

Evaluation of Haemoglobin Level in Anaemic Patients with Periodontitis

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Abstract: ***Aim:** To evaluate the haemoglobin level in anaemic patients with periodontitis. **Background:** Anaemia is a common and serious health disorder among both sexes and all age groups, with anemia of chronic disease being the second most prevalent anemia. Periodontitis is a serious gum infection that damages the soft tissue and destroys the bone that supports your teeth. Periodontitis can cause tooth loss or worse, an increased risk of heart attack or stroke and other serious health problems. Therefore, periodontitis results in low-grade systemic inflammation, which may cause lower number of erythrocytes. **Reason:** To create awareness about the intake of iron in anaemic patients with periodontitis.*

Keywords: Periodontitis, Anaemic, Haemoglobin, Level, Erythrocytes

1. Introduction

Periodontitis is a serious gum infection that gives damage to the soft tissue and bone supporting the tooth. The meaning of the word 'periodontitis' is inflammation around the tooth. This disease is caused by infection of periodontium. Periodontium is the tissue that surrounds the tooth and tissue supporting the bone. The alveolar bone around the teeth in patients with periodontitis is lost slowly and continuously. Due to the large surface of epithelium, periodontal pockets can ulcerate hence periodontitis is considered to be a continuous pathogenic and inflammatory challenge at a systemic level. Microorganism such as bacteria create lesions at different levels by reaching the products of bacteria to other parts of the organism[1].

Epidemiologic studies show that periodontal disease can increase the risk of having systemic problems. For example, cardiovascular diseases, diabetes mellitus, atherosclerosis and preterm low birth weight of infants [2,3,4]. Some studies suggested that periodontal infection brings out the systemic blood chemistry changes[5].

Patients with periodontitis have elevated in acute-phase protein such as the C-reactive protein. This suggests a possible influence on periodontitis on systemic status of the patient[6][7][8]. Periodontitis is usually associated with systemic disease such as stroke, vascular disease and atherosclerosis. These studies indicate that periodontitis leads to low grade systemic inflammation.

In India, anaemia is a common and serious health disorder among both sexes and all age groups, although it has a higher prevalence among women than men[9]. Anaemia is a disease due to deficiency of iron. Anaemia also develops when blood does not contain enough healthy red blood cells or haemoglobin as these cells are important for carrying oxygen around the body. Thus, the condition has been termed as "anaemia of inflammation" [10].

Decreased in blood counts was the down-regulation of erythropoiesis. This event takes place in the bone marrow caused by the pro-inflammatory cytokines released due to periodontal related disease. Hence, this shows association of anaemia in periodontitis patients.[10,11]. Periodontitis results

in inflammation which will lead to lower number of erythrocytes and eventually cause low haemoglobin concentration. Hence, these conditions may lead to a disease called anaemia of chronic disease (ACD)[11,12].

ACD is defined as the anaemia that occurs in chronic infections, inflammatory conditions or neoplastic disorders that is not caused by marrow deficiencies or other diseases. ACD occurs despite there are enough iron and vitamins stored in the body[13]. This type of anaemia is known as microcytic anaemia[14]. Current study shows the interrelationship between periodontitis and anaemia in healthy, gingivitis and periodontitis patients.

In order to detect the presence of anaemia, the haemoglobin (Hb) level can be used as a parameter for screening the blood of the patients. There are many methods to measure Hb levels. The most common used method is the photometric detection of cyanmethaemoglobin, which is the stable compound derived from Hb. Methods such as Coulter and Cobas methods can be used to measure Hb levels. Both of these methods are based on the detection of cyanmethaemoglobin[15].

2. Methods and Methodology

A group of 40 patients were selected from the Department of Periodontology, Saveetha Dental College. The patients were divided into 2 groups, which is 20 anaemic patients with periodontitis and 20 normal patients. The patient with systemic disorder (diabetes, pregnant, immunological disorder, etc), past smokers and patients that underwent periodontal treatment 6 months before conducting this study were excluded from the study. The age range of the patients are 20 - 50 years old. Periodontitis patients were identified by using a William periodontal probe at six sites of each tooth. 10 ml of venous blood sample was taken from each patient under aseptic condition. The blood is then taken to be analysed and haemoglobin level of blood samples from each patient was recorded.

3. Result

Normal haemoglobin level : - Female(F) - 12-15 gms%
- Male (M) - 12-18gms%

Patients with Periodontitis

No.	Age (Years Old)	Gender	Haemoglobin Level (gms%)
1.	23	F	7.7
2.	32	F	7.2
3.	40	F	7.9
4.	25	F	7.1
5.	46	F	7.6
6.	33	F	5.4
7.	35	F	6.9
8.	42	M	7.5
9.	28	F	6.4
10.	22	F	6.3
11.	25	F	7.7
12.	33	F	6.9
13.	36	F	8.7
14.	40	F	8.4
15.	27	F	7.2
16.	29	F	9.1
17.	31	M	7.7
18.	36	F	8.5
19.	29	F	8.4
20.	46	F	8.7

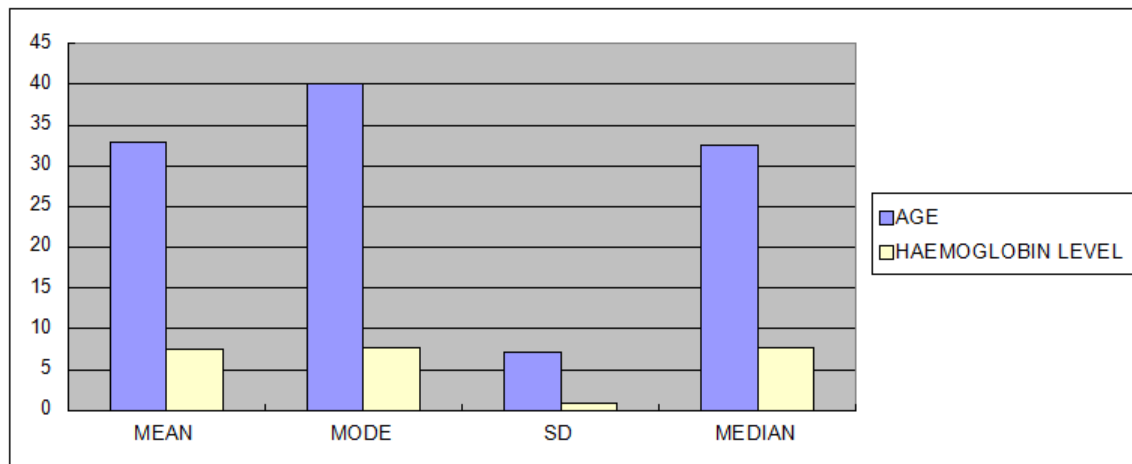
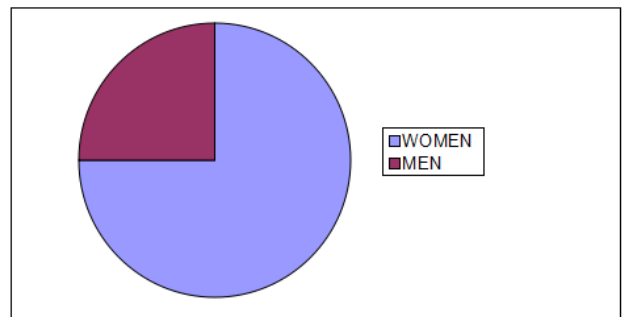
Normal Patients

No.	Age (Years Old)	Gender	Haemoglobin Level (gms%)
1	25	F	12.9
2	22	F	13.8
3	20	F	14.2
4	46	M	14
5	34	M	15.04
6	45	F	13.9
7	34	M	15.7
8	32	F	12.2
9	26	F	12.7
10	36	F	14.5
11	21	F	14.1
12	29	F	13.9
13	25	F	12.3
14	28	F	14.2
15	37	M	12.6
16	43	F	15.2
17	26	F	13.8
18	33	M	14
19	41	F	12.6
20	26	F	14.5

Patients with Periodontitis

WOMEN	MEN
90%	10%

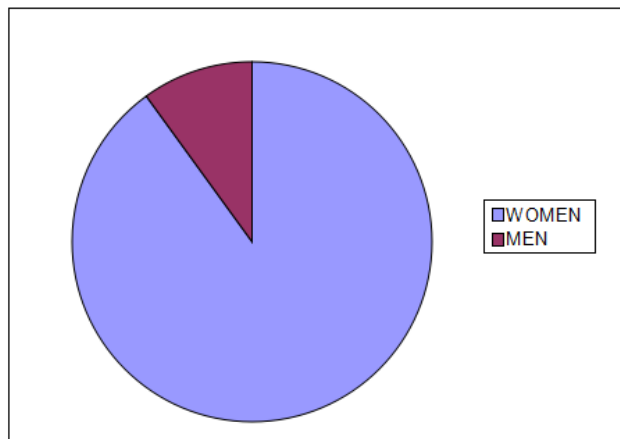
	Age	Haemoglobin Level
Mean	32.9	7.57
Mode	40	7.7
SD	7.20	0.929
Median	32.5	7.65



Normal Patients

<i>Women</i>	<i>Men</i>
75%	25%

	Age	Haemoglobin Level
Mean	31.5	13.8
Mode	26	13.8
SD	7.97	0.981
Median	30.5	13.9



4. Discussion

The relation between anaemia and chronic systemic disorders has been well established. The study shows that periodontitis frequently occur more in females and males. Various studies have shown that periodontitis patients have a low number of erythrocytes, low hematocrit, low haemoglobin number and higher ESRs when compared to normal individuals[11][16].

There are 90% of women with periodontitis and 10% of men with periodontitis participant in this study. As for the normal patients, 75% of women and 25% of male participant in this study. Hormonal imbalance often occurs in female during puberty and towards menopause age. This causes microbial flora and host immune response are altered to response of the periodontal tissue to local factors[17]. In India, females are prone to anaemia due to menstrual losses, poor nutrition and high incidence of tropical and intestinal infections[18].

Periodontitis can also be associated with patients that smoke. A study that is done by Erdemir et al[19], shows that smoker that suffered from chronic periodontitis tend to have lower number of erythrocytes, lower number of hematocrit, lower number of haemoglobin level and iron level in the body compared to non-smokers that suffered from periodontitis.

In conclusion, present study shows that periodontitis like other chronic conditions may tend towards anaemia, as the number of erythrocytes and haemoglobin decrease in affected patient. This study can be related to elevated levels of pro-inflammatory cytokines in plasma of suppressing erythropoiesis.

5. Conclusion

Anaemic patients that suffered from periodontitis show a marked decrease in haemoglobin level. This shows that there is connection between periodontitis and haemoglobin level. If a patient is identify as periodontitis patient, that individual is mostly likely to have a lower haemoglobin level. Further longitudinal studies with larger sample size should be done to investigate the association of haemoglobin level with different types and levels of periodontitis and the effect of periodontal treatment on haemoglobin level.

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