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Research Article

Dental Implants: An Impeccable Reality, Arduous Practice. Knowledge Regarding Dental Implants amongst Dental Professionals of Lucknow City. A KAP Study

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Abstract

Introduction: A dental implant is legitimately an endosseous implant or fixture inclusive of a surgical component that interfaces with the radical aspect of the jaw to extraordinarily, positively replicate a dental prosthesis such as multiple unit abutments inclusive pontic supporting prosthesis, single-unit prosthesis, partially and completely edentulous prosthesis, facial prosthesis or to act as an orthodontic anchor. Hence, the knowledge about dental implants evidently instills an exclusive rehabilitative instinct in the practitioner along with a co-existing competent and satisfactory attitude of the patient. Therefore, this study aims towards the assessment of the knowledge, attitude, and practice regarding dental implants among dental practitioners of Lucknow city.

Methodology: A cross-sectional study was done among 306 dental professionals of Lucknow city. A 21 variable, structured, self-administered, close-ended questionnaire in English was given to each dentist to evaluate their knowledge, attitude and practice regarding dental implants. The variables assessed were, 7 knowledge-based, 9attitude based and 5 based on practice few questions even had subparts. Few questions had multiple options. Descriptive statistics and chi-square test was applied keeping $p < 0.05$.

Result: Knowledge with education, age and years of practice was found to be significant. However, no significance was seen based on gender. The practice was highly significant to the years of practice and no significance was seen with questions on attitude.

Conclusion: Lack of knowledge is the reason for ignorance towards dental implants. Dentists should be more aware of implants in the current era.

Keywords: Dental Implants; Lucknow City; Attitude

Introduction

An Implant is legitimately an endosseous implant or fixture inclusive of a surgical component that interfaces with the radical aspect of the jaw to extraordinarily, positively replicate a dental prosthesis such as multiple unit abutments inclusive pontic supporting prosthesis, single-unit prosthesis, partially and completely edentulous prosthesis, facial prosthesis or to act as an orthodontic anchorage [1]. Loss of tooth is extremely common and it can happen due to various factors like as a result of trauma, disease or age therefore, the utilization of dental implants to supply support for edentulous area has a long and multifaceted history [2-5]. The new era of dental implants in clinical practice emerged and gained credit to satisfy the patient's needs in terms of comfort, aesthetics, prosthesis stability and retention, phonetics, and masticatory performance. Endosseous implants have undergone surface modification from smooth machined surfaces to more roughened surfaces created through process like blasting, by acid etching or by combinations of the treatments [6]. Titanium, a material of choice for implant was introduced by Branemark in 1960 [7]. Alternative to titanium, ceramic came into light, which were first introduced about 40 years ago. It was made from aluminum oxide [8-13]. with changing times these days, ceramic dental implants are made of zirconia, which seems to be a better suitable alternative to titanium because of its properties like tooth- color, biocompatibility, low plaque affinity and mechanical properties [14]. The assimilator for implant success are the quality of bone, density of bone, the age of patient,

the experience of dentists, site of implant placement, length of the implant, loading, and oral hygiene maintenance. Failure of implant can be caused because of poor bone quality, smoking, systemic diseases, old age, site of implant, short implants, acentric loading, an inadequate number of implants, chronic periodontitis, parafunctional habits and absence/loss of implant integration with hard and soft tissues. Inappropriate prosthesis design is also reason of implant failure [15]. The major interest in implant research has been investigated on the basis of success and failure from a biologic point of view, while relatively little has been focused on factors like knowledge of dental professionals, patient perception and evaluation of the treatment outcome [16,17]. The knowledge about dental implants evidently instills an exclusive rehabilitative instinct in the practitioner along with a co-existing competent and satisfactory attitude of the patient.

Aim of the Study

Thus, this study aims towards the assessment of the knowledge, attitude and practice regarding dental implants among dental practitioners of Lucknow city.

Methodology

The present Cross-Sectional, questionnaire study was conducted to evaluate the knowledge regarding dental implants amongst the dental practitioners and post graduates of Lucknow city. The study was conducted during December 2019-January 2020 i.e. extending till 2 months. The sample size was estimated to be 306 estimating a total of 1500 dentists keeping margin of error to (e) 5% and confidence interval (z) to 95%. Pre validated questionnaire in English was taken. The questionnaire was reviewed and tested among 20 participants in order to ensure the reliability of the questionnaire. No change was adopted in the questionnaire. People willing to participate in the study were included in the study while those who did not give a consent were excluded from the study. A two-stage random sampling technique was used. Lucknow city was divided into five zones (north zone, south zone, east zone, west zone, and central zone). An informed consent was obtained from the participating population. A 21 variable, structured, self-administered, close ended questionnaire in English was given to each dentist to evaluate their knowledge, attitude and practice regarding dental implants in Lucknow city. The variables assessed were, 7 knowledge based, 9attitude based and 5 based on practice few questions even had sub parts. Few questions had multiple options. The questionnaire was distributed personally by the investigators and collected back the same day. The details of participants were kept anonymous and confidential to encourage honest responses from the participants. The data collected were entered in IBM SPSS statistics 20 and descriptive analysis and chi square was applied to observe the association keeping a level of significance $p < 0.05$.

Results

It was observed that amongst 306 dental practitioners 182 (59.5%) were males and 124 (40.5%) were females. Most of population lied between age group 35 - 45 years i.e. 39.9% (122) and those practicing in the group 10 - 15 years (Table 1). The age of dentist was 25 - 60 years and minimum practice was of 6 months.

Age	Frequency	Percentage
25-35	93	30.4%
35-45	122	39.9%
45-55	78	25.5%
55-65	13	4.2%
Gender	Frequency	Percentage
Male	182	59.5%
Female	124	40.5%
Education	Frequency	Percentage
Post graduate student	192	62.7%
M.D.S	114	37.3%
Years of practice	Frequency	Percentage
0-5 years	67	21.9%
5-10 years	89	29.1%
10-15 years	75	24.5%
15-20 years	62	20.3%
20-25 years	13	4.2%

Table 1: Sociodemographic data.

Knowledge showed high level of significance with education and years of practice. Therewas no association with gender. Significance was seen with material of implants, body design of implants, success of implants.

Less significance was observed with attitude to level of education, age, years of practice or gender like Do you feel implant therapy is superior to conventional therapy for replacing missing anterior and posterior teeth, (Table 2).

All dental professionals had knowledge regarding dental implants and 66% of them have attended training in the field. 68% (208) agreed to Titanium, 13% (40) to Stainless steel, 32% (98) to Cobalt and 24% (73) agreed to All three material for implant.

Questions	Gender (p value)	Age (p value)	Education (p value)	Year of experience (p value)
Which material is used for implants?	0.14	0.01	0.04	0.02
Which implantation method are you aware of?	0.20	0.00	0.00	0.12
Are you aware of various body designs of implants?	0.01	0.00	0.01	0.01
Are you aware of various surface modifications of implants?	0.51	0.47	0.03	0.03
Are you aware of Branemark's Theory of Osseointegration?	0.41	0.01	0.02	0.21
What are the factors which determine the success of dental implants?	0.80	0.01	0.11	0.02
Does your experience and training modify the choice of treatment?	0.01	0.01	0.01	0.32
Which level of clinical evidence do you refer?	0.67	0.33	0.23	0.43
Do you feel implant therapy is superior to conventional therapy for replacing missing anterior and posterior teeth?	0.76	0.02	0.01	0.04
Do you feel implant supported prosthesis has a better chewing efficacy than conventional prosthesis?	0.43	0.65	0.01	0.01
Do you feel implant supported prosthesis has a better aesthetic outcome than conventional prosthesis?	0.19	0.29	0.03	0.42
Do you feel dental implants are too expensive for most patients?	0.31	0.01	0.02	0.01
Do you feel dental implants need maintenance?	0.25	0.32	0.01	0.13
Do you feel dental implants have technical and biological complications?	0.24	0.34	0.00	0.02
Have you ever placed any dental implant?	0.05	0.01	0.01	0.01

Table 2: Chi square applied; $p < 0.05$.

11% (34) were aware of the Submucosal method, 17% (52) Subperiosteal. Most of the 78% (239) were aware of the endosteal method. While 9% (28) were aware of all methods of implantation.

58% (177) knew about various body designs while 42% weren't aware of it. Of which 72% (220) knew about screw designs, 39% (119) knew about cylinder design, 28% (86) knew about and 16% (49) knew about all design.

47% were aware of various surface modifications of implants. 69% (211) had knowledge regarding ceramics, 53% (162) about hydroxyapatite, 34% (104) had knowledge on Titanium Plasma Sprayed and 42% (129) had knowledge about all three-surface modification.

60% were aware of Branemark's Theory of Osseointegration.

When asked about the factors which determine the success of dental implants?

57% (174) said it was because of the shape of the alveolar ridge,46% (141) said it depends on the Site of the edentulous area, 43% (132) Density of alveolar bone and 62% (190) said it depends on all three factors.

Only 6% of dental practitioners said that patient's financial status doesn't affect their choice. while 94% agreed to financial status affecting the choice.

64% admitted that training and experience modify the choice of treatment.

None of the participants had any knowledge regarding meta-analysis and systematic review while only 2% (6) referred randomized controlled trial and 6% (18) referred case reports. 87% (266) don't refer any scientific literature.

When asked if they feel implant therapy is superior to conventional therapy for replacing missing anterior and posterior teeth? 78% (239) Yes for replacing both anterior and posterior teeth. Nil for replacing both anterior and posterior teeth 68% (208) For replacing anterior teeth only 82% (251) For replacing posterior teeth only 47% (144) felt implant-supported prosthesis has better chewing efficacy than conventional prosthesis?

74% (226) feel implant-supported prosthesis has a better aesthetic outcome than conventional prosthesis while 26% (80) didn't.

Only 2%(6) didn't feel dental implants are too expensive for most patients whereas 98% (300) felt dental implants to be expensive.

43% (132) feel dental implants need maintenance.

73% (223) feel dental implants have technical and biological complications.

Only 27% (83) of dentists have placed dental implants whereas 73% (223) Have never placed any dental implant.

42% (129) prefer a One-stage placement of dental implants while 58% (177) preferred a Two-stage. In the case of two-stage 39% (119) of participants waited for 2 - 4 months for the mandible, 22% (67) took 4 - 6 months for mandible 2 - 4 months for maxilla 48% (148) waited 4 - 6 months for maxilla and 0% Immediately after the first surgery.

59% (181) have patients of the older age group for implants. 44% (135) feel they are competent enough to place implants 57% (174) feel the need for attending training courses on dental implants.

Discussion

The present cross-sectional study was done amongst 306 dental practitioners of Lucknow city. In our result, all the dentists had knowledge regarding dental implants which was similar to the study done by Nagpal., *et al* [19].

Postgraduate had better knowledge it can be because of the training received or implant is the part of curriculum.

Some researchers have suggested that the judgment of treatment success should be rendered by individual patients, rather than via traditional clinical evaluation methods [20], as predetermined treatment-assessment criteria do not necessarily consider patients' requirements and attitudes [21].

The participants had good theoretical knowledge regarding implantology. It can be because of factors such as the training on dental implants, years of experience, and postgraduate specialization. It is clearly evident from the study that those with more than 5 years of experience had better knowledge, positive attitude, and practice of implants. Which is in contrast to study conducted by Eckert., *et al*. in 2012 where it was observed that younger dentist had better knowledge and practice regarding implants. In the study by Eckaert., *et al.* it is quite evident that dentists with more experience prefer conventional methods as a choice for the replacement of missing teeth [22].

In 1957, Per-Ingvar Brånemark, a Swedish orthopedic surgeon studied bone healing and regeneration. He found that bone can grow around Titanium which could effectively be adhered to the metal without being rejected. Brånemark called this phenomenon 'osseointegration', and he carried out many further studies using both animal and human subjects [23]. Dental implants are made out of grade 4 commercially pure Titanium because of its corrosion resistant and strength which is better than other grades. Titanium alloys, Ti6Al4V, are also used because of its strength and fatigue resistant than pure titanium [24]. Titanium, including alloy Ti-6 aluminum-4 vanadium, is that the first material used for dental implants, and it's still amongst the most prominent utilized contemporary dental implants. Commercially pure Titanium is a light metal with excellent biocompatibility, relatively high stiffness, and high resistance to corrosion [25,26]. However, when exposed to air,

a surface oxide is made and this layer of oxide determines the biological response. This oxide layer is a dynamic interface that acts as a platform for the opposition of the bone matrix [25].

Other metals are used for osseointegration, including zirconium, gold, and Ti-aluminum- vanadium alloys. These alloys provide strength to the implant but have been observed to have relatively poor bone-to-implant contact in our study 68% of participants supported the use of Titanium for implants [27].

58% participant of the study had knowledge regarding the various implant design of which 72% were aware of screw design. The Screw type implants was observed to be the most accepted type implant due to its retention and strength [28]. The frame work which contribute to a successful implant are configuration like v-shaped, square-shaped, height and pitch of the thread [29]. The shape of implant does not affect the cortical bone but it seems to have an influence on trabecular bone [26,29].

47% of dental professionals had knowledge regarding surface modification. Plasma spray coating is done spraying a material dissolved in the heat on the surface of the implant, it forms a thick layer of deposition such as hydroxyapatite and titanium. Process of spraying particles on the surface of the implant with ceramic material or silica. Titanium dioxide, Hydroxy apatite, Alumina particles are used and acid etching is performed to remove the remaining blasting particle [30]. Bio ceramics like hydroxyapatite also are used because although their low strength, excellent biocompatibility, and capacity to integrate with hard tissue and living bone.[31] Surface modification improves surface for osseointegration.

Complications occurring in implants are biological and technical. Biological complications associated with preimplant whereas Technical complications associated with the implant or prosthetic components [32]. 73% of dental professional were aware of these complications.

Earlier, endo-osseous dental implant placements were used for healed extraction sockets and alveolar ridges; however, with further advancements in the biologic principles of bone healing around dental implants, placement in fresh extraction sockets has a two-stage protocol which advocates for a load-free period between 3 and 6 months between placement and loading. Although the one-stage protocol offers instant rehabilitation additionally to raised esthetics and self-confidence, factors known to influence clinical success [33].

There are not many cross-sectional studies done regarding knowledge, attitude and practice among dental practitioners so we didn't have many studies to support our result.

Limitation

The limitation of the study is response bias and social desirability bias as all the participants of the study are dental practitioners and the evaluating body also consists of dental practitioners. Since the study sample was not too large hence the study cannot be generalized.

Not many articles are available with respect to KAP study.

Recommendation

CDE programs should be conducted to increase knowledge regarding implantology. Implantology is a part of the curriculum should be taught during BDS.

Implantology workshops should be held more frequently.

Conclusion

The study was a cross-sectional study on dental practitioners of Lucknow city.

To maximize the application of implant, it is necessary that dental practitioners should know the basic principles and techniques of the subject. Its recommended that similar studies involving dentists in other states of the country should be conducted so that more valuable data can be accumulated.

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