Changes in the profile of dental procedures performed in a pediatric clinic between 1980 and 2004

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ABSTRACT

The goal of this research was to assess whether there was a change in the profile of dental procedures performed in the Pediatric Dental Clinic at the School of Dentistry of Ribeirão Preto at University of São Paulo during the period between the years 1980 to 2004. Using the dental records of 3,484 pediatric patients attended at the Pediatric Dental Clinic, we conducted a survey of clinical procedures performed by undergraduate students in the years 1980, 1984, 1988, 1992, 1996, 2000 and 2004. The following procedures, performed in deciduous and permanent teeth in children from 1 to 12 years, were: topical applications of fluoride, pit and fissure sealant applications, silver amalgam and composite resin fillings, pulpotomy and tooth extraction. The numeric values obtained for each procedure were converted into percentages, and data were analyzed using Fisher Exact or qui-square tests (α = 0.05). The results revealed the occurrence of a significant increase (p < 0.01) in percentage of topical fluoride applications (increase of 18.9%) and sealants applications (increase of 11.2%). On the other hand, the percentage of performance of silver amalgam and composite resin fillings, pulpotomies and tooth extraction showed a significant decline of 16.0, 6.0 and 16.1%, respectively (p < 0.05). It can be concluded that there was a decline of restorative, surgical and conservative endodontic procedures, with a concomitant increase of preventive procedures.

DESCRIPTIONS


INTRODUCTION

Since the 1970s, the diagnosis and treatment of dental caries have suffering major modifications. Dentistry migrated from the so-called “Restorative Dentistry Age”, when the diagnosis and treatment of dental caries were based almost exclusively on repair of the signs of the disease, to a “Health Promotion Dentistry Age”. Another important change has been the replacement of a standardized dental treatment, in which all individuals received the same attention, for a preventive and restorative Dentistry based on individual caries risk and/or activity. Such changes have occurred due to the advancement of knowledge about the aetiologic agents and the possibility of controlling dental caries progression, associated with the failure of an exclusively restorative Dentistry. Tooth decay, an infectious disease, results from the combination of three key factors: cariogenic microorganisms, a diet rich in fermentable carbohydrates and a susceptible host. Secondary factors such as saliva, exposure to fluoride, oral hygiene, among others, increase or decrease the susceptibility to dental caries or, in other words, can modulate the disease progress. Therefore, the control of dental caries theoretically could be accomplished through elimination of cariogenic microorganisms. Since this method of prevention has low applicability at a population level, the control is usually accomplished by means of interference in secondary factors. These findings led the
introduction of fluoride in public water supply, use of fluoride dentifrices, professional application of topical fluoride, use of pit and fissure sealants, use of antimicrobial agents and guidance on diet and oral hygiene\textsuperscript{6,11,12}. Due to these changes, the level of oral health in industrialized countries or in the process of development has suffered expressive improvement in recent years, with an appreciable reduction in caries index (DMF-T) and improvement of periodontal conditions, particularly in children and adolescents\textsuperscript{6,13}.

**OBJECTIVES**

The goal of this research was to evaluate the types of dental procedures performed in the Pediatric Dental Clinic at the School of Dentistry of Ribeirão Preto at University of São Paulo (FORP-USP) in the period between 1980 and 2004, in order to investigate possible changes in the profile of procedures performed in this time frame.

**METHODS**

Using the records of 3,484 patients attended in the undergraduate Pediatric Clinic at the School of Dentistry of Ribeirão Preto at University of São Paulo (FORP-USP), it was conducted a survey of clinical procedures performed by graduation students in the years 1980, 1984, 1988, 1992, 1996, 2000 and 2004. The following procedures performed in permanent and deciduous teeth of children, from 0 to 12 years, were analyzed: topical fluoride applications, applications of pit and fissure sealants, silver amalgam restorations, composite resin restorations, conservative endodontic treatment (pulpotomies) and tooth extraction. The values obtained for each procedure were converted into percentage. Statistical analysis was performed by means of Fisher Exact and qui-squared tests ($\alpha = 0.05$), using GMC 8.0 software.

**RESULTS**

A significant increase in the percentage of topical applications of fluoride was observed; which in 1980 represented 3.92% of the procedures carried out in the Pediatric Clinic, in 2004, came to represent 22.08% (Figure 1). The application of pit and fissure sealants also showed an increase from 3.06%, in 1980, to 21.78% of the procedures in 2000. However, there was a decline of this procedure of 6.87% between the years 2000 and 2004 (Figure 1). The converted percentages revealed the occurrence of a significant increase in topical fluoride applications (increase of 18.9%) and sealants applications (increase of 11.2%) ($p < 0.01$). On the other hand, the percentage of silver amalgam restorations, pulpotomies and tooth extraction showed expressive declines. The silver amalgam fillings that comprised 40.31% of the procedures in 1980 became 11.9% in 2004 (Figure 2), although composite resin restorations, representing 9% of procedures in 1980, in 2004 began to represent 24% (Figure 2). Overall, the percentage of dental restoration, regardless of the material used, decreased from 49.31 to 35.9% ($p < 0.05$). Conservative endodontic treatment (pulpotomy) went from 6.84 to 0.88% of the procedures (Figure 2), and teeth extractions migrated from 24.88 to 8.74% over the period considered (Figure 2). The decline in silver amalgam fillings, pulpotomies and tooth extraction were significant ($p < 0.05$), representing a drop of 16.0, 6.0 and 16.1%, respectively.

**DISCUSSION**

In general, it could be observed an increase in the percentage of preventive procedures and a decrease of restorative, surgical and endodontic procedures overtime. In this study, the percentage of application of sealants of septic and fissures (11.85%) and topical application of fluoride (18.16%) increased overtime, as reported previously\textsuperscript{15}. However, despite the broad application of pit and fissure sealants observed from 1980 to 2000 (3.06 versus 21.78%), with an emphasis on caries risk assessment of the patient prior to application of sealant, in 2004 there
was a decrease in the percentage of this procedure. The pit and fissure sealants as a preventive measure shall be applied in light of the risk and activity of each individual or, according to the British Society of Paediatric Dentistry, the decision to seal shall be taken by clinical grounds based on clinical examination, supported by X-rays, medical history and previous experience of caries.\textsuperscript{14}

The percentage of silver amalgam restorations showed a significant decline in the period evaluated, as has been shown in other countries. In the United States, a decline of 37\% in the number of amalgam restorations has been shown\textsuperscript{16} similarly to Israel (33\%) in the period from 1980 to 1992.\textsuperscript{4} In agreement, the time spent performing restorative procedures decreased from 37.5 to 29.5\%, with a 38\% reduction in the percentage of silver amalgam restoration.\textsuperscript{15} However, it should be pointed out an increase in the number of composite resin restorations observed in our study and other\textsuperscript{18}, which can be assigned to the improvements that this material has been suffering in recent years and the minimal necessity of health dentin removal, compared to silver amalgam.\textsuperscript{3,4} Changes in restorative philosophy and knowledge that the composite resin restorations are most appropriate for restoration of teeth with small lesions of caries have contributed to this shift in the choice of restorative material.\textsuperscript{17}

A reduction in the percentage of pulpotomies over the years was observed, which indirectly corroborates with a previous study. According to Bimstein and Eidelman\textsuperscript{4}, 95\% of dental students performed pulpotomy in the pediatric clinic in 1980, and in 1990 this percentage reduced to 71\% of the students, indicating a decrease in performance of pulpotomy. The need for pulpotomies and silver amalgam restorations have decreased in United States over the years\textsuperscript{18}, perhaps as a reflection of the greater emphasis on preventive procedures in developed countries.

The percentage of dental extractions decreased considerably during the period studied (18.14\%), as well as on the study of Nash and Bentley\textsuperscript{15}, who observed a decrease in the percentage of extractions from 17 to 11\% in a period of 11 years of survey. These changes in the profile of procedures carried out in the current study may reflect the change in experience of caries in Brazil. In the State of São Paulo, in 12 years, there was a reduction of the mean DMF-T index from 6.7 in 1986 to 3.7 in 1998 and 2.5 in 2002. In the city of Ribeirão Preto, the mean DMF-T index was 2.7 in 1996 and 1.65 in 2002\textsuperscript{10,13}.

**Conclusion**

The results revealed a decline in performance of restorative, surgical and endodontic procedures, with concomitant increase of preventive procedures, such as application of pit and fissure sealants and topical fluoride.
REFERENCES


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