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KNOWLEDGE, ATTITUDE AND SKILLS OF ENDODONTIST AND PEDODONTIST ON USE OF RECENT ADVANCEMENTS IN CARIES DIAGNOSIS: A QUESTIONNAIRE BASED SURVEY

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Abstract:
Background: Dental caries is a dynamic disease process where early lesions before being expressed clinically undergo many demineralization and remineralization cycles. The recognition of initiation and early detection of dental caries is a primary concern while managing caries.
Aim: This study aimed to evaluate the knowledge, attitude, skills and preparedness of endodontist and pedodontist on use of recent advancements in caries diagnosis.
Materials and Methodology: A cross-sectional survey was carried out in May 2020 on 50 endodontist and pedodontist who had done post graduation from Delhi NCR. A 10 question based questionnaire was developed to assess their knowledge, awareness and skills. Data were subjected to appropriate statistical measures and analyzed.
Subjects and Methods: The data were collected through an online survey questionnaire based on awareness, knowledge, skills and attitude of endodontist and pedodontist.
Result: All the endodontist and pedodontist (100%) believed early detection and recognition was the preliminary concern while managing dental caries. 16% of the specialists were only aware of both uses of FOTI that is for diagnosing carious lesions and identification of the necrotic canals. 72% of specialists managed carious lesions by Minimally invasion dentistry rather than old philosophy of extension for prevention.
Conclusion: This survey reported 28% of dental specialist used ICDAS tool for diagnosing caries and thus managing caries rather than age old use of explorer or sharps which decrease chances of remineralization in incipient lesions. So this survey helps in awaring the dental specialists and educating them about recent advancements and latest devices used for diagnosing dental caries and practicing preservation of natural tooth by minimal intervention dentistry.
Keywords: Dental caries, FOTI, ICDAS

Introduction

Dental caries is a progressive, irreversible, microbial diseases affecting the hard parts of tooth exposed to the oral environment, characterized by demineralization of inorganic constituents and destruction of the organic constituents leading to cavity formation.[1]

The Diagnostic criteria and tools used in the early diagnosis play a pivotal role in devising the treatment plan of carious lesion. [2] ICDAS (International caries detection and assessment scoring) is a clinical scoring system used by dental practioners to detect and assess dental caries which is used in dental education, clinically, in researches and epidemiological studies.[3]

The present dentistry emphasizes on prevention and is based on minimal intervention dentistry rather than original maxim of “extension for prevention” and treating decay in its early stages is universally acknowledged.[4,5] This study was done to evaluates the knowledge, attitude, awareness, skills and preparedness of endodontist and pedodontist who had done postgraduation from Delhi NCR on use of recent advancements in caries diagnosis and also educating them.

Materials and Methodology:

A cross-sectional study was conducted on 50 freshly trained or undergoing training dental specialists of pedodontics and preventive dentistry and conservative and endodontic dentistry endontics fullfulling inclusion criteria of being trained mainly through lectures and clinical experience in ITS Dental College, Greater Noida. All the specialized dentist with or greater than a year of experience post graduation were excluded. This whatsapp based survey was conducted in two phases (survey tool development and data collection) for a period of 3 days to the contacts of the two invigilators.

Survey tool development

After a thorough literature search a survey tool of 10 item questionnaires was drafted in form of whatsapp based questionnaire. The first section focused on the dentist

background such as age and professional years of experience to measure the awareness related to recents in diagnosis of caries. A 3-point scale was made to analyze the attitude, awareness, knowledge and skills of dental specialists with one year or less educational experience and skills post specialization by giving option A as yes, B as No and C as may be .The settings of the survey were such that one phone could only take the survey once to remove bias.

Table 1: Data collection:

QUESTIONNAIRE	A	B	C
1. Do you believe recognition of initiation and early detection of caries is a primary concern while managing caries?	Yes	No searching for cavities is	I never gave a thought about use of remineralizing agentsand directly go for extension by use of airrotor
2. Do you advocate the use of sharp probe/explorer while diagnosing caries?	Yes I find it convenient	No use intraoral camera as sharps can disrupt remineralization and transfer microorganisms	I use ICDAS detection and assessment tool for dental caries
3. Are you aware of full form of ICDAS and its scoring system?	Yes	No	I know the basics but don't practice it in my day to day management of carious lesions.
4. Have you ever used caries detector dyes to detect less mineralized dentin?	Yes I have used them	Never heard about them	I know about them but never applied them on lesions
5. FOTI (Fiber optic transillumination) which works on the difference of index of light transmission between a sound and decayed tooth is used for?	Diagnosis of carious lesions	Identification of necrotic canals	Both of them
6. Have you ever used D-caries mini which works on the principle of FOTI to detect proximal and interproximal caries?	Yes and I see the change of color from green to red	Never heard about it	I know the principle but never used it
7. Have you used laser for diagnosing the caries and sterilising the canals?	Yes	No	I only use laser for laser canal sterlization
8. Are you aware of the scoring of Diagnodent (infrared laser flouroscence)?	Yes	No	I don't remember completely
9. Do you use Diagnodent for diagnosis of caries?	Yes	No	Sometimes
10. The present philosophy used to diagnose and manage caries at an early stage is?	Extension for prevention	Minimally invasion dentistry	Constriction by conviction

Statistical Analysis

The doctors' knowledge, awareness of recent advances, skill, and attitude as well as recent approaches in diagnosis and management were expressed in proportions. The 3-point scale was adapted for each of the following 10 questions.

Result:

Table 1: The percentage of dentist that choose opotion A,B and C for particular questions.

S.NO	A	%age	B	% age	C	% age	SKIPPED
Q1	50	100%	0	0	0	0	0
Q2	16	32%	20	40%	14	56%	0
Q3	32	64%	4	8%	14	56%	0
Q4	12	48%	0	0	36	76%	0
Q5	42	84%	0	0	8	32%	0
Q6	4	8%	4	8%	42	84%	0
Q7	14	28%	24	48%	12	24%	0
Q8	32	64%	2	4%	16	32%	0
Q9	8	16%	36	72%	6	12%	0
Q10	10	20%	36	72%	4	8%	0

100% (n=50) of the endodontist and pedodontist believed recognition of initiation and early detection of caries is a primary concern while managing caries **(Figure 1).**

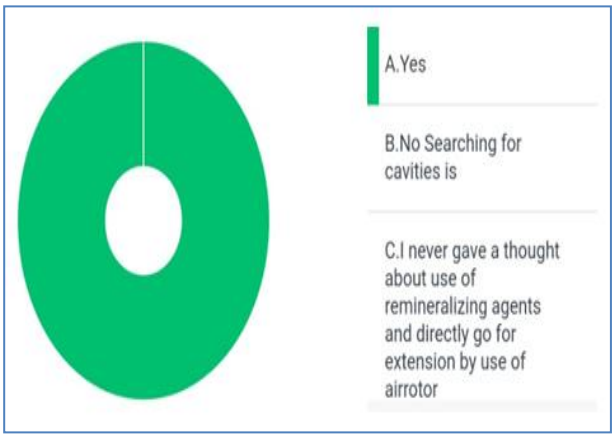

Figure 1

40% of dentists said that they use intraoral camera rather than a sharp probe/explorer as they can disrupt remineralization and transfer microorganisms where as only 28% of dental specialist used ICDAS tool for diagnosing caries. **(Figure 2) (Table1).**

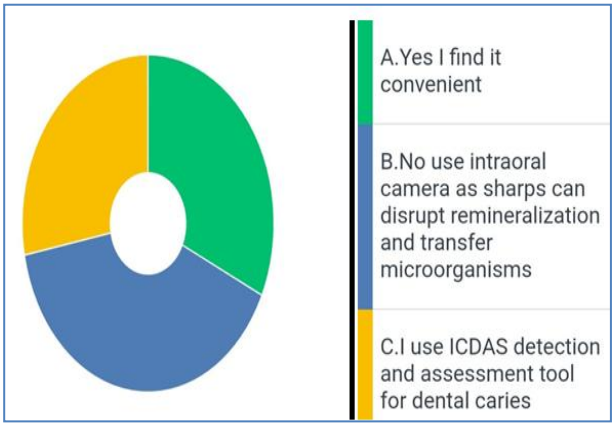

Figure 2

64 % were aware of full form of ICDAS and its scoring system whereas 28% only knew basics but didn't practice ICDAS in day to day caries management.**(Figure 3) (Table 1).**

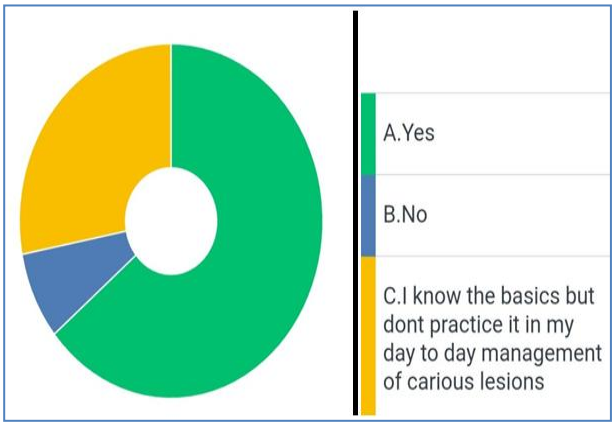

Figure 3

76% were aware of caries detector dyes but they had never applied them on lesions and only 24% had used them **(Figure 4).**

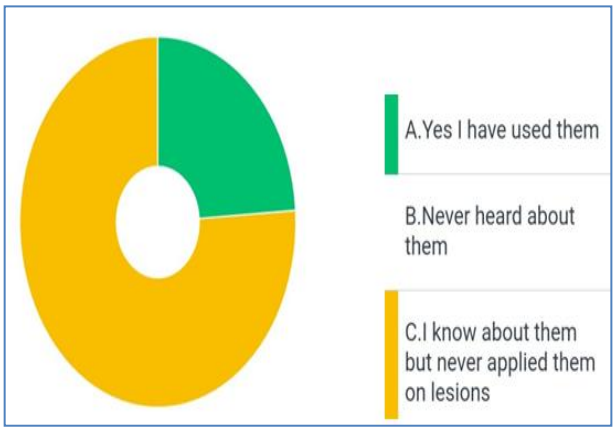

Figure 4

Only 16% knew FOTI is used for diagnosing carious lesions and identification of the necrotic canals while 84% only knew one use of FOTI that is diagnosing the carious lesions .**(Figure 5) (Table 1).**

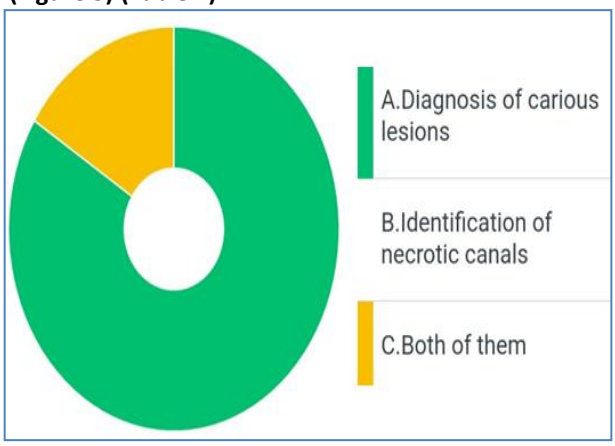

Figure 5

Only 8% had used D-Caries mini which works on principle of FOTI to detect proximal and interproximal caries and 8% had never heard about this latest diagnosing aid. 84% of the dental specialist were aware of its principle which is change from green to red (**Figure 6).**

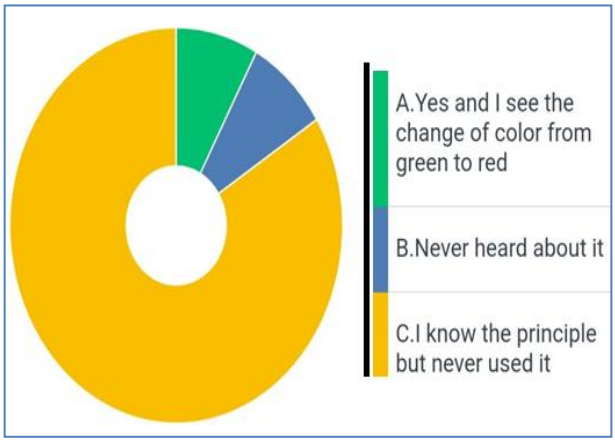

Figure 6

24% use laser for laser canal sterlization while as 28% use for diagnosing caries. **(Figure 7)**

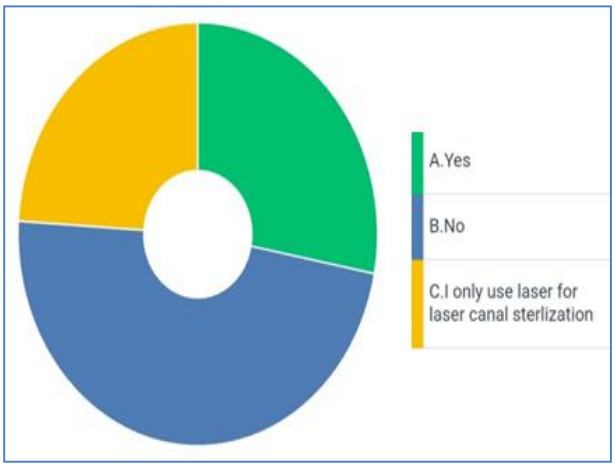

Figure 7

64%of specialist dentist were completely aware of diagnodent scoring system and 4% were unaware **(Figure 8).**

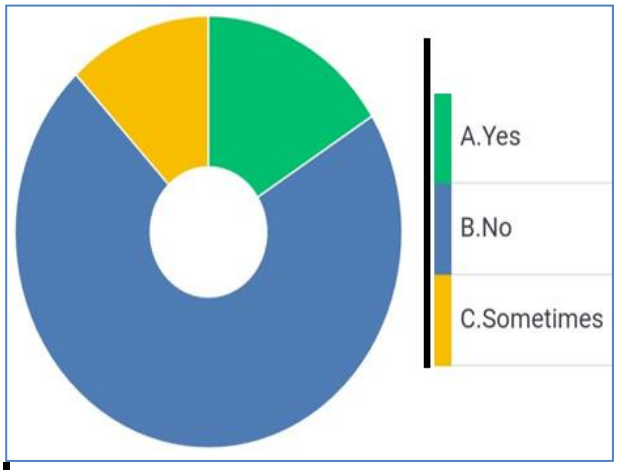

Figure 8

12% specialists used Diagnodent for diagnosing caries , 12% used it sometimes whereas 72% (n=36) have never used Diagnodent for diagnosing caries.**(Figure 9) (Table 1).**

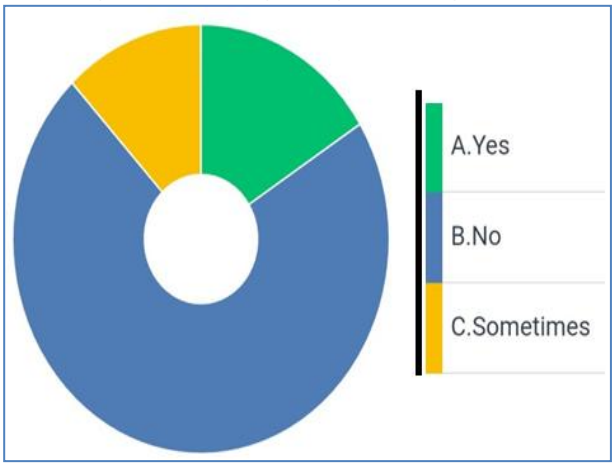

Figure 9

72% of specialists were well aware of the present philosophy used to diagnose and manage caries at early stage called minimally invasion dentistry (**Figure 10).**

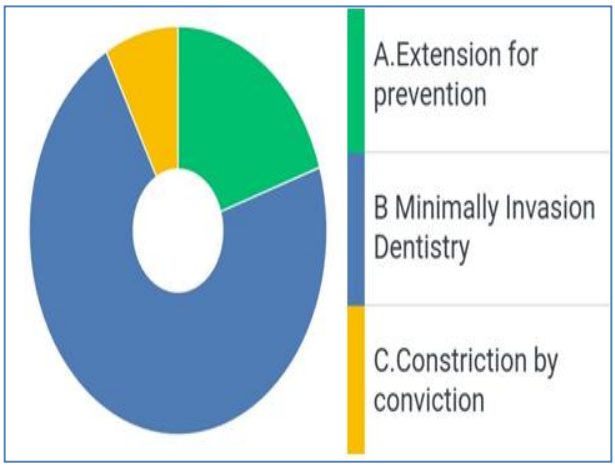

Figure 10

Discussion:

In 1990 Intraoral camera was introduced by Gorden J.Christen as an alternative for visual oral examination for caries screening giving a magnified (10 x) and multiple viewing angles of carious lesions.[6] Due to 12% sensitivity for occult caries it led to development of concept of fluorescence for detecting initial caries.[5]

The amount of demineralization of tooth due to caries is associated with discoloration based on which Fusiyama introduced basic fuchsine red stain as a dye to differentiate infected and affected dentin having different ultrastructural and chemical characteristics.[7]

FOTI developed for caries detection uses a narrow beam of white light to transilluminate a tooth and was initially designed by Friedman and Marcus in 1970 for detection of proximal caries by placing light on the gingival below the cervical margin of tooth. It has higher sensitivity for dentin lesions than for enamel lesions however a drawback of giving false negative readings has. The benefits out number being non invasive, non time consuming, being comfortable to patient, simple and giving optimum positive predictive value.[8]

Quantitative light induced fluorescence (QLF) can be used to assess the impact of preventive measures on the remineralization and reversal of caries as it monitors and quantifies changes in mineral content of white spot lesionsas as reported by Stookey.[9]

As an adjunct to visual and radiographic examination Diagnodent was introduced in 1998 by Hibst and Gal.[10] Goel et al concluded higher sensitivity of diagnodent over other conventional methods for detecting enamel caries whereas accuracy was similar to other conventional caries diagnostic methods for dentinal caries.[11]

FACE (fluorescence assisted caries excavation) technique is also a recent caries detector system which detects on the

basis of color changes to clinically differentiate between infected and affected carious dentin. It detects the orange red fluorophores produced by microorganisms as by-products of their metabolism due to proto- and meso-porphyrins.[12]

The questions were such framed that other than analysing the dental specialists the questionnaire it also served the educative purpose of awaring about recent advances in diagnosing dental caries and management. This article stresses on new emerging branch of dentistry in the near future called "WhatsApp Dentistry'' for educating and raising awareness in the specialist regarding the recent diagnosing tools available in market.

Conclusion:

A sudden shift from "extension for prevention" to "minimally invasive dentistry" paves opportunity in diagnosis and managing caries at an early stage. Though not even a single tool fits to be ideal caries detection method as none captures the whole continuum of caries process. So newer devices are the need of hour which promises in early detection of incipient carious lesions so that preventive dentistry techniques can be executed. This questionnaire helped in raising awareness of dental specialists about the recent advances in diagnosing thus helping in proper management of early carious lesions.

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