

RESEARCH PROPOSAL: EVALUATION OF THE ART APPROACH IN ELDERLY PATIENTS

PROTOCOLO DE PESQUISA: AVALIAÇÃO DO TRATAMENTO RESTAURADOR ATRAUMÁTICO EM PACIENTES IDOSOS

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ABSTRACT

With the increase of life expectancy in the world's population, oral health care of elderly people has attracted considerably more attention over the last years. Many elderly may benefit from oral health promotion measures that involve the Atraumatic Restorative Treatment (ART) approach. The purpose of this study will be to evaluate, over 3 years of follow-up, the clinical behavior of atraumatic restorations placed in elderly patients. The study will comprise a structured interview, intraoral clinical examination, oral hygiene instructions and the atraumatic restorative treatment. Intraoral examination will be carried out as recommended by the World Health Organization (WHO). Small to medium size class I, II or V cavities without pulp involvement and spontaneous painful symptomatology will be selected to undergo the atraumatic restorative treatment. The restorations will be evaluated by direct observation at baseline and after 6, 12, 24 and 36 months, using modified USPHS criteria. Two dentists with training and expertise in the ART approach, but who will not participate in the ART procedures, will evaluate the restorations.

Uniterms: Elderly; Atraumatic Restorative Treatment; Glass ionomer cements; Oral health.

RESUMO

Com o aumento da expectativa de vida da população mundial, a saúde bucal do idoso tem recebido maior atenção nos últimos anos. Muitos idosos podem ser beneficiados por meio de ações de promoção de saúde bucal onde esteja incluído o Tratamento Restaurador Atraumático (TRA). Este estudo terá como proposta avaliar o comportamento clínico de restaurações atraumáticas em pacientes idosos, por um período de 3 anos. O estudo incluirá uma entrevista estruturada, exame clínico bucal, instruções de higiene oral e o tratamento restaurador atraumático. O método utilizado para o exame bucal será o preconizado pela Organização Mundial de Saúde (OMS). Cavidades classe I, II ou V pequenas ou médias, sem envolvimento pulpar nem sintomatologia dolorosa espontânea serão selecionadas para o tratamento restaurador atraumático. As restaurações serão avaliadas de maneira direta no início e após 6, 12, 24 e 36 meses, de acordo com os critérios modificados do USPHS. Dois cirurgiões-dentistas treinados para o TRA, mas que não participarão dos procedimentos restauradores, avaliarão as restaurações.

Unitermos: Idosos; Tratamento Restaurador Atraumático; Cimentos de ionômero de vidro; Saúde bucal.

INTRODUCTION

The increase of the elderly population, in both absolute and relative numbers, is a worldwide phenomenon. In Brazil, the elderly population represents a contingent of almost 15 millions of people at the age of 60 years or older (8.5% of the total population). According to last demographic census⁹, within the next 20 years, the Brazilian elderly population may be over 30 millions of people and should represent 13% of the total population by the end of this period.

As a result of the increase of life expectancy in the world's population, oral health care of aged people has attracted considerably more attention over the last years. Poor oral health remarkably affects nutrition, speech, social contact and self-esteem and may negatively interfere with the systemic health, thus constituting a limiting factor for life quality. This is particularly representative in such age group.

The last oral health epidemiologic survey carried out in Brazil (SB 2000)¹⁰ showed an extremely high mean DMF-T score (Decayed, Missing and Filled Teeth) (27.8) for the

population aged 65 years and older, with predominance of the “Missing” component (93%). Only 10% of the aged people had 20 teeth or more present in the oral cavity.

This situation reflects the difficulty of access to dental assistance and the lack of effective public policies over the past decades. The elderly have been almost systematically excluded from oral health community programs. In addition, the oral health programs are primarily directed to outpatient assistance and great part of the geriatric patients present some kind of medical, physical and/or emotional limitation that restricts their accessibility to public health care centers or private dental clinics.

The ART approach is based on excavation and removal of carious tissue using hand instruments only, thus all necessary material and instruments can easily be packed and carried, when dental care needs to be provided at the patient’s home or in elderly care institutions⁵. Glass ionomer cements are the restorative materials of choice for the ART technique due to their properties of adhesion to tooth substrate and fluoride release. Such preventive effect is highly important considering that most elderly patients have compromised oral self-care skills owing to either physical handicap, lack of motivation or disinterest.

It should also be taken into account the lack of knowledge of the need for continued oral care in this phase of the life. Most people believe that tooth loss is unavoidable (and even an expected event) as they get older. According to the SB 2000¹⁰, in spite of the clinical conditions observed, nearly 50% of the elderly are satisfied with their oral health status (including esthetics, mastication and phonetics), and 63% of the patients reported that their oral status did not affect their social relations in any way. Finally, it is worthy mentioning the high costs of dental treatment, especially considering that most aged people receive low monthly retirement payments.

Because it demands minimally invasive intervention, the ART technique is practically painless and therefore does not require local anesthetic in the majority of the cases. This is of particular importance for geriatric patients, in whom alterations in drug distribution, metabolization and excretion (including for local anesthetics) are frequently observed. There is also a higher risk of drug interaction in these patients.

Nevertheless, despite the above-mentioned issues, there are very few reports in the literature addressing the ART approach in aged individuals⁴. Therefore, the purpose of this study will be to evaluate, over a 3-year follow-up period, the clinical behavior of atraumatic restorations placed in elderly patients.

METHODS

The research proposal will be submitted to the local Ethics in Research Committee’s review and approval.

Study Design

This study will comprise a structured interview, intraoral clinical examination, oral hygiene instructions and the atraumatic restorative treatment. These procedures will be carried out by a dentist with expertise and training in the ART technique.

A total of 50 patients who meet the following inclusion criteria will be enrolled in the study.

Inclusion criteria

- 1 Be either male or female aged 65 years or older;
- 2 Present small to medium size class I, II or V cavities without pulp involvement and spontaneous painful symptomatology;
- 3 Sign the approved Informed Consent Form;

Structured Interview

A detailed structured interview will be carried out and should gather patient’s basic information such as age, gender, quality of life, degree of physical and/or mental handicap, last visit to the dentist and daily toothbrushing frequency. The patient’s medical history will be thoroughly reviewed and, if applicable, he/she will be submitted to a comprehensive medical evaluation prior to the initiation of the dental treatment.

Intraoral clinical examination

The intraoral clinical examination will be performed as recommended by the World Health Organization (WHO)⁸, that is, under natural illumination and after drying of occlusal surfaces with gauze. Small to medium size class I, II or V cavities will be selected to undergo the atraumatic restorative treatment. Deep cavities close to the pulp will not be included in the study. These criteria are in compliance with those preconized by Frenken, et al.³ (1994).

After clinical examination, the patients will receive oral hygiene instructions and will undertake supervised toothbrushing. This approach is of paramount importance because the ART approach is primarily a preventive-restorative treatment and therefore adjunctive oral health promotion programs and preventive measures are needed and should be stimulated to actually control the onset and/or progression of the etiologic factors of caries disease.

Atraumatic Restorative Treatment

The following instruments and materials will be utilized for the ART technique: dental mirror, explorer, dental tweezers, enamel hatchet, small and medium-sized spoon excavators, glass slab, cement spatula, insertion spatula or Centrix injector, disposable plastic coffee cups or dappen dishes, gloves, cotton rolls and pellets, glass ionomer cement (powder and liquid), dentinal conditioner, cavity varnish or colorless cosmetic nail varnish, clean water and articulating paper. For class II cavities, specifically, the technique also requires the use of a pair of scissors, wooden wedges, matrix metal band and a matrix retainer.

The dental treatment should be rendered within visits of short duration preferably scheduled in the late morning or

in the afternoon. The dental chair should be adjusted to a more vertical position because geriatric patients usually feel insecure and afraid of suffocating, if the dental chair's back is too reclined. On the other hand, for both home-assisted patients and those treated at elderly care institutions, dental care may be compromised from an ergonomic standpoint because many of these patients are bedridden or wheelchair-bound and the treatment will be performed within the limitations of these conditions.

The ART technique should be performed according to the following sequence:

1. Relative isolation of the operative field with cotton rolls;
2. Cleaning of the tooth surface with a moist cotton pellet;
3. If necessary, widening of the cavity entrance with a sharp hand instrument (e.g., enamel hatchet);
4. Removal of the soft carious tissue with hand instruments (e.g., spoon excavators);
5. Conditioning of the cavity with 10% polyacrylic acid for 10 seconds using cotton pellets. Removal of excess conditioner with moist cotton pellets and drying of tooth surface with dry cotton pellets;
6. Mixing of the glass ionomer cement (powder and liquid components), according to the manufacturer's instructions on a glass slab or a mixing pad;
7. Insertion of the glass ionomer cement into the cavity with an insertion spatula or a Centrix injector;
8. The cement should be firmly pressured into the cavity for 2 minutes ("press-finger" technique);
9. Protection of the restoration with a layer of cavity varnish or colorless cosmetic nail varnish;

10. Removal of the relative isolation;
11. The patient should be instructed not to eat for at least the first hour after the restoration is placed.

RESULTS

Evaluation of the atraumatic restorations

The development of the criteria for clinical evaluation of restorative materials or a particular technique is probably the most important individual aspect in clinical research methodology. Several criteria have been proposed to assess the longevity of atraumatic restorations.

In the present study, the restorations will be evaluated by direct observation at baseline and after 6, 12, 24 and 36 months, using modified USPHS criteria⁷. Two dentists with expertise and training in the ART technique, but who will not participate in the restorative procedures, will evaluate the restorations. Both examiners will be calibrated at the 6-, 12-, 24- and 36-month evaluations (FIGURE 1)

The occurrence of postoperative sensitivity will also be included as a study variable and will be categorized using a score ranking, in the same manner as described for the above mentioned characteristics (FIGURE 2).

Statistical Analysis

The evaluation criteria are designed to be objectively used for assessment of the quality of the restorations. However, the reliability of the results is subjected to the examiners' subjectivity. According to Elderton¹ (1977) and Ryge and Snyder⁶ (1973), the examiners should be calibrated

FIGURE 1

Characteristic	Score	Evaluation
Anatomical Form	0	Continuity between the restoration and tooth surface
	1	Slightly overcontoured or undercontoured restoration; slightly lowered marginal ridge; slightly opened interproximal contact
	2	Undercontoured restoration with dentin exposure; opened interproximal contact; no occlusal contact
	3	Total or partial loss of the restoration; tooth fracture; occlusal interference; restoration causing painful symptomatology either in the tooth or in the adjacent tissues
Recurrent Caries	0	No evidence of caries adjacent to the restoration margins
	1	Evidence of caries adjacent to the restoration margins
Marginal Adaptation	0	Continuity between the restoration and the tooth surface The explorer tip does not engage at the interface
	1	The explorer tip engages at the interface, but no gap is visible
	2	Gap at tooth/restoration interface, exposed enamel
	3	Fractured, partially lost or completely lost restoration
Surface Texture	0	Smooth surface
	1	Slightly roughened surface
	2	Rough surface
	3	Very roughened surface, with depressions

FIGURE 2

Characteristic	Score	Evaluation
Postoperative Sensitivity	0	The patient did not report any postoperative sensitivity
	1	The patient reported mild postoperative sensitivity with rapid resolution
	2	The patient reported strong postoperative sensitivity, indicating removal of the restoration

to reach an agreement level of at least 85%. In order to assess the reliability of the evaluations, minimize examiner bias and confirm the accuracy of the assigned behaviors, the Reliability Index (RI), as proposed by Fagundes² (1985), will be calculated and may be utilized to assess both intra- and inter-examiner reliability.

$$RI = \frac{A}{A + D} \times 100$$

where, A: agreements and D: disagreements

Data will be analyzed using Kruskal-Wallis and Mann-Whitney non-parametric statistical tests.

Budget

- Permanent Material (US\$ 806,00)

a) 10 ART kits containing the following instruments: tray, dental mirror, explorer, dental tweezers, enamel hatchet, small and medium-sized spoon excavators, glass slab, cement spatula, insertion spatula, scissors and matrix retainer (US\$ 526,00).

b) 10 periodontal kits, containing a periodontal probe with ruled millimeter markings and 2 Gracey periodontal curettes (US\$ 280,00).

- Consumption Material (US\$ 292,00)

a) Preventive and Restorative Procedures: glass ionomer cement (kit), dentifrice, wooden wedges (package w/ 100), toothbrushes, wooden spatula (package w/ 100); roll of dental floss (500 m), matrix metal band, articulating paper (package w/ 12), dappen dishes, cotton rolls (package), cavity varnish (US\$ 197,00).

b) Individual physical protective barriers/Biosafety: alcohol 70% (1 L), disposable drapes (package w/ 100), instrument cleaning brushes, masking tape (roll), gauze (package), paper napkins (package w/ 50), thick rubber gloves (pair), procedural gloves (boxes w/ 50 pairs), 3-layer face mask (boxes w/ 50 pairs), Tupperware-like containers with cover (15cm x 30 cm), antiseptic soap, glutaraldehyde solution (1L), disposable head cover with elastic band (package) (US\$ 95,00).

- Other (US\$ 876,00)

Cash reimbursement to compensate the patients for their travel expenses, printer cartridges, fuel (visits to home-assisted patients), mail expenses (aerograms), photocopies and folders with elastic band.

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