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ORIGINAL RESEARCH

Assessment of anemia in patients with chronic periodontitis- A cross sectional study

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ABSTRACT:

Background: Anemia of chronic disease is defined as anemia occurring in chronic infections, inflammatory conditions, or a neoplastic disorder. The present study was conducted to assess signs of anemia among patients with chronic periodontitis. **Materials & Methods:** The present cross sectional study was conducted on 120 subjects with chronic periodontitis of both genders. Subjects were divided into 2 groups. Group I comprised of chronic periodontitis patients and group II was control. A thorough clinical examination was performed in both groups. 2 ml of blood was obtained for analysis of hemoglobin, MCV, RBC, MCH and MCHC. **Results:** Group I had cases and group II had controls. Both groups had 120 subjects each. Hemoglobin in group I was 12.8 gm% and 13.9gm% in group II. RBC count was 4.2 million/mm³ in group I and 4.8 million/mm³ in group II. MCV was 87.5 fl in group I and 91.2 fl in group II. MCH was 29.1 pg in group I and 31.6 pg in group II. MCHC was 33.2 g/dl in group I and 35.2 g/dl in group II. The difference was significant (P < 0.05). **Conclusion:** Authors found low level of Hb, RBC, MCV, MCH and MCHC in patients with chronic periodontitis as compared to normal subjects hence suggested a possible correlation between anemia and chronic periodontitis.

Key words: Anemia, chronic periodontitis, Hemoglobin

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INTRODUCTION

Anemia of chronic disease is defined as anemia occurring in chronic infections, inflammatory conditions, or a neoplastic disorder, which is not caused by marrow deficiencies or other diseases, and occurring despite the presence of adequate iron stores and vitamins.¹ Chronic periodontitis has been defined as "an infectious disease resulting in inflammation with in supporting tissues of the teeth, progressive attachment loss and bone loss."² Chronic periodontitis was further classified into localized periodontitis: when less than 30% of sites assessed in the mouth demonstrate attachment and bone loss and

generalized when 30% or more of the sites in the mouth demonstrate attachment and bone loss.³

Most prevalent in adults but can occur in children and adolescents (age-35+yrs). Amount of disease progression is consistent with the presence of local factors. Subgingival calculus is a frequent finding. Disease progression is usually slow.⁴ It is associated with a variable microbial pattern. The current concepts on the etiology of periodontitis consider three groups of factors that determine whether a disease will occur in a subject. It comprise of a susceptible host, the presence of pathogenic organisms & the absence or a small proportion of beneficial bacteria. Lowe et al⁵ reported a definite correlation between anemia

and chronic periodontitis. The present study was conducted to assess signs of anemia among patients with chronic periodontitis.

MATERIALS & METHODS

The present cross sectional study was conducted in the department of Public health dentistry. It comprised of 120 subjects with chronic periodontitis of both genders. Diagnosis of chronic periodontitis was made based on criteria of >2 mm of clinical attachment loss and > 5mm of probing pocket depth. Equal number of controls was also included. The study protocol was approved from

institutional ethical committee. All subjects were informed regarding the study and written consent was obtained. General information such name, age, gender etc. was recorded. Subjects were divided into 2 groups. Group I comprised of chronic periodontitis patients and group II was control. A thorough clinical examination was performed in both groups. 2 ml of blood was obtained for analysis of hemoglobin, MCV, RBC, MCH and MCHC. Results were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of subjects

Total- 120		
Groups	Group I (Cases)	Group II (Control)
Number	120	120

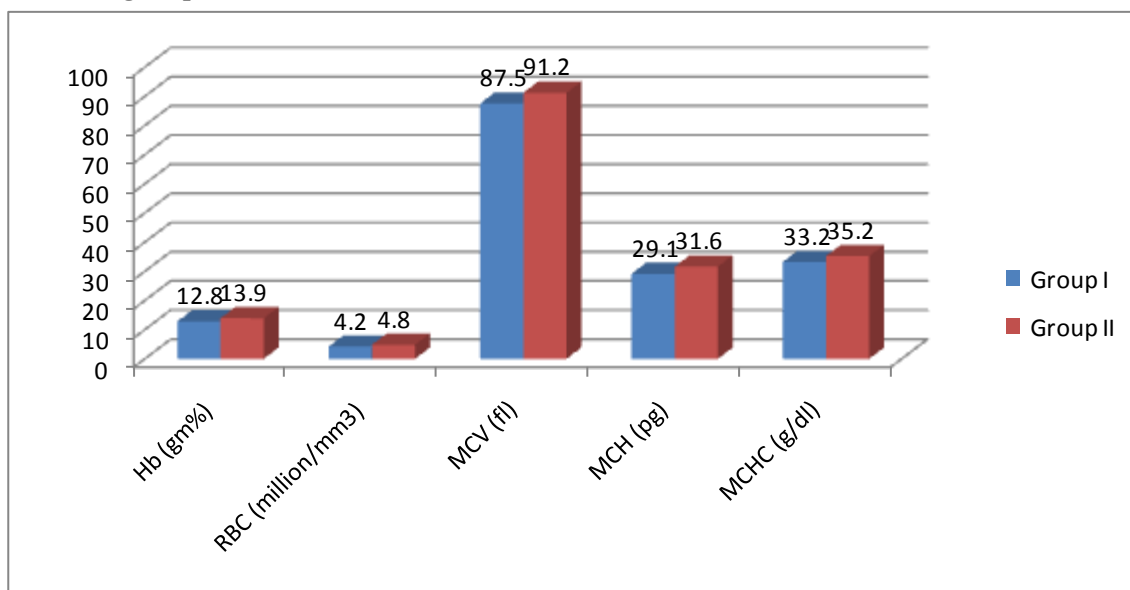
Table I shows that group I had cases and group II had controls. Both groups had 120 subjects each.

Table II Assessment of Hematological parameters

Parameters	Group I	Group II	P value
Hb (gm%)	12.8	13.9	0.01
RBC (million/mm ³)	4.2	4.8	0.04
MCV (fl)	87.5	91.2	0.01
MCH (pg)	29.1	31.6	0.05
MCHC (g/dl)	33.2	35.2	0.02

Table II, graph I shows that hemoglobin in group I was 12.8 gm% and 13.9gm% in group II. RBC count was 4.2 million/mm³ in group I and 4.8 million/mm³ in group II. MCV was 87.5 fl in group I and 91.2 fl in group II. MCH was 29.1 pg in group I and 31.6 pg in group II. MCHC was 33.2 g/dl in group I and 35.2 g/dl in group II. The difference was significant (P< 0.05).

Graph I Hematological parameters



DISCUSSION

Chronic periodontitis is the most common form of periodontal disease, which progresses relatively slowly and is more common in adults. It is, therefore, speculated that periodontitis results in low-grade systemic inflammation, which may cause lower number of erythrocytes and, consequently, lower hemoglobin (Hb) concentration. However, conflicting results have been reported regarding the association of periodontal disease and anemia.⁶

In India, anemia is a common and serious health disorder among both sexes and all age groups, although it has a higher prevalence among women than men. The disorders associated with anemia of chronic disease (ACD) are characterized by the production of certain inflammatory cytokines primarily, macrophage-derived which includes IL-1 α , IL- β , IL-6, transforming growth factor- β and TNF- α . In chronic inflammatory disorders, cellular or humoral factors including TNF and IL-1 cause suppression of the bone marrow response to Epo and thus possibly contribute to this anemia.⁷ The present study was conducted to assess signs of anemia among patients with chronic periodontitis.

In present study, there were 120 cases of chronic periodontitis and 120 controls. We observed that there was low level of hemoglobin, MCV, MCH, MCHC in cases as compared to controls. We found that hemoglobin in group I was 12.8 gm% and 13.9gm% in group II. RBC count was 4.2 million/mm³ in group I and 4.8 million/mm³ in group II. MCV was 87.5 fl in group I and 91.2 fl in group II. MCH was 29.1 pg in group I and 31.6 pg in group II. MCHC was 33.2 g/dl in group I and 35.2 g/dl in group II.

Hutter et al⁸ included forty patients with severe chronic periodontitis (Group A) and forty periodontally healthy participants (Group B) in the age group of 30–55 years. Group A showed lower hemoglobin (Hb, 13.47 \pm 1.05, P = 0.019), erythrocyte count (4.63 \pm 0.40, P = 0.002), and mean corpuscular Hb concentration (32.58 \pm 0.90, P = 0.003) values compared to Group B (13.95 \pm 0.70, 4.90 \pm 0.33, and 33.18 \pm 0.81, respectively).

Pradeep et al⁹ included a total of 100 systemically healthy male patients visiting the outpatient department. Of these, 50 patients had healthy periodontium and 50 patients had chronic periodontitis. Clinical parameters and red blood cell parameters of all the patients were assessed at baseline and 6 months after non-surgical periodontal therapy. Data analysis revealed that patients with chronic periodontitis showed an improvement in both clinical and red blood cell parameters from baseline to 6 months after non-surgical periodontal therapy.

Gokhale et al¹⁰ included a total of 50 healthy controls, 50 chronic generalized gingivitis, and 50 chronic generalized

periodontitis patients. Hemoglobin levels (Hb), erythrocyte count red blood cell, erythrocyte sedimentation rate (ESR), mean corpuscular volume (MCV), mean corpuscular Hb (MCH) and MCH concentration (MCHC), gingival index, plaque index, probing pocket depth, and clinical attachment level were recorded. The results revealed a decrease in Hb and erythrocyte counts and increase in white blood corpuscles counts in chronic generalized periodontitis when compared to healthy controls and chronic generalized gingivitis group. There was no statistically significant difference in MCV, MCH, MCHC, and ESR among the groups.

CONCLUSION

Authors found low level of Hb, RBC, MCV, MCH and MCHC in patients with chronic periodontitis as compared to normal subjects hence suggested a possible correlation between anemia and chronic periodontitis.

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