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PRACTICE OF ENDODONTIC THERAPY AMONG PRACTITIONERS: A QUESTIONNAIRE SURVEY

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Abstract:

Aim: The aim of the study was to ascertain practitioner's point of view (treatment philosophy, rationale and preference) regarding single and multi-visit root canal treatment along with the basis on which the choice of treatment is made.

Materials and method: The study was conducted on 150 practitioners of Chennai through a comprehensive questionnaire asking about method of root-canal preparation, instrumentation, choice of irrigants and disinfectants among the participants.

Result: A total of 104 filled survey forms out of 150 were finally evaluated in the study, which is 63.3% practitioners survey is evaluated. Only 60% of practitioners always do single visit root canal treatment, few of the practitioners preferred to do multiple visit root canal treatment and single visit root canal treatment was preferred mostly in vital tooth. 95.23% of the practitioners preferred to dress the canal between the visits. 74.03% practitioners preferred sodium hypochlorite as an irrigant. Prescription of antibiotics is preferred by 80.05% of practitioners and analgesics by 100% of practitioners. Full veneer crown as post endodontic restoration is preferred by 79.03% of practitioners.

Conclusion: Within the limitations of this study it was concluded that most of the practitioners in Chennai are started performing a root canal treatment in single visit with prescription of analgesics. The use of antibiotics is been limited as practitioners prefer doing single visit RCT and believes in proper canal preparation by using proper irrigants and intra canal medicaments. Dental patients not only pressure their dentist to get an antibiotic prescription, they also self-medicate. Self-medication with antibiotics was found to be alarmingly high in some developing countries as it creates resistance towards many microorganism, thus prescribing practices of dentists can be improved by increasing awareness among dental practitioners of the recommended guidelines. Furthermore, the importance of initiating awareness programs among the general public should not be overlooked.

Introduction:

The practice of dentistry shows a vast difference owing to the place of practice i.e., between private practice and institutional one as well as between the general practitioner and the specialists. Endodontic treatment itself offers a wide gamut of options to a clinician in the way a simple root canal can be carried out. Use of rubber dam, irrigants, prescription of antibiotics, choice in Single and multiple-visit treatment and inter appointment dressings are the aspects of one most commonly carried out procedure i.e., root canal treatment in dentistry. But unfortunately there is no unanimous practice or even view point concerning above methods among the clinicians nationwide(1). For example, single and multiple-visit root canal treatment has been the subject of debate in the endodontic community since 1990's(2). In fact, the attempt to complete root canal treatment in one visit has been documented since before the beginning of the twentieth century, yet there has been no definite conclusion to the debate(3). It has been established that the current available evidence has failed to demonstrate a difference in therapeutic efficacy (healing rates) between these two treatment regimens(4-6). Also, a compelling evidence is lacking regarding prevalence of a significant postoperative pain/flare-up of either single or multiple-visit root canal treatment(5,7). The questionnaire-based study aimed at identifying issues that influence treatment decisions from the operator point of view, by exploring practitioners perspectives on single and multiple-visit treatment approaches. Attempts were also made to identify the basis on which the choice is made and how the information necessary for the choice is acquired. By surveying a substantial majority of practitioners in Chennai, a broadly national perspective on issue was sought.

Materials and Methods:

A questionnaire for this cross-sectional study was designed with the purpose of evaluating the routine endodontic treatment performed by Chennai practitioners. Covering subjects were demographic and professional activity, root-canal preparation and instrumentation, choice of irrigants and disinfectants. The questionnaire covering all the above aspects comprising of 15 questions with multiple-choice answers was framed. The questionnaire was distributed among 150 practitioners. [Table 1]

TABLE-1: Survey sample among practitioners.

1. When do you start with root canal treatment
 - a) As soon as after diagnosis.
 - b) After prescribing medication for few days.
2. In your endodontic treatment, do you use rubber dam

- a)Always. b)Occasionally.c) Never.

3. Number of visit to complete endodontic therapy

No: of roots. Single visit. Two visit. More than two visit

- a)single rooted(vital)
b)single rooted(non-vital)
c)multi rooted (vital)
d)multi rooted (non-vital)

4. How long do you take to finish the complete single visit RCT

- a) less than 45mins. b) 1hour. c) more than 1hour

5. What type of irrigant do you use while doing cleaning and shaping the canal?

- a) sodium hypochlorite b) EDTA. c) cholrhexidine digluconate. d)MTAD

6. If more than one visit; do you use intra-canal medicaments

- a) yes. b) no

7. If yes, what type of material do you use?

8. Do you prescribe antibiotics for patients undergoing endodontic treatment?

- a) yes. b)) no

9. When all do you prescribe antibiotic?

Yes. No.

- a)during pain
b)sinus tract present
c)during swelling.
d)tooth is tender on percussion

10. Do you prescribe analgesics for patients undergoing endodontic treatment?

- a) yes. b) no

11. When all do you prescribe analgesics?

Yes. No.

- a)during pain
b)sinus tract present

c)during swelling

d)tooth is tender on percussion

12. To prepare canal, what do you use routinely?

a) stainless steel hand file. b) NI-TI hand file. c) endodontic instrument. d) rotary instruments

13. How often do you dispose your endodontic file?

a) after every use. b) files become blunt. c) any other specify_____

14. How often do you dispose your rotary file?

a) after every use. b) files become blunt. c) any other specify_____

15. When all do you prefer giving FVC

a) for all teeth underwent endodontic treatment. b) teeth which are discoloured.c) grossly decayed teeth. d)

any other specify __

Results:

A total of 104 filled survey forms out of 150 were finally evaluated in the study. According to the results evaluated, 60.5% practitioners prefer to start root canal treatment immediately after diagnosis, 39.5% prefer to start after prescribing antibiotics for few days. The results for the use of rubber damfor root canal treatment also varied considerably, 26.9% of practitioners used rubber dam always, 39.4% used occasionally and 33.6% practitioners never use rubber dam.

The number of visit of root canal treatment is also varied, 56.61% practitioners completed single rooted vital teeth in first visit, 44.03% in two visits and 2.88% practitioners in more than two visits. Single rooted non-vital teeth treatment was carried out in single visit by 45.57%, in two visits by 62.5% and 4.80% in more than two visit. Multi rooted vital teeth treatment 63.19% practitioners completed in single visit, Whereas 32.15% in two visits and 5.65% in more than two visits. Multi rooted non vital teeth treatment in 28.83% practitioners completed in single visit, 32.69% in two visit and 38.41% practitioners in more than two visits.

Single visit treatment time varied among the practitioners, 17.30% practitioners finished the single visit root canal treatment in less than 45mins, 25.96% in an hour and 56.73% in more than one hour.

Type of irrigant used in treatment also varies, 48.07% practitioners preferred using sodium hypochlorite, 9.61% preferred using EDTA, 2.88% preferred using chorhexidine digluconate, 34.61% preferred using both sodium

hypochlorite and EDTA, 3.84% prefers using all the three irritants to clean the debris in canal during cleaning and shaping of the canal.

Use of intracanal medication between the visits were used by 95.23% practitioners and 5.76% practitioners never uses the intracanal medicaments.

The choice of intracanal medication is calcium hydroxide by 74.03% practitioners and 5.76% practitioners preferred using triple antibiotic paste and 19.23% prefers using both the medication.

Antibiotic prescribing during root canal treatment was carried out by 80.05% of practitioners, 12.06% does not prescribe antibiotics whereas 6.98% prescribes occasionally. The condition where antibiotics used where 6.76% practitioners during pain, 47.83% during sinus tract present, 11.65% during swelling 0.96% during tooth tender on percussion. 35.57% practitioners uses in all the above conditions.

Analgesic prescribing during root canal treatment was carried out by 100% of practitioners.. The condition where analgesic used where 80.16% practitioners during pain, 9.83% during sinus tract present, 11.53% practitioners uses during pain, sinus tract opening, swelling and tooth tender on percussion.

Endodontic instrument used for preparation of canal also varied as 63.57% practitioners uses stainless steel files, 16.67% uses NITI files, 8.03% uses endodontic instrument and 20.03% uses rotary instruments to prepare canal, whereas 22.11% practitioners uses combination of instruments.

Disposal of hand files were varied as 37.5% practitioners disposes after every use, 45.19% when files become blunt and 9.61% after 5 canals preparation.

Disposal of rotary files were varied as 5.76% practitioners disposes after every use, 46.15% when files become blunt and 9.61% after 5 canals preparation.

Practitioners preference for giving full veneer crown (FVC) varied as 79.80% gives for all the endodontically treated teeth, 4.80% in case of discoloured teeth, 2.88% during grossly decayed teeth, 0.96% based on strength of the teeth, 11.53% chooses to give in both the discoloured and grossly decayed teeth.

Discussion:

During under graduate study in dental colleges one is subjected to all the treatment methods and modalities available or recommended for a particular case but in one's clinical practice, the perception of any practitioners differs from case to case. The choice of treatment varies and the cause may be cost, time or any other. This survey was carried out to see the practitioners point of view regarding the root canal treatment. A high response rate from any sample is essential for

the data to be representative of the entire population(8). Opinionsdiffered as to a response rate high enough to eliminate nonresponse response bias, but the range reported was commonly 70-80%(9,10). our response rate was(70-73%) in range.

Generalizability of this study may be limited, as it represents only views of practitioners among Chennai. Practitioners in other parts of the world will have different educational background, practice philosophy and belief systems. Whitten et al. in 1996 conducted a survey in USA and concluded that in the US almost 70% of the endodontists would treat teeth with a necrotic pulp and chronic apical abscess in one visit, which was different from the finding (18.5%) of this study. The major concern of participants who preferred a multiple-visit approach was bacterial control and management of infected canals. Most respondents preferred to use calcium hydroxide medication as interappointment medicament, even though the current best available evidence does not support such a notion (11,12).

Studies of healing rates have consistently documented the absence of any difference between single and multiple-visit treatment. (4-6) It must be acknowledged; however, that the reliability of clinical data on healing has been questioned,(13) with strong advocacy of the continuing need for intracanal medicaments(14,15).There is no evidence to suggest that one treatment regimen (single- visit or multiple-visit root canal treatment) is better than the other. Neither can prevent 100% of short- and long-term complications.It is likely that the benefit of a single-visit treatment, in terms of time and convenience, for both patient and dentist, has the cost of a higher frequency of late postoperative pain (and as a consequence, painkiller use) and swelling(16).There was no significant difference in the incidences of post-obturation pain after one day and seven days with single-visit or multiple-visit endodontic treatments(17). Study on apical periodontitis condition revealed the current best available evidence, single-visit root canal treatment appeared to be slightly more effective than multiple visit, i.e. 6.3% higher healing rate. However, the difference in healing rate between these two treatment regimens was not statistically significant ($P = 0.3809$)(18).

The treatment decision depends not only on scientific principles but also on social and psychological dimensions. It was clearly shown that some operators preferred a multiple-visit approach even in cases where bacterial control is not an issue (specifically vital cases). Therefore, the actual reason for the preference for multiple visit treatment must have been something other than bacterial control e.g., practice management, operator convenience, or simply a habit.

All endodontic procedures should be performed with a rubber dam, which should be considered standard care. The purpose of rubber dam protection in dentistry on whole cannot be overemphasized. Although rubber dam isolation is taught as mandatory during postgraduate training, its importance appears to be ignored by most of the practitioners in

Chennai. Empirical antibiotic therapy and drainage are recommended for more severe infections such as facial cellulitis, pericoronitis, lateral periodontal abscess, and necrotizing ulcerative gingivitis(19). Systemic antibiotics can lead to adverse effects including drug interactions, overgrowth of resistant organisms, nausea, vomiting and other gastro-intestinal symptoms, as well as potentially fatal allergic reactions(1). Recent reviews revealed that systemic antibiotics alone offer no additional benefit in the management of acute apical periodontitis and acute abscess in permanent dentition. This study also showed that the surveyed practitioners in Chennai like to prescribe antibiotics in conjunction with endodontic treatment, especially when the patients present with intra or extraoral swelling. However, due to the questionnaire's design, no information about the use of combination antibiotic regimens was obtained. The type of antibiotic chosen and its dosing regimen are dependent upon the severity of infection and the predominant type of causative bacteria.

According to the British National Formulary, amoxicillin is recommended for dental infections in doses ranging from 250 mg to 500 mg, every 8 hours.(20). The use of 3 g amoxicillin repeated after 8 hours is also mentioned, as a short course of oral therapy (20). Another antibiotic that is also recommended by the BNF is co-amoxiclav, which can be used in doses ranging from 375 mg to 625 mg every 8 hours (21). In patients allergic to penicillin, clindamycin can be used in doses ranging from 150 mg to 450 mg every 6 hours (22). Another option for penicillin-allergic patients (as recommended by the BNF) is metronidazole, which can be used in a dose of 200 mg every 8 hours for 3–7 days (23). Patients who are allergic to penicillin should benefit from clindamycin; it is active against some oral anaerobes and facultative bacteria, and has the advantage of good bone penetration. However, increasing the dose may increase the possibility of serious side effects such as pseudomembranous colitis (24-26), Sweet's syndrome (27), and neutropenia (28). Infections in which anaerobic bacteria are implicated (such as pericoronitis, periodontal abscess and necrotizing ulcerative gingivitis) are better treated with metronidazole; the best dosage regimen in terms of pharmacodynamic/pharmacokinetic aspect is 250 mg every 8 hours (29). In addition to the proper dosing regimens and professionally responsible prescribing practices, the general public needs to be educated about the importance of restricting the use of antibiotics to only cases of severe infection. Patients have become accustomed to being given an antibiotic for a range of medical complaints. Unfortunately, patients presenting at dental surgeries also routinely expect an antibiotic for the treatment of 'toothache' (30). Dental patients not only pressure their dentist to get an antibiotic prescription, they also self-medicate. Self-medication with antibiotics was found to be alarmingly high in some developing countries (31-34). Also in Europe, self-prescription of antibiotics was reported, particularly in eastern and

southern parts (35,36). Bystrom and Sundqvist(37) evaluated the antibacterial effect of 0.5% NaOCl on fifteen single-rooted teeth. Each tooth was treated at five appointments, and the presence of bacteria in the root canal was studied on each occasion. No antibacterial intracanal dressings were used between the appointments. When 0.5% hypochlorite was used no bacteria could be recovered from twelve of fifteen root canals at the fifth appointment. This should be compared with eight of fifteen root canals when saline solution was used as an irrigant. Ercan et al.(38) compared the antibacterial efficacy of 2% CHX and 5.25% NaOCl as root canal irrigants. Their findings demonstrated that both solutions were significantly effective in reducing the microorganisms in teeth with necrotic pulp, periapical lesions, or both. Vianna et al.(39) Dunavant et al.(40) evaluated the efficacy of 6% NaOCl, 1% NaOCl, Smear Clear™, 2% CHX, REDTA, and BioPure™ MTAD™ against *E. faecalis* biofilms using a novel in vitro testing system. Biofilms grown in a flow cell system were submerged in test irrigants for either 1 or 5 minutes. There was a significant relationship between test agent and percentage kill of the biofilm bacteria. No significant relationship between time and percentage kill was found. The percentage kill of the biofilms bacteria was: 6% NaOCl (>99.99%), 1% NaOCl (99.78%), Smear Clear™ (78.06%), 2% CHX (60.49%), REDTA (26.99%), and BioPure™ MTAD™ (16.08%). There was a significant difference between 1% and 6% NaOCl, and all other agents including Smear Clear™, 2% CHX, REDTA, and BioPure™ MTAD™. Therefore, both 1% NaOCl and 6% NaOCl were more efficient in eliminating *E. faecalis* biofilm than the other solutions tested. In this study we have even discussed about the irritants used during canal preparation. It also varied among practitioners based on cost, their flexibility to use a material.

Endodontic treatment causes pain post operatively, thus from this survey we even found that all the practitioners among Chennai population have prescribed analgesics after endodontic treatment. Previous investigations have described the anti-inflammatory effects of ibuprofen and indomethacin (41,42). Several subtypes of sodium channels play important roles in mediating inflammatory pain, such as Nan 1.7, Nan 1.8, and Nan 1.9 (43). Prostaglandins play an important role in sodium channel augmentation during inflammation. Pretreatment with ibuprofen prevents up-regulation of the Nan 1.7 and Nan 1.8 sodium channels. Ibuprofen has been used in previous investigations for pre or post-treatment analgesia (44,45). Seymour and Ward-Booth (46) evaluated various doses of ibuprofen (200 mg, 400 mg, and 600 mg) for the management of postoperative dental pain and reported a trend of higher pain relief in patients who had taken 400-mg doses. Parirokh reported that premedication with ibuprofen and indomethacin significantly increased the success rates of inferior alveolar nerve block anaesthesia in teeth with irreversible pulpitis. The overall success rates for the placebo, ibuprofen and indomethacin groups were 32%, 78% and 62%, respectively (47). Ibuprofen and

indomethacin were significantly better than placebo ($p < 0.01$). There was no difference between ibuprofen and indomethacin ($p = 0.24$). Ibuprofen blocks both the COX-1 and the COX-2 enzymes, but has been shown to be safe and cost-effective with a highly effective analgesic and anti-inflammatory action in post-endodontic pain (48). The prescription of narcotics has gone up in the following conditions: postsurgical pain (28%), postoperative flare-up (31%), or severe pain associated with a necrotic pulp and acute periradicular abscess (34%).

Non-rotary manual endodontic files were commonly used by the practitioners surveyed. Recently introduced rotary NiTi files are able to produce a uniformly tapered canal configuration without canal transportation. However, unpredictable instrument separation remains a deterrent to their popularity. Moreover, cost of rotary files also restrained their use. Majority of practitioners only replaced their instruments when signs of distortion and bluntness were obvious, which is likely to result in a higher risk of instrument separation in the canal.

Post endodontic treatment is also surveyed, which revealed that majority of practitioners gives FVC for all the teeth underwent endodontic restorations. The choice of the definitive restoration is strongly dependent on the amount of the remaining tooth structure, the morphology of the tooth, its position in the dental arch, functional loading on the tooth and the esthetic requirements (49).

Type of material used for ET teeth are- FVC, post and core, internal bleaching where teeth is intact. One prospective (50) and one retrospective study (98) compared the gold standard cast post-and-cores with carbon fiber posts. The retrospective study, which included 200 restored teeth, demonstrated significantly more failures with teeth restored with cast post-and-cores including unrestorable root fractures after an observation period of 4 years (52). In contrast, the prospective study (50) evaluating 27 maxillary anterior teeth restored with metal-ceramic crowns over a mean observation period of 87 months revealed a reduced survival rate of 71% for the carbon fiber posts compared to 89% for the cast post-and-core based restorations.

Nevertheless, both studies did not consider the amount of remaining tooth structure and variations of the tooth type as having influenced these contradictory results. A recently published study investigated the effect of the amount of residual coronal dentin and of post placement on the survival rate of endodontically treated premolars that all received crowns (51).

After a 2-year observation period the results revealed that post placement resulted in a significant reduction of failure risk and that the failure risk was significantly increasing for teeth that had lost all coronal walls (51). A retrospective study evaluating 1,304 teeth restored with three different types of fiber posts from 1-6 years without recording the loss

of coronal tooth structure, reported a failure rate of 3.2%, which is in accordance with the prospective studies mentioned above.

In addition, another retrospective study¹⁰⁰ evaluating the clinical performance of carbon fiber posts with an observation period from 2-3 years revealed a success rate of 98% (50).

Conclusion:

Within the limitations of this study it was concluded that most of the practitioners in Chennai are started performing a root canal treatment in single visit with prescription of analgesics. The use of antibiotics is been limited as practitioners prefer doing single visit RCT and believes in proper canal preparation by using proper irrigants and intra canal medicaments.

Dental patients not only pressure their dentist to get an antibiotic prescription, they also self-medicate. Self-medication with antibiotics was found to be alarmingly high in some developing countries as it creates resistance towards many microorganism, thus prescribing practices of dentists can be improved by increasing awareness among dental practitioners of the recommended guidelines. Furthermore, the importance of initiating awareness programs among the general public should not be overlooked.

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