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Comprehensive assessment of dentists knowledge and awareness about Cone Beam Computed Tomography technique used in dental implant therapies: An original research study

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***Abstract*---**Aim: The aim of this study was to assess the existing knowledge and awareness about Cone Beam Computed Tomography among general dental practitioner in Bhopal District, India. Materials & Methods: Total 250 private general dental practitioners of Bhopal were approached for the study. However, after considering various factors this number was reduced to 160 general dental practitioners. Questions of CBCT knowledge and awareness were prepared in a

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questionnaire style. It was an exclusive close ended questionnaire containing 8 questions. Questionnaire was emailed to the email addresses of the participating dentists. Informed consent was obtained from the respondents those were willingly ready for involvement. The study was conducted over a period of 1 month in which dentists are asked to fill and send back the questionnaire. P value less than 0.05 was considered significant ($p < 0.05$). Statistical Analysis & Results: Statistical analysis was completed by using statistical software Statistical Package for the Social Sciences version. Out of 160 practitioners, males were 109 and females were 51. Total 41 practitioners were belonging to age group >55 years. Total 120 practitioners were practicing for less than 5 years. Nevertheless, 24 practitioners were practicing in the range of 5 to 10 years. Questionnaire responses assessment with related statistical inferences confirmed significant P value (0.010). Conclusion: Within the limitations of the study authors concluded that dentists Knowledge and awareness about Cone Beam Computed Tomography was at moderate levels only.

***Keywords*---**prosthodontics, cone beam computed tomography, awareness, implant.

Introduction

Cone beam computed tomography (CBCT) was originally invented in the dental field as a newer technological advancement. Primarily it was intended to replace the unwieldy, costly and high-exposure medical radiological scans.[1,2,3] Many of the researchers have demonstrated that the cone beam computed tomography scans were more precise than traditional scans.[4,5] The American Association of Oral and Maxillofacial Radiology have confirmed that cross-sectional views are suggested for precise planning of dental implants.[6,7,8] This can be achieved effectively by cone beam computed tomography which is user friendly and exhibit low-radiation dose. In dental implantology, three-dimensional imaging can be achieved by dental cone beam computed tomography wherein it offers volumetric statistics of jaws and teeth with comparatively low exposure and prices.[9,10,11] Since the innovation of x-rays hundred years ago, dental radiographs have been the principal source of investigative information in the head and neck region.[12,13] Yet, two-dimensional imaging methods are incapable to represent complex three-dimensional anatomical structures and associated pathologies. Therefore, in light of the growing accessibility of CBCT in dental practices, authors aimed to assess the existing knowledge and awareness about Cone Beam Computed Tomography among general dental practitioner in Bhopal District, India.

Materials and Methods

This study was principally designed to assess the existing knowledge and awareness about Cone Beam Computed Tomography among general dental practitioner in Bhopal District, India. The basic procedure was based on asking the related questions in prescribed format. Initially, total 250 private general

dental practitioners of Bhopal were targeted for the study. The contact details, emails of the general dental practitioners were arranged from the city association of dental practitioners. There were total 250 general dental practitioners were screened for the study. Out of which, 70 were not enthusiastically practicing dentistry, rest remaining was 180. On further examination we found that 20 of them not responded to our questionnaire. Consequently final sample including in the study was total 160 general dental practitioners. Authors have studied questionnaire response data of 160 respondents efficiently. The questions of CBCT knowledge and awareness were prepared in a questionnaire style. It was an exclusive close ended questionnaire containing 8 questions. Questionnaire was emailed to the email addresses of the participating dentists. The questionnaire based studies are remarkably useful for personal and group perceptions and attitudes. Questionnaire based studies also save time and economical. As well, they also offer enhanced explanation and perceptive. The privacy policy and other rights of the dentists were totally ensured. Informed consent was obtained from the respondents those were willingly ready for involvement. The study was conducted over a period of 1 month in which dentists are asked to fill and send back the questionnaire. The importance of this study was explained in detail to all general dental practitioners. Results thus obtained was tabulated and subjected to basic statistical analysis. P value less than 0.05 was considered significant ($p< 0.05$).

Statistical Analysis and Results

Reactions those received from questionnaire work out were sent for statistical analysis using statistical software Statistical Package for the Social Sciences version 21 (IBM Inc., Armonk, New York, USA). The consequential data was subjected to suitable statistical tests to obtain p values, mean, standard deviation, chi- square test, standard error and 95% CI. Table 1 and Graph 1 showed that out of 160 practitioners, males were 109 and females were 51. Total 41 practitioners were belonging to age group >55 years. Only 10 practitioners were in the age range of 35-40 years hence we can believe that most of the general dental practitioners were not from younger age groups. P value was significant in group III of age range 46-50 years. Assessments of knowledge by assessment of the professional degrees were also completed (Table 2). More than two third of practitioners were possess only graduate dental degree while 20 practitioners were having additional post graduate degrees. Evaluation of knowledge according to number of years of private practice was also done (table 3). Total 120 practitioners were practicing for less than 5 years. Nevertheless, 24 practitioners were practicing in the range of 5 to 10 years. However, 8 practitioners (each) were practicing in the range of 5 to 10 years and more than 15 years. Table 4 showed questionnaire responses assessment with related statistical inferences. P value was significant here (0.010).

Table 1
Age & Gender Based Distribution Of Dentists

Age Group (Yrs)	Male	Female	Total %	P value
35-40	6	4	10 [6 %]	0.07

41-45	17	6	23 [14 %]	1.00
46-50	25	8	33 [21 %]	0.01*
51-55	35	18	53 [33 %]	0.30
>55	26	15	41 [26 %]	0.08
Total	109	51	100%	*p<0.05 Significant

Table 2
Assessment of Dentists by Professional Degree

Educational Degree	Number	Mean	Standard Deviation
Under Graduate	137	12.56	24.76
Post Graduate	20	14.84	13.03
Post Graduate + PhD	3	2.03	1.36
Total	160	-	-

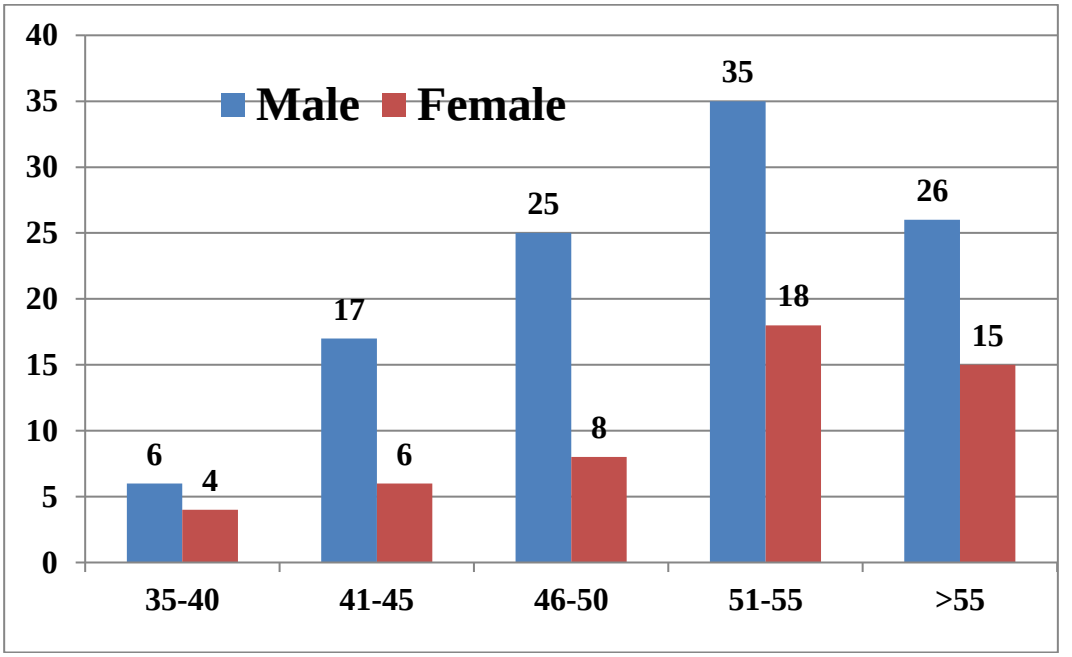
Table 3
Assessment of dentists according to the number of years of private practice

Years of Employment	Number	Mean	Standard Deviation
<5	120	23.27	12.55
5-10	24	12.95	18.29
10-15	8	3.49	2.75
>15	8	2.45	2.05

Table 4
Questionnaire responses assessment with related statistical inferences

Questionnaire	Variables	Responses of Practitioners [Yes]	Responses of Practitioners [No]	p Value
1	Know details about CBCT in Dental Practice	34	126	0.010* [*p<0.05 significant]
2	Is CBCT used for Oral Implantology	110	50	
3	Is CBCT a outstanding diagnostic means	78	82	
4	Is dental syllabus is insufficient concerning CBCT	152	8	
5	Did you attend any Demo on CBCT	15	145	
6	Do you believe that CBCT might be proved	71	89	

	as an promising tool in future researches			
7	Did you ever advised CBCT for your patient	20	140	
8	Do you believe that CBCT imaging is vital for Head and Neck diagnosis	60	100	



Graph 1. Age & gender wise distribution of practitioners

Discussion

Undoubtedly, the three dimensional cone beam computed tomography imaging is a new diagnostic tool in present day practice. Over across the globe, the cone beam computed tomography is exaggerated and has been considered as the 'gold standard' for radiological diagnostic procedures of head and neck region.[14,15,16] Cone beam computed tomography also serves as a necessary analytical tool for clinical evaluation and treatment planning of implant. Cone beam computed tomography has also transformed and affected almost all aspects of oral implantology. In recent times, dental implants therapies have become the treatment of choice for restoring missing teeth.[17,18,19] This modality has also become very much popularize in the last decades as it satisfies the principle of conservation of tooth structure. Its popularity has been noticed particularly in the urban regions owing to high education level and awareness. Surgical rehabilitations and Prosthodontic substitution are the two imperative aspects where implant and cone beam computed tomography is utilized accurately.[20,21] Nevertheless, the capability of a head and neck radiologist would be essential for appropriate explanation of anatomical structures, which remains the unnoticed

otherwise. Many of the researchers have stated that although predictable radiographs (periapical and opg) offer sufficient information about the living structures, there are numerous buried spaces which cannot be recognized without advanced radiological measures.[22,23] Cone beam computed tomography in contrast with standard radiographic techniques for the assessment of implant location has shown enhanced clinical efficiency. In many of the prominent studies, pioneer workers have shown and confirmed cone beam computed tomography as ultimate radiologic tool for planning, locating and placing of dental implants.[24,25]

Conclusion

Within the limitations of the study authors concluded that dentists Knowledge and awareness about Cone Beam Computed Tomography was at moderate levels only. Majority of the dentists were unaware about the specifications and other advantages of CBCT. Yet, CBCT is a promising innovation in the field of prosthodontics and implantology. The inferences of this study must be considered as suggestive for predicting clinical prognosis for critical situations. Nevertheless, authors anticipate some other large scale studies to be conducted that can further establish certain authentic guidelines.

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