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ORIGINAL ARTICLE/ARTICOLO ORIGINALE

Attitudes of general practice dentists in private dental clinics in Almadinah Almunawarah toward novel endodontic technologies

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KEYWORDS
Attitudes;
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Abstract
Objective: The purpose of this study was to evaluate the current trends and the adoption of new technologies in endodontic treatment by general practitioners in private dental clinics in Almadinah Almunawarah.
Methods: A questionnaire was distributed randomly to 70 general practitioners working in private dental clinics in Almadinah Almnourah, Saudi Arabia. After one week, the questionnaires were hand-collected. Sixty-three dentists (90%) returned the questionnaire. The study was conducted between February and May 2014.
Results: The results indicated that 100% of the general practitioners did not use any magnification device during root canal treatments; 11% of the respondents used digital X-ray equipment, 12.7% used an electronic apex locator, 38% used NiTi rotary instrumentation in root canal preparations, 100% did not use any adjunctive device for irrigant activation and 100% did not use new devices or techniques for root canal obturations.
Conclusions: This study provides data regarding the current trends and attitudes of general practitioners in private dental clinics in Al-Madinah Al-Monawarah regarding novel technologies in endodontic treatment and reveals the gap between the new advances in endodontics and clinical practice, as well as the need to improve root canal treatment in private dental practices.

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Introduction

Dentistry has rapidly developed during the last several decades, and innovative techniques have changed conventional treatment methods as applications of new dental materials yield better outcomes.[1] Endodontics has experienced major technological developments. Digital radiography, surgical microscopes, electronic apex locators, ultrasonic units with specific endodontic tips, rotary nickel titanium (NiTi) instruments and new obturation systems have advanced the technical steps of root canal treatment procedures.

These new advances affect endodontic clinical practice.[2]

Decreases in radiation exposure, computer archiving and immediate development are major advancements in digital radiography.[3,4] Operating microscopes (OM) have changed nonsurgical and surgical endodontics. In nonsurgical endodontics, management of the straight portion of the root canal system is performed appropriately and easily, even if it is located in the most apical section.[5]

Modern electronic apex locators could determine the working length of a root canal with high accuracy.[6–8] Ultrasonic units with specific endodontic tips are useful in the access cavity preparation, cleaning and shaping, obturation of the root canals, removal of the intracanal materials and obstructions, and endodontic surgery.[9] Rotary nickel titanium (NiTi) root canal instrumentation reduces time and procedural accidents and improves the quality of root canal preparations.[10–12] Novel obturation systems have enhanced the quality of root canal obturation, which could improve the outcome of root canal therapy[13] Although the quality and efficiency of root canal treatments have been improved by the novel technologies, dental general practitioners remain hesitant to use them.[14,15]

The purpose of this study was to evaluate the current trends in endodontics by general practitioners in private dental clinics in Almadinah Almunawarah.

Materials and methods

This study is based on a self-administered questionnaire survey. A questionnaire was distributed to general practitioners in private dental clinics in Almadinah Almunawarah, Saudi Arabia.

The questionnaire was distributed randomly to 70 dental general practitioners were hand collected after one week. A total of 63 (90%) questionnaires were collected. The study was conducted between February and May 2014.

This questionnaire consisted of 10 questions regarding the use of digital radiography, magnification, electronic apex locators, ultrasonic units with endodontic tips, rotary nickel titanium (NiTi) instruments and new obturation systems. The questionnaire is summarized in Table 1.

The collected data were analyzed with SPSS 16 software (SPSS, Inc., Chicago, IL).

Results

The results are summarized in Table 2. In total, 63 (90%) respondents completed the questionnaires. Most of the respondents (50%) had had more than 13 years of postgraduate professional experience as a dentist. The average number of teeth treated endodontically per month was less than 10 teeth by 3% of the participants, 10–20 teeth by 30% of the participants, 21–30 teeth by 27% of the participants, 31–40 teeth by 30% of the participants, and more than 40 teeth by 10% of the participants. In this study, none (0%)of the participants used magnification devices during root canal treatments. Only 11% used digital X-ray equipment, 12.7% used an apex locator during the working length determination, and 38% used NiTi rotary instrumentation during everyday practice. Protaper NiTi rotary instruments were the most used (66.67%). Of the participants who used NiTi rotary instruments, 75% prepared[6–10] canals per NiTi rotary instrument,

Table 1 The questionnaire form.

Question	Choices			
1. How long have you been working in this profession?				
2. What is the average number of teeth that you treat endodontically per month?				
3. Do you use digital X-Ray equipment?	Yes		No	
4. Do you use any device for magnification?	Yes		No	
5. Do you use an apex locator for the working length determination?	Yes		No	
6. Do you use NiTi rotary instruments?	Yes		No	
7. If you use rotary instruments, what system do you use?	a. Protaper	b. Revo S	c. Protaper and Revo S	c. Hero
8. If you use rotary instruments what is the maximum number of prepared canals per instrument?	a. 3–5 canals	b. 6–10 canals	c. More than 10 canals	
9. Do you activate the irrigant by any type of adjunctive activation device?	Yes (specify)		No	
10. Do you use any of the new obturation techniques?	Yes (specify)		No	

Table 2 Various data analyzed in this study.

Analyzed data	%				
Experience years	2–5 years 5%	6–9 years 10%	10–13 years 35%	More than 13 years 50%	
The average numbers of endodontically treated teeth per month	<10 3%	10–20 30%	21–30 27%	31–40 30%	<40 10%
Using magnification devices	Yes 0%		No 100%		
Using digital X-ray equipment	Yes 11%		No 89%		
Using an apex locator	Yes 12.7%		No 87.3%		
Using NiTi rotary instruments	Yes 38%		No 62%		
NiTi Rotary systems	ProTaper 66.67%	Revo S 20.84%	HERO Shaper 8.33%		
The maximum number of prepared canals per NiTi rotary instrument	3–5 canals 16.67%		6–10 canals 75%	More than 10 canals 12.5%	
Using instruments and devices for irrigant activation	Yes 0%		No 100%		
Using new techniques in root canal obturation	Yes 0%		No 100%		

16.67% prepared[3–5] canals per instrument, and 12.5% used the instruments to prepare more than 10 canals. None (0%) of the dentist general practitioners used devices to activate the irrigant during root canal treatments and nobody used new techniques and devices for root canal obturation.

Discussion

Survey questionnaires are frequently used for evaluation purposes in health care systems. In this study, we distributed the questionnaire by hand to improve the response rate. This study investigated the attitudes toward new endodontic technologies held by dental general practitioners working in private dental clinics in Almadinah Almunawarah.

The results of this study revealed a low rate of adopting new technology by general practitioners in private dental clinics in Almadinah Almnourah.

There are several advantages to using digital radiographic imaging systems in endodontic practice. Compared to D-speed film, the advantages of digital radiographic imaging include high resolution, computerized processing, and lower doses of radiation.[16,17] Digital radiography is used by 11% of the participants in this study whereas other reports have mentioned that 36.7% of the general practitioners in KSA use digital X-ray equipment[18] and this percentage increases to 72% in the USA[19] Dental operating microscopes and other forms of magnification facilitate the precise performance of endodontic procedures[20]; however, in our study, the percentage of general practitioners using magnification devices was 0%. In a recent study, magnification was reported to be widely used by 80% of general practitioners, predominantly in the form of loupes (75%). Two percent of general practitioners reported using a dental operating microscope (DOM).[19] The use of microscopes in everyday general practice is rare because of the high costs of microscopes; however, using magnification by other devices (loupes) is surprising because 17.2% of second mesiobuccal canals in the first upper molar were located without the aid of magnification, whereas the probability of detecting the MB2 canal is increased threefold by using some form of magnification.[21]

Electronic apex locators are essential devices among the modern endodontic innovations; they have greater accuracy than radiographs in measurements of the location of the minor foramen as well as in the determination of the working length.[22,23] In this survey, 12.7% of the general practitioners used apex locators in daily practice, and some practitioners not using an apex locator explained that apex locators are cost prohibitive, whereas other practitioners were not familiar with them because training in the use of apex locators was not included in their undergraduate studies; some practitioners depend on experience to determine the working length by tactile sensation. In other countries, 70% of general practitioners use apex locators in endodontic treatment[19] nickel–titanium (NiTi) instruments, which have high flexibility, maintain the original path of the canal[22] and reduce the incidence of several clinical problems such as the formation of blocks or ledges, transportation, and perforation.[23] In our study, 38% of general practitioners used NiTi rotary instruments for root canal instrumentation, predominantly, the ProTaper system, which is used by 66.67% of the general practitioners; these results are similar to the results of other studies in KSA[18] Other reports mentioned that only a small percentage (17.5%) of general practitioners in northern KSA used NiTi rotary instruments,[24] whereas 74% of practitioners use NiTi rotary instruments in the USA.[19] The ProTaper system is produced by Dentsply-Tulsa Dental, Oklahoma, USA, which has active marketing strategy that might explain the widespread preference for this system.

Irrigation is a key part of a successful root canal treatment. Activation of the irrigant by ultrasonic instruments is more effective in removing debris from the canal.[25] In our study, none of the dentists use irrigant activation devices. Adjunctive activation of root canal irrigants is used by 19% of the general dentists in the USA.[19] Filling of the root canal system (RCS) is essential for the success of endodontic therapy.[26] Warm vertical compaction produces a significantly greater volume of gutta-percha and a significantly lower percentage of voids than those achieved with cold lateral compaction.[27] The novel devices and techniques for root canal obturation include carrier-based obturators and

continuous wave compaction devices; in our study, lateral compaction was the primary technique used in root canal obturation (84.13%), and 15.87% of the general practitioners used the single cone technique. In the USA, 54% of the general practitioners used various warm obturation techniques.[19] General practitioners explain that lateral compaction is easy, does not require expensive tools, and is safe regarding the extrusion of filling materials. Lateral condensation remains the most accepted technique for root canal obturation, and several reports have indicated that most dental schools in the USA (>90%) teach only cold lateral compaction in their pre-doctoral programs.[28]

Conclusions

This survey revealed the low rate of adoption of new endodontic technological advances by general practitioners in private dental clinics in AlMadinah AlMnourah. This study demonstrates the importance of continuing post-graduate education programs for general practitioners as well as the necessity of supporting endodontists in private practice.

Conflict of interest

The author has no conflict of interest to declare.

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