Endodontic materials in practice - Impact Study

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In this survey we tried to identify using the questionnaire's method the attitude of the dentists from the region where our university is situated concerning the endodontic materials on the market. The questionnaires were sent to 87 dentists and we received answers from 60 of them. There is an increased interest in improving the knowledge about endodontic treatment options among dentists in our region, interest that is showed also by the high number of dentists with special training in endodontics (20% have attended postgraduate courses, 18.3% have attended endodontic practice stages, and 5% who have attended a master in endodontics). Modern materials and techniques used in endodontic treatments are not a part of current therapeutic procedures yet, except for the young graduates who use them more often. Sodium hypochlorite is frequently used for the irrigation of the roots canals (63.3%). The classical single-cone technique (58.33%) remains the most often used technique in our region, but materials based on paraformaldehyde still hold an important place in the dentists' preferences (46.6%).

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1. Introduction

There has been a great evolution and development in dental materials in the last years. Major discoveries have appeared in endodontics, such as new materials and novelty techniques used in dental practice [1].

It can be noticed a high interest for the improvement of the knowledge in endodontic treatment in the last years. This interest is highlighted by an increase number of specialized trained practitioners in endodontics [2].

However, a series of statistical studies have shown a decrease of using new materials in dental practice. This can be explained by the high costs of these materials and of these techniques in countries with low economic development such as Iran [3], Lithuania [4] or Turkey [5]. However, a slightly lower use of these materials has also been noticed in west-European countries such as Great Britain, Belgium or Denmark [6, 7, 8].

The present study is trying to identify the dentists' attitude from the region of our university towards the dental materials on the market and also to observe how a series of factors such as age and experience influence the choice of the material.

2. Materials and methods

We designed in the Dental Materials Discipline of the University of Medicine and Pharmacy from Craiova a questionnaire in order to measure the usage of different

endodontic materials among the dentists in our region. The questionnaires were sent to 87 dentists but only 60 of them gave us an answer. The questionnaires were handed personally, with a short description of our study and its objectives. Their filling in was anonymous being made separately by each dentist.

The results have been analysed taking in consideration several criteria that we have considered important. The results have been analysed and interpreted within the Dental Materials scientific meetings.

3. Results

Out of 60 dentists who have answered the questionnaire, 16 of them practice dentistry in rural areas (26.6%), while the rest work in urban areas (73.4%) (fig. 1).

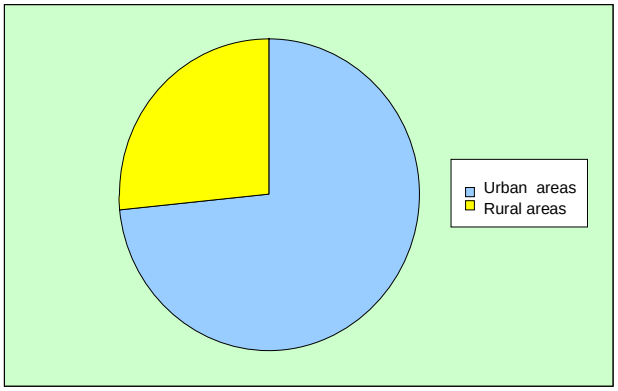

Fig. 1. Dentists distribution in rural and urban areas.

Out of the 60 dentists, 9 (15%) are under 30 years old, 26 (43.3%) are between 30-40 years old, 19 (33.3%) are between 40-50 years old, 4 are between 50-60 years old and 2 of them are over 60 years old (Fig. 2).

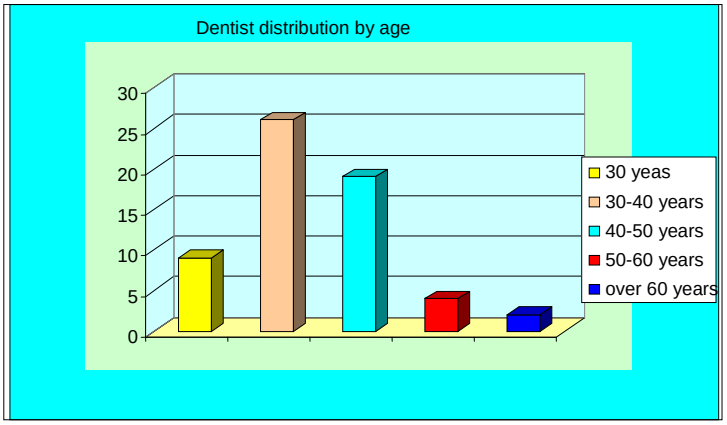

Fig.2. Dentists distribution by age.

12 dental practitioners (20%) have attended postgraduate courses, 11 dental practitioners (18.3%) have attended endodontic hands-on courses and 3 dentists (5%) have a Master Degree in endodontics (Fig. 3).

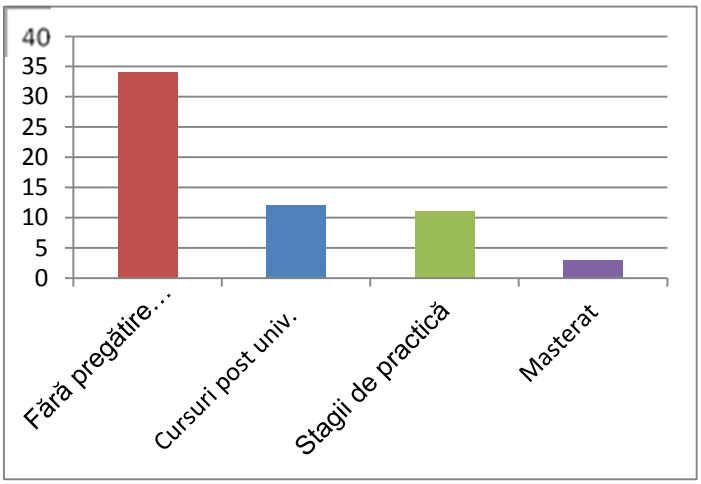

Fig. 3. Dentists distribution according to their postgraduate training level in endodontics.

38 (63.3%) dentists use sodium hypochlorite for endodontic canal cleaning. 17 dentists (44.73%) who use sodium hypochlorite for endodontic cleaning are between 30-40 years old and 12 dentists (31.57%) are between 40-50 years old. 22 of the 60 dentists who have answered the questionnaire do not use sodium hypochlorite for endodontic cleaning (Fig. 4).

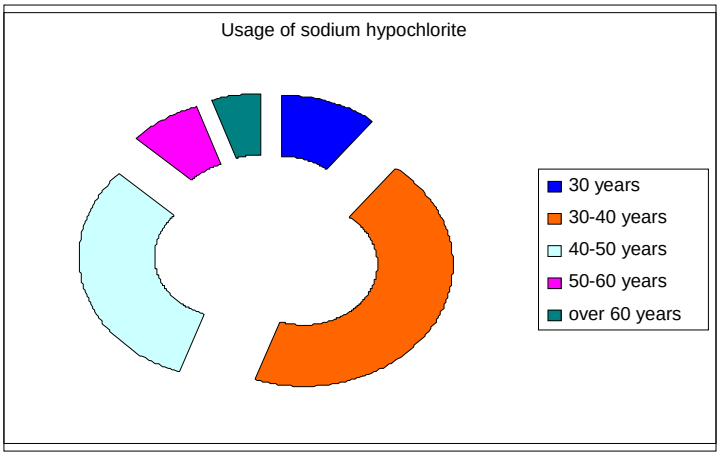

Fig. 4. Dentists using sodium hypochlorite – age distribution.

28 (46.6%) dentists use bakelite in endodontic treatments. 15 of these 28 (53.57%) are between 30-40 years old, while 9 of them (32.14%) are 40-50 years old (Fig. 5).

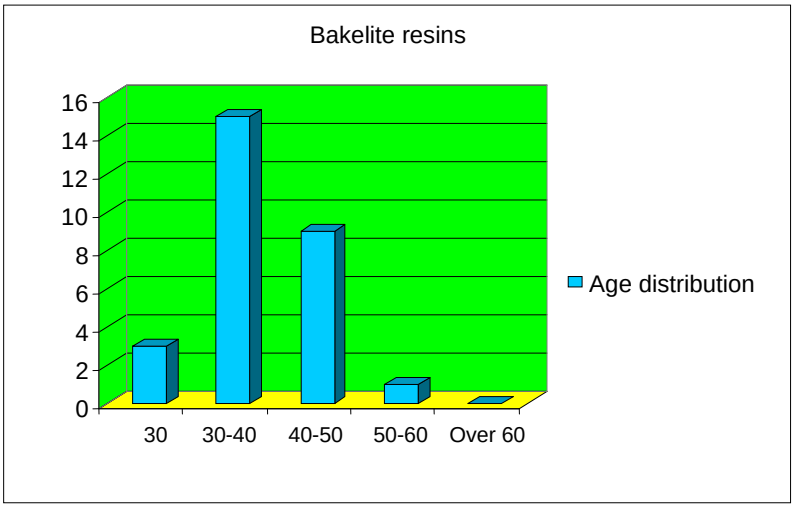

Fig. 5. Dentists using Bakelite resins in endodontics – age distribution.

Concerning root canal filling technique, 35 (58.33%) dentists use the monocone technique.

17 dentists (48.57%) who use the monocone technique are between 30-40 years old and 12 dentists (34.28%) are between 40-50 years old (Fig. 6).

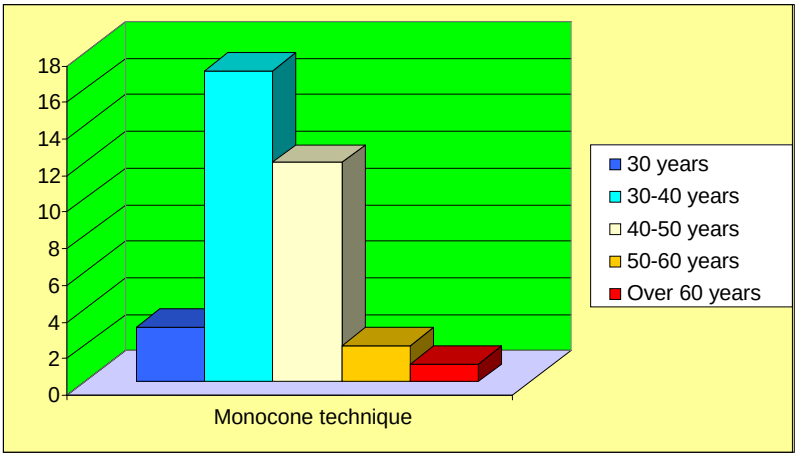

Fig. 6. Dentists using monocone technique – age distribution.

From those 35 dentists who declared to use monocone technique, 3 of them (8.57% of the total number using the monocone technique) have a Master Degree in endodontics, 6 (17.14%) have attended endodontic hands-on courses, 9 (25.71%) have attended postgraduate endodontic courses and 17 dentists (48.5%) do not have attended any endodontics courses (Fig. 7).

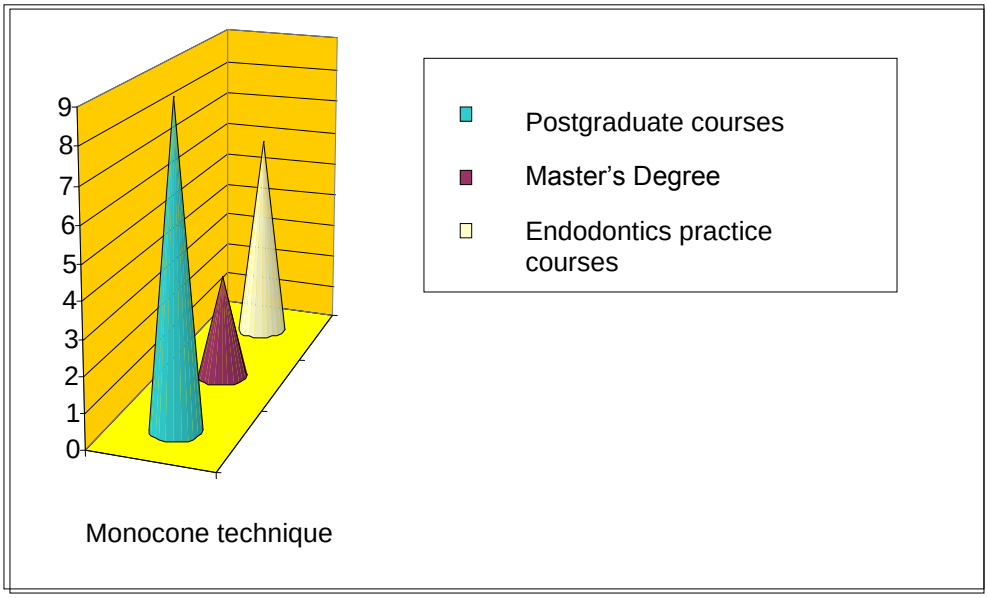

Fig. 7. Dentists using monocone technique – distribution according to their attendance at postgraduate training.

From all the 60 dentists who answered the questionnaires, 22 (36.6%) use cold lateral condensation.

From these 22 dentists, 6 (27.7% of those who use lateral condensation) have attended endodontics postgraduate courses, 2 (9%) have a Master Degree in endodontics, 4 (18.18%) have attended endodontics hands-on courses, and 10 (45.5%) have not attended any postgraduate courses in endodontics (Fig. 8).

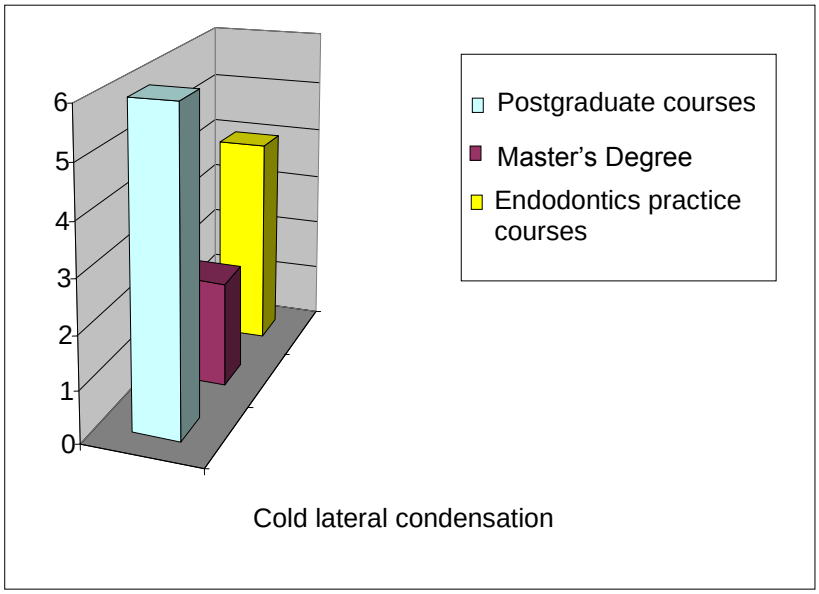

Fig. 8. Dentists using cold lateral condensation – distribution according to their attendance at postgraduate training.

4. Discussions

This study was developed on a group of dental practitioners in Dolj County, randomly chosen from both urban and rural areas. The questionnaires have been handed personally by a student at the Faculty of Dental Medicine from Craiova, along with further information about the filling in procedure without influencing the answers. This approach led to a very good percentage of answers - 69% (60 dentists from all 87 approached). It is a high percentage compared to others cited by related studies in literature, which vary between 25 and 50% [5, 6, 7]. Although we have taken into account only a small area – Dolj County, the results are extremely relevant, because the total number of dentists in this area is 498 (number of members of Dolj Dentists Committee).

According to our survey, a number of 26 dentists (43.3%) have attended postgraduate endodontics trainings: 12 dentists (20%) have attended postgraduate courses, 11 dentists (18.3%) have attended endodontics hands-on courses and 3 dentists (5%) have a Master Degree in endodontics. This high percentage also proves an important interest from dentists in Dolj County for modern endodontic materials and techniques. A high interest of the young graduates in advanced endodontics practice has been emphasized by other studies too [9]. This high interest may be motivated by a need of the young graduates to improve their practical skills, many graduates considering themselves insufficiently prepared for solving difficult cases [10, 11].

Although there is a great variety of materials on the market that can be used for root canal irrigation, the sodium hypochlorite is the widest spread solution in the world because of its proteolytic and antimicrobial properties [12]. In our study, a percentage of 63.3% from the total number of the responding dentists claimed to be using this substance for root canal cleaning. Although a study based on the same questionnaire method has had similar results in Belgium in 2002 - 65% [7], in a recent study from Turkey the percentage of dentists using sodium hypochlorite for root canal irrigations was 73% [5]. 25% of the respondents use a combination of sodium hypochlorite and hydrogen peroxide.

Bakelites have been widely used for root canal filling in Romania, same as in the neighbouring countries from the ex-communist bloc [13]. The mummifying action of the paraformaldehyde and its antiseptic and antimicrobial properties made materials based on bakelite be an attractive choice in endodontics. A series of in vitro studies have shown that these substances have cytotoxic and mutagenic effects upon cell cultures [14]. Moreover, after applying paraformaldehyde in the root canal, it might be systemically absorbed and it can lead to some severe general side-effects [15]. Because of its toxic and mutagenic effects, in countries like U.S.A., the endodontic paraformaldehyde substances were forbidden although their in vivo effects are still remaining uncertain. In our survey, 46.6% of the responding dentists still use materials based on bakelite for root canal filling. Although it represents a high percentage, there is a similarity with the results of other European studies. In the Turkish study conducted in 2012, the percentage of dentists using paraformaldehyde substances in endodontics was 42% [5]. Also in the west-European countries not using the paraformaldehyde was slowly completed; in 1993, in Switzerland, half of the dentists were still using substances based on formaldehyde for root canal therapy [16]. In Denmark between 1995 and 2004, 13.7% of the malpractice cases were the consequences of the

endodontic treatments and paraformaldehyde usage was the second cause for it [17].

Concerning the usage of filling technique, 35 dentists (58.33%) from our survey use the monocone technique. The data are similar with the ones from the 1993 Swiss study where 68% of the dentists preferred to use the monocone technique [16]. However, these results are in contradiction with more recent studies.

Cold lateral condensation technique is simple and versatile and does not involve any expensive equipment. Therefore, this technique is worldwide used by the dentists and remains the main technique used in dental medicine schools all over the world [18]. In our survey, from the 60 dentists, only 22 of them (36.6%) use cold lateral condensation technique. In the Turkish study conducted in 2012, 66.2% of the respondents used the same technique, being preferred by the young practitioners with less than 10 years of experience [5]. In Lithuania, in 2010, 72.8% of the respondents preferred to use the monocone technique [4].The monocone technique was also preferred by the 60% of the dentists in Belgium in 2002 [7], and by the most dentists from the north-western England in 2009 [19].

5. Conclusions

The presence on the market of so many endodontic materials offers the practitioners a wide selection of therapeutic options that can be individualized for each clinical case. The sodium hypochlorite is frequently used for the root canal irrigation (63.3%). The monocone filling technique is the most used technique in our region (58.33%), while materials based on paraformaldehyde however still remain an important root canal filling material for the dentists (46,6%).

Dental practitioners in our region have a high interest for the improvement of knowledge for therapeutic techniques in endodontics. This interest is proven by the large number of dental practitioners with special training in endodontics (20% have attended postgraduate courses, 18.3% attended endodontics practice courses and 5% have a Master Degree in endodontics). Modern materials and techniques are mostly used by young graduates but they have not entirely replaced the old methods.

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