



## **Assessment of Knowledge and Awareness about the Role of Vitamin D in Relation To Dental Implants In Clinicians Practicing Oral Implantology: A Short Survey**

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### **ABSTRACT**

*Vitamin D has been closely associated with bone metabolism and thus it is expected to be closely related to the success of dental implants as they are directly related to the bony tissues. The primary aim of this article was to assess the awareness and knowledge about the role of vitamin D in dental implantology in clinicians practicing oral implantology which may affect the success of dental implants in their clinical practice. A total sample size of 220 clinicians practicing oral implantology from Delhi and NCR participated in this cross-sectional survey. Result based on the pie chart showed that there was lack of awareness about the significance of vitamin D in dental practitioners placing dental implants. Only 19.6 % practitioners prescribed serum vitamin D test before placing implants, 29.1% clinicians think that vitamin D plays role in success of dental implants and only 12.7% prescribed vitamin D supplement to patients who had vitamin D deficiency. More than 80 % think that only older age groups are deficient in vitamin D. The knowledge and awareness about the vitamin D is lacking in the dentist practicing oral implantology and this might be the cause of failure in dental implants when all the other conditions are favorable.*

*Keywords : Vitamin D, Dental implants, awareness, deficiency*

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### **INTRODUCTION**

The most common method of replacing lost natural teeth in today's era is dental implants and is routinely done by dental practitioners all over the world[1]. Yet, to this day, 100 percent success is still not achieved in the field of oral implantology and quite a number of implants fail without any reason within the initial phase of healing after implant placement[2]. The current scenario of diet in the general population is more inclined toward fast foods which are lacking in essential nutrients such as vitamin D which leads to several complications[3]. Unfortunately, one of the most commonly found micronutrient deficiencies today is that of vitamin D, which is critical for maintaining the immune system as well as calcium-phosphorus homeostasis in the body.

Vitamin D has been closely associated with bone metabolism and thus it is expected to be closely related to the success of dental implants as they are directly related to the bony tissues<sup>6</sup>. The current scientific literature reports that there is 50% to 200% increase in dental implant failure resulting due to smoking and periodontal diseases, whereas vitamin D deficiency increases the risk to 300% resulting in early implant failure. These findings suggest that micronutrients i.e., vitamins and minerals play an important role in the successful osseointegration of dental implants and prevention of early implant failures. The primary aim of this article is to highlight the lack of awareness and knowledge about the deficiency of vitamin D in dental practitioners practicing dental implantology which may affect the success of dental implants in their clinical practice[4-5].

### **MATERIAL AND METHODS**

A total of 220 dental practitioner, were targeted and approached for the study. The study protocol was explained in detail to all the practitioners and their consent was taken. They had the right to withdraw their name from the survey. All the subjects were asked 10 questions. Based on their answers the analysis was done. Questionnaire survey was done and the format is as follows:

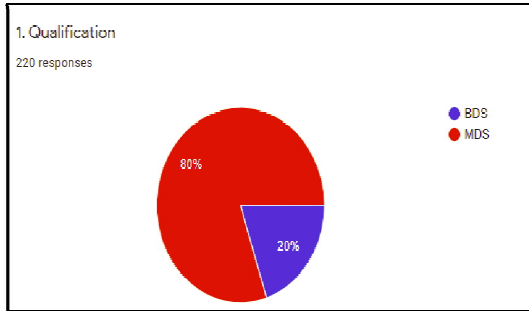
Table 1: Questionnaire assessment with responses of clinicians

S. No.	Variables (Questions)	Options	Responses of Patients
1.	Qualification	1.BDS 2.MDS	MDS-80% BDS-20%
2	Clinical experience	1.Less than 5 years 2.5- 10 years 3.10-20 years 4.more than 20 years	5-10 yrs-42.3% 10-20 yrs-30.9% <5 yrs-22.3%
3	Do you practice dental implantology in your dental practice?	1.Yes 2.No	Yes-98.2%
4	How many dental implants do you place in your dental practice in a month?	1.less then 5 implants 2.5-10 implants 3.more than 10 implants	5-10 implants-45.9% >10- 28.9% <5- 25.2%
5	Which radiographic investigation you prefer before placing the implant?	1.RVG 2.OPG 3.CBCT	CBCT-74% RVG-39.3% OPG-27.9%
6	Which blood investigation you do before placing implants?	1.Complete blood count, bleeding time, clotting time 2.Fasting blood sugar, postprandial plasma glucose test, HbA1c 3.VIT. D3 4.HIV/Hep B/ COVID 5. None of the above	Fasting blood sugar, postprandial plasma glucose test, HbA1c-99.5% Complete blood count, bleeding time, clotting time-98.6% HIV/Hep B/ COVID-47.5% VIT. D3-19.6%
7	Do you think vitamin D3 plays important role in success of dental implant?	1.Yes 2.No 3.May be	No-36.8% May be-34.1% Yes-29.1%
8	If vitamin D3 level is deficient do you prescribe vitamin D supplement to patient before planning dental implant?	1.Yes 2.No 3.Some time	No-54.5% Yes-32.7% Sometime-12.7%
9	What is the prevalence of vit D3 deficiency in India?	1.Less than 30% 2.30-50% 3.50-70% 4.70-90%	50-70%-53.6% 30-50%-25% 70-90%-11.4% <30%-10%
10	According to you, in which age group vitamin D3 is deficient?	1.Children 2.Young age group 3.Adult age group 4.All of the above	Adult age group-80.8% All of the above-14.2%

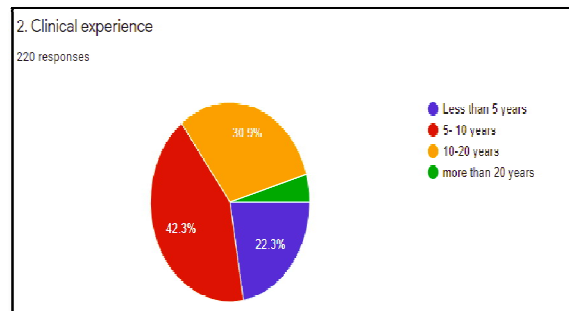
## RESULTS AND DISCUSSION

On evaluating the results from the pie diagram it was found that the most of dental clinicians who participated in the survey were young under graduates (Fig 1 and 2) are practicing oral implantology (Fig 3) and are placing dental implants in the patients (Fig 4). During pre-implant screening of patients, the clinicians prescribe various radiographs and blood test (Fig 5 and 6). However, the percentage of clinicians prescribing vitamin d as a routine investigation is quite low. Also the clinicians are not aware about the percentage of vitamin D deficiency in general population and what are the age groups affected by it. This is quite an alarming situation and should be addressed at priority.

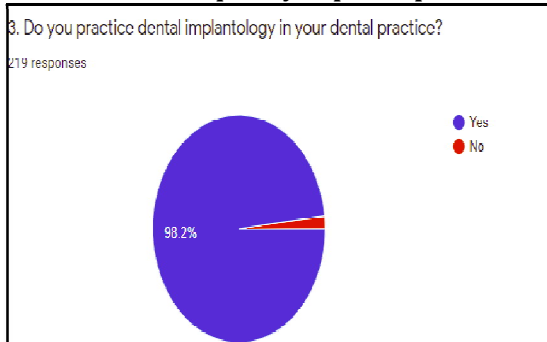
## RESPONSES IN FORM OF PIE CHART AND BAR DIAGRAM



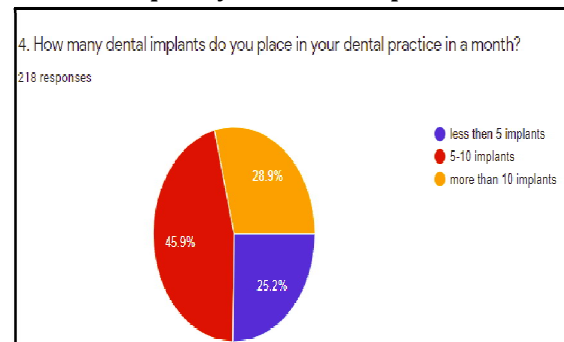
**FIG 1** Frequency of participant



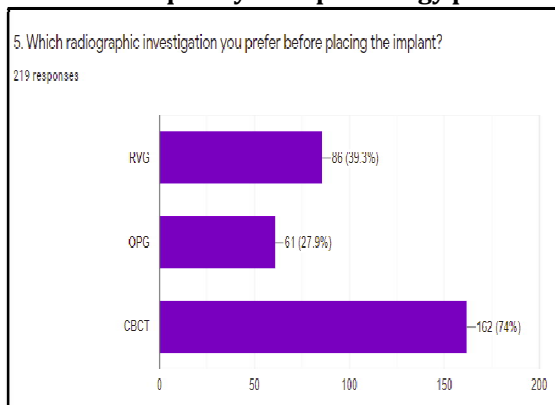
**FIG 2** Frequency of clinical experience



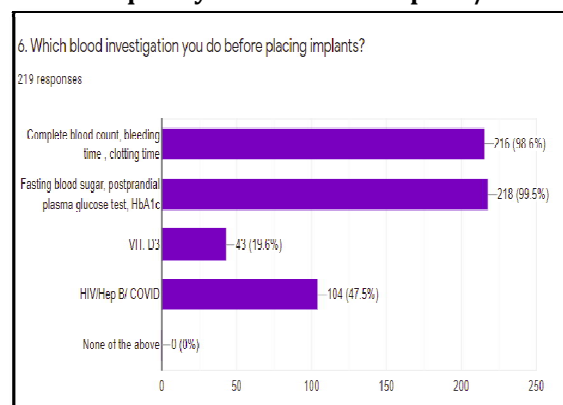
**FIG 3** 2 Frequency of implantology practise



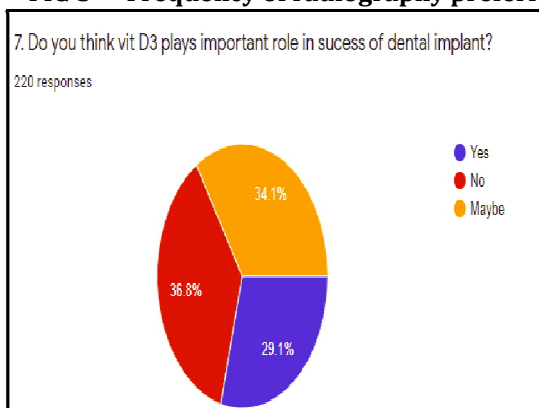
**FIG 4** Frequency of number of implant/month



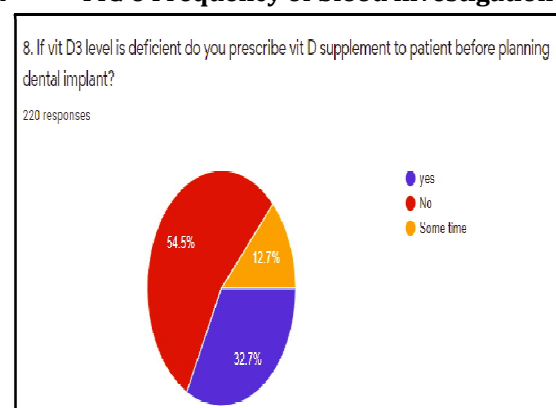
**FIG 5** Frequency of radiography preferred



**FIG 6** Frequency of blood investigation



**FIG 7** Frequency of Vit D3 effect



**FIG 8** Frequency of Vit D prescription

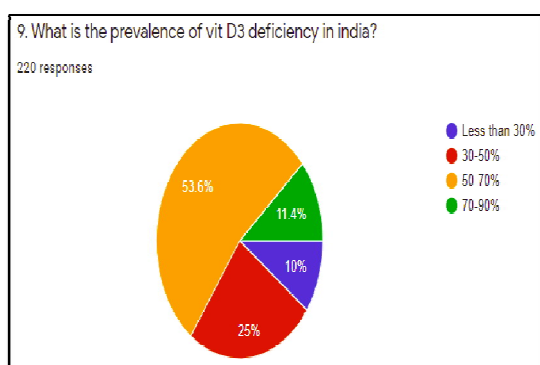


FIG 9 Frequency of VitD deficiency

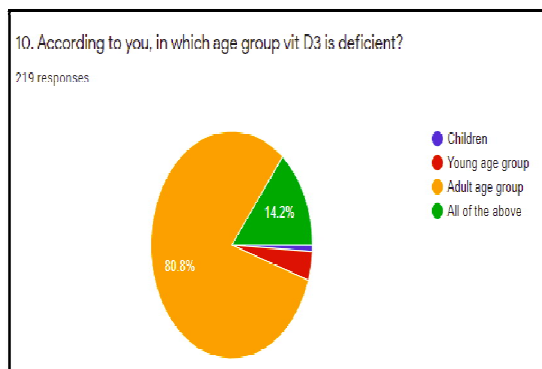


FIG 10 Frequency of Vit D deficiency age

With the changing lifestyle, the deficiency of Vitamin D3 is quite common finding nowadays which affects the Musculo-skeletal system, cardiovascular system and immune system of the human body. Dental implants are now considered a reliable and predictable solution with survival rate of more than 95% which has been repeatedly demonstrated in long term clinical trials and prospective studies. Since Vitamin D3 is an integral part of human body calcium and phosphorus metabolism which affect the hard tissues such as teeth and bone, the deficiency of Vitamin D3 should have a positive correlation with the success of dental implants in oral cavity which in turn depends on the successful osseointegration[6].

The most accurate way of determining vitamin D status in the human body is serum vitamin D3 levels. The present recommendation suggests that, a subject with a serum level ranging between 21ng/l - 29 ng/l is considered to have vitamin D insufficiency, subjects with serum level less than 20 ng/l are considered as vitamin D deficient whereas serum level below 10 ng/l are considered severely deficient[7-8].

Currently, due to lack of evidence a general recommendation for a standardized vitamin D screening before placing dental implants is not followed by the dental practitioners practicing oral implantology. This statement is proven from the present survey as only 19.6% clinician practicing oral implantology prescribed the serum vitamin D3 test as a screening procedure before placing dental implants (Fig 6). Patients with deficient vitamin D3 levels may have low bone density and poor bone quality and consequently will be more prone to implant failure. But still only 29% dental practitioner believe that vitamin D may play a role in the success of dental implants and only 32.7% clinicians prescribed supplement for the deficiency before placing dental implants (Fig 7 and 8).

The optimal range of vitamin D in a healthy adult is a serum value greater than 30 ng/mL. Vitamin D deficiency is very common nowadays and is widely prevalent in the world. When we talk about India the prevalence rate of vitamin D deficiency ranges from 40-99% with maximum studies reporting it to be between 80-90%. Vitamin D deficiency is prevalent in all age groups and high-risk groups alike. Despite of such high prevalence in all age groups only 11.9% practitioner were aware about the exact prevalence of the vitamin D deficiency and only 14.9% clinicians were aware about the fact that it is deficient in all age groups (Fig 9 and 10), most of them had the opinion that it is deficient in the elderly age group which is not true[9-10].

As the field of oral implantology has been expanding the dental health care workers are becoming more and more aware of the importance of vitamin D in maintaining disease free oral health[11]. Researchers in the past have seen relation between vit D and bone formation by preparing various animal models in which dental implants were placed in animals carrying various abnormalities such as osteoporosis, ckd, diabetes etc& the results were observed for the rate of BIC and implant stability with vitamin D supplementation. Animal studies have also been done where implants have been coated with vit. D and placed in the bone. The results reported that the bone formation was stimulated where implants were coated with vit. D and there were less CBL. Recent *In Vivo* study[12] showed positive correlation between Vit D & CBL and it concluded that vitamin D supplements reduces bone loss in dental implants. Recognition of various systemic risk factors associated with dental implants has shown that success can be increased[13-14]. As osseointegration is closely related to bone metabolism, this might suggest that low vitamin D levels may lead to impaired healing and adversely affect the osseointegration[15]. Few recent case reports in the scientific literature have raised this important fact of the association of Vit. D & early success of the dental implants[16]. However, it is very concerning that vit. D screening is not done in oral implantology due to lack of evidence is a matter of concern.

## CONCLUSION

Based on the results of the present survey we would like to conclude that the knowledge and awareness about the vitamin D is lacking in the dentist practicing oral implantology due to lack of evidence and this might influence the success rate of dental implants. So, our recommendation is that there should be more prospective in vivo studies which will establish the role of vitamin D in oral implantology.

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