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A survey study to assess the knowledge and awareness of the indian sub-population regarding the effects of diabetes on dental implants

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Abstract

Background: Diabetes is a chronic metabolic disease having various negative effects on bone metabolism. Dental Implants are widely used in recent times for rehabilitation of missing teeth, therefore there is a need for evaluation of risk factors of bone metabolism. Since a large population in India is suffering from diabetes, it is essential to evaluate their knowledge regarding dental implant placement in diabetic patients. Therefore, this survey aims to address this issue and raise knowledge and awareness regarding the same.

Materials and Methods: A well-structured survey consisting of 14 questions was carried out among the general population in Mumbai through various social media platforms.

Results: A total of 512 people participated in the survey, with around 59.8% male and 40.2% female participation. 80.9% of the participants were of the opinion that implants could be placed in a diabetic person. 73.4% felt that informing their dentist about diabetic status will cause a change in their treatment plan. However only 20.5% of the participants received any information regarding diabetes affecting the success of dental implants.

Conclusion: There is sufficient knowledge among the participants regarding effects of diabetes on the oral health in dental implant therapy. Patients should be educated regarding the possibilities of placing dental implants in a diabetic patient regardless of their glycemic control with the help of dental professionals and healthcare practitioners.

Keywords: Diabetes; Implant; Survey; Indian population



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Introduction

Diabetes is a chronic metabolic disease characterized by elevated blood sugar levels which may occur either due to insulin resistance or decrease in production of insulin. According to WHO about 422 million people worldwide are suffering from diabetes, with the majority living in low- and middle-income countries and around 1.6 million deaths are directly attributed to diabetes each year. The number of people suffering from diabetes in India has increased from 26 million in 1990 to 65 million in 2016 [1-3]. According to the Lancet study India ranks among the top three countries in the world with the highest diabetic population. Increased blood sugar levels can lead to several complications in various parts of the body due to macro and microangiopathy. In relation to oral pathology, it can lead to increased frequency of bone loss, periodontitis, impaired immune response and delayed wound healing [4, 5]. In recent times dental implants are widely used for dental rehabilitation to replace missing teeth. Implant survival rate after placement is dependent on successful osseointegration. Bone remodeling is essential for successful osseointegration as well as to meet the functional demands of dental implants and their supporting bone. Therefore, there is a need for the evaluation of risk factors of bone metabolism for successful implant survival. Since diabetes is an important risk factor of bone metabolism, there is a need for understanding the impact of diabetes on dental implant placement [6]. For a very long-time diabetes was considered as a relative risk factor for dental implant placement. However, a change in paradigm is occurring, where in recent times studies

suggest that diabetic patients require sufficient dental rehabilitation in order to attain a good metabolic as well as nutrition control, which can be achieved through implant therapy [6]. Quite a few surveys have been conducted evaluating the knowledge and satisfaction of people with regards to dental implants [7]. However very few surveys have been conducted in India to evaluate knowledge and awareness of people regarding the association and effects of diabetes on dental implants. Since a large population in India is suffering from diabetes, it is essential to evaluate their knowledge regarding dental implant placement in diabetic patients. Therefore, this study aims to address this issue and evaluate the knowledge and awareness regarding the implications of diabetes mellitus on dental implant therapy of the general population in India.

Materials and Methods

This questionnaire survey was conducted among the general population of Mumbai, to study the knowledge and awareness of people regarding the effects of diabetes on dental implants. The members' suppositions concerning their thoughts on the effects of diabetes on dental implants were recorded utilizing an exceptionally structured survey. The questionnaire was formed by reviewing published literature assessing knowledge and awareness of the population regarding the effects of diabetes on dental implants. A survey form was made with google for and was sent to the participants through various social media platforms and was given the set of instructions on how to complete the entire

form of 14 questions. A list of the questions is given below.

Serial Number	Questions
1.	Age
2.	Gender
3.	Are you suffering from diabetes?
4.	If yes, are your blood sugar levels under control?
5.	Do you think diabetes affects the health of tissues around an implant?
6.	Do you think implants can be placed in a diabetic patient?
7.	Should you inform your dentist about your diabetic condition prior to implant placement?
8.	Will informing your dentist cause any changes in the treatment?
9.	Can uncontrolled blood sugar levels affect the success rate of an implant in a negative way?
10.	Do you think an implant will be affected if the gum disease around it is left untreated?
11.	Does diabetes affect the healing after an implant surgery?
12.	According to you, is it essential for a diabetic patient to take care of his oral health after an implant placement?
13.	Do you think it is essential to have good oral health prior, during and after placement of implants?
14.	Have you received any tips on diabetes affecting the success of dental implants?

Data Collection

The study protocol was explained to the participants and the participants were requested to fill the questionnaire that had a total of fourteen questions related to awareness regarding effects of diabetes on dental implants. For simplification and better understanding of the survey, all the questions had only two options: Yes/No. The instructions for filling the questionnaire were given and filled questionnaires were collected.

Discussion

The present study evaluates the awareness of people in India regarding the implications of diabetes in dental implant therapy. Only 5.7% participants in our survey were diabetics, while the remaining were either non-diabetics or had no idea regarding their diabetic status. The International Diabetes Federation in 2020, reported an 8.9% prevalence of diabetes among the adults in India [4]. According to

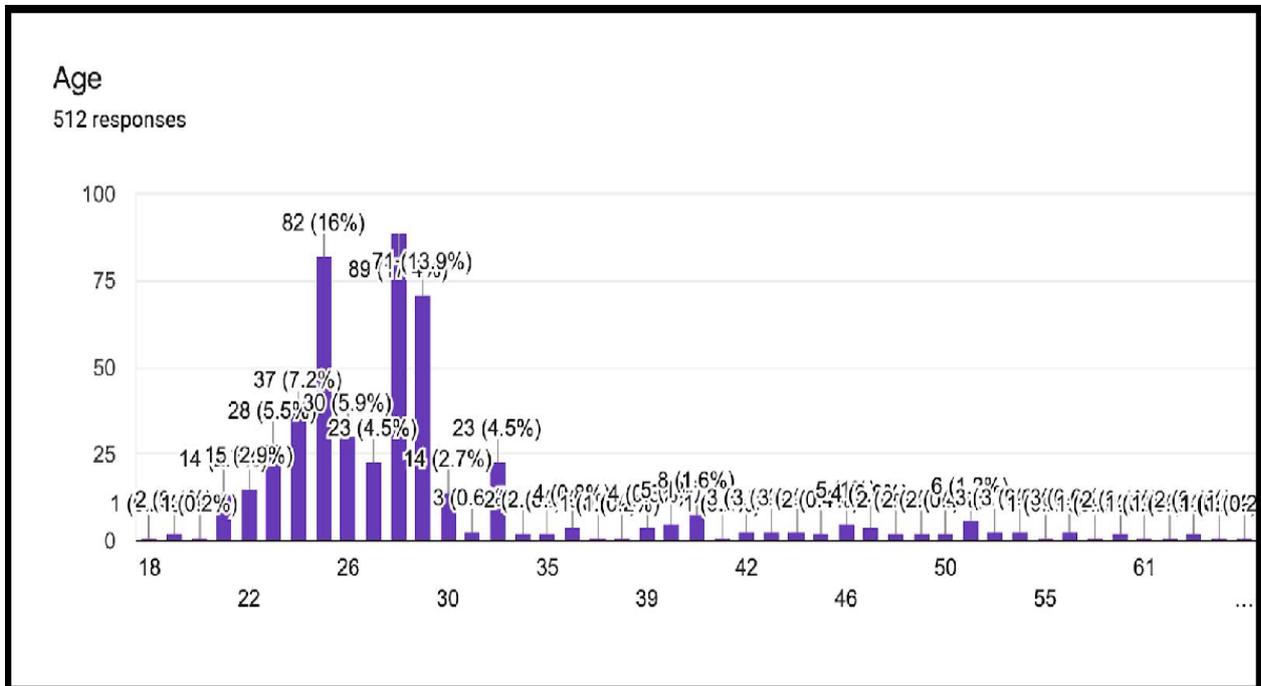
WHO in 2016 the total prevalence of diabetes and related risk factors in India were around 7.8%. Therefore, the prevalence depicted in our study is quite similar to other statistical studies. Nonetheless it indicates that quite a fair percentage of the population is diabetic, and there is a great need to study diabetic related oral health awareness within the Indian population, to enable them to maintain good oral health and in turn have a better success rate for oral rehabilitation.

Results

A total of 512 people participated in the survey. The age of the participants in the survey ranged from 18 to 70 years (Figure 1) with around 59.8% male and 40.2% female participation. Overall, 94.3% of the participants were not suffering from diabetes. 79.9% of the participants were aware of their blood sugar levels being under control. 78.7% of the participants thought diabetes affected the tissues around an implant. 80.9% of the participants were of the opinion that implants

could be placed in a diabetic person. 79.3% of the participants were aware that the dentist should be informed about their diabetic condition prior to implant placement and about 73.4% felt that informing their dentist will cause a change in their treatment plan. 77.5% of the survey participants conveyed the fact that uncontrolled sugar levels could have a negative effect on the implant success rate and 77.9% of the participants believed that not treating any gum disease around an implant

could also affect its success rate. 77.5% of the participants were of the opinion that diabetes affects the healing after an implant surgery. According to 78.1% of the survey participants a diabetic patient should take care of his oral health after implant placement and about 79.5% of participants agreed that good oral health is necessary for implant placement. However only 20.5% of the participants have received any information regarding diabetes affecting the success of implants.



In our study about 78.7% of the participants felt that diabetes affected the health of tissues around an implant. In a similar study conducted in Saudi Arabia in 2019, around 85% of the participants were aware of diabetes having a negative effect on the oral health of tissues around an implant. A study conducted in Jordan in 2010, 48% of the study population was aware of diabetic patients being more prone to oral health diseases [8, 9]. A study conducted in 2010 in the UAE, revealed 60% of participants were aware of diabetic patients having an increased risk of periodontitis [10]. A study conducted in 2008 in Ireland revealed

that only 33% of the study population was aware of diabetic patients being at an increased risk of periodontitis [11]. In contrast to other studies our study reveals a fair percentage of the participants are aware of diabetes affecting the health of oral tissues around an implant, as they are at an increased risk of periodontitis. This is essential as periodontitis is believed to be the 6th complication of diabetes mellitus and there exists a two-way relation between them [12]. In our study around 77.9% of participants were aware of implants being affected if the periodontal disease around them is left

untreated and around 77.5% of participants were aware of diabetes also affecting the healing after implant surgery. This is essential because awareness of people regarding negative effects of diabetes on oral health of tissues around an implant and also awareness regarding its effects on the healing process will help them in turn to achieve better glycemic control, maintain good oral health and choose better treatment options for oral rehabilitation. Patients should be educated regarding the need on informing their health practitioners or dentists regarding their diabetic status as a part of their medical history as this can lead to a change in the course of treatment, thereby enabling the dental practitioner to provide a much suitable treatment plan based on the glycemic control as well as presence or absence of systemic complications. In our survey around 79.3% of the participants were aware of informing the dentist regarding their diabetic condition prior to implant placement, and around 73.4% of the participants were aware that informing the dentist prior could lead to change in the treatment plan. Another study conducted in India in 2017, revealed that around 64.8% of the participants informed their dentist regarding their diabetic status [13]. A study conducted in Sweden showed around 47.7% of the patients had no idea regarding their diabetic status [14]. A study conducted in the UK in 2011, revealed that around 30.2% of the participants reported their dentists were aware regarding their diabetic status [15]. This clearly demonstrates there is a certain degree of unawareness among the patients as well as incompetence of dentists to take a detailed history before initiating treatment. This demonstrates the need for primary health care providers to educate patients on informing their dentist regarding their diabetic status and also more research should be done regarding why dentists are missing this essential step of taking a detailed medical history. Diabetes is associated with osteopathic changes as well as changes in bone metabolism. Studies indicate that increased blood glucose levels can also

lead to decrease in bone strength and fracture healing which might therefore interfere with the osseointegration of implants with bone. Therefore, it is essential patients understand the association of diabetes with the success of implant therapy. In our study 80.9% of the participants reported that implants could be placed in a diabetic patient. This is essential as there is no clear literature which contraindicates implant placement in a diabetic patient, even if they lack good glycemic control. Patients should therefore be aware, regarding diabetes not being an absolute contraindication for dental implants, and that a good success rate can be achieved even in a diabetic patient. Since a fair percentage of our population is diabetic, it is essential that awareness regarding diabetes related oral health information is spread among the general population. In our study, 20.5% of the participants said that they received any information regarding diabetes affecting the success of dental implants. In a study conducted in Saudi Arabia in 2019, 31% of the participants reported to have received any tips regarding the same [16]. This reveals that there is a vast communication gap among healthcare professionals and the general population. It is important that dentists and healthcare professionals definitely ask about diabetes while taking their medical history and also educate their patients regarding the negative effects of diabetes mellitus on oral tissues.

Conclusion

Through our study we have concluded that there is sufficient knowledge among the participants regarding the effects of diabetes on oral health in dental implant therapy. Patients should be educated regarding the possibilities of placing dental implants in a diabetic patient depending on their glycemic control. Dental professionals and healthcare practitioners should be directed towards educating their patients regarding effects of diabetes on oral health and also efforts should be made to direct external sources such as the

media, to spread information among the general population regarding effects of diabetes on oral health and dental implants.

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