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Atraumatic Restorative Treatment: evolution of knowledge and acceptance among Doctor of Dental Surgery of the Family Health Strategy of Ponta Grossa - Paraná, Brazil over 5 years

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Abstract

Objective: this study evaluated the possible modifications in the theoretical / technical knowledge and the acceptance of the atraumatic restorative technique (ART) among Doctor of Dental Surgery (DDS) of the Family Health Strategy (FHS) of Ponta Grossa – PR, Brazil over 5 years. **Material and Methods:** for this purpose two instruments were used: in-depth interviews and semi-structured questionnaires, applied to the same group of 14 DDS that work at the FHS. During this period of time, there were moments of empowerment offered by the Health Department of the Municipality and State Health Secretariat. **Results:** the DDS affirmed, in the two stages of the research, to know the ART and they considered it useful in Public Health, making use of atraumatic restorations (AR) routinely. There were modifications in the perceptions regarding the definitive nature of AR; in the indication of the technique according to the characteristic of the carious lesion and according to the age of the patient; in the use of polyacrylic acid and protective agents for glass ionomer cement (GIC), among others. In addition, dentists have come to recognize GIC as essential material for the technique and to accept the maintenance of carious dentin. There was a change in the habit of scientific reading about ART among the evaluated professionals, in addition to the increase in the number of individuals who received ART training in the service. **Conclusion:** we can conclude that there were positive changes in the theoretical/ technical knowledge and acceptance of the ART technique among the professionals interviewed, thus acknowledging the importance of the training offered in the service.

Keywords: Dental atraumatic restorative treatment, Family health strategy, Doctor of Dental Surgery

Introduction

In April 1994, a World Health Organization (WHO) exhibited the Atraumatic Restorative Treatment (ART)[1] as a strategy for the treatment of heart disease, combining measures to restore the balance of the oral environment, such as fluorotherapy and education in oral health and atraumatic restorations (RAs) .[2-8]

ART, as a program, has a philosophy very similar to defining Primary Health Care and the Family Health Strategy (FHS). Need to create a bond with the patient, to facilitate the use of fantasies and the incorporation of health habits,[9] it is a culturally sensitive intervention program, capable of being molded to the reality of the changes that I use and is capable of expanding the " collective access to oral health promotion, prevention and recovery actions "mainly in the portions most affected by the population, improving their indicators.[10-11]

When the implantation of the Oral Health teams in the FHS, in December 2000,[12] there was a need to reorganize actions and protocols. It was a possibility to abandon the curative model, only focused on treating the disease with invaders, for a health promotion vision, adopting other diagnostic, treatment and prevention measures. Thus, when performing an early diagnosis, minimally invasive restorative measures and educational programs for populations gradually gain space.[3,5,6]

However, while progress is being made in the planning and coverage of collective procedures, the same cannot be mentioned in relation to the needs of individuals who recover the reactor, who remain dependent on dental equipment, drills and conventional restorative material.[12] SB Brasil 2010 revealed that the average CPO-D index aged 12 years and 2.07 and the component based on this index is 1.21, exceeding the mark for the restored component (0.73), requiring restorative procedures for this population.[13] Notoriously for the treatment of heart disease, or the current system remains failing to reverse the condition and in feeding or in the repetitive restorative cycle.

The adoption of Atraumatic Restorative Treatment is a prevention strategy, focusing on the adoption of health education programs, motivation in oral health and non-invasive or minimally invasive techniques,[3,5,6] all disease control strategies[14] and goals for Public Health. However, the use of ART in the FHS is still incipient.[12] The current literature indicates that there is still resistance on the part of professionals and those responsible for oral health programs regarding ART, this usually occurs due to the lack of knowledge regarding techniques and doubts regarding its feasibility and ahead in relation to advances. technological aspects of dental materials and equipment.[8,15] In addition to these factors, despite a relative knowledge and a positive attitude towards ART, there is a need for more qualification in relation to the technique and its indication by professionals.[15]

Through this study, we intend to observe after wide dissemination and incentive to ART, and after training

processes experienced by professional dentists of the FHS in the city of Ponta Grossa, there will be changes in the knowledge they cause about the technique and the scientific principles that govern the inspection of atraumatic restorations, as well as if there are changes related to the rejection of professionals considered strategic ART after a long period.

Material and Methods

The methodology adopted for the development of this research was qualitative. The study scenario was the city of Ponta Grossa, located in the south-central region of the state of Paraná and whose population is estimated at around 350,000 inhabitants. It is a medium-sized city and, therefore, qualified by the Ministry of Health to implement the FHS. The research subjects were the dental surgeons who were members of the Oral Health Teams of the Family Health Strategy in the city. Before any data collection procedure was carried out, the project was sent to the local Research Ethics Committee, which issued a favorable opinion for the development of the research under Opinion No. 103,220. A letter was sent to the FHS Oral Health coordinator, explaining the purpose, objectives and methodology of the research and requesting permission for researchers to have access to the names of dentists and health units. From this contact, a list of 14 professionals emerged, who were contacted by phone. In this first moment, the professionals received basic clarifications about the work and were asked about their desire to participate as research subjects. Once there was a positive response, a time was scheduled for individual meetings between the researchers and the research subjects.

The inclusion criteria for the professionals were: capacity and effective performance in FHS in the municipality of Ponta Grossa for at least one year and agreement to participate in the research, declared through the signing of the Free and Informed Consent Term (ICF).

After the initial contact, all professionals agreed to participate, thus forming the sample group. After 5 years, the same professionals were contacted again and responded to the same research instruments used previously.

In both moments, these professionals were personally interviewed by one of the researchers, and such an interview was designed combining characteristics of structured, semi-structured and in-depth interviews.[16,17] It is worth remembering that before the beginning of the in-depth interview, the research subjects authorized recording the interview.

In the first phase of the interview, each dental surgeon was asked whether or not to use the atraumatic restorative technique in their daily practice and was encouraged to speak freely about the reason for their choice. An open question, characteristic of in-depth interviews, started the data collection process: "This research is about atraumatic restorations and their use in Public Health. What could you tell me about your daily practice at FHS? ". Such a procedure was adopted so that it was possible for researchers to discover the interviewee's own structure of meanings, avoiding imposing the researcher's structure and assumptions on his report.[16,17]

Then, the interviewees answered a questionnaire with structured and semi-structured questions that defined the area to be explored, without, however, preventing the researched subject from discussing his opinion in greater detail. The researchers made an initial explanation regarding the items in the questionnaire, emphasizing the need for answers consistent with their daily work and experience. The interviewees who performed the written record of the data, without further intervention by the researchers. This stage investigated the technical knowledge of the dentist to perform the restorations (indications, diagnosis, instrumental, material, execution protocol, training received), as well as the theoretical basis of the professional on atraumatic restorations.

At the end of the interview process, two records were obtained: audio (in-depth interview, recorded in MP3 format and later transcribed by the researchers) and in the form of notes written on the spot (structured and semi-structured interview - questionnaire - recorded by interviewed). The option to use the two data collection instruments was aimed at convergent validation of the information obtained.

The qualitative methodological strategy used for data analysis was content analysis, that is, the material obtained was systematically analyzed and categorized according to the relationship between the content and the guiding questions of the research. This process allowed the identification of 3 main categories (concepts or practical attitudes, theoretical foundation, acceptance of the technique), which were used in the descriptive approach of the empirical material, in the light of the theory of social representations. The transcription of the speeches, which was used to support the discussion, kept the information confidential, since the dental surgeons subject to the research were identified by the expression of the dental surgeon followed by numbers 1 to 14. The data related to the characterization of the interviewees and technical procedures were analyzed using descriptive statistics, with representation in absolute numbers.

It is worth mentioning that all the methodology mentioned was applied equally in both moments of the research. During this period, there were specific moments of training on ART: lecture with the faculty of the State University of Ponta Grossa, for professionals and managers promoted by the State Health Department, within the Oral Health Network; lecture with invited professors during the 19th CIOPG (19th International Dentistry Congress of Ponta Grossa).

Results

The group of interviewees was composed of experienced professionals, graduated on average for 22 years (between 17 and 31 years since graduation) and who have worked in Public Health for over 16 years. There is a high rate of professionals with postgraduate courses, and the area of Public Health or ESF concentrated most of the titles.

We can identify some changes regarding the knowledge and acceptance among dentists of the Family Health Strategy of Ponta Grossa, regarding ART, over these 5 years, the main ones being shown in Table 1.

Table 1. Changes in the knowledge and acceptance of dentists of the Family Health Strategy of Ponta Grossa/Paraná - Brazil, regarding ART, over 5 years.

Variable	Research Moment	
	1 (N)	2 (N)
Consider the ARs as definitive procedures (n = 14)		
Yes	4	9
No	10	5
They believe they are able to perform ART (n = 14)		
Yes	11	14
No	3	0
They received training on ART in the service (n = 14)		
Yes	3	9
No	11	5
Have the habit of scientific reading about ART (n = 14)		
Yes	1	6
No	13	8
Indicate ART for chronic caries lesions (n = 14)		
Yes	8	5
No	6	9
Indicate ART for acute caries lesions (n = 14)		
Yes	5	9
No	9	5
Indicate ART for Adolescents (n = 14)		
Yes	1	8
No	13	6
Indicate ART for adults (n = 14)		
Yes	1	4
No	13	10
Indicate ART for the elderly (n = 14)		
Yes	1	5
No	13	9
They judge the GIC as essential material for the practice of ART (n = 14)		
Yes	10	13
No	4	1
Use Polyacrylic Acid before insertion of the GIC (n = 14)		
Yes	0	8
No	14	6
Use protective agents for GIC (n = 14)		
Yes	3	8
No	11	6
Accept maintenance of decayed dentin (n = 14)		
Yes	8	11
No	6	3
Believe in stopping the carious process (n = 14)		
Yes	10	12
No	4	2

Abbreviation: ART = Atraumatic Restorative Treatment; GIC = Glass Ionomer Cement

All respondents claim to know ART (14), only one DDS claimed to have come into contact with the technique during their graduation; the other 13 respondents learned about ART through congresses or in-service training.

Even so, the great majority of professionals considered atraumatic restorations as a useful resource in Public Health at both times of the research.

The use of the technique as a routine in the FHS was mentioned by 9 professionals initially and by 10 in the second moment of the study, who evaluated ART as a "good service provided to patients' oral health".

However, there was a strong tendency to disregard atraumatic restorations as a definitive restorative procedure (10) at the beginning of the research, a tendency that was less evident in the second stage, since the number of professionals with this opinion fell by half (5). Despite this advance, some professionals still do not see advantages in the use of ART when it is possible to perform conventional restorations (1st moment - 6 and 2nd moment - 5). *"... It is more or less like making an adjustment, only using an ionomer instead of MRI. I prefer to go straight to restoring what you need ... permanent restoration, with resin mainly "* (DDS 9 in the first moment of the research). "*... In my opinion, in reality, ART is just ... improved suitability*" (DDS 10 in the second moment of the research). *"I think that our country ... has conditions to make a treatment already definitive "*(DDS 12 in the 2nd moment of the research). Even considering the progress made after 5 years, there are 5 professionals who still believe that atraumatic restorations are temporary.

When practice in a private practice was at the center of the questioning, acceptance dropped a lot (3 at the first moment of the research). *"... it's public health, I don't use it in my office. ART was made for places where there is no equipment "*(DDS 10 at the first moment of the research). In the second stage, of the 9 professionals who also worked in the private sector, only 4 used ART as a restorative practice and even so, one of them justified the use of the technique "*because it serves children*" (DDS 5 in the second moment of the research) .

The longevity of the restorations is another topic that also raised doubts among the participants in the first moment of the research *"I think ART is a provisional procedure, like a dressing, which needs to be changed later"* (DDS 2 in the first moment of the research). In the second moment, however, constant statements such as *"... some patients come back and still 'so' with ionomer in the tooth there ... there was no pain, there was no problem"* (DDS 8 in the second moment of the research), or else: *"... we realize, with the return of the patients that the tooth, it really comes intact ... you don't lose that much structure"* (DDS 14 in the 2nd moment of the research). Other statements also showed that after 5 years, professionals are concerned with the correct indication and performance of the technique, associating longevity and success of restorations with these factors. *"If you do the technique properly, it ends up becoming a permanent restoration"* (DDS 2 in the 2nd moment of the research). "What you have to take care of is (perform) within a technique, right? Contraindications ... a slightly bigger restoration ... then the durability is compromised. But I believe that using it within a technique and certain indications, there is no problem using it "(DDS 6 in the 2nd moment of the research). *"... I believe that the effectiveness is really much greater, as long as the technique (is) well applied and with the correct indication"* (DDS 13 in the 2nd moment of the research).

The professionals also showed another barrier to the use of the technique, the association between the high number of patients and the physical/material resources, which are not always adequate, which tend to hinder the work, especially when a new therapeutic and/or technical approach must be adopted. *"I have worked at the City Hall for over 15 years and have always done so. I know that restoring yourself in amalgam or resin will work. I have a lot of people to attend to test new things. I prefer to go against what is doubtful"* (DDS 1 in the 1st moment of the research). The vast majority of respondents considered themselves able to perform the technique at the initial moment (10), and after 5 years of follow-up, all professionals pointed to this ability. The knowledge or fundamentals for both

Discussion

Atraumatic restorations can be considered as a possibility to expand the population coverage and increase the effectiveness of dental services within the Family Health Strategy to control caries disease. It is possible that, gradually, the surgical-restorative model will be replaced by Minimally Invasive DDS. This change, however, can only happen from the human resources involved and, for that, professionals need not only to accept atraumatic restorations as part of the treatment of caries disease, but also to become familiar with the clinical protocol and appropriate it. the scientific basis that supports this procedure.

Based on these data, it is expected that professionals have already had some contact with ART, however, the real application of this strategy requires training and conviction of its real value. Taking into account that, initially, these professionals had been trained for more than fifteen years, it is also to be expected that they did not have contact with the technique in their undergraduate course.

Although all the interviewees claimed to know the ART, only one DDS claimed to have come into contact with the technique during their graduation. In the work of Busato *et al*.,[19] when interviewing 191 public health care DDS, with ages and working time in public health similar to the present study, they found that 21.7% had contact with the technique during professional training, index much higher than that

found in our sample (7.14%).

Even so, the vast majority of professionals considered atraumatic restorations as a useful resource in public health at both times of the research and with its routine use in the FHS. However, there was a strong tendency to disregard atraumatic restorations as a definitive restorative procedure initially, a tendency that was less evident in the second stage. The need to differentiate oral adequacy from atraumatic restoration, by the public health professional, was mentioned in other studies, emphasizing the exclusive provisional character of oral adequacy, and not of ART.[6,18] The structure of meanings specific to each interviewee obtained in the present study, in the first stage, it was corroborated by another research, when observing that more than 50% of the dentists they interviewed, did not consider ART as a definitive restorative procedure.[19]

When asked about the practice in a private practice, our results showed a drop in acceptance. This discrepancy between the relatively high level of acceptance as a Public Health procedure and the negative use in private practice may be based on the belief that atraumatic restorations are not definitive procedures and the consequent preference for adopting conventional procedures, even with the knowledge of ART technique.[3,19,20]

Doubts regarding the longevity of atraumatic restorations were clearly demonstrated in the first phase. This contradicts recent research, such as that presented by the meta-analysis by Tedesco *et al.*,[21] who studied the success of the technique in occlusal restorations of primary teeth, concluding that as the main objective of restoring these teeth is to keep them functional until their exfoliation, the treatment that was most successful in this case was ART with 82% success in 3 years of follow-up.[21]

In the FHS surveyed, the average number of patients seen daily is 15 individuals, with an average population of 7128 inhabitants in the areas where health units operate. This number is close to what is recommended by the Ministry of Health (Ordinance No. 1444), however, the professionals commented that the association between the high number of patients and the physical / material resources, which are not always adequate, usually hinder the work, especially when a new therapeutic and / or technical approach should be adopted. The workload is really one of the main barriers to the implementation of Atraumatic Restorative Treatment, as well as the dentist's perception that he did not develop the necessary skill to perform the technique.[22]

However, in this study, the second factor was not important. As in other reports published in the literature,[6,23] the vast majority of respondents considered themselves able to perform the technique at the initial moment, and after 5 years of follow-up, all professionals pointed to this aptitude. The knowledge or fundamentals for this purpose would have been obtained through congresses, symposia or similar (6 in the 1st and 7 in the 2nd) and postgraduate courses (2 in the 1st and 5 in the 2nd). Another source of knowledge cited by professionals was in-service training. In this regard, there was a considerable increase in the number of dentists who received training related to ART during the follow-up period. These data highlight the information reported in the literature by Bullock *et al.*[24] and Firmstone *et al.*[25] that spread the idea that for a good clinical practice the professional must be constantly updating their knowledge and clinical skills and that this update must be a essential element in the professional life of the DDS.

It should be noted that the fact that all subjects surveyed claim to know the ART does not quantify their level of knowledge or preparation for performing the technique. As observed by Burke *et al.*[23] and Carlotto *et al.*[20] even though the professional claims to know the technique, he does not always execute it according to the proposed protocol.

The main misconception observed in the initial moment refers to the indication of atraumatic restorations with regard to the diagnosis of the elective injury for this treatment modality. In this first phase of the research, it was found indication of atraumatic restorations for chronic caries injuries and contraindication in acute injuries, a situation exactly opposite to that recommended by the literature. This misunderstanding seems to have been remedied after the follow-up.

When considering the age group, there were changes in the concept of the professionals evaluated during the study period. This indicates that, even among professionals who consider ART as an alternative treatment, it is little explored and is restricted to a specific population.

It was also questioned what are the reasons that would lead the professional to choose ARTs over a conventional restoration. In this sense, the reasons cited can be accepted, since the literature shows that there is a tendency among children to accept ART better than invasive procedures, since there is no need for local anesthesia, use of absolute isolation and high/low speeds , allowing the patient to cooperate more with the treatment.[2]

The last stage of the interview verified the theoretical basis of the subjects researched for the application of the ART, emphasizing two important points of the technique: the maintenance of decayed dentin and the reaction of the tooth to the cavity seal.

The maintenance of the affected dentin in the cavity was considered acceptable, but the justification for stopping the carious process still continued pointing to the characteristics of the restorative material that "releases fluoride and stops the carious process" (DDS 3 in the first moment of the research). This opinion is mistaken, since the main factor responsible for the reorganization of the affected dentin maintained in the

cavity is the sealing, which provides a radical change in the habitat of the remaining microorganisms due to the cessation of the nutritional supply. So much so that, in the study by Kuhn *et al*.,[26] two materials were used to cover the cavities, the glass and wax ionomer before performing the composite resin restoration. It was evidenced that the reorganization of the infected dentin occurs independently of the material used in its sealing, emphasizing its importance. In the study by Mertz-Fairhurst *et al*.[27] it was also observed that even with composite resin there was paralysis of carious lesions under restorations after 10 years of clinical and radiographic monitoring. Given the above, we can thus identify some changes in terms of knowledge and acceptance among dentists of the Family Health Strategy of Ponta Grossa/Paraná, regarding ART, along.

Conclusion

The results show that there were some positive changes in the theoretical/technical knowledge and in the acceptance of the ART technique among the dental surgeons of the Family Health Strategy of Ponta Grossa, thus recognizing the importance and the need to train professionals in service, motivating them to reflect and redirect their practice, based on the most recent knowledge about dental caries.

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