Original Research

Relation between anemia and periodontitis with blood parameters in Silchar, Assam

Purobi Choudhury[1], Madhurjya Chakraborty[2]

[1]Associate professor of dentistry, Department of Periodontics, Silchar Medical College, Silchar , Assam, India;
[2]Registrar of Dentistry, Silchar Medical College, Silchar, Assam, India

ABSTRACT

Introduction: Localized infections which are characteristic of periodontitis can have a significant effect on the systemic health of humans and animals. **Aim and objectives:** The aim of the present study was to evaluate the relationship between anemia and periodontitis using various blood parameters in Silchar , Assam. **Materials and methods:** A total of 60 systemically healthy individuals within the age group of 20–55 years were included in the study. Three groups consisting of 20 healthy controls, 20 generalized chronic gingivitis, and 20 generalized chronic periodontitis patients were selected following baseline periodontal evaluation. **Results:** When comparing the clinical parameters (Hb, RBC, ESR, MCV, MCH, and MCHC) between healthy, gingivitis, and periodontitis, there was no clinical significance. **Conclusion:** Our present study did not have any significant change in the various blood parameters between the healthy, gingivitis, and periodontitis group. This may be attributed to the small sample size selected.
Key words: anemia, periodontitis, blood parameters, inflammatory disease, microorganisms

Corresponding author: Dr. Purobi Choudhury, MDS, Associate professor of dentistry, Department of Periodontics Silchar medical college, Silchar , Assam , India

INTRODUCTION

Periodontitis is inflammation of the gums and supporting structures of the teeth. It is one of the most common human diseases. Initiation of periodontitis is most commonly associated with Gram-negative anaerobic bacteria.[1] Localized infections which are common in periodontitis can have a significant effect on the systemic health of humans and animals.

Just as the periodontal tissues exhibit an immune inflammatory response to bacteria and their products, systemic challenges with these agents also show a major vascular response. There are explanatory mechanisms for the interaction between periodontitis and a variety of systemic disorders through the host response. [2]Infections, malignant cells, and autoimmune dysregulation all are responsible for the activation of the immune system and production of cytokines most preferably tumor necrosis factor-alpha (TNF-α) and interleukin-1 (IL-1) and IL-6 (IL-6).[3] Such inflammatory cytokines can reduce erythropoietin (Epo) production leading to the development of anemia.[4,5]The aim of the present study was to evaluate the relationship between anemia and periodontitis using various blood parametersin Silchar , Assam.

MATERIALS AND METHODS

Within the age group of 20–55 years, a total of 60 systemically healthy individuals were included in the study. Three groups consisting of 20 healthy controls, 20 generalized chronic gingivitis, and 20 generalized chronic periodontitis patients were selected following baseline periodontal evaluation. Proforma was prepared. Gingival index (GI), plaque index, probing pocket depth, and clinical attachment level (CAL) were recorded.

Inclusion Criteria

The patients diagnosed with generalized chronic periodontitis (30% or more of the teeth examined having ≥5 mm probing depth and ≥2 mm CAL), patients diagnosed with chronic generalized gingivitis (with GI criteria 2–3), and healthy controls (with GI criteria 0–1) were included in the study.

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Exclusion Criteria

Patients with systemic diseases, past and present smokers, patients who had periodontal treatment 6 months before the study, and patients with <l teeth in the oral cavity were excluded from the study.

METHODOLOGY

From all individuals of the study, about 10 ml of venous blood samples were collected. From the blood samples, Hb levels, erythrocyte count red blood cell (RBC), erythrocyte sedimentation rate (ESR), mean corpuscular volume (MCV), mean corpuscular Hb (MCH), and MCH concentration (MCHC) were estimated.

Statistical Analysis

All the variables are found to follow a normal distribution curve through the results of the normality tests, Kolmogorov-Smirnov and Shapiro-Wilks tests. One-way analysis of variance and *post hoc* analysis is applied to compare the parameters between the healthy, gingivitis, and periodontitis groups, SPSS (IBM SPSS Statistics for Windows, Version 20.0) is used to analyze the data. $P < 0.05$ was fixed as Significance level.

RESULTS

Table 1 shows descriptive statistics of the study population. Table 2 shows Comparison of blood parameters between the study subjects in healthy, gingivitis, and periodontitis groups. No clinical significance was found when comparing the clinical parameters (Hb, RBC, ESR, MCV, MCH, and MCHC) between healthy, gingivitis, and periodontitis

DISCUSSION

Recently, so many studies have evaluated the relation between periodontitis and anemia. Few studies show conflicting results.

Hutter *et al*. showed that patients with periodontitis have lower number of erythrocytes, lower Hb levels, lower haematocrit and higher ESRs.[6] Whereas, the studies by Wakai *et al*. failed to show any association between periodontal status and Hb.[7] Most of these studies are epidemiological in nature. Our present cross-sectional study was carried out to identify the risk of periodontitis and anemia. It was carried out in 20 healthy controls, 20 chronic generalized gingivitis, and 20 chronic generalized periodontitis (male and female) patients to assess the effect of periodontal inflammation on blood parameters. Our present study did not have any significant change in the various blood parameters between the healthy, gingivitis, and periodontitis group. This may be attributed to the small sample size selected. On the contrary, results of several studies[8-15] indicated that periodontal inflammation results in decrease in number of erythrocytes and levels of Hb and increase in WBC count.[16]

CONCLUSION

Our present study did not have any significant change in the various blood parameters between the healthy, gingivitis, and periodontitis group. This may be attributed to the small sample size selected.

Table 1: Descriptive statistics

Parameters	Healthy subjects	Gingivitis	Periodontitis
Number of study subjects	20	20	20
Mean age	28.12±6.18	26.05±2.54	44.65±14.12
Gender			
Male	18 (90.0 %)	8 (40 %)	14 (70 %)
Female	2 (10.0 %)	12 (60%)	6 (30 %)

Table 2: Comparison of the blood parameters between the study subjects in healthy, gingivitis and periodontitis groups

Groups	Healthy	Gingivitis	Periodontitis	F	P value
Hemoglobin	18.08±2.32	11.52±3.77	13.11±4.03	7.623	0.071
RBC	6.02±1.13	5.12±1.02	4.19±2.05	4.089	0.745
ESR	15.18±1.02	13.07±3.98	14.82±4.12	1.358	0.062
MCV	87.01±5.42	92.55±3.66	82.18±3.97	1.042	0.956
MCH	25.75±2.25	32.56±2.67	31.65±1.65	0.146	0.496
MCHC	38.23±5.98	45.76±4.76	39.67±7.89	4.86	0.809

RBC: Red blood cell, ESR: Erythrocyte sedimentation rate, MCV: Mean corpuscular volume, MCHC: MCH concentration

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