

Original Research**Assessment of clinical and microbiological status of dental implant
And adjacent teeth****Himangi Dubey¹, Nida Ansari², Vidhi Srivastava³, Nand Lal⁴, Umesh P. Verma⁵**¹ Senior Resident Department of Periodontology, F.O.D.S.,K.G.M.U., Lucknow² Ex Resident, BBDU, Lucknow³ Senior Resident Department of Prosthodontics, F.O.D.S.,K.G.M.U., Lucknow⁴ Professor and Head, Department of Periodontology, Faculty of dental sciences ,K.G.M.U, Lucknow⁵ Associate Professor, Department Of Periodontology, Faculty of dental sciences, K.G.M.U., Lucknow

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ABSTRACT

Background: Dental plaque carries numerous bacteria which are harmful for the normal health of gingiva. Dental implants are widely used in dentistry. There are various factors which affects the outcome of implant therapy. The present study was conducted to assess the presence of bacteria around dental implants. **Materials & Methods:** The present study was conducted on 20 patients who received dental implants in the last 2 years. They were divided into 2 groups of 10 patients each. Group I comprised of patients in which subgingival plaque sample was obtained around dental implant and group II had those patients in which subgingival plaque sample was obtained around teeth adjacent to dental implant. Samples were subjected to microbiological analysis using PCR. In all patients, plaque index, sulcus bleeding index and probing pocket depth was measured. **Results:** In group I, mean plaque score for P. gingivalis was 2.16 and in group II was 1.78. The difference was non- significant ($P > 0.05$). Sulcus bleeding score was 1.85 and 1.02 in group I and group II respectively. Probing depth was 4.46 and 3.83 in group I and group II respectively. The difference was non- significant ($P > 0.05$). The mean plaque score for A. Actinomycetemcomitans in group I was 2.6 and 2.4 in group II. Sulcus bleeding index (SBI) was 2.1 and 2.2 in group I and group II respectively. Probing depth was 4.5 and 4.41 in group I and group II respectively. The difference was non- significant ($P > 0.05$). The mean plaque score for Prevotella intermedia in group I was 2.1 and 1.8 in group II. Sulcus bleeding index (SBI) was 1.4 and 1.1 in group I and group II respectively. Probing depth was 4.2 and 3.7 in group I and group II respectively. The difference was non- significant ($P > 0.05$). **Conclusion:** Microbiological analysis found A. Actinomycetemcomitans, P. intermedia and P. gingivalis in both groups. The qualitative assessment of these bacteria between both groups found to be similar.

INTRODUCTION

The presence of dental plaque on tooth surface is potentially the cause of gingivitis. The amount of dental plaque affects the oral health and ultimately leading to periodontal breakdown. Both plaque and calculus are the causative factors for the gingivitis and periodontitis. Dental plaque carries numerous bacteria which are harmful for the normal health of gingiva.

There is variation in distribution of bacteria depending upon type of plaque. Subgingival plaque is plaque which is present in unexposed area of teeth below the gingival margin such as roots and supragingival plaque is that plaque which is present above the gingival margin in the exposed area of teeth.¹

Supragingival plaque exhibits mostly the gram positive cocci and subgingival plaque contains

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predominantly gram negative anaerobic bacilli such as Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis etc. Oral cavity contains as much as 500 species of microorganism. Recent studies reveal that 1mg of dental plaque contains at least 10⁸ bacteria. Normal commensal of mouth is not harmful for the teeth but presence of gingivitis causing bacteria is threat to normal oral health. It has been observed that there is bacteria induced deepening of gingival sulcus leading to tooth mobility and gingival recession. Excessive mobility is the sign of periodontitis which demands immediate careful assessment. The chances of tooth loss increases with the progression of disease.²

Dental implants are widely used in dentistry and 90% success rate over 10 years has been reported. There are various factors which affects the outcome of implant therapy. The presence of peri- implantitis which is induced by bacteria in the dental plaque leads to failure of dental implants. Hence it becomes mandatory to take care of oral hygiene to prevent bio film formation on and around the dental implant.³ The present study was conducted to assess the presence of bacteria around dental implants.

MATERIALS & METHODS

The present study was conducted in the department of Periodontics. It comprised of 20 patients who received dental implants in the last 2 years. All were informed regarding the study and written consent was obtained. Ethical clearance was taken from the institutional ethical committee. Patients with atleast 1 dental implant in the age range 20- 60 years of either gender was considered for the study. Patients with history of smoking, alcoholism, previous periodontal therapy and any known systemic disease such as hypertension etc. were excluded from the study. Patient general

information such as name, age, gender etc. was recorded in case history proforma. They were divided into 2 groups of 10 patients each. Group I comprised of patients in which subgingival plaque sample was obtained around dental implant and group II had those patients in which subgingival plaque sample was obtained around teeth adjacent to dental implant. Samples were subjected to microbiological analysis using PCR. In all patients, plaque index, sulcus bleeding index and probing pocket depth was measured. Results thus obtained were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

RESULTS

Total- 20		
Group I	Group II	P value
10	10	1

Table I Distribution of patients

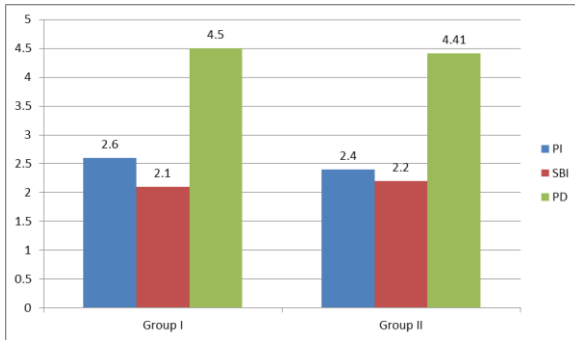
Table I shows that both groups, group I and group II had 10 patients each. The difference was non- significant (P= 1).

P. gingivalis	Number	Mean	S.D	P value
Plaque index +ve				
Group I	5	2.16	0.482	0.5
Group II	6	1.78	0.528	
Sulcus bleeding index +ve				
Group I	7	1.85	0.78	0.31
Group II	8	1.02	0.72	
Probing depth +ve				
Group I	6	4.46	0.85	0.07
Group II	7	3.83	0.88	

Table II Correlation between clinical and microbiological findings of P. gingivalis in both groups

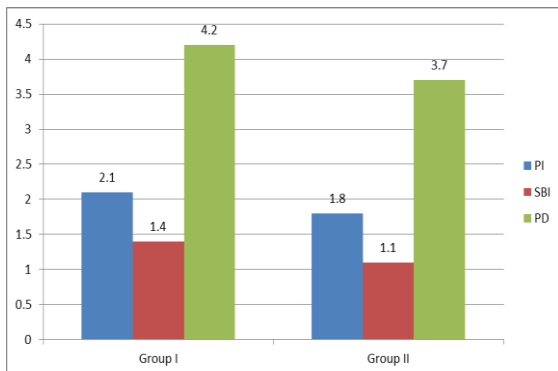
Table II shows that in group I, mean plaque score for P.

gingivalis was 2.16 and in group II was 1.78. The difference was non- significant ($P > 0.05$). Sulcus bleeding score was 1.85 and 1.02 in group I and group II respectively. Probing depth was 4.46 and 3.83 in group I and group II respectively. The difference was non-significant ($P > 0.05$).



Graph I Clinical and microbiological findings for *A. Actinomycetemcomitans* in both groups

Graph I shows that mean plaque score for *A. Actinomycetemcomitans* in group I was 2.6 and 2.4 in group II. Sulcus bleeding index (SBI) was 2.1 and 2.2 in group I and group II respectively. Probing depth was 4.5 and 4.41 in group I and group II respectively. The difference was non- significant ($P > 0.05$).



Graph II Clinical and microbiological findings for *Prevotella intermedia* in both groups

Graph II shows that mean plaque score for *Prevotella intermedia* in group I was 2.1 and 1.8 in group II. Sulcus bleeding index (SBI) was 1.4 and 1.1 in group I and group II respectively. Probing depth was 4.2 and 3.7 in group I and group II respectively. The difference was non- significant ($P > 0.05$).

DISCUSSION

Dental plaque contains variety of bacteria which can lead to gingivitis and ultimately periodontitis. The deleterious effect can be seen with the loss of teeth due to excessive mobility and bone loss resulting from progression of gingivitis to periodontitis. Studies have suggested the role of dental plaque bio film on teeth and their effects on dental implants as well.^{4,5}

Dental implants have been used in dentistry for the last two decades. With the modification in structure, more compatible dental implants with superior properties than previous one have been introduced in the market. These have shown significant success in terms of stability, survival rate and limited complications. However, failures cannot be denied. Among various causative factors, role of dental plaque biofilms on success of dental implant have been the topic of discussion since long.⁶ Considering this the present study was conducted to determine the bacterial flora such as *P. gingivalis*, *Prevotella intermedia* and *A. Actinomycetemcomitans* around dental implants and around natural teeth adjacent to dental implants.

In present study, both groups, group I and group II had 10 patients each. Group I comprised of patients in which subgingival plaque sample was obtained around dental implant and group II had those patients in which subgingival plaque sample was obtained around teeth adjacent to dental implant. We found that mean plaque score for *P. gingivalis* group I was 2.16 and in group II was 1.78. Mean sulcus bleeding score was 1.85 and 1.02 in group I and group II respectively. Mean probing score was 4.46 and 3.83 in group I and group II respectively. This is in agreement with Bauman et al.⁷

Peri- implantitis is one of the major causes of dental implant failure. It is periapical inflammation around dental implant leading to bone loss and ultimately

failure. Radiographically it is detected by the presence of radiolucency around the surface of implant mostly at apical region. The role of bacterial flora is well established in causing peri- implantitis. Bacteria such as *P. gingivalis*, *Prevotella intermedia* and *A. Actinomycetemcomitans* are causative factor of Peri-implantitis.⁸

In present study we found that mean plaque score for *A. Actinomycetemcomitans* in group I was 2.6 and 2.4 in group II. Sulcus bleeding index (SBI) was 2.1 and 2.2 in group I and group II respectively. Probing depth was 4.5 and 4.41 in group I and group II respectively. As found in study, there was no difference in all indices around dental implant as in group I and adjacent to dental implant as in group II. In a study by Arun et al⁹, 10 patients were enrolled in the study who were divided into 2 groups of 10 each. In group I, subgingival samples were obtained around dental implants and in group II from adjacent teeth to dental implant. Author found correlation between PI, SBI and PD and presence of *P. gingivalis* and *A. Actinomycetemcomitans*.

In present study we found that mean plaque score for *Prevotella intermedia* in group I was 2.1 and 1.8 in group II. Sulcus bleeding index (SBI) was 1.4 and 1.1 in group I and group II respectively. Probing depth was 4.2 and 3.7 in group I and group II respectively. This is in agreement with Kohavi et al.¹⁰

Nakou M et al¹¹ in their study of early microbial colonization of perimucosal implants in edentulous patients found that there was significantly presence of *A. Actinomycetemcomitans* and *P. intermedia* around dental implant and adjacent teeth to dental implant. A positive correlation existed between two. Similarly, Koka S et al¹² in their study of microbial colonization of dental implants in partially edentulous subjects found a relation between clinical and microbial findings and dental implants.

CONCLUSION

Microbiological analysis found *A. Actinomycetemcomitans*, *P. intermedia* and *P. gingivalis* in both groups. The qualitative assessment of these bacteria between both groups found to be similar.

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