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Assessment And Comparison Of Rbc And Wbc Parameters Among Chronic Periodontitis

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ABSTRACT:
Chronic periodontitis is a common disease of the oral cavity consisting of chronic inflammation of the periodontal tissue that is caused by the accumulation of plaque. This disease is related to common and preventable biological risk factors like high blood pressure, high blood cholesterol, diabetes, genetic factors, and obesity and behavioral risk factors like unhealthy diet, physical inactivity, and tobacco use.

AIM:
The main aim of the study is to assess and compare RBC and WBC parameters among chronic periodontitis.

MATERIALS AND METHODS:
The study population included 30 patients with chronic periodontitis and blood parameters like RBC count , neutrophils and lymphocytes were measured and recorded. The values were statistically analysed using the SPSS software and results were derived.

RESULTS AND DISCUSSION:
The severity of periodontitis decreases with increase with the severity of periodontitis.The neutrophils count decreases with increase in severity and lymphocytes increase with severity.

CONCLUSION:
From the results of the present study, it can be concluded that RBC count , neutrophils decrease and lymphocytes increase in patients with chronic periodontitis. This can be due to increase in inflammation which leads to elevated levels of lymphocytes.

KEYWORDS: Chronic Periodontitis, RBC , WBC, anaemia , innovative

INTRODUCTION:

Chronic periodontitis is a common disease of the oral cavity consisting of chronic inflammation of the periodontal tissue that is caused by the accumulation of plaque. It is a chronic inflammatory condition affecting the supporting structures of the teeth. The disease has a specific microbial etiology(1). The microbial challenge posed by the subgingival plaque biofilm elicits an immune response in the host which results in the progressive destruction of the periodontal ligament in alveolar bone resulting in pocket formation and tooth mobility. Clinical attachment loss which is also known as CAL, is the presence of periodontal disease(2). Periodontal disease, or gum disease, is a set of inflammatory conditions which affect the tissues that surround the teeth. In the early stage, the condition is called gingivitis and Probing-depth measurement provides the clinician with an accurate estimate of the size of the denuded root surface(3). The difference between probing-depth measurement and anatomic measurement of the sulcus, or pocket depth, appears to be due to the increased accumulation of inflammatory cells in the tissues Chronic periodontitis can be localised or generalised. This disease is related to common and preventable biological risk factors like high blood pressure, high blood cholesterol, diabetes, genetic factors such as interleukin (IL)-1 composite genotype and obesity and behavioral risk factors like unhealthy diet, physical inactivity, and tobacco use(4). Other risk elements for periodontal diseases are diabetes , pathogenic bacteria, stress , HIV/AIDS , osteoporosis(5). Symptoms of periodontitis can include swollen gums , bright red gums , bleeding gums and bad breath.It is a long-lasting inflammatory disease affecting the soft and hard tissues around the teeth and it is common worldwide. It is an inflammatory disease of the supporting tissues of the tooth caused by specific microorganisms in a susceptible host. Gram-negative anaerobic bacteria are most commonly associated in the initiation of periodontitis(6). Localized infections which are characteristic of periodontitis can have a significant effect on the systemic health of humans. Just as the periodontal tissues mount an immune inflammatory response to bacteria and their products, systemic challenges with these agents also induce a major vascular response(7).The sulcular epithelium acts as a protective barrier and prevents entry of microorganisms and other irritants into the systemic circulation(8). The host-microbial interaction in periodontitis leads to ulceration of sulcular epithelium. The ulcerated pocket epithelium acts as a portal of entry for the bacteria to enter the connective tissue and thus into the systemic circulation and causes bacteremia(9). The role of RBC, neutrophils and lymphocytes showed changes in case of chronic periodontitis. As periodontitis progresses, anemia sets in. Anemia of chronic disease , ACD is defined as anemia occurring in chronic infections, inflammatory conditions, which is not caused by marrow deficiencies or other diseases, and occurring despite the presence of adequate iron stores and vitamins.A decreased erythrocyte count can be observed along with neutrophils. Thus , the main aim of the study is to assess and compare RBC and WBC parameters among chronic periodontitis.Our team has extensive knowledge and research experience that has translate into high quality publications.(10–22),(23–27) (28) (29)

MATERIALS AND METHOD:

A total of 30 patients from the out-patients of Saveetha Dental College and hospitals participated in the study. It was a cross sectional study. Prior to the study, the purpose of the study was explained to the patients. The study included both males and females between the age group of 40-75. The study included the subject diagnosed with chronic periodontitis based on pocket depth.

BLOOD ANALYSIS:

Under aseptic conditions, venous blood samples of the patients with chronic periodontitis were drawn from the antecubital fossa by venipuncture. The blood was taken in vacuum tubes and measurement of the blood cell parameters were recorded.The count of Red blood cells , neutrophils and lymphocytes were measured.

STATISTICAL ANALYSIS:

The age of the patients , RBC count , lymphocytes , neutrophils , clinical attachment loss and probing depth were transferred to Microsoft spreadsheet and later statistically analysed using SPSS software to determine the levels of blood parameters in chronic periodontitis patients.

RESULT:

In the current study , figure 1 shows the number of males and females in the study population. The study included 63.33% of males and 36.67% of females. In figure 2, the different age groups are depicted. 16.67% of individuals were between the age group of 40-45, 13.33% of the study population were between 45-50 , 10% were between 50-55, 16.67% were 55-60, 20% of them were between 60-65, 10% of them were between 65-70 and 13.33% 70-75. In figure 3 , based on the RBC count per million cu/mm, severity of periodontitis is classified as mild with 4.6 million cu/mm, moderate with 4.45 million cu/mm and severe with 4.19 million cu/mm. In figure 4, based on the values of neutrophils and lymphocytes, the severity of periodontitis is classified. 70% and 28% of neutrophils and lymphocytes respectively were classified as mild, 65.07% and 36% of neutrophils and lymphocytes respectively were classified as moderate and 61.6% and 32% of neutrophils and lymphocytes respectively were classified as severe.

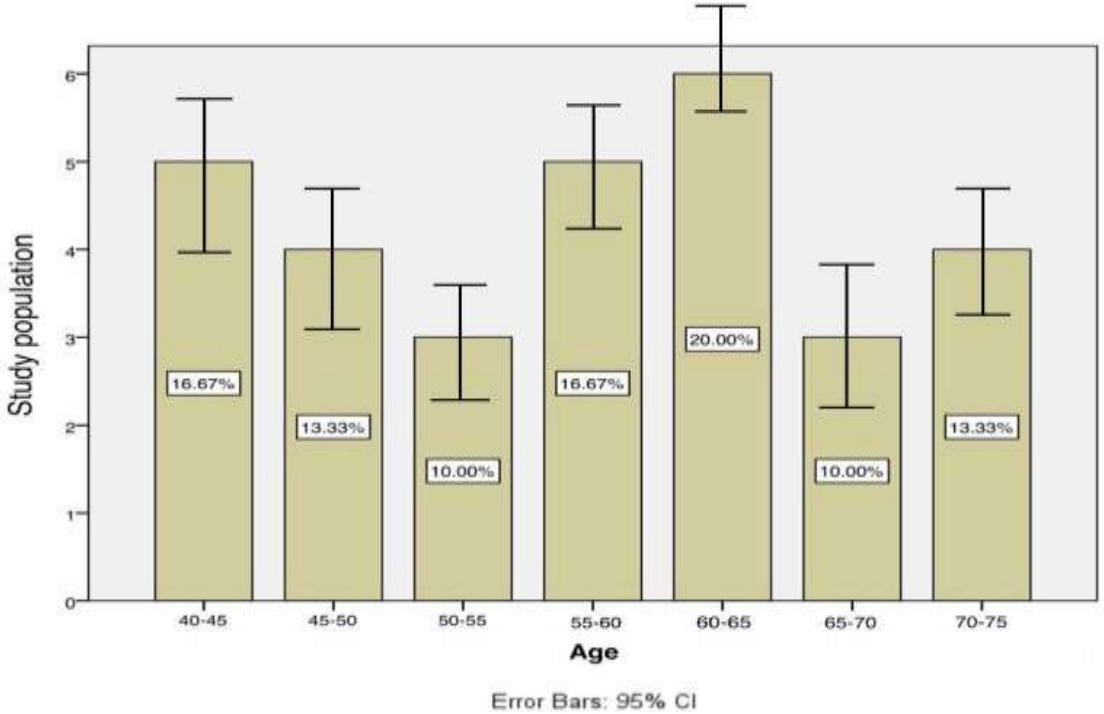

Figure 1:The above graph represents the different age groups of the study population. 16.67% of individuals were between the age group of 40-45, 13.33% of the study population were between 45-50 , 10% were between 50-55, 16.67% were 55-60, 20% of them were between 60-65, 10% of them were between 65-70 and 13.33% 70-75.

Figure 2: The above graph represents the gender of the study population. 63.33% of the population are males and 36.67% are females.

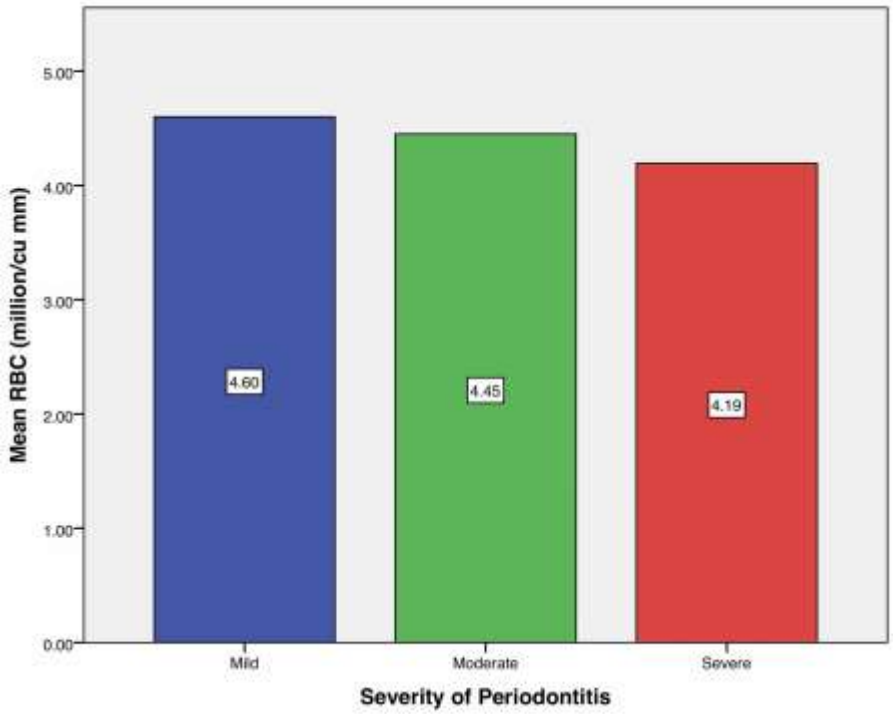

Figure 3: The above bar graph represents the severity of periodontitis based on the count of RBC (million / cc mm). The X axis represents the severity of the periodontitis and the Y axis represents the mean RBC (million / cu mm). The blue bar represents mild severity, green represents moderate and red represents severe periodontitis. 4.6, 4.45 and 4.19 million per cc mm was present in mild , moderate and severe periodontitis respectively.

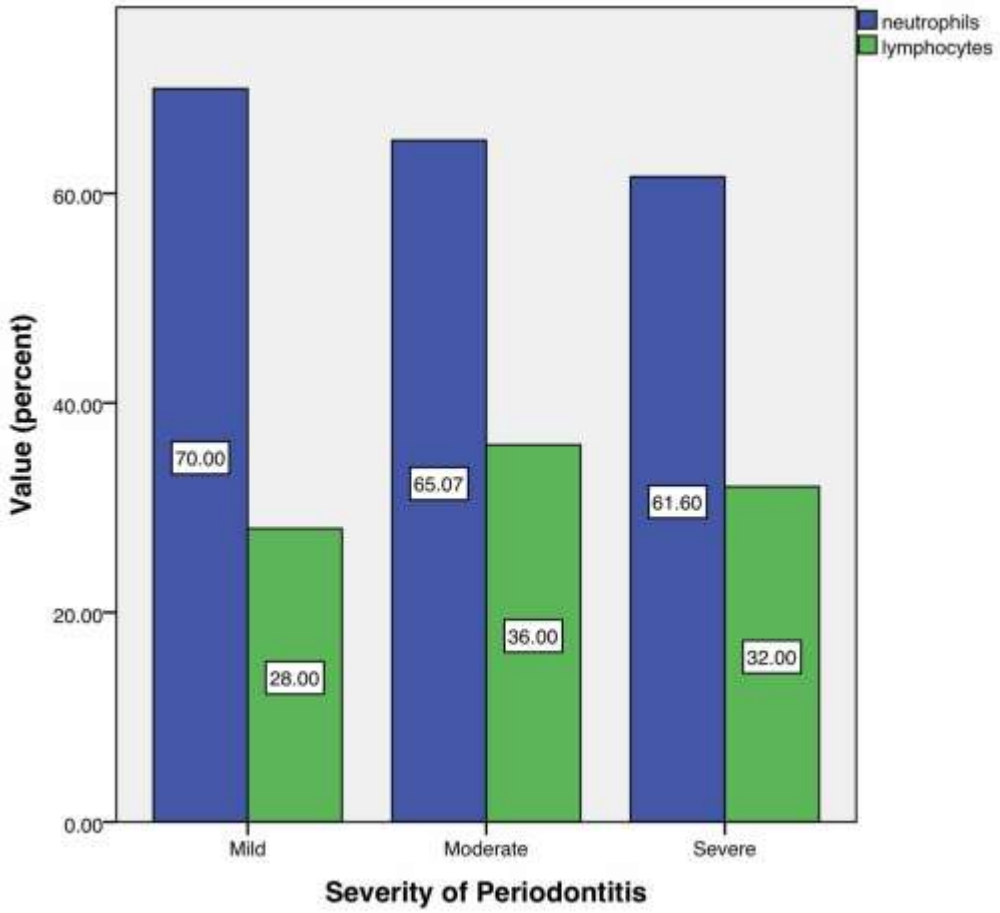

Figure 4: The above bar graph represents the severity of periodontitis based on the values of neutrophils and lymphocytes. The X axis represents the severity of the periodontitis and the Y axis represents the values in percentage of neutrophils and lymphocytes. The blue bar represents the neutrophils value and green represents the lymphocytes. 70% and 28% of neutrophils and lymphocytes respectively were classified as mild, 65.07% and 36% of neutrophils and lymphocytes respectively were moderate and 61.6% and 32% of neutrophils and lymphocytes respectively were classified as severe.

DISCUSSION:(put demographic details)

In the current study, the male population was 63.33% whereas the female population was 36.67%. A study by Genco RJ et al states that risk factors which include diabetes mellitus , especially in individuals in whom metabolic control is poor, and cigarette smoking can initiate and progress to periodontitis(30). This can be seen more often in males. Mild state of chronic periodontitis in males can be a pronounced threat towards cardiovascular diseases also. The different age groups depicted in figure 2 shows that the age group with maximum chronic periodontitis is between 60-65 years and the least is between 50-55 years. A study by Wu Y et al states that older individuals have higher levels of some Gram-negative bacilli, such as *Pseudomonas aeruginosa, Klebsiella pneumonia*, and *Enterobacter*, as compared with young individuals which can a reason for chronic periodontitis in aged patients with an increased probing depth and clinical attachment loss, however , relatively little is known on how aging affects oral bacterial communities(31).

The bar chart in figure 3 shows severity of periodontitis based on RBC count. 4.6, 4.45 and 4.19 million per cc mm is present in mild , moderate and severe periodontitis respectively. This depicts that the RBC cells decrease with increased severity of periodontitis. A study by Gokhale et al shows data that patients with chronic periodontitis had lower values of hematocrit, number of erythrocytes, and hemoglobin compared to healthy controls. The same study concludes that patients suffering from chronic periodontitis have a lower number of erythrocytes and hemoglobin compared to healthy controls, based on these results it can be concluded that, like any other chronic condition, chronic periodontitis can lead to anemia(32). In figure 4 , 70% and 28% of neutrophils and lymphocytes respectively were classified as mild, 65.07% and 36% of neutrophils and lymphocytes respectively were moderate and 61.6% and 32% of neutrophils and lymphocytes respectively were classified as severe. This depicts that neutrophils count decreases with increase with increase in severity and increase in lymphocytes with increase in severity. A study Al-Rasheed et al shows that WBC count was higher in patients with chronic periodontitis when compared with controls. Elevated WBC count plays a key role in chronic periodontitis and in turn a risk factor for cardiovascular diseases(33).
Add pathogenesis of neutrophils accordingly , and have to do longitudinal study. Explanation for destruction

CONCLUSION:

From the results of the present study, we could infer that RBC count , neutrophils were decreased and lymphocytes increased with chronic periodontitis. This could be attributed to the inflammatory cascade role in periodontal pathogenesis at early phase , followed by lymphocyte production to combat the local tissue destruction. Thus further studies are required to assess levels of blood parameters post periodontal therapy.

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CONFLICT OF INTEREST**:** Nil

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