by taking Independent t-Test as a means of variable test.

Table 4. Inter Group Comparison by Independent t-test

Rheumatoid Factor	N	Mean	Std. Deviation	Independent t Test
Present	13	25.63	4.47	P<0.001
Absent	37	7.72	3.78	

Inference: Statistically significant comparison between Rheumatoid Factor positivity between the group with p<0.001.

Statistical Analysis

Statistical analysis was done using IBM SPSS Statistics for Windows, Version 28. Normality of data was assessed using Chi-square test while the inter-group comparison was done using Independent t-test.

A p value of 0.05 was considered as statistically significant.

DISCUSSION

Chronic inflammatory conditions often is a leading concern to any health professional due its impact on the quality of life and associated morbidity. Such diversified conditions require early evaluation and prompt diagnosis so as to offer betterment to patient's life even though not all conditions have a single treatment modality.

Group B beta-haemolytic Streptococcus is the most common microbial isolate in patients presenting with chronic tonsillitis.

In a study by A Zborovsky et al(7) on 247 patients showed the presence of high titres of antibodies to polysaccharide of group B streptococcus during the early phase of development of Rheumatoid Arthritis in the synovial fluid.

Free circulation of endotoxins and exotoxins of Streptococcus in the blood possibility accounts as a triggering agent for alteration in human immune system and responses, thus predisposing the inflammatory process of rheumatoid factor.

In a case report by Takuya Ikeda et al supported the evidence of worsening of IgA nephropathy in presence of chronic tonsillitis, for which when tonsillectomy was performed showed enhanced therapeutic response to IV Immunoglobulins, thus quoting chronic tonsillitis as a possible immune trigger for various autoimmune conditions including rheumatoid arthritis(5).

In another study conducted by Kenji Tani et al in 2020 observed significant correlation between Anti Citrullinated protein autoantibodies(ACPA) and rheumatoid factor where significant inverse relation was found between ACPA and past history of infectious diseases. This led to the possibility of various bacterial infectious conditions being a causative agent for initiation and development ACPA-negative Rheumatoid Arthritis(3).

There exists a possibility of presence Streptococcal or related bacterial antigens in the aetiology of juvenile or adult Rheumatoid Arthritis. Various large base animal studies a/have supported and demonstrated the hypothesis of presence of cell walls from selected types of streptococci and other bacteria as inducers of rheumatoid arthritis-like disease in certain strains of rats(6).

Our study showed significant result (p<0.001) when the Rheumatoid Factor positivity was compared with the negatives. This necessitates the evaluation of Rheumatoid Arthritis by serology in all patients presenting with the clinical features of Chronic Tonsillitis in order to provide them an effective early treatment and to reduce the associated morbidity with the disease and thus improving the quality of life.

CONCLUSION

In all patients with Chronic Tonsillitis evaluation of Rheumatoid Factor should be considered mandatory.

Early evaluation, diagnosis and appropriate medical or surgical intervention not only leads to better quality of life for the patient but also ensures reduced morbidity associated with it.

Limitations

Various limitations have been proposed as a larger sample size is required for such studies which will yield promising results.

Extensive research is required in this possible association of Rheumatoid Factor and Chronic Tonsillitis.

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