Scholars Journal of Dental Sciences
Abbreviated Key Title: Sch J Dent Sci
ISSN 2394-4951 (Print) | ISSN 2394-496X (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

A Descriptive Study on the Prevalence of Peri-Implantitis with Severe Disease and Bone Loss

Dr. Abdullah Al Mamun Khan[1*], Dr. Nasrin Parvin Zahan[2]

[1]Assistant Professor, Department of Oral and Maxillofacial Surgery, City Dental College, Dhaka, Bangladesh
[2]Dental Surgeon, Banasree Dental and Implant Center and German Dental & Implant Center, Dhaka, Bangladesh

DOI: 10.36347/sjds.2022.v09i08.002 | **Received:** 25.08.2022 | **Accepted:** 19.09.2022 | **Published:** 23.09.2022

***Corresponding author**: Dr. Abdullah Al Mamun Khan, Email: drmamun@icloud.com
Assistant Professor, Department of Oral and Maxillofacial Surgery, City Dental College, Dhaka, Bangladesh

Abstract **Original Research Article**

Background: Peri-implantitis is a common complication in dental implant. It is associated with peri-implant pocket formation and loss of supporting bone which hinder the treatment of replacement of missing teeth in partially or fully edentulous patients. ***Aim of the Study:*** The aim of this study was to assess the prevalence of peri-implantitis with severe disease and bone loss. ***Methods:*** This descriptive study was conducted in the post oral implant care unit of Banasree Dental and Implant Center and German Dental & Implant Center, Dhaka, Bangladesh during the period from February 2013 to January 2022. The sample size of this study was 99. ***Result:*** Among 99 study people, mean age was 56.4 years (SD±8.1 years). Majority of the study people (53.5%) were female. From the past history, we found that 21.2% study people had smoking habit, 19.2% had diabetes, 11.1% had hypertension, 39.4% had history of periodontitis, 6.1% had osteoporosis, 2% had history of chemotherapy and 1% had history of radiotherapy. Mean follow-up was 920 days (SD±37 days). Mean implant width was 4.1 mm (SD±0.5 mm) and mean implant length was 11.0 mm (SD±0.6 mm). Most of the implants (63.6%) were located in posterior site. Mean longitudinal bone changes in mesial part were 3.0 mm (SD±4.2 mm). Mean longitudinal bone changes in distal part were 3.4 mm (SD±5.6 mm). Mean marginal bone loss was 4.3 mm (SD±3.3 mm). Mean probing depth was 4.2 mm (SD±2.1 mm). ***Conclusion:*** Older people specially women are more affected by peri-implantitis. Smoking habit, several diseases and history of periodontitis are associated with more risk for peri-implantitis. We have found peri-implantitis patients associated with severe bone loss and deep probing depth.

Keywords: Prevalence, Peri-implantitis, Severe Disease, Implant for diabetic patient, Implant for hypertensive patient, Implant for smoker and Bone Loss.

I. INTRODUCTION

Peri-implantitis is a pathological illness that affects the tissues surrounding dental implants and is characterized by inflammation of the peri-implant mucosa and a gradual loss of the bone that supports the implant [1-3. Peri-implant mucositis was outlined as one of the peri-implant disorders in the consensus report from the 6th European Workshop on Periodontology as being present mucosal inflammation at an implant site without any indication of supportive bone loss. The presence of mucosal inflammation and a lack of supporting bone were also referred to as peri-implantitis [4]. Two peri-implant diseases, peri-implantitis (PI) and peri-implant mucositis (PM), were initially defined as separate conditions by Albrektsson and Isidor [5] in 1994. PM was described as an inflammatory response that is reversible in the soft tissues around an implant that is functional, whereas peri-implantitis was described as an inflammatory response linked to a gradual loss of supporting bone. According to various degrees of radiographic bone loss, probing depth (PD), and the presence of bleeding on probing (BOP) and/or suppuration, Koldsland *et al.*, [6] assessed the severity of peri-implantitis. Because there isn't a clear definition for peri-implant illnesses, researchers apply a variety of criteria in clinical investigations, leading to a variety of results that might lead to confusion and incorrect diagnoses. According to Ferreira *et al.*, [7] PM is defined as the presence of BOP, while peri-implantitis is defined as the presence of BOP and/or suppuration, pocket depth 5 mm, and bone loss. Based on these criteria, they discovered that the prevalence of PM and peri-implantitis was 64.6 and 8.9%, respectively. Contrarily, Renvert *et al.*, [8] found that 63.7% of patients had peri- implantitis, using Sanz and Chapplel's [9] definition of the condition as peri-implant bone loss

more than 2 mm in conjunction with clinical indications of inflammation. Currently, dental implants have a success rate of over 95%, and these findings have been consistent for a long time [10]. Although the majority of longitudinal studies have indicated survival rates of about 90-95% over intervals of 5-10 years, implant therapy failures do occasionally occur [11]. Dental implants undergo an osseointegration process that can result in biological concerns of infectious or inflammatory origin that can impact the surrounding tissues. Because there is no periodontal ligament around dental implants, infections are more susceptible to degeneration [12]. Since there is presently no evidence-based treatment available, it is crucial to identify early illness indications in order to stop further development [13]. In a scientific environment, precise diagnostic criteria are required, especially when comparing outcomes, as in meta-analyses. The difficulty of comparing research addressing peri-implant circumstances for meta-analyses was noted in review publications [14-18]. Therefore, the impact on the reported prevalence of peri-implantitis when applying different criteria describing the severity of the disease should be further elucidated. This current study is conducted to assess the prevalence of peri-implantitis with severe disease and bone loss.

II. OBJECTIVES

To assess the prevalence of peri-implantitis with severe disease and bone loss.

III. METHODOLOGY & MATERIALS

This descriptive study was conducted in post-oral implant care unit of Banasree Dental and Implant Center and German Dental & Implant Center, Dhaka, Bangladesh during the period from February 2013 to January 2022. Total 99 patients who had oral implant treatment before from other centers or our centers and now having problem with peri- implantitis and bone loss was included in this study. Consent of the patients and guardians were taken before collecting data. After collection of data, all data were checked and cleaned. After cleaning, the data were entered into computer and statistical analysis of the results being obtained by using windows-based computer software devised with Statistical Packages for Social Sciences version 22. After compilation, data were presented in the form of tables, figures and charts, as necessary. Numerical variables were expressed as mean and standard deviation, whereas categorical variables were count with percentage.

Inclusion Criteria

- All age groups.

Exclusion Criteria

- Patients who did not give consent.
- Patients transferred to another hospital.

IV. RESULT

This study was conducted among 99 patients with peri-implantitis having severe disease and bone loss. Table I shows the demographic characteristics and history of the study people. Mean age of the study people was 56.4 years (SD±8.1 years). Majority of the study people (53.5%) were female. From the past history, we found that 21.2% study people had smoking habit, 19.2% had diabetes, 11.1% had hypertension, 39.4% had history of periodontitis, 6.1% had osteoporosis, 2% had history of chemotherapy and 1% had history of radiotherapy. Table II shows the implant characteristics. Mean follow-up was 920 days (SD±37 days). Mean implant width was 4.1 mm (SD±0.5 mm) and mean implant length was 11.0 mm (SD±0.6 mm). Most of the implant (63.6%) was located in posterior site (Figure 1). Table III shows the bone criteria of the study people. Mean longitudinal bone changes in mesial part were 3.0 mm (SD±4.2 mm). Mean longitudinal bone changes in distal part were 3.4 mm (SD±5.6 mm). Mean marginal bone loss was 4.3 mm (SD±3.3 mm). Mean probing depth was 4.2 mm (SD±2.1 mm).

Table I: Demographic characteristics and history of the study people (n=99)

Characteristics		n	%
Age (Years)	≤30	3	3.0
	31-40	9	9.1
	41-50	21	21.2
	51-60	30	30.3
	61-70	20	20.2
	>70	10	10.1
	Mean±SD	56.4±8.1	
Gender	Male	46	46.5
	Female	53	53.5
Smoking habit	Yes	21	21.2
	No	78	78.8
Diabetes	Yes	19	19.2
	No	80	80.8
Hypertension	Yes	11	11.1
	No	88	88.9
History of periodontitis	Yes	39	39.4
	No	60	60.6
Osteoporosis	Yes	6	6.1
	No	93	93.9
History of chemotherapy	Yes	2	2.0
	No	97	98.0
History of radiotherapy	Yes	1	1.0
	No	98	99.0

Table II: Implant characteristics (n=99)

Characteristics	Mean±SD
Follow-up (Days)	920±37
Implant width (mm)	4.1±0.5
Implant length (mm)	11.0±0.6

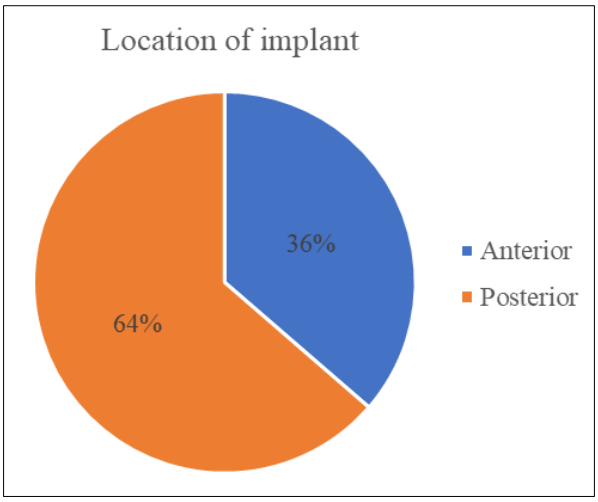

Figure 1: Implant location (n=99)

Table III: Bone criteria (n=99)

Characteristics	Mean±SD
Longitudinal bone changes, mesial (mm)	3.0±4.2
Longitudinal bone changes, distal (mm)	3.4±5.6
Marginal bone loss (mm)	4.3±3.3
Probing depth (mm)	4.2±2.1

V. DISCUSSION

This current study was conducted to assess the prevalence of peri-implantitis with severe disease and bone loss among 99 patients admitted in post-oral implant care unit. In this study, mean age of the study people was 56.4 years (SD±8.1 years). Majority of the study people (53.5%) were female. This indicates that older people specially women are more affected by peri-implantitis. In the study of Elemek E *et al.*, [19] among 200 patients, mean age was 52.8 ± 12.2 years and 63% were females which is similar to our study. From the past history, we found that 21.2% study people had smoking habit, 19.2% had diabetes, 11.1% had hypertension, 39.4% had history of periodontitis, 6.1% had osteoporosis, 2% had history of chemotherapy and 1% had history of radiotherapy. 3 to 9 years after oral implant treatment 6.1% elderly females had osteoporosis, 5 to 7 years after oral implant treatment 2% male had chemotherapy and 10 years after oral implant treatment 1% male had radiotherapy, which may lead to peri-implantitis and severe bone loss. Cigarette smoking has been identified as a risk indicator in several studies.[20-21] History of periodontitis was also found to be a significant risk factor for the development of peri-implant diseases in several studies [22, 23]. In the study of Marrone A *et al.*, [24] 39.3% peri-implantitis patients had history of periodontitis, 30% were smoker, 42.9% had diabetes and 28.6% had Rx Therapy. In this current study, mean follow-up was 920 days (Almost 2 and half years) (SD±37 days). Mean implant width was 4.1 mm (SD±0.5 mm) and mean implant length was 11.0 mm (SD±0.6 mm). Most of the implants (63.6%) were located in posterior site. Kordbacheh Changi K *et al.*, [25] found that the follow up period was 960 ± 331 days for peri-implantitis affected implants. Mean implant width was 4.0 mm (SD±0.9 mm) and mean implant length was 11.0 mm (SD±2.2 mm). Most of the implants (67.9%) were located in posterior site. All these findings are similar to our study. In our study, mean longitudinal bone changes in mesial part was 3.0 mm (SD±4.2 mm) and mean longitudinal bone changes in distal part was 3.4 mm (SD±5.6 mm). In the study of Kordbacheh Changi K *et al.*, [25] similar results were found. In this study, mean marginal bone loss was 4.3 mm (SD±3.3 mm). Mean probing depth was 4.2 mm (SD±2.1 mm). Jemt and Johansson [26] observed MBL ≥3 mm only in 1.3% of the implants. Koldsland *et al.*, [6] using the same level of MBL to define peri-implantitis reported the prevalence 8.2% at implant level.

Limitations of the Study

In our study, there was small sample size and absence of control for comparison. Study population was selected from one center in Dhaka city, so may not represent wider population. The study was conducted at a short period of time. The sampling was retrospective and there was no random allocation, so there is risk of selection bias.

VII. CONCLUSION AND RECOMMENDATIONS

Older people specially women are more affected by peri-implantitis. Smoking habit, several diseases and history of periodontitis are associated with more risk for peri-implantitis. We have found peri-implantitis patients associated with severe bone loss and deep probing depth. Further study with larger sample size is required to have better understanding.

REFERENCES

1. Lang, N. P., Berglundh, T., & Working Group 4 of the Seventh European Workshop on Periodontology. (2011). Periimplant diseases: where are we now?–Consensus of the Seventh European Workshop on Periodontology. *Journal of clinical periodontology*, *38*, 178-181.
2. Sanz, M., Chapple, I. L., & Working Group 4 of the VIII European Workshop on Periodontology*. (2012). Clinical research on peri-implant diseases: consensus report of W orking G roup 4. *Journal of clinical periodontology*, *39*, 202-206.
3. Jepsen, S., Berglundh, T., Genco, R., Aass, A. M., Demirel, K., Derks, J., ... & Zitzmann, N. U. (2015). Primary prevention of peri-implantitis: Managing peri-implant mucositis. *Journal of clinical periodontology*, *42*, S152-S157.
4. Zitzmann, N. U., & Berglundh, T. (2008). Definition and prevalence of peri-implant diseases. *Journal of clinical periodontology*, *35*, 286-291.
5. Albrektsson, T., & Isidor, F. (1994). Consensus report of session IV. In: Lang, N. P., & Karring, T. (eds.) *Proceeding of the 1st European Workshop on Periodontology*. London: Quintessence Publishing, 365-369.

6. Koldsland, O. C., Scheie, A. A., & Aass, A. M. (2010). Prevalence of peri-implantitis related to severity of the disease with different degrees of bone loss. *Journal of periodontology*, *81*(2), 231-238.
7. Ferreira, S. D., Silva, G. M., Cortelli, J. R., Costa, J. E., & Costa, F. (2006). Prevalence and risk variables for peri-implant disease in Brazilian subjects. *Journal of clinical periodontology*, *33*(12), 929-935.
8. Renvert, S., Aghazadeh, A., Hallström, H., & Persson, G. R. (2014). Factors related to peri-implantitis–a retrospective study. *Clinical oral implants research*, *25*(4), 522-529.
9. Sanz, M., Chapple, I. L., & Working Group 4 of the VIII European Workshop on Periodontology*. (2012). Clinical research on peri-implant diseases: consensus report of W orking G roup 4. *Journal of clinical periodontology*, *39*, 202-206.
10. Esposito, M., Grusovin, M. G., Willings, M., Coulthard, P., & Worthington, H. V. (2007). The effectiveness of immediate, early, and conventional loading of dental implants: a Cochrane systematic review of randomized controlled clinical trials. *International Journal of Oral & Maxillofacial Implants*, *22*(6), 893-904.
11. Berglundh, T., Persson, L., & Klinge, B. (2002). A systematic review of the incidence of biological and technical complications in implant dentistry reported in prospective longitudinal studies of at least 5 years. *Journal of clinical periodontology*, *29(S3)*, 197-212. Doi: 10.1034/j.1600-051X.29.s3.12.x.
12. Hansson, H. A., & Albrektsson, T. (1983). Bra nemark PI. Structural aspects of the interface between tissue and titanium implants. *J Prosthet Dent*, *50*(1), 108-113. doi: 10.1016/0022-3913(83)90175-0
13. Claffey, N., Clarke, E., Polyzois, I., & Renvert, S. (2008). Surgical treatment of peri-implantitis. *Journal of clinical periodontology*, *35*, 316-332.
14. Heitz-Mayfield, L. J. (2008). Peri-implant diseases: diagnosis and risk indicators. *Journal of clinical periodontology*, *35*, 292-304.
15. Hultin, M., Komiyama, A. I., & Klinge, B. (2007). Supportive therapy and the longevity of dental implants: a systematic review of the literature. *Clinical Oral Implants Research*, *18*, 50-62.
16. Karoussis, I. K., Kotsovilis, S., & Fourmousis, I. (2007). A comprehensive and critical review of dental implant prognosis in periodontally compromised partially edentulous patients. *Clinical oral implants research*, *18*(6), 669-679.
17. Ong, C. T., Ivanovski, S., Needleman, I. G., Retzepi, M., Moles, D. R., Tonetti, M. S., & Donos, N. (2008). Systematic review of implant outcomes in treated periodontitis subjects. *Journal of clinical periodontology*, *35*(5), 438-462.
18. Berglundh, T., Persson, L., & Klinge, B. (2002). A systematic review of the incidence of biological and technical complications in implant dentistry reported in prospective longitudinal studies of at least 5 years. *Journal of clinical periodontology*, *29*, 197-212.
19. Elemek, E., Agrali, O. B., Kuru, B., & Kuru, L. (2020). Peri-implantitis and severity level. *European Journal of Dentistry*, *14*(01), 024-030.
20. Karbach, J., Callaway, A., Kwon, Y. D., d'Hoedt, B., & Al-Nawas, B. (2009). Comparison of five parameters as risk factors for peri-mucositis. *International Journal of Oral & Maxillofacial Implants*, *24*(3), 491-496.
21. Rinke, S., Ohl, S., Ziebolz, D., Lange, K., & Eickholz, P. (2011). Prevalence of periimplant disease in partially edentulous patients: a practice-based cross-sectional study. *Clinical oral implants research*, *22*(8), 826-833.
22. Heitz-Mayfield, L. J. (2008). Peri-implant diseases: diagnosis and risk indicators. *Journal of clinical periodontology*, *35*, 292-304.
23. Passariello, C., Di Nardo, D., & Testarelli, L. (2019). Inflammatory periimplant diseases and the periodontal connection question. *European Journal of Dentistry*, *13*(01), 119-123.
24. Marrone, A., Lasserre, J., Bercy, P., & Brecx, M. C. (2013). Prevalence and risk factors for peri-implant disease in Belgian adults. *Clinical Oral Implants Research*, *24*(8), 934-940.
25. Kordbacheh Changi, K., Finkelstein, J., & Papapanou, P. N. (2019). Peri-implantitis prevalence, incidence rate, and risk factors: A study of electronic health records at a US dental school. *Clinical Oral Implants Research*, *30*(4), 306-314.
26. Jemt, T., & Johansson, J. (2006). Implant treatment in the edentulous maxillae: a 15-year follow-up study on 76 consecutive patients provided with fixed prostheses. *Clinical Implant Dentistry and Related Research*, *8*(2), 61-69.