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Original Article

Correlation of Peri- implantitis and the Periodontal Health of the adjacent and contralateral tooth with and without peri-implantitis- A Clinical Study

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***ABSTRACT*:**
Background: Dental implant survival depends on various factors. Oral health of patient determines the outcome of the treatment. Periodontitis have negative impact on success of dental implants. The present study was conducted to determine correlation between peri-implantitis and periodontitis in adjacent teeth. **Materials & Methods:** The present study was conducted on 58 patients with 84 dental implants. They were divided into 2 groups, group I (50) were with peri- implantitis in and group II (34) were without it. In all patients, PD, GR and CAL was calculated around implant, adjacent to implant and on contralateral side. Intraoral periapical radiographs (IOPAR) were taken to evaluate peri- implantitis. **Results:** Males were 30 with 52 dental implants and females were 28 with 32 dental implants. CAL was 5.82± 0.52 in group I and 3.62± 0.63 in group II (P- 0.001) around implants. P. D was 4.28± 1.26 in group I and 2.20± 0.52 in group II around adjacent teeth (P- 0.002). P.D around contralateral teeth was significant (P- 0.05) in group I (3.18± 1.01) and in group II (2.71± 0.73). **Conclusion:** Periodontitis have negative effect on implant success. Teeth adjacent to dental implant plays an important role in deciding the success or failure of implant. **Clinical significance:** Maintenance of periodontal health is of paramount importance for successful implant therapy.
Key words: Implant, Periodontal health, Peri- implantitis.

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INTRODUCTION

The management of missing teeth is nowadays no longer considered complicated procedure. In the last few decades there has been transition in the field of dentistry. With the change in trend from removable partial denture (RPD) to fixed partial denture (FPD) to dental implants, the advancement has led successful treatment. Dental implants have brought revolution, with replacing few teeth to several.[1]

Dental implants have gained importance in past few years. It has become the choice for the patients as well as for the dentist. The dental and soft tissue trauma of clasps of RPD was the common occurring shortcoming which led to failure of the treatment. It has eliminated the need of crown reduction of adjacent teeth as in cases of FPD in replacing a tooth. Moreover, it has abolished postoperative sensitivity which was the major drawback of FPD.[2]

The long term survival rate of dental implants have been well documented in the literature.[3,4] The survival rate of 95% in 5 years has been considered successful treatment. However, failure rates are still there. Complication of dental implants are fracture of prosthetic part, fracture of implant, peri- implantitis etc. Among all, peri- implantitis which is inflammation around dental implant is common occurring lesion. General health of the patient plays an important role which decides outcome of the therapy.

Diabetes, hypertension, smoking etc. are risk factors for peri- implantitis. Oral health status determines the survival of dental implant. It has been observed that in patients with periodontitis, there are more chances of peri- implantitis.[5] The present study was conducted to determine correlation between peri- implantitis and periodontitis in adjacent teeth.

MATERIALS & METHODS

The present study was conducted in the department of Prosthodontics. It comprised of 58 patients of both genders with 84 dental implants. Patients who received dental implants in either of the arch in the last 2 years were enrolled in the study. All were informed regarding the purpose of the study and written consent was obtained. Ethical clearance was taken from the institutional ethical committee.

Inclusion criteria was patients with MISH dental implants, evidence of periodontitis with bleeding on probing, >4.5mm pocket depth, clinical and radiographic presence of bone loss, presence of atleast one teeth adjacent to implant (either mesial or distal) and in opposing and contralateral arch. Patients with prior periodontal surgery, and edentulous opposing and contralateral arch were excluded from the study.Depending upon presence or absence of peri- implantitis, patients were divided into 2 groups. Group I (50) were with peri- implantitis and group II (34) were without peri- implantitis. In all patients, William graduated periodontal probe was used to calculate the pocket depth (PD) around the implant as well as around the teeth adjacent to the implant. Teeth in the contralateral site were also measured.

Gingival recession (GR) was calculated by measuring the distance from gingival margin to the CE junction. In all patients, the mean of parameters was considered which were measured at 6 sites such as buccal, mesio- buccal, disto- buccal, lingual, mesio- lingual and disto –lingual around the dental implant and teeth adjacent to implant and on the contralateral site. Clinical attachment loss (CAL) was calculated by adding GR and PD. All measurements were performed around 84 implant sites, 84 adjacent teeth and 84 contralateral teeth. Intraoral periapical radiographs (IOPAR) were taken to evaluate peri- implantitis. Results thus obtained were subjected to statistical analysis using fisher's exact test and chi- square test. P value less than 0.05 was considered significant.

RESULTS

Out of 58 patients, males were 30 and females were 28. The difference was non- significant (P- 1). In 30 males, 52 dental implant and in 28 females, 32 dental implants were present. The difference was significant (P- 0.01) (Graph I). Table II shows that Probing depth (PD) (mean± S.D) around implant (4.24± 1.15), adjacent teeth (3.20± 1.08) and contralateral teeth (3.04± 0.26). The difference was significant (P- 0.01). Gingival recession (GR) showed significant difference (P- 0.02) around implants (0.55± 0.92), adjacent teeth (0.83± 1.02) and contralateral teeth (0.80± 0.96). Clinical attachment loss (CAL) found to be 4.79± 1.46, 4.03± 1.32 and 3.84± 1.17 around implant, adjacent teeth and contralateral teeth, which showed non-significant difference (P- 0.07).CAL was highly significant (P- 0.001) among group I (5.82± 0.52) and group II (3.62± 0.63) around implants. P. D was 4.28± 1.26 in group I and 2.20± 0.52 in group II around adjacent teeth which showed significant difference (P 0.002). CAL around adjacent teeth to implant also showed significant difference (P- 0.001). P.D around contralateral teeth was 3.18± 1.01 in group I and 2.71± 0.73 in group II. The difference was significant (P- 0.05) (Table III).

Graph I: Distribution of patients

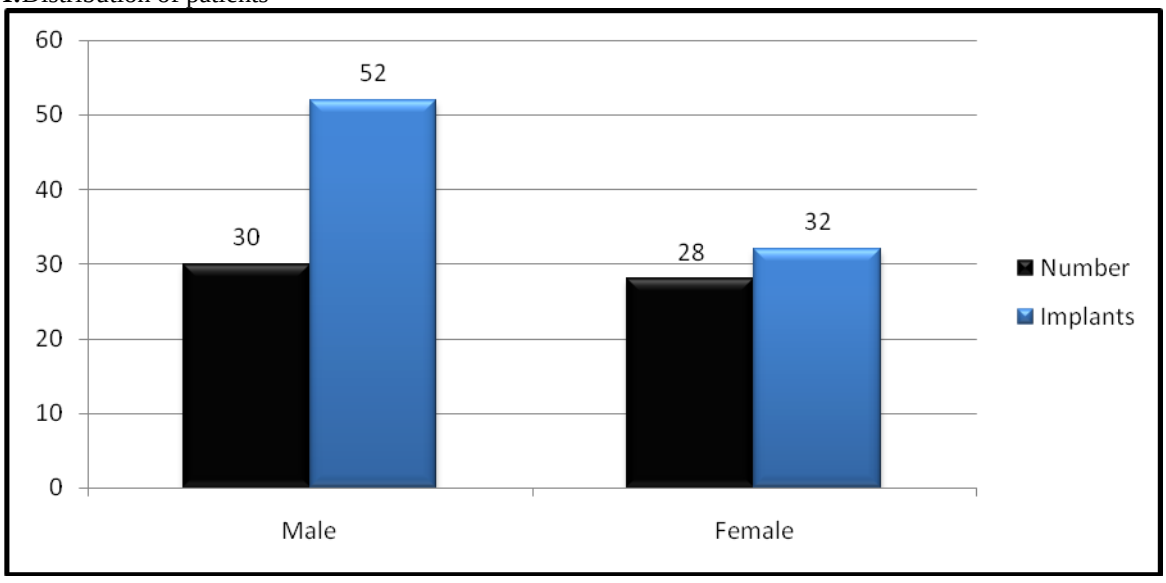

Table I: Assessment of periodontal &peri- implant status in 84 implants

Parameters (Mean± S.D)	Implants	Adjacent teeth	Contralateral teeth	P value
PD	4.24± 1.15	3.20± 1.08	3.04± 0.26	0.01*
GR	0.55± 0.92	0.83± 1.02	0.80± 0.96	0.02*
CAL	4.79± 1.46	4.03± 1.32	3.84± 1.17	0.07*

*: Significant

Table II: Periodontal status around implant, adjacent teeth and contralateral teeth in both groups

Parameters (Mean± S.D)	Group I (50)	Group II (34)	P value
Implants			
PD	5.28± 1.27	3.20± 0.75	0.01
GR	0.54± 0.82	0.42± 0.58	0.06
CAL	5.82± 0.52	3.62± 0.63	0.001
Adjacent teeth			
PD	4.28± 1.26	2.20± 0.52	0.002
GR	0.91± 0.80	0.86± 0.75	0.08
CAL	5.19± 1.42	2.06± 1.27	0.001
Contralateral teeth			
PD	3.18± 1.01	2.71± 0.73	0.05
GR	0.82± 0.85	0.86± 0.95	0.2
CAL	4.00± 0.81	3.57± 0.77	0.4

DISCUSSION

The successful dental implant therapy may be judged by its ability to free from complications such as peri- implantitis, fracture of implant and prosthetic part. The presence of peri-implantitis can be evaluated by taking radiographs in recalled visits and the amount of bone loss and mobility of implant determines the survival rate of implant.[6]The present study was conducted to evaluate the effect of periodontitis in dental implants in terms of peri- implantitis.

In this study, a total of 84 dental implants in 58 patients (males- 30, females- 28) were considered for the study. A total of 52 implants were present in males and 32 in females. All patients had chronic periodontitis. In all patients, periodontal status (PD, GR and CAL) was evaluated following standardized parameters.

Zitzmann& Berglundh[7] in their study found 28%- 56% of prevalence of peri-implant diseases among patients and 12%- 43% around dental implants. They suggested that the chances of peri- implantitis are higher among those who have periodontal diseases as compared to healthy one.Peri-implant mucositis and peri- implantitis are two peri- implant diseases which affects the treatment outcome. Peri- implant mucositis is inflammation of mucosa adjacent to implant and peri- Implantitis is inflammation around implant characterized by bone loss.[8]

Claudio et al[9] in their review analyzed the associated risk factors for peri- implantitis and found that periodontitis is one of the commonly seen initiating factor causing peri-implantitis. Thus potentiates the need of maintaining good periodontal health before and after inserting dental implant. Klokkevoldet al[10] in their systemic review revealed that periodontitis is among various risk factors for peri-implantitis. Author found that periodontitis has a negative influence on survival rate of dental implants and even treated cases of periodontitis does not affect treatment outcome.

In present study, we evaluated PD, GR and CAL around dental implants, adjacent teeth to implant and contralateral teeth in patients with periodontitis. We found that CAL was higher in patients with peri- implantitis than those without it. Thus it may be suggested that risk of peri- implantitis is more in patient with periodontal diseases than those with healthy periodontium. Similarly, PD and CAL were significantly higher in adjacent teeth group I as compared to group II.

Wang et al conducted a cross-sectional study on Chinese patients to evaluate the relation between peri-implant conditions and periodontal conditions and found that 58% of patients with 120 dental implants had more peri-implantitis with modified gingival index score >3. They concluded that periodontal health adversely affects the implant health in patient.[11]

We found that although GR and CAL on contralateral side in group I was higher than group II but the difference was statistical non- significant (P> 0.05).Chrcanovic et al in their meta- analysis of dental implants and periodontically compromised and periodontically healthy subjects found that 5.37% implant failures were seen out of 10, 927 dental implants inserted in periodontically compromised patients as compared to 3.84% failure rate in periodontically healthy subjects. Authors suggested that periodontitis exaggerate the bone loss around dental implant and ultimately leading to implant loss.[12]

Johan in her critical review established the fact that periodontitis is a risk factor for implant failure. Author suggested that bone loss >4mm demands extensive care before placing implant in such patients. Moreover, periodic evaluation of oral health is necessary to avoid peri- implant diseases in patients with dental implants.[13]Safii et al in their

3 year follow up study of risk of implant failure and marginal bone loss in subjects with periodontitis suggested periodontitis as a potential risk factor for peri- implantitis.[14] Pable et al in their study on 208 patients with 518 implants confirmed that marginal bone loss >2mm in patients with periodontitis had higher chances of peri- implantitis. The amount of bone loss was done clinically and radiographically at 5 months and 18 months.[15]Sgolastra in their study of periodontitis and implant loss found risk ratio of 1.89 of implant loss in patients with periodontal breakdown.[16]Alani& Bishop also demonstrated that there is strong correlation between bone loss in periodontitis and peri- implantitis.[17]Heitz et al in their study suggested that there is 4 time more chances of dental implant failure in those who have periodontal diseases as compared to those without it.[18] Similarly, Levin et al in their study included healthy as well as periodontitis patients. They were further divided into moderate chronic periodontitis patients and severe chronic periodontitis patients. Among healthy (283), 1.2% patients showed implant failure, among moderate chronic periodontitis patients (149), 2.7% had implant failure and in case of severe chronic periodontitis patients (285), 4.2% showed implant failure. Author concluded that severity of periodontal breakdown directly affects the success of dental implant.[19]Mengel et al in their study established the relation of peri- implantitis with periodontitis. They included 46 dental implants of 5 patients who had aggressive periodontitis and 7 implants of 5 healthy patients. There were no cases of implant failure of evidence of peri- implantitis among healthy subjects whereas 17% of aggressive periodontitis patients showed signs of peri- implantitis.[20]

CONCLUSION

Periodontal health strongly affects the outcome of dental implant therapy. Teeth adjacent to dental implant also play an important role in deciding the success or failure of implant. Contralateral teeth have no strong relationship between peri- implantitis and periodontitis.

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