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Dentists' knowledge and attitude in immediate implant loading protocol of dental implants- A cross-sectional survey

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ABSTRACT

Background: Dental implant therapy is still considered an evolving field in Nepal, with most dentists favoring implant placement following the delayed loading protocol (>3 months) even in the rehabilitation of missing anterior teeth. There is need to understand the clinical difference between immediate and delayed loading protocols of the dental implants. With advent of immediate loading protocol of dental implants, instant rehabilitation in addition to better esthetics and self-confidence can be obtained. **Aims and Objectives:** This study aims to evaluate the knowledge and attitude of general dentist towards immediate loading protocol of dental implants. **Materials and Methods:** A descriptive, cross sectional survey was conducted among Nepalese general dentists who have entered their clinical practice in private or government hospital regardless of their years of experience. A self-administered questionnaire adapted from some previous studies was framed and distributed with the primary objective to determine their knowledge and attitude towards immediate loading protocols of dental implants. Data collected were analyzed using the Statistical Packages for the Social Sciences version 22 (IBM Corp, Armonk, NY, USA). **Results:** Among the 250 participants included in this study, 94.8% of the respondents completely filled the questionnaire. Nearly 46.4% of participants had good knowledge on the procedure and advantages offered by the immediately loaded dental implants with provisional restorations, whereas 83.1% had negative reservations toward implant placement using the protocol. In addition, this study found a statistically significant association ($p<0.05$) between the knowledge and attitude of dental practitioners regarding the protocol. **Conclusion:** Although dental implants have changed the outlook of dentistry in the past few decades, there is slightly poor knowledge and significant negative attitude of dentists toward the immediate implant loading protocol. The general dentist are expected to increase their awareness about immediate loading with subsequent training on its use and viability so that proper information can be disseminated to the patients. This will help to increase the practice of immediate implant in indicated cases by implantologist with further benefit to patient's time and esthetics.

Key words: Dental practitioners; Dental implant; Immediate implant loading; Survey

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INTRODUCTION

The introduction of osseo-integrated dental implant is considered as one of the greatest breakthroughs in clinical dentistry. The treatment of replacing missing teeth with removable or fixed partial dentures was the only treatment before the advent of implants. For centuries, there were ways to replace the crown but not the root but root replacement is now possible.[1] Recently, Implant dentistry has evolved into the mainstream of restorative practices all over the world.[2] It has mainly two phases; a surgical phase and a prosthodontic phase. Endoseous dental implants are

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alternative tooth roots and implant supported prostheses are considered the best substitute for missing teeth. Awareness about dental implants is increasing among the general public and more and more patients are seeking information about dental implants.[3,4]

A dental implant is an increasingly popular treatment option with a high success rate. Immediate loading, conventional loading and delayed loading are three main loading protocols in implants. With the advent of immediate single-stage implant placement, the edentulous patient can receive replacement in the same surgical visit, thereby reducing the time that has elapsed between implant placement and restoration with the prosthesis.[5,6] However, these benefits come at the cost of associated risk factors including increased risk of infection, the need for bone augmentation procedure to solve disturbances between the implant surface and alveolar bone, esthetic complications, and mucosal recession which occurs due to the paucity of the facial bone wall to support the facial soft tissues.[7,8]

It is hypothesized that the immediate implant loading protocol is quite uncommon and as general dentists have been reported to be the primary providers of information regarding dental implant treatment modality and stages to patients,[9] it is important to determine their current knowledge and attitude toward the immediate loading of osseointegrated dental implants.[10,11] Hence, this study aims to evaluate the knowledge, and attitude of general dentist towards immediate loading of dental implants, so as to ascertain the need for awareness of the protocol among dentist and improve its use when indicated.

MATERIALS AND METHODS

This is a descriptive, cross sectional questionnaire-based survey conducted among Nepalese dentists after taking ethical clearance and approval from the research committee. The sample size was calculated using the appropriate statistical formula for qualitative variables, and a total of 250 participants were recruited into the study. All the participants were recruited at once at the Nepal Dental Association Conference, Bhairahawa, 15-16 November 2019, using the simple random sampling technique. Individuals were included into the study based on the premise that they were employed as a dentist in a government or private establishment regardless of their cadre or years of experience. However, practitioners who were identified as trained and practicing implantologists were excluded from the study.

Data was collected using self-administered, questionnaire adapted from some previous studies[12-14] and was designed in printed format. The questionnaire was carefully and thoroughly explained to all the respondents individually, and informed consent was obtained from them before it was administered. The questionnaire comprised of three sections: A) Sociodemographic data (Table 1), B) Indicators of the knowledge of dentists regarding immediate loading of dental implants (Table 2), C) Indicators of the attitude of dentists toward immediate loading of dental implants (Table 3).

To assess the knowledge level of the participants, participants who provided acceptable answers to 75% of the total questionnaire indicators were deemed to have good knowledge of the protocol, whereas participants that answered 50%-74% of the indicators appropriately were adduced to have a fair knowledge of the protocol. Poor knowledge on the aforementioned subject matter was indicated by providing appropriate answers to <50% of the indicators. The study participants based on their attitude toward the immediate implant loading protocol were classified as having positive and negative reservations toward the protocol. Those with positive attitude answered more than 50% of the questions in Section C appropriately, whereas participants that answered <50% of these questions in an acceptable manner were categorized as having negative attitude toward the protocol.

Data derived from the study were analyzed using Statistical package for the Social Sciences (IBM Corp, Armonk, NY, USA) for Windows version 20. Descriptive tabulations were employed for data presentation on findings from the respondents. The Pearson's Chi-square test was used to determine the statistical relationship between the categorical variables, and the Pearson's correlation coefficient (r) was employed to determine the linear relationship between the knowledge and attitude of the study participants. For all statistical comparisons, $P < 0.05$ was adopted as the criteria for establishing statistical significance.

Table 1: Sociodemographic characteristics of the respondents (n=237)

Variables	Frequency	n (%)
Sex		
Male	92	(38.8)
Female	145	(61.2)
Age group (years)		
25-29	36	(15.4)
30-34	60	(25.6)
35-39	72	(30.8)
40 and above	66	(28.2)
Period of practice (years)		
1-5	61	(25.8)
>5	176	(74.2)
Location of practice		
Private facilities	170	(71.8)
Government facilities	67	(28.2)

n: Number of study participants

Table 2: Indicators of the knowledge of dentists regarding immediate implant loading of dental implants (n=237)

Variables	Frequency	n (%)
Knowledge of the term "immediate implant loading"		
Yes	212	(89.5)
No/not sure	25	(10.5)
Immediate loading of dental implants refers to the placement of provisional or definitive superstructure on the implant within 72 h of implant insertion into the jaw bone		
Yes	85	(35.8)
No/not sure	152	(64.2)
Immediate loading of dental implants refers to the placement of provisional or definitive superstructure on the implant within weeks of implant insertion into the jaw bone		
Yes	45	(19.0)
No/not sure	192	(81.0)
Immediate loading of dental implants refers to the placement of provisional or definitive superstructure on the implant within 3-6 months following implant insertion into the jaw bone		
Yes	40	(16.9)
No/not sure	197	(83.1)
A fundamental requisite for immediate loading is adequate primary implant stability of at least 35 Ncm torque		
Yes	52	(21.9)
No/not sure	185	(78.1)
Surgery-related factors such as primary implant stability and surgical technique influence the surgeons' decision to load dental implants immediately		
Yes	136	(57.3)
No	101	(42.7)
Host-related factors such as good bone quality and quantity influence the decision to perform the immediate loading protocol		
Yes	160	(67.5)
No	77	(32.5)
Implant-related factors such as implant design/configuration, implant surface coating, and implant characteristics influence the decision to perform the immediate loading protocol		
Yes	150	(63.3)
No/not sure	87	(36.7)
Specific indications for immediate loading of dental implants in the anterior region		
Esthetics	180	(75.9)
Absence of anatomical constraints	30	(12.7)
Comfort	115	(48.5)
Improved function	32	(13.5)
Unware of the indications	78	(32.9)

n: Number of study participants

RESULTS

The number of dentists' present (number of questionnaires distributed) was around 250, out of which 237 responded completely. Thus, the true response rate was 94.8%. Descriptive statistics of the sociodemographic characteristics of the respondents revealed that most of them were females (n=145, 61.2%) and within the age range of 35-39 years (n=72, 30.8%). The average age (SD) of the participants in this study was 36.8 years. Majority of the respondents had practiced the dental profession for at least 5 years (n=176, 74.2%), with gainful employment of slightly more participants in the private (n=170,71.8%) than the government sector (n=67, 28.2%) (Table 1).

Despite being dental professionals in general practice, a few participants (n=25, 10.5%) attested to not having heard the term "immediate loading of dental implants" previously. In addition, only 85 respondents (35.8%) knew the appropriate definition regarding the right time for loading the superstructure in immediate implant loading. A slightly higher percentage of respondents (n=136, 57.3%) believed that surgery related factors influence the dental implantologist's decision to load immediately following embedment within the alveolar ridges, whereas a significant percentage (n=160, 67.5%) attested to the influence of host-related factors in the decision to perform the procedure. In relation to relevant indications for the procedure, most respondents (n=180, 75.9%) agreed that esthetic consideration is the main reason for employing the immediate implant loading protocol, whereas 115 respondents (48.5%) and 35 respondents (14.8%), respectively, cited comfort and the absence of anatomical constraints as special reasons for undertaking the protocol as opposed to the conventional technique. However, 78 participants (32.9%) were unware of the specific indications for the protocol (Table 2).

Fifty-eight dental surgeons (24.5%) practiced their professions in centers where implant therapy is one of the

Table 3: Indicators of the attitude of dentist toward immediate loading of dental implants

Variables	Frequency	n (%)
Center uses implant therapy for tooth replacement		
Yes- often	30	(12.7)
No- sometimes	28	(11.8)
No	179	(75.5)
Center uses the immediate loading protocol of implant placement		
Yes- often	8	(3.4)
No- sometimes	12	(5.1)
No	217	(91.5)
Center uses delayed loading protocol of implant placement		
Yes- often	50	(21.1)
No- sometimes	40	(16.8)
No	147	(62.1)
Immediate loading protocol is stressful and technique sensitive		
Yes	115	(48.5)
No/not sure	122	(51.5)
The entire technique is not really necessary/beneficial to the patient		
Yes	20	(8.4)
No/not sure	217	(91.6)
Previous training on immediate training protocol		
Yes	39	(16.5)
No/not sure	198	(83.5)
Willing to attend awareness conferences on immediate loading protocol		
Yes	180	(75.9)
No/not sure	57	(24.1)
Willingness to perform immediate loading in the esthetic region in all favorable conditions		
Yes	120	(50.7)
Not yet convinced	80	(33.8)
Afraid of failure of implants	50	(21.1
Afraid of the need constant reviews and follow-ups	10	(4.3)

n: Number of study participants

utilized options for prosthetic rehabilitation of missing teeth, with all of these centers practicing the conventional type of implant loading. Only 20 respondents (8.4%) were affiliated to centers where the immediate protocol is being employed when indicated. Overall, most respondents (n=110, 46.4%) had good knowledge of the immediate loading protocol of implant placement, whereas 66(27.8%) and 61(25.8%) participants had fair and poor knowledge on the subject, respectively, although this was not statistically significant ($p>0.05$). The analysis further revealed that most dentist that had 5 years or more practicing experience were statistically significantly better informed about the immediate implant loading protocol than their counterparts with less experience ($p<0.05$). One hundred ninety seven of the respondents (83.1%) had negative reservations toward the protocol, with this being statistically significant ($p<0.05$) (Table 3).

There was a statistically significant association between the knowledge and attitude of the study participants toward this one-stage protocol, and cross-tabulation showed that most dental practitioners regardless of their knowledge levels regarding the immediate implant loading protocol had reservations to its use. Bivariate correlation analysis revealed a weak, positive linear relationship between the knowledge of the general dental practitioners and their attitude toward the immediate implant loading protocol ($p<0.05$).

DISCUSSION

Prosthodontic rehabilitation of missing teeth has greatly evolved especially with the introduction of dental implants. Appropriate knowledge of diagnostic and therapeutic options within the scope of dental implant therapy is therefore, mandatory even for general dental practitioners.[15,16] Immediate implant loading can shorten treatment time, provide immediate restoration of function and esthetics, and mitigate the psychological impact. This study showed that the knowledge of our participants about immediate dental implant therapy is relatively low, as evidenced by the percentage of participants with good knowledge in our study (46.4%). Accordingly to Aparicio et al.,[17] Immediate implant loading has been defined as a restoration placed in the occlusion with the opposing dentition within 72 h of implant placement.[17] From our study, only 35.8% answered this correctly- further revealing the relatively low knowledge of immediate dental implants among Nepalese dental practitioners and under-scoring the need to promote the knowledge of the protocol in this respect. In our study, the observed level of practitioners with good knowledge is lower than what was reported by

Lang-Hua et al.[18] in a study. Furthermore, this may mean that more recent advancement in treatment procedures (such as the immediate implant protocol) is typically not taught at the undergraduate level, with interested dentists who aspire to obtain this knowledge having to seek it in developed parts of the world where it is being carried out on a more routine basis.

Maintenance of esthetics was regarded as the most common indication for the immediate loading protocol in the anterior region 75.9% followed by provision of comfort to the patients (48.5%), which is similar to reports from cross sectional survey conducted by Keerthika and Jain among 100 dental students where 68% of the respondents also regarded esthetics as the most important factor for the one-stage protocol of implant placement.[12] Majority of the general dental practitioners in this study (83.1%) had negative attitudes toward the one-stage implant protocol. This observation is in contrast with the recent reports of Nagpal et al.[19], where 91.3% of the respondents had either positive attitude or no reservations toward dental implant therapy. The reason for the very high level of reservations in our region may be attributed to the low level of good knowledge available at the disposal of these dentists concerning this type of implant protocol as this study found a significant association between the knowledge of the general dental practitioners and their attitude toward the one-stage protocol, with more individuals with fair or poor knowledge having negative attitudes. In our study 16.4% of the participants were previously trained on the protocol via lectures, seminars, and observational sessions, 75.9% expressed their willingness to attend conferences that would improve their knowledge in further understanding the indications and procedures related to it.

Implant training is said to be an additional factor that improve the knowledge, attitude, and practice of practitioners regarding dental implant therapy[20] and as such, significant advancements are expected if more practitioners are trained on the immediate loading protocol. The study suggests that there is a need to raise awareness regarding implant loading protocols among dental practitioners.[21]

CONCLUSION

There is slightly low knowledge and significantly negative attitude toward the immediate loading protocol of dental implant among general dental practitioners. Therefore, awareness regarding the protocol should be instilled, so that it helps in eradicating any negative reflection of this procedure that may have been caused due to lack of adequate information and allow dental practitioners offer extensive treatment options for patients with missing tooth.

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SS- Concept and design of the study; prepared first draft of manuscript; Interpreted the results; reviewed the literature and manuscript preparation;
SKY- Statistically analyzed and interpreted, preparation of manuscript and revision of the manuscript.

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