ORIGINAL RESEARCH

Assessment of Vitamin D levels and prognosis of dental implants

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ABSTRACT:
Background: Dental implants are today considered a successful treatment for restoring function and aesthetics. Vitamin D plays a fundamental role in bone metabolism. Hence, the present study was undertaken for assessing the correlation between serum vitamin D levels and prognosis of dental implants. **Materials & methods:** A total of 50 patients were enrolled in the present study. Complete demographic data of all the patients was recorded. All the patients were broadly divided into two study groups. Group A consisting of 25 patients in which dental implant therapy was successful both clinical and radiographically on two years follow-up and Group B consisting of 25 patients in which dental implant therapy failed. Blood samples were obtained from all the patients and serum vitamin D levels were assessed. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. **Results:** Mean vitamin D levels among patients in group A and group B was 56.11 ng/mL and 61.88 ng/mL respectively. Non-significant results were obtained while comparing the means serum vitamin D levels between patients of group A and group B. **Conclusion:** Our study failed to establish any relationship between serum vitamin D levels and prognosis of dental implants.
Key words: Vitamin D, Dental implant

INTRODUCTION

Dental implants are today considered a successful treatment for restoring function and aesthetics. In fact, dental implant treatment has proven to be a predictable modality for replacing missing and failing teeth with various types of fixed and removable dental prostheses, with high survival rates even in the long term. Osseointegration, i.e. the formation of a direct interface between implant and bone is key for the success of a dental implant. It is important that the implant be integrated into the bone during the initial healing period; this results in a clinically asymptomatic fixation under functional load, and this integration has to be maintained over time.[1-3]

Vitamin D plays a fundamental role in bone metabolism. It is a fat-soluble vitamin which promotes the absorption of calcium in the intestine and regulates calcium and phosphate homoeostasis in the tissues and it is a fundamental element in the mineralization of bones and teeth. It also acts as a hormone and is vital for the health of the blood vessels and the brain. It has been demonstrated that vitamin D plays a crucial role in the health of the cardiovascular tract, the immune system, and the respiratory tract.[4-6] Hence, the present study was undertaken for assessing the correlation between serum vitamin D levels and prognosis of dental implants.

MATERIALS & METHODS

The present study was undertaken for assessing the correlation between serum vitamin D levels and prognosis of dental implants. A total of 50 patients were enrolled in the present study. Complete demographic data of all the patients was recorded. All the patients were broadly divided into two study groups. Group A consisting of 25 patients in which dental implant therapy was successful both clinical and radiographically on two years follow-up and Group B consisting of 25 patients in which dental implant therapy failed. Blood samples were obtained from all the patients and serum vitamin D levels were assessed. All the results were recorded in Microsoft excel sheet and were analyzed by SPSS software. Mann Whitney U test was used for evaluation of level of significance.

RESULTS

A total of 50 patients were enrolled in present study. All the patients were broadly divided into two study groups. Group A consisting of 25 patients in which dental implant therapy was successful both clinical and radiographically on two years follow-up and Group B consisting of 25 patients in which dental implant therapy failed. Mean age of the patients of Group A and group B was 49.5 years and 48.1 years respectively. Mean vitamin D levels among patients group A and group B was 56.11 ng/mL and 61.88 ng/mL respectively. Non-significant results were obtained while comparing the mean vitamin D serum levels between patients of group A and group B.

Table 1:Age-wise and gender-wise distribution of patients

Parameter		Group A	Group B
Age group (years)	Less than 30	5	7
	30 to 50	10	9
	More than 50	10	9
Gender	Males	18	15
	Females	7	10

Table 2: Comparison of Vitamin D levels

Vitamin D levels (ng/mL)	Group A	Group B
Mean	56.11	61.88
SD	12.85	13.14
Mann-Whitney U value	89.6662	
p- value	0.1255	

DISCUSSION

Osseointegration is defined as "a process whereby a clinically asymptomatic rigid fixation of alloplastic materials is achieved and maintained in bone during functional loading". Osseointegration is involved in dental implants healing, thus leading to a functional unit that may rehabilitate one or more missing teeth supporting dental prosthesis. In addition to key factors that affect the osseointegration, such as the surgical technique, bone quality and quantity, postoperative inflammation or infection, smoking habits, and implant material and surface. Other factors should be taken into account including the immunological and nutritional status of the host.[4-6] Hence, the present study was undertaken for assessing the correlation between serum vitamin D levels and prognosis of dental implants.

A total of 50 patients were included in the present study. All the patients were broadly divided into two study groups. Group A consisting of 25 patients in which dental implant therapy was successful both clinical and radiographically on two years follow-up and Group B consisting of 25 patients in which dental implant therapy failed. Mean age of the patients of Group A and group B was 49.5 years and 48.1 years respectively.

Long-term stable osseointegrated implants are the primary goal in dental implantology. Although dental implants have proven clinical reliable in the long term, the failure of implants at a very early stage of osseointegration has been described. The pursuit to identify the mechanisms leading to early implant failure is ongoing to date and include the following: tobacco usage, diabetes, wear particle release and foreign body reaction, local bone necrosis due to heat generation during bone preparation or implant placement. Systematic reviews demonstrated that an antibiotic regimen before dental implant placement subtly reduces the early implant infection and consequently implant failure. In orthopedics, the risk to develop a peri-prosthetic joint infection has been associated with a low vitamin D level. A relationship between bone metabolism, vitamin D and early implant failure in human has not been proven to date. Vitamin D induces bone formation around implants in rodents. Besides the classical function, findings of the last decades indicate vitamin D as an important immune regulator targeting both the innate and adaptive immune response, since all cells of the immune system express vitamin DS receptor (VDR).[6-8]

In the present study, mean vitamin D levels among patients in group A and group B was 56.11 ng/mL and 61.88 ng/mL respectively. Non-significant results were obtained while comparing the means serum levels in between patients of group A and group B. Guido Mangano F et al investigated whether there is a relationship between low serum levels of vitamin D and EDIF. Originally, 885 patients treated with 1,740 fixtures were enrolled in this study. Overall, 35 EDIFs (3.9%) were reported. No correlation was found between EDIF and the patient's gender (P=0.998), age (P=0.832), smoking habit (P=0.473) or history of periodontal disease (P=0.386). Three EDIFs (11.1%) were reported in 27 patients with serum levels of vitamin D <10 ng/mL, 20 EDIFs (4.4%) in 448 patients with levels between 10 and 30 ng/mL, and 12 EDIFs (2.9%) in 410 patients with levels >30 ng/mL. Although there was a clear trend toward an increased incidence of EDIF with lowering of serum vitamin D levels, no statistically significant difference (P=0.105) was found among these three groups. Their study failed to demonstrate a significant relationship between low serum levels of vitamin D and increased risk of EDIF.[9]

CONCLUSION

Our study failed to establish any relationship between serum vitamin D levels and prognosis of dental implants.

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