

## A Questionnaire Survey of Current Trends in Oral Implantology Practice in Post Graduate Prosthodontic Programs among various Dental Colleges in India

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### ABSTRACT

**Aim:** To know the current trends of oral implantology practice in post graduate prosthodontic programs among various dental colleges of India.

**Methodology:** An online questionnaire form having 17 questions were e-mailed to 182 Head of the Department of Prosthodontics of the Dental colleges of India running post graduate program in the subject of prosthodontics. All the filled up forms were saved in google spreadsheet and were analyzed by using suitable descriptive statistics. All responses remained anonymous throughout the survey.

**Result:** A total of 112 (61.53%) questionnaire forms were answered. 88.39% participants favored the use of dental implant as a treatment modality for rehabilitation of missing teeth. 97.32% chose threaded implant design, 48.21% preferred 4 implants supported mandibular overdenture. 44.64% chose Locator type of attachment for overdenture. 69.64% favored open tray impression technique and 62.5% favored polyether as impression material. 70.53% preferred cement retained prosthesis while 29.46% preferred screw retained prosthesis. 77.67% participants preferred long implants with sinus lift rather than short implants. 57.14% considered mounted casts, IOPA X rays, OPG X rays and CT Scan all together for treatment planning. 85.71% reported that surgical stents made using navigation system is not a necessity in every case. 92.85% participants feel the need to have standardization of implant surgical kit. 53.57% participants preferred splinting of adjacent implant while 45.61% did not prefer splinting. 69.64% participants reported that single piece implant should be restricted to the anterior zone when the amount of bone available is adequate. Only 64.28% accept that the concept of immediate loading of implant is good. 65.17% preferred direct sinus floor elevation.

**Conclusion:** Dental implants are the most preferred treatment modality for the replacement of missing teeth. The present study concluded that the choice of threaded implant design, use of standardized implant surgical kit, using longer implants with direct sinus lift procedure, making impression using open-tray technique with polyether impression material and cement retained restorations were preferred over by majority of the participants. There were mixed opinion regarding the splinting of two or more adjacent implants. Further, most

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of participants believed that the use of single piece implant should be restricted to the anterior zone and the concept of immediate loading is good.

**Keywords:** Oral Implantology, Dental Colleges, India, Survey.

## INTRODUCTION

Today, dental implants have proved to be an established mode of treatment for partially or completely edentulous patients with a large number of clinical studies supporting their long term prognosis. Osseointegration is a process of direct structural and functional integration of the implant to the surrounding living bone. The success of dental implant depends on good osseointegration which is further influenced by choice of implant material, design and surgical protocol.<sup>1,2</sup> Implant education is an integral part of undergraduate and postgraduate prosthodontic curriculum.<sup>3</sup>

Several surveys have been conducted to assess the status of the implant curricula as a part of the undergraduate curricula, but seldom one finds a survey assessing the current status of oral implantology for the postgraduate curricula.<sup>4</sup> A study conducted by Huebner in 2002 concluded that exposure to implant dentistry during pre-doctoral training resulted in a significantly greater participation in implant dentistry in general practice.<sup>5</sup>

A dearth in well conducted randomized controlled trials leads to difference in opinion over the choice of concept, techniques and materials used to make oral implantology more successful.<sup>6</sup> A greater than before success and survival rate of dental implant prosthesis has led to increase in demand for dental implants amongst the patients, which creates a necessity to assess the current trends in this field at both practitioner and post graduate student level. Literature search showed various studies conducted at practitioner level to understand the existing trends in implant practice, but none were found at level of post graduate level. Hence, this study was aimed to know the current trends of dental implantology with respect to diagnosis and treatment planning, implant design, surgical procedures, impression material and technique, prosthetic attachments, type of prosthesis amongst the post graduate prosthodontic programs run in various Dental Colleges across India.

## MATERIALS AND METHODS

This study was conducted in the Department of Prosthodontics, Crown and Bridge. As per the details available on the website of Dental Council of India as accessed on 10<sup>th</sup> June 2014, there were 195 dental colleges with active postgraduate program (recognized and approved) in the subject of Prosthodontics in India, which constituted as sample for the study. Out of 195, contact details of only 182 participants could be obtained. All the Heads of Department with active post graduate program in the subject of Prosthodontics, who gave written consent were included in the study. Those who were not willing to be a part of the study were excluded.

The participants were sent an email enclosing both the participant information sheet and a link created using Google Docs for survey questionnaire.<sup>6</sup> Responses received were stored in Google Spreadsheet. A reminder was sent via an e-mail and also by telephone after 07 days and 15 days respectively.

All the responses which were received within a period of one month from the date of sending the first email containing the participation sheet and a link to the questionnaire were considered in the study. Out of 182, 112 participants responded back within the stipulated time period. The forms were analyzed by using suitable descriptive statistics.

## RESULTS AND DISCUSSION

It is not uncommon to find that a conventional partial and/or complete denture may fail to provide psychological comfort, satisfactory function, esthetics, or speech. With an increase in awareness regarding dental implant therapy amongst the patients and newer advancements in the field of implant design, materials, diagnostic and surgical techniques has made it one the most successful treatment modality in the current dental scenario to achieve the above goals.<sup>7</sup> Implant training is an integral part of the Prosthodontic post graduate

training program. As no such evidences are available which determines the current trends of dental implantology amongst the post graduate prosthodontic programs of dental colleges of India, it seemed necessary to conduct such a study. 112 out of 195 Heads of the Department submitted their responses.

All 112 selected dental implant as a choice of treatment over the other available options. 109 participants favored placement of threaded implants against smooth surfaced. This is in accordance with the findings of previous studies that concluded that threaded implants have increased surface area which results in improved primary stability and also allows better stress distribution than implants with smooth surface.<sup>8,9,10</sup>

When rehabilitating edentulous mandible with mandibular implant supported overdenture, 54 participants preferred placing 4 implants followed by 30 participants who chose placing 2 implants. This result is supported by a systematic review which shows mandibular overdentures with 4 implants showed better results with respect to survival and success rates rather than 2 implants which leads to more complications and maintenance.<sup>11</sup> It is also evident in the literature that retention and stability of a prosthesis is significantly affected by number of implant and four parallel implants provides the most retentive and stable mandibular overdenture.<sup>12</sup> A finite element analysis on influence of implant number on biomechanical behavior of mandibular implant retained overdentures concluded that single-implant-retained mandibular overdentures did not show damaging strain concentration in the bone around the only implant and also provides a cost effective treatment option for edentulous patients.<sup>13</sup> In this study 16 of 112 participants preferred single implant over 2, 3 or 4 to support mandibular implant overdenture.

44.64 percent participants desired to use Locator attachment system over stud attachment (32.14%) followed by bar attachments (5.35%) and Dolla bona (3.57%). 14 percent did not favour any of the above attachment systems. These results are in agreement with a study done by Duohong Zou et al who recommended use of locator system as the problems associated with these prostheses are usually simple to resolve.<sup>14</sup> However, a systematic

review shows that type of attachment system used has no effect on the prosthetic outcome of overdentures during the first year, between 1 to 5 years and after 5 years of function.<sup>15</sup> Other studies also conclude patient satisfaction is independent of the type of attachment system used.<sup>16,17</sup>

A systematic review on accuracy of implant impressions for partially and completely edentulous patients concluded that open tray technique is more accurate than closed tray for completely edentulous patients, but for partially edentulous patients there seems to be no difference.<sup>18</sup> A review by Prithviraj DR<sup>19</sup> concluded that for situations in which there were 3 or fewer implants there was no difference between accuracy of open and closed tray techniques, whereas for situation with 4 or more implants open tray technique proved more accurate than closed tray technique. In the present study, 78 participants chose open tray impression technique over closed tray impression technique.

Polyether impression material was preferred by 62.5 percent as compared to addition silicone 36.6 percent in the present study. However, various systematic reviews concluded that most of the evidence supports polyvinylsiloxane and polyether as the most accurate impression materials for edentulous multiple-implant situations, without any clear advantage of either.<sup>18,20</sup>

79 participants preferred Cement retained prosthesis and 33 participants chose replacement using screw retained prosthesis. A critical review by Sanath Shetty et al. on "Principles of screw - retained and cement - retained fixed implant prosthesis" concluded that both the cement and screw retained have their own advantages and disadvantages. Hence, selection of type of prosthesis should be individualized. Increased implant predictability, patient demand for high esthetic outcomes and lower cost recommend use of cement-retained restorations for implant-supported single crowns. Due to increased technical and prosthetic complications associated with screw-retained prosthesis, cement-retained restorations are preferred in patients with parafunctional habits.<sup>21</sup> However, recent systematic reviews reported no significant difference between the two types of prosthesis with regards to implant survival or crown loss.<sup>22,23</sup>

For the next question on preference of implant length in maxillary posterior edentulous situation with insufficient bone height 87 participants reported to place long implants with direct sinus lift rather than short implants. However, Literature suggests that short implant placement is an effective alternative to long implant placement with maxillary sinus augmentation because of fewer biological complications and similar survival and marginal bone loss. However, the risk of mechanical complications associated with the prostheses fitted on short implants should be considered.<sup>24</sup>

More than half of participants (64 out of 112) were of the opinion that a combination of the existing diagnostic aids (Mounted cast, IOPA, OPG, CT scan) must be utilized to plan treatment for implant supported prosthesis. Mounted casts play a pivotal role in evaluating inter arch distance, whereas IOPA, OPG and CT scan are important to provide an insight into bone quality and quantity as well as determine the relation of implant to surrounding vital structures.

Even though, it has been well documented in literature that the implants placed using surgical stents were more accurately positioned than those without them<sup>25</sup> majority of the participants (85.7 percent) in this study believed that surgical stents made using navigation system were not a necessity for every case. 68.7 percent participants were of the opinion that the general dentist be trained in implantology and 92.8 percent also favored the standardization of implant surgical kits across all brands as it lessens the hassle of buying different implant systems and makes the practice of implantology simpler (53.5 percent).

There were mixed opinion, with 53.5 percent in favor of splinting of adjacent implants in this study. Evidences also reports that splinted prostheses generated more uniform strain distributions<sup>26</sup> and eliminate the risk of occlusal overload.<sup>27</sup>

69.64% participants reported that single piece implant should be restricted to the anterior zone when the amount of bone available is adequate whereas 30.35% participants reported that it can be used in all situations and all locations. Barrachina-Diez J.M. et al in a systematic review and meta-analysis concluded that irrespective of high long-term prosthetic survival rates, technical and

biologic complications are common in one-piece implants.<sup>28</sup>

In this study 64.2 percent supported the concept of immediate loading of implants. However, evidence show that there is no significant difference in implant success rates with different loading Protocols.<sup>29</sup> 65 percent participants preferred direct sinus floor elevation than indirect sinus floor elevation. Pal U.S. et al reported that in case of advanced resorption direct sinus lift method through lateral antrostomy provides better results. Further, the study revealed that use of either direct or indirect sinus elevation techniques did not seem to affect the success rate of implant.<sup>30</sup> Some participants did not prefer to perform sinus floor elevation to avoid invasive procedure. As this is a questionnaire study, it can cause response bias from the participants regarding the opinion and practice towards implantology.

## CONCLUSION

Within the limitation of this study, it is concluded that dental colleges of India having active post graduate program in prosthodontics follow well accepted techniques and materials in the field of dental implantology. Dental implants are the most preferred treatment modality for the replacement of missing teeth. The present study concluded that the choice of threaded implant design, use of standardized implant surgical kit, using longer implants with direct sinus lift procedure, making impression using open-tray technique with polyether impression material and cement retained restorations were preferred over by majority of the participants. There were mixed opinion regarding the splinting of two or more adjacent implants. Further, most of participants believed that the use of single piece implant should be restricted to the anterior zone and the concept of immediate loading is good.

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## CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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