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Preference of caries preventive agents among the practicing dentists of Davangere City, Karnataka

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Abstract

Objectives: To identify which caries preventive agents are commonly used by the dentists of Davangere city and is there any association between gender and use of caries preventive agents among the dentists of Davangere.

Methods: It is a cross sectional survey, consisting of 25 questions to that which caries preventive agents are used by the 56 practicing dentists of Davangere city.

Results: In-office topical fluoride was the method most frequently used. There is a significant difference between sex and application of dental sealants on occlusal surface of permanent tooth in patient with age 6-18 years.

Conclusion: There is need to increase awareness regarding various caries preventing agents as well as the importance of performing caries risk assessment in an individual patient. Also there is need to increase the awareness among the female dentists regarding use of dental sealant in patients with age 6-18 years.

Keywords: Caries, chlorhexidine, dentists, fluoride, prevention, sealants.

1. Introduction

The value of dentist- or patient-administered caries preventive agents is supported by a number of studies. The most frequently studied caries prevention modality is fluoride use in children. Knowledge of dentists' clinical decisions related to caries preventive agents in adults is limited, but existing data on the provision of specific procedures and numbers of procedures recommended for specific patients demonstrate substantial variation. There are few studies documenting dentist, patient, or practice variables associated with the use of specific agents for caries prevention or management^[1]. Assessing a patient's risk of developing caries is a vital component of caries management. A comprehensive caries assessment should consider factors such as past and current caries experience, diet, fluoride exposure, presence of cariogenic bacteria, salivary status, general medical history, behavioral and physical factors, and medical and demographic characteristics that may affect caries development. A caries risk assessment also should consider factors that may challenge the patient's ability to maintain good oral hygiene^[2]. Caries risk assessment determines the probability of caries incidence (that is, number of new cavities or incipient lesions) in a certain period. It also involves the probability that there will be a change in the size or activity of lesions in the mouth. Most dentists likely incorporate into their practice some form of caries risk assessment based on their overall impression of the patient, which together with previous caries experience has been shown to have good predictive power^[3]. The process of charting the results of caries detection, diagnosis and risk assessment, as well as informing patients about specific findings and their implications on treatment and prognosis, are as important for appropriate patient care and effective management of the caries disease process as is recording the proposed treatment plan and eventual treatment outcomes^[3]. The detection of frank cavitations in teeth requiring restorations has been a hallmark of dentistry. In contrast, modern caries management also focuses on the detection of incipient, noncavitated lesions and the practitioner's ability to diagnose whether those lesions are active. This diagnosis should be one of the guiding factors for caries risk assessment and management decisions^[3].

2. Materials and Methods

2.1 Study design

It is a cross sectional questionnaire based survey. There were total 25 questions. Of them first 8 question were to assess the method dentists uses to diagnose dental caries. Question 9-22 were there to assess the method they use to prevent or treat dental caries. Among these 9-22 questions 9-14 were for 6-18 years of age group and 15-22 were for above 18 years of age. Last three questions were general questions regarding caries prevention.

2.2 Study population

The target population was the practicing dentists (who have their clinics in Davangere) of Davangere city, India. The list of the dentists was obtained from the Indian Dental Association, Davangere branch, College of Dental Sciences, Davangere and Bapuji Dental College and Hospital, Davangere. The total number of dentists were 56.

Prior to the survey, the permission was obtained from the principals of the respective colleges and programme was scheduled accordingly. The study was conducted between 1.04.2011.to 30.04.2011. The data was collected by a post graduate student along with the 8 undergraduate students posted in the Department of Preventive and Community Dentistry, College of Dental Sciences, Davangere. The questionnaires were distributed to the target population on the scheduled dates and were collected the day after. Of the 56 dentists 50 dentists who returned back the filled questionnaire the following day were included in the study.

2.3 Data collection

Ethical clearance for conducting the study was obtained from the Ethical Committee of the college. Informed consent was obtained from all the participants prior to the survey. The questionnaire was developed based on a literature review, and presented as a series of 25 questions. In addition, demographic information collected from the respondents included their degree, gender and years of experience based on which they were classified into three groups (pursuing post-graduation course, dentists with B.D.S degree, and dentists with M.D.S degree).

2.4 Statistical analysis

The data were coded and analyzed using the SPSS software. Chi square test was used to know whether there was any statistically significant difference in preference of caries preventive agents & designation (M.D.S./ B.D.S), sex and years of experience. The level of significance was set at $p = 0.05$.

3. Results & Discussion

With 50 out of 56 dentists participating in the study 89.28% of the target population was covered in the survey. Of the total respondents 76% (n=38) were males and 24% (n=12) were females, 70% (n= 35) were M.D.S. and 30% (n= 15) were B.D.S. Regarding the years of experience (since when they are practicing) of the dentists, 32% (n=16) were practicing since less than 5 years, 36% (n=18) were practicing since 5 -10 years, 22% (n= 11) were practicing since 10 -20 years and 10% (n= 5) were practicing since more than 20 years.

For diagnosis of caries on proximal surface of teeth 40% (n=20) use radiograph Oftenly where as 20% (n=10) rarely uses the radiograph. On examining patients to determine the caries lesion on the occlusal surface, 40% (n=20) patients used sometimes with 36% (n=18) used rarely to diagnose the lesion.

On examining patients to determine whether they have a primary occlusal caries lesion, 40% (n=20) dentists uses the dental explorer to diagnose the lesion always while 18% (n=9) used it sometimes. For examination of an existing restoration (recurrent or secondary) 24% (n=12) uses dental explorer to diagnose the lesion sometimes while 40% (n=20) used it oftenly. While examining patients to determine if they have a primary caries lesion on the occlusal surface, 100% (n=50) dentists never use laser fluorescense with 52% (n=26) dentists using air drying to diagnose the lesion and 18% (n=9) dentists rarely used it. For diagnosing the caries lesion on proximal surface of an anterior tooth, 100% (n=50) dentists never use fibre optic transillumination to diagnose the lesion. For examining the patients to determine the caries lesion, 88% (n=44) never use some sort of magnification to diagnose the lesion while 12% (n=6) rarely used it. (The next refer to patients 6 to 18 years old)...

Used of dental sealants on the occlusal surface of the permanent teeth applied by 52% (n=26) of the dentists Oftenly while 18% (n=9) used it rarely. With 36% (n=18) dentists used fluoride application such as fluoride gel, fluoride varnish, or fluoride rinse as in office use with 34% (n=18) dentists using it sometimes. For recommendation of a non-prescription (over the counter) fluoride rinse 58% (n=29) dentists never used it with 22% (n=11) rarely recommend it. 34% (n=14) Oftenly and 30% (n=15) dentists sometimes will provide a prescription for fluoride. For recommendation of the chlorhexidine rinse 72% (n=36) will Oftenly recommend while 18% (n=9) will recommend it sometimes. For recommending a use of sugarless chewing gum or xylitol chewing gum 36% (n=18) rarely recommend with 28% (n=14) will never recommend its use. [The next refer to the patients who are more than 18 years old]

For the patients who are more than 18 years old with at least one posterior tooth, application of dental sealants on the occlusal surface of their teeth is 52% (n=26) apply it sometimes with 18% (n=9) do not apply or will apply it rarely. For recommendation of a non-prescription (over the counter) fluoride rinse 36% (n=18) Oftenly with 28% (n=14) will never recommend it. For providing a prescription for fluoride 44% (n=22) Oftenly and 24% (n=12) rarely prescript it. For chlorhexidine rinse 36% (n=18) sometimes while 28% (n=14) rarely with 24% (n=12) Oftenly recommend it. For recommendation of use of sugarless chewing gum or xylitol chewing gum 38% (n=19) never recommend while 26% (n=13) rarely recommend it.

For assessing the caries risk for individual patients in any way 56% (n=28) never assess with 44% (n=22) assess the caries risk.

Only 74% of the dentists are interested in participating in educational programme.

On asking how often they advise dietary counseling to patient 36% (n=18) dentists gives dietary counseling to their all patients and 38% (n=19) gives counseling to patient with high sugar consumption and with high caries are present.

On asking for treatment of initial caries 50% (n=25) dentist prefer for pit and fissure sealant and 14% (n=7) for topical fluoride application.

58% (n=29) dentists advice oral hygiene instructions to their patients and 24% (n=12) advice Oftenly to their patients.

4. Discussion

This study identified the preference of caries preventive agents among the practicing dentists of Davangere city and also identified whether there is any statistically significant

difference in preference of caries preventive agents & designation (M.D.S./ B.D.S), sex and years of experience.

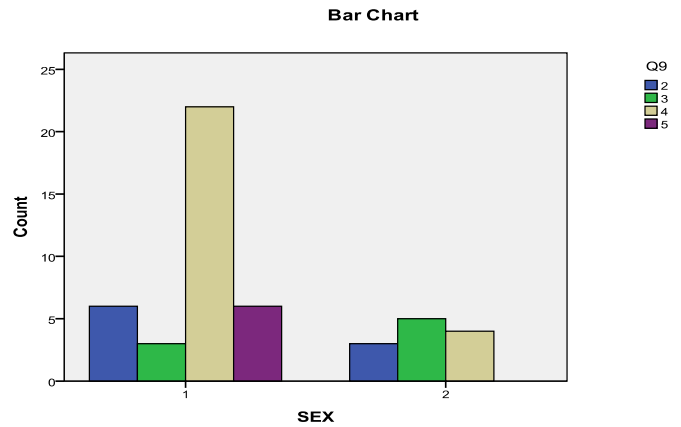
According to the study results in-office applied topical fluoride was the most frequently used method of caries prevention; however, at-home applied fluoride regimen and chlorhexidine rinse were also frequently used, this was in accordance to a study conducted by Amundson C *et al.* in 2010 Florida.¹ Results from the current study suggest that dental sealants are an infrequent choice for caries prevention for adult patients among practicing dentists. Davangere dentists recommended a non-prescription fluoride or a prescription fluoride to about one in every four adult patients. Assuming that when an at-home fluoride is suggested, the dentist chooses one or the other, about 50% of adult patients would be sent home to apply some form of fluoride treatment this is in accordance to a study conducted by Amundson C *et al.* in 2010 Florida [1].

Chewing gum has important potential as a delivery vehicle for caries protective agents, as clinical trials have shown that chewing sugarless gum leads to substantial caries prevention, with xylitol-containing gums being particularly effective. We found that gum was the rarely recommended preventive agent not applied in the dental office.

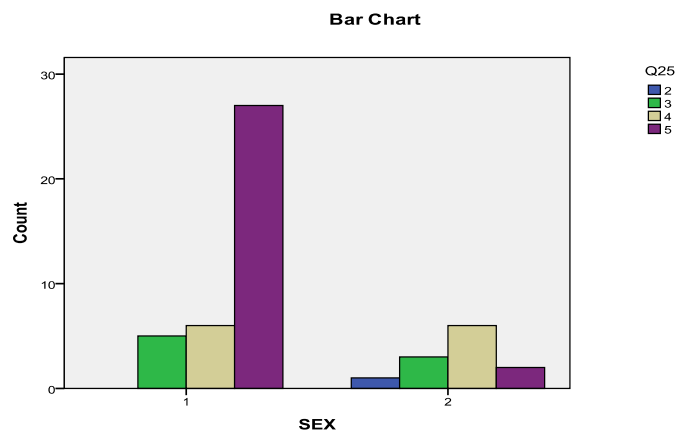
Caries risk assessment determines the probability of caries incidence (that is, number of new cavities or incipient lesions) in a certain period. It also involves the probability that there will be a change in the size or activity of lesions in the mouth³. Zero and colleagues suggested that determining caries activity may be a stronger predictor of caries risk than decayed, filled or missing teeth. Sugar exposure is an important etiologic factor in caries development. Owing to the wide use of fluoride and its effect in lowering the incidence and rate of caries, it is difficult to show a strong clear-cut positive association between a person's sugar consumption and his or her caries development [3]. If a patient consumes a lot of sugar, but at the same time uses a lot of fluoride, the teeth may not be as damaged as they would be if there were no fluoride use.

Caries risk assessment is an important component in the decision making process, and it is important to reevaluate a patient's caries risk status periodically [4]. In this study the half of the Davangere dentists did not perform caries risk assessment. So there is need to educate the importance of performing caries risk assessment among Davangere dentists. Sealants should be placed on pits and fissures of children's and adolescents' permanent teeth when it is determined that the tooth, or the patient, is at risk of experiencing caries. Sealants should be placed on pits and fissures of adults' permanent teeth when it is determined that the tooth, or the patient, is at risk of experiencing caries [4]. In the current study dentists recommended dental sealants oftenly in the children where as in the adult patient dentists uses dental sealants very rarely. Today in adult patient also we should use dental sealants if patient is at risk of developing caries at any age.

We also found significant differences in preference of dental sealant application in patient age 6-18 years of age between male and female dentists. We found that males more often applied dental sealant than women dentists. According to study conducted by Michael A *et al.* in 2001 at Washington did not find any significant difference between the no systematic differences existed between female and male dentists and the relative percentage of dental service categories was highly similar for male and female practitioners [5]. In a comprehensive review, Niessen and colleagues concluded that much of the literature on the nature and scope of dental practice by female dentists is composed of anecdotal or descriptive reports [5].



Graph I: Association of sex and application of dental sealant on occlusal surface of permanent teeth in patient with age 6 – 18 years



Graph II: Association of sex and oral hygiene instruction given to patients.

5. Conclusion

Result shows that there is need to increase awareness regarding various caries preventing agents as well as the importance of performing caries risk assessment in an individual patient. Also there is need to increase the awareness among the female dentists regarding use of dental sealant in patients with age 6-18 years as well as regarding the importance of oral hygiene instructions in preventing dental caries.

Appendix

Department of Preventive and Community Dentistry

Preference of Caries Preventive Agents among the Practicing Dentists of Davangere City, Karnataka.

This is an anonymous survey; precious information will be kept confidential.

Designation: M.D.S. / B.D.S **SEX:** MALE / FEMALE **Years since practicing:** a) <5 years b) 5 - 10 years c) 10 – 20 years d) > 20 years

Note: Here rarely means near to 0%, sometimes means about 50% and Oftenly means near to 100%

Section 1: Questions 1- 8 have to do with methods that you may or may not use to diagnose dental caries. Please circle the one alphabet that best corresponds to your answer.

Questionnaire

1. When you examine patients to determine if they have a caries lesion on a **proximal** (mesial or distal) surface, how often do you use **radiographs** to help diagnose the lesion?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
2. When you examine patients to determine if they have a caries lesion on the **occlusal** surface, how often do you use **radiographs** to help diagnose the lesion?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
3. When you examine patients to determine if they have a **primary occlusal caries** lesion, how often do you use a **dental explorer** to diagnose the lesion?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
4. When you examine patients to determine if they have a **caries** lesion **adjacent to an existing restoration** (recurrent/secondary caries), how often do you use a **dental explorer** to diagnose the lesion?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
5. When you examine patients to determine if they have a **primary caries** lesion on the occlusal surface, how often do you use **laser fluorescence**?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
6. I) When you examine patients to determine if they have a **primary caries** lesion, how often do you use **air-drying** to diagnose the lesion?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
7. When you examine patients to determine if they have a **caries** lesion on a **proximal** (mesial or distal) surface of an anterior tooth, how often do you use **fiber optic** transillumination to diagnose the lesion?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
8. When you examine patients to determine if they have a **caries** lesion, how often do you use some sort of **magnification** to diagnose the lesion?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always

Section 2: Questions 9-22 have to do with methods that you may or may not use to prevent or treat dental caries. Please circle the one alphabet that best corresponds to your answer.

The first 6 questions (9 TO 14) refer to patients 6 to 18 years, please skip to question 15 if you do not see any patients 6-18 years old:

9. How often do you apply **dental sealants** on the occlusal surfaces of the permanent teeth?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
10. How often do you apply an **in-office fluoride application**, such as fluoride gel, fluoride varnish, or fluoride rinse?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
11. How often do you recommend a **non-prescription (over-the-counter) fluoride rinse**?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always

12. How often do you provide a **prescription for fluoride**?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
13. How often do you recommend a **chlorhexidine rinse**?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
14. How often do you recommend a **sugarless chewing gum or xylitol chewing gum**?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always

The next 6 questions refer to patients who are more than 18 years old, please skip to question 21 if you do not see any patients who are more than 18 years old:

15. Of patients **more than 18 years old** with at least one posterior tooth, how often do you apply **dental sealants** on the occlusal surfaces of their teeth?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
16. Of patients **more than 18 years old** with at least one tooth, how often do you apply an **in-office fluoride application**, such as fluoride gel, fluoride varnish, or fluoride rinse?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
17. Of patients **more than 18 years old** with at least one tooth, how often do you recommend a **non-prescription (over-the-counter) fluoride rinse**?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
18. Of patients **more than 18 years old** with at least one tooth, how often do you provide a **prescription for fluoride**?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
19. Of patients **more than 18 years old** with at least one tooth, how often do you recommend a **chlorhexidine rinse**?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
20. Of patients **more than 18 years old** with at least one tooth, how often do you recommend a **sugarless chewing gum or xylitol chewing gum**?
a) Never b) Rarely c) Sometimes d) Oftenly e) Always
21. Do you assess caries risk for individual patients in any way?
a) Yes b) No
22. Do you like to participate in the educational programs which teach you about various preventive methods?
a) Yes b) No
23. How often do you advice dietary counseling to your patient?
a) In patient with high sugar consumption
b) In patient with high caries
c) Both a) and b)
d) All the patients
e) Never
24. What treatment do you prefer for initial caries?
a) Traditional drill and fill with amalgam
b) Tooth colored restorative material like composite
c) Pit and fissure sealants

- d) Topical fluoride application
- e) No treatment / Wait and watch

25. How often do you advice oral hygiene instruction to your patients to combat against dental caries?

- a) Never b) Rarely c) Sometimes d) Oftenly e) Always

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