

Original Research

To determine failure rate of dental implants in medically compromised patients- A clinical study

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ABSTRACT:

Background: A dental implant has been designated as a surgical element that serves as an anchor between the jaw bone and the dental prosthesis. The present study was conducted to determine failure rate of dental implants in medically compromised patients. **Materials & Methods:** The present study was conducted on 134 patients who received dental implants in last 10 years of both genders. Patients were assessed and failure rate such as peri- implantitis, fracture of prosthetic part, loosening of implant was recorded. **Results:** 26 patients had diabetes mellitus, 30 had hypertension, 56 had osteoporosis and 22 had hyperthyroidism. The difference was significant ($P < 0.05$). Diabetes mellitus patients, 2 patients had peri- implantitis, 1 had fracture of prosthetic part and 1 had loosening of implant. In hypertension patients, 1 had peri- implantitis and 1 had loosening of implant. In osteoporosis patients, 2 had peri- implantitis, 1 had fracture of prosthetic part and 1 had loosening of implant. In hyperthyroidism, 1 had peri- implantitis. The difference was significant ($P < 0.05$). **Conclusion:** Among various medically compromised patients, maximum failure rates were seen in diabetes mellitus and osteoporosis.

Key words: Diabetes mellitus, Hypertension, osteoporosis

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INTRODUCTION

A dental implant has been designated as a surgical element that serves as an anchor between the jaw bone and the dental prosthesis. While in the past the use of removable or fixed partial dentures was customary for the replacement of missing teeth, nowadays with recent developments in implant surgeries, the reintegration of edentulous area by implant has become a routine procedure in the last 10 years. The key factor before contemplating any dental surgery is the cautious selection of patient in consideration with the medical history and local oral health of the subject.¹

At the present time, dental implants are a well-established and dependable solution for patients desiring replacement of their teeth. The advantages of dental implants include better functions of mastication and phonetics, aesthetics.

The number of medically compromised patients requiring implant surgery is increasing gradually. Diabetes, hypertension, hyperthyroidism, osteoporosis etc. are commonly seen systemic diseases.²

There are a few studies which have reported the success of dental implants in bone diseases other than osteoporosis.³ These diseases include osteogenesis imperfecta, ankylosing spondylitis, rheumatoid arthritis and connective tissue disorders. Implant therapy has been reported to be successful in osteogenesis imperfecta, ankylosing spondylitis and rheumatoid arthritis. However, in connective tissue disorders, some amount of bone resorption and an increased bleeding tendency can be expected.⁴ The present study was conducted to determine failure rate of dental implants in medically compromised patients.

MATERIALS & METHODS

The present study was conducted in the department of Prosthodontics. It comprised of 134 patients who received dental implants in last 10 years of both genders. All were the cases of medically compromised such as diabetes, hypertension, hyperthyroidism, osteoporosis. They were informed regarding the study and written consent was

obtained. Ethical clearance from ethical committee was taken prior to the study.

Data such as name, age, gender etc. was recorded. Patients were assessed and failure rate such as peri- implantitis, fracture of prosthetic part, loosening of implant was recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Systemic diseases	Number	P value
Diabetes mellitus	26	0.01
Hypertension	30	
Osteoporosis	56	
Hyperthyroidism	22	

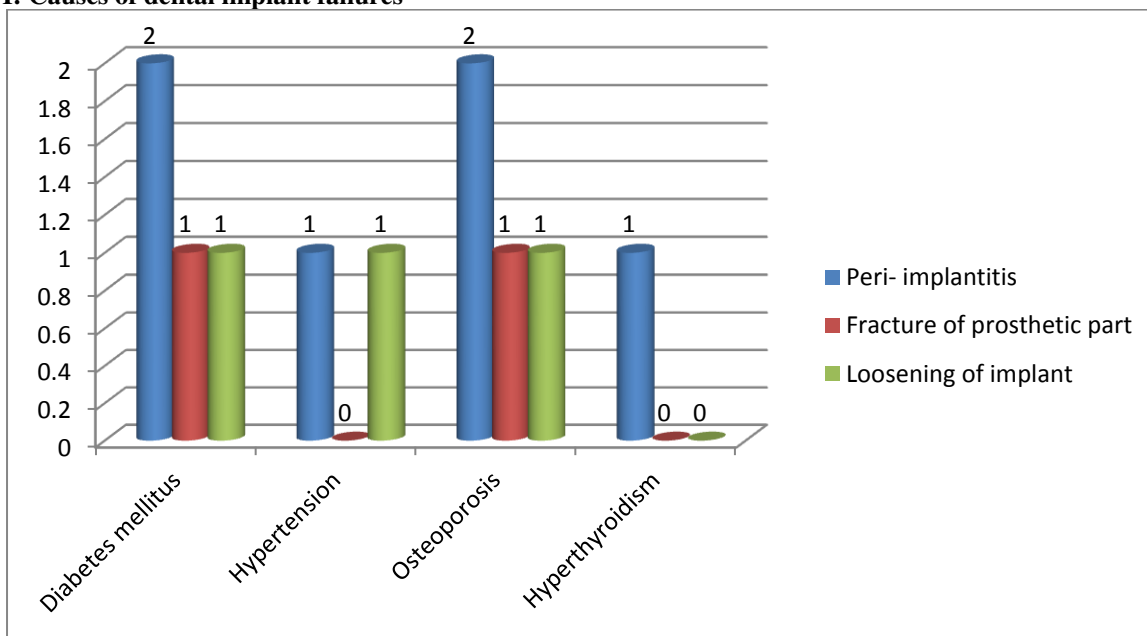
Table I shows that 26 patients had diabetes mellitus, 30 had hypertension, 56 had osteoporosis and 22 had hyperthyroidism. The difference was significant (P< 0.05).

Table II Causes of dental implant failures

Systemic diseases	Peri- implantitis	Fracture of prosthetic part	Loosening of implant	P value
Diabetes mellitus	2	1	1	0.05
Hypertension	1	0	1	
Osteoporosis	2	1	1	
Hyperthyroidism	1	0	0	

Table II, graph I shows that diabetes mellitus patients, 2 patients had peri- implantitis, 1 had fracture of prosthetic part and 1 had loosening of implant. In hypertension patients, 1 had peri- implantitis and 1 had loosening of implant. In osteoporosis patients, 2 had peri- implantitis, 1 had fracture of prosthetic part and 1 had loosening of implant. In hyperthyroidism, 1 had peri- implantitis. The difference was significant (P< 0.05).

Graph I: Causes of dental implant failures



DISCUSSION

Dental implant (DI) is broadly considered to be the ideal treatment of the tooth loss, which is mostly required in the aged population.⁵ The prevalent age-range for implant therapy has been reported above 40 years or between 51 and 60 years, thus the patients who required dental implant therapy are usually associated with systemic comorbidities. For both patients' and clinicians' benefit, systemic comorbidities of the patient should be well-diagnosed before DI therapy. Besides, treatment plan and patient selection should be carried out with reference to the clinical evidence. Patients should be ensured to inform thoroughly about the risks and precautions.⁶ The present study was conducted to determine failure rate of dental implants in medically compromised patients.

We found that 26 patients had diabetes mellitus, 30 had hypertension, 56 had osteoporosis and 22 had hyperthyroidism. Diabetes mellitus patients, 2 patients had peri-implantitis, 1 had fracture of prosthetic part and 1 had loosening of implant. In hypertension patients, 1 had peri-implantitis and 1 had loosening of implant. In osteoporosis patients, 2 had peri-implantitis, 1 had fracture of prosthetic part and 1 had loosening of implant. In hyperthyroidism, 1 had peri-implantitis.

Manor et al⁷ found that the study group consisted of 117 patients that had a history of major medical illness while the control group consisted of 103 patients that did not reveal any history of existing medical conditions. Based on this information, the efficacy of the implants in medically compromised patients was explored. In the study group, designated as group A, out of 117 patients, 57 were females, and 60 were males. In the control group, designated as group B, out of 103 patients, 48 were females, and 55 were males. Group A had 331 implants intact and in the healthy condition which amounted for 83.37% implant success. However, the group had 66 failed implants amounting to 16.63%. Group B had 287 implants intact and in the healthy condition which amounted for 89.96% implant success. However, the group had 32 failed implants amounting to 10.04%.

Lee et al⁸ stated that as being the most prevalent endocrine disease, diabetes mellitus is a metabolic disorder that is generally diagnosed by the characteristic symptoms of polydipsia, polyuria, and polyphagia in correlation with exceeded blood glucose levels more than 200 mg/dL. It causes hyperglycemia due to a defect of insulin secretion, that insulin has an effect on the regeneration of bone matrix. In a diabetic patient, hyperglycemia reduces clot quality, number of osteoclasts, and collagen production, which are the keys of bone regeneration.

Thyroid hormones of triiodothyronine (T3) and thyroxine (T4) have been demonstrated to have influence on cortical bone healing than cancellous bone around titanium implants. Thus, thyroid hormones-related disorders could be regarded as the considerable issues for evaluating the success of dental implants. Concerning the peri-implant pathology, thyroid disorders are reported to have the lowest potential risk compared to the other systemic disorders, in a recent clinical study.⁹

CONCLUSION

Authors found that among various medically compromised patients, maximum failure rates were seen in diabetes mellitus and osteoporosis.

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