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THE EFFECT OF FULL MOUTH DISINFECTION ON HAEMATOLOGICAL PARAMETERS IN PATIENTS WITH CHRONIC PERIODONTITIS.

Dental Science

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ABSTRACT

Periodontitis is an infectious disease associated with a subgingival biofilm resulting in the inflammation within the supporting tissues of the teeth, progressive attachment loss, and bone loss. Periodontitis has been linked to cardiovascular diseases where many authors have suggested that chronic oral infection leads to prolonged systemic inflammation hence development of arterial atheromas . A study was performed to see the effect of full mouth disinfection on the haematological parameters and see if there is any improvement in infectious state after the periodontal therapy. It was concluded that the haematological parameters like TLC, DLC and platelet count improved from their higher range towards the lower and normal range after the periodontal therapy.

KEYWORDS

INTRODUCTION:

Periodontitis is an infectious disease associated with a small number of predominantly gram-negative microorganisms that exist in subgingival biofilm resulting in the inflammation within the supporting tissues of the teeth, progressive attachment loss, and bone loss . William Hunter suggested that oral microorganisms had specific actions on different tissues and that these organisms acted by producing toxins, thereby resulting in low grade "subinfection" that produced systemic effects over prolonged periods of time[1] this might be considered as one of the mechanisms that explain how periodontitis is linked to the development of atherosclerosis and cardiovascular disease.

There is enough evidence to support that atherosclerosis is an inflammatory disease [2] Ross proposed the response-to-injury hypothesis of atherosclerosis, according to which the initial lesion results from injury to the endothelium which might be caused by the infectious agents in blood and leads to a chronic inflammatory process in the artery. This results in the migration of monocytes through the endothelium into the underlying tissue and the proliferation of smooth muscle cells. Activation of the monocytes (macrophages) in the blood vessel leads to the release of hydrolytic enzymes, cytokines, chemokines, and growth factors, which induces further damage, leading to focal necrosis and in later stages, the atheromatous plaque can be covered with a fibrous cap over the focal necrotic area.[3]

The chronic oral infection leads to entry of bacteria ad their products into the blood stream. the bacteria activate the host inflammatory response by multiple mechanisms. the host immune response favours atheroma formation , maturation and exacerbation

Traditionally, the total number of white blood cells (leukocytes) have been used as a diagnostic measure to investigate whether a given individual suffers from an infection or inflammatory disease [3] . So the aim of this study was to investigate the effect of full mouth disinfection on total leukocyte count (TLC), differential leukocyte count (neutrophils, lymphocytes, eosinophils, basophils, and monocytes), and total platelet count in patients with periodontitis.

MATERIALS AND METHODS

A total of 30 patients with moderate to severe chronic periodontitis were included in the study.

Inclusion criteria

1. Age: 20–50 years of both the genders
2. Systemically healthy patients
3. Subjects having at least 30 percent of sites with Probing pocket depth ≥ 4 mm periodontal probing depth.

Exclusion criteria

1. Patient undergoing any periodontal therapy
2. Patients on antibiotic drugs
3. Smokers
4. Pregnant women and lactating mothers.

Clinical measurements

For all the patients, the periodontal status was recorded using the following clinical parameters: Plaque index (PI) {Loe and Sillness, 1964}, Probing Pocket Depth .

Blood sampling and treatment

Under aseptic condition, peripheral venous blood was drawn from antecubital fossa guidelines in the morning hours, and the samples were then immediately transported to the laboratory for analysis of all the hematological parameters which included TLC , DLC , BT , CT and Platelet count.

All the clinical and hematological parameters were assessed preoperatively at baseline and at 2 weeks after full mouth disinfection therapy.

For all the patients, complete supragingival scaling was performed using the ultrasonic scalers, and subgingival scaling and root planing were performed using Gracey curettes in two visits within 24 h followed by 1) brushing the dorsum of the tongue (by the patient) for 60 seconds with Chlorhexidine 1% gel; 2) rinsing twice with Chlorhexidine 0.2% solution during 1 minute 3) subgingival irrigation with Chlorhexidine 0.2 % solution of all pockets using a syringe with a blunt needle . All the patients were given proper oral hygiene instructions along with 0.2% of chlorhexidine digluconate mouth wash twice a day for 10 days as an adjunctive oral hygiene measures.

STATISTICALANALYSIS

The collected data were subjected to statistical analysis through GRAPHPAD . Paired T test was applied to the data.

RESULTS

TABLE 1 Shows the Changes in Clinical Parameters from Baseline to 2 weeks

Clinical Parameter	Baseline	2 weeks	P value
Plaque index	2.74±0.32	1.22±0.40	<0.001
Probing pocket depth	5.2±1.14	4.09±0.93	<0.001

Table 2 Shows The Changes In Hematological Parameters From Baseline To 2 Weeks

Haematological Parameters	Baseline	2 weeks	P value
TLC(total leucocyte count)	10543.3±1571.4	7523.3±729.4	0
Platelet Count	327233.3±62301	272333.3±54909	<0.001

Differential Leucocyte Count (TLC)			
Neutohpils	61.9± 5.4	57.2± 5.29	0.004
Lymphocytes	39.3± 6.9	34.4± 6.17	0.011
Eosinophils	15.5± 5.4	12.1± 5.74	0.051
Monocytes	3.53± 0.89	2.60± 0.46	0.001

Table 1 shows the change in clinical parameters. The plaque index reduced considerably from baseline to 2 weeks and this was statistically significant when paired T test was applied .The mean probing pocket depth also reduced from 5.2 mm at baseline to 4.09 mm at 2 weeks.

Table 2 shows changes in haematological parameters . The mean total leucocyte count reduced from 8543 / mm^3 at baseline to 7523 /mm^3 at 2 weeks. And mean platelet count reduced from 327233.3 lac/ mm^3 at baseline to 272333.3 lac/mm^3 at 2 weeks . There was a reduction in neutrophils , lymphocytes , eosinophils and monocytes but this difference was not statistically significant .

DISCUSSION

Various research studies suggested that periodontitis is associated with increased risk of systemic diseases such as cardiovascular, cerebrovascular diseases, low birth weight of infants, and preterm births. These associations indicate that periodontitis has systemic inflammation thereby increasing the risk of systemic diseases.

In this study it was found that periodontal therapy in the form of full mouth disinfection effectively and significantly reduced the TLC (total leucocyte count) from baseline to 2 weeks. This finding was in accordance with study done by Srinivasa Tenkasale Siddeshappa et al [8] on 30 periodontitis patients who found a reduction in TLC from 7800/mm at baseline to 7200/mm at 1 weeks, and 6900/mm3 at 2 weeks . Yutaka Takeda et al [9] has concluded in his study done on 6021 Japanese workers that an elevated WBC count may be a risk factor of Acute Coronary Syndrome. Thus the reduction in the total WBC count post periodontal therapy as seen in this study may prove to be beneficial in preventing the risk for Acute Coronary Syndrome.

The platelet count also significantly reduced from baseline to 2 weeks in this study . . Our finding was in accordance with that of Banthia et al [12] and Wang X both of which found a decrease in mean platelet volume after non surgical periodontal therapy. Abdulaziz AlRasheed [10] in his study found that levels of WBCs and platelets are elevated in periodontitis patients compared to healthy controls whereas Kumar BP [11] et al stated that there is no significant role of platelets in periodontal infection even though it has a major role in atherogenesis.

In this study, a reduction in counts of individual WBCs, i.e., neutrophils, lymphocytes, eosinophils, and monocytes, were also observed, but this decrease was statistically nonsignificant. These findings were similar to the Banthia *et al*. study

CONCLUSION

Periodontal therapy in the form of full mouth disinfection is effective in reducing the systemic bacterial overload and also the level of total leucocyte count , differential leucocyte count and platelet count thereby possibly decreasing the risk for the development of cardiovascular disease by lowering the established risk factors for periodontal atherosclerosis.

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