Abstract

Introduction: The World Health Organization has a long tradition on the methodology and monitoring of oral health epidemiological investigations, even in the field of dental caries. According to the targets to be attained in 2020, at the age of 6 years, 80% of children should be cavity-free and, at the age of 12, DMFT should be no more than 1.5. Based on WHO targets for 2020, an epidemiological study was performed on school children affected by dental caries, aged between 7-12 years, from the rural areas of the Dolj County. Methodology: The study protocol included conventional and meticulous visual clinical examination of students, according to WHO methodology, in the Pedodontic Clinics of Craiova - Faculty of Medical Dentistry. Also calculated was the DMFT index, by analysis of the DT, MT, FT components, as well as the dmft index, by analysis of the dt, mt, ft components. Results: The mean indices of carious experience in temporary dentition decrease with age, due to the progressive disappearance of milk teeth. The DMFT index values are given, in particular, by components that indicate the number of teeth affected by caries and not of the blocked ones. Conclusions: The results obtained emphasize the need for dental health education programs at national and community level, the kindergartens and schools having a great potential to influence dental health care habits in children. Also emphasized was the need for regional prevention programs, as part of an overall national program, which has to consider the socio-economic and cultural factors. Keywords: dental caries, DMFT index, school children.

INTRODUCTION

Dental caries, representing a continuing concern for researchers in the field around the world, occupies an important place on WHO list of priorities. WHO has a long tradition as to the methodology and monitoring of oral health epidemiological investigations. Considering the close relationship between oral health, general health and quality of life, the global policy for the improvement of oral health, adopted at the 60th General Assembly of WHO, in 2007, emphasizes the integration of oral health promotion projects into the national prevention programs and treatment of chronic diseases.

According to the targets to be attained in 2020, at the age of 6 years, 80% of children should be cavity-free and, at the age of 12, DMFT should be no more than 1.5. Based on the WHO targets for 2020, an epidemiological study was performed on school children affected by dental caries, aged between 7-12 years, from the rural areas of the Dolj County.

MATERIALS AND METHOD

The study included a total number of 258 children of both sexes, aged between 7 and 12 years, studying in 8 schools from the rural areas of the Dolj county. The protocol included conventional and meticulous visual clinical examination according to the WHO methodology, in the Pediatric Dentistry Clinics of Craiova - Faculty of Medical Dentistry:
- Registering, in the examination sheet, of the odontal status in accordance with the WHO methodology;
- Determination of DMFT index by analysis of the DT, MT, FT components;
- Determination of dmft by analysis of the dt, mt, ft components;
- Determination and comparison of dmft and DMFT mean values;
RESULTS

The results of the study, presented below, agree with those of literature. Thus, from the group of 258 patients included in the study, a total of 138, representing 53.48%, were females, and the remaining 120 (46.52%) - male patients, no major differences being recorded between the two groups. In terms of age, inside the group of 258 patients, 18 were aged 7 years (6.97%), 36 were aged 8 years (13.95%), 32 were aged 9 (12.40%), 52 were aged 10 (20.15%), 48 - 11 years (18.61%) and 72 were aged 12 years (27.90%).

Calculation of the dmft index of the temporary teeth, as a function of the age of the patients, gave the following values: at the age of 7 years, the index was 4.11, 3.72 at 8 years, at 9 years it was 3.37, 2.84 at 10 years, at 11 years the index was 1, and at 12 years the value was 0.52. It appears that the dmft index values decrease with age, due, as with the prevalence of dental caries, to dental unit reduction in temporary dentition of the arcade occurring with age. (fig. 1)

The DMFT index calculated for the permanent teeth of children from the age group had the following values: at 7 years the index was 0.55, at 8 years it was 0.77, at 9 years it was 1.06, at 10 years it was 2.3, at 11 years the index value was 3.33, and for 12 years, the value was 3.27 (fig. 2).

According to the results obtained during the study, the dt index contributes mostly to the value of dmft, insignificant differences being noticed between the two groups – see the chart plotted in fig. 3.

A possible conclusion is that the dmft values – are due mostly to the temporary number of decayed teeth, being much higher than those of teeth with fillings. The values – of the temporary carious teeth are mostly due to components that indicate the number of teeth cavities, at the expense of the components indicating the number of filled teeth, which evidences a lack of concern for active caries therapy, bowing to the idea that temporary teeth are lost anyway, and therefore would not require treatment.

Figure 4 shows that the DMFT index values, increasing with age, are mostly due to the DT component, which represents the number of decayed permanent teeth (fig. 4). The study also evidenced no significant differences between the mean caries indices calculated for the temporary and permanent dentition at group level (1.87 DMFT, dmft 2.56).
DISCUSSION

Dental caries represent one of the conditions of the oral cavity with a high prevalence in children and adolescents. This disease is ubiquitous and has a continued evolution if preventive or therapeutic measures are not taken. Thus, in time, untreated cavities produce chewing, phonation and physiognomy disorders, thus adversely affecting the individuals’ quality of life [2].

Specialized studies suggest that carious disease is a multifactorial pathology, caused by a series of factors, namely: microorganism, food substrate, morphological features of tooth structure and the time at which all these factors act on the teeth [3].

Also, the environmental and socio-behavioral factors were found as risk indicators for dental caries in children and adolescents, in both the developing and developed countries [4].

The prevalence and distribution of dental caries is different in developed countries compared to the developing ones, a decline of dental caries levels in recent decades being observed in the former ones [5]. This reduction was attributed to the use of fluorides, changes of life style, improvement of oral hygiene practices, establishment of preventive dental services and changes in diagnosis criteria [6].

It is estimated that more than half of the children have caries in the primary dentition. The mean value (2.56) of the dmft index here calculated for temporary teeth is relatively high, the maximum value being present at children aged 7 (4.11). Data from the literature on dental caries which affect children of 5 or 6 years are still limited [7]. Caries in primary dentition may be a good predictor of caries in permanent dentition [8]. A national oral health survey conducted in 2003 in Brazil showed that 65% of the 5 year-old children have at least one temporary tooth decayed. The average dmft index was 3.21, 90% of this value being due to component (d), which represents the decayed teeth [9].

Taking into consideration these WHO criteria, the mean value of the DMFT index – of 1.87 – obtained in the present study, falls between the values – considered low at world level. The DMFT index values – at the age of 12 were similar to those obtained in other studies conducted in our country.

Epidemiological studies conducted in America, Europe, Africa and Asia on 12 year-old children showed an average index of carious experience of 3.0, 2.6, 1.6 and, respectively, 1.3 [10]. It seems that, in the late ‘60ies, dental caries experience was higher in developed countries, even if a reversal was recorded in late ‘90ies. In developed countries, changes in diagnosis criteria appear to have contributed to the lower prevalence of caries [11].

In 2009, a study was conducted to analyze the prevalence and severity of dental caries in children aged between 12 to 15 years in six regions of Lithuania [12]. The study reported that the mean value of DMF-T decreased from 4.5 (in 1983) to 3.7 (in 2005), for 12 year-old students and from 6.4 (in 1983) to 5.6 (2005) among the 15 year-old ones. Tooth decay is the primary cause of tooth loss among young people in Lithuania. Tooth loss in the arcade can cause aesthetic, psychological and emotional disturbances and general health problems. The results of epidemiological studies conducted for different age groups showed a higher prevalence and severity of dental caries [13].

The prevalence and severity of dental caries varies from country to country, a downward trend being observed in recent years. Specialized studies indicate a decline of the DMF-T index from 5.0 to 0.9 between 1980-2002 for 12 year-old students in Denmark and from 3.1 to 0.9 between 1985 and 2001 in Sweden. In the UK (table 1),
within 8 years, the DMF-T index decreased from 3.1 to 0.9 [14]. Also, a study conducted over a period of 3 years in Lithuania, for 12 year-old children, showed a decrease of the DMF-T index from 4.2 to 3.9 [15].

In Belarus, a dental caries prevention program was conducted between 1996 and 2002. The study indicates that the prevalence of dental caries in children was 85% in 1996. The DMF-T index has declined over the last 6 years from 5.3 to 2.6 for 12 year-old students, and from 7.1 to 5.7 among the 15 year-old ones [16].

Table 1. The DMFT index in Western countries

<table>
<thead>
<tr>
<th>Country</th>
<th>DMFT 12 yrs</th>
<th>DMFT 17 yrs</th>
</tr>
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<tbody>
<tr>
<td>Philippines</td>
<td>74.9%</td>
<td>3.7</td>
</tr>
<tr>
<td>Thailand</td>
<td>53.7%</td>
<td>1.6</td>
</tr>
<tr>
<td>China</td>
<td>45.8%</td>
<td>1.03</td>
</tr>
<tr>
<td>Indonesia</td>
<td>76.9%</td>
<td>2.2</td>
</tr>
</tbody>
</table>

The DMFT scores for 12 year-old children of Philippines were also higher than the values reported by WHO (2001) for industrialized and developing countries, such as: Australia (0.8), Finland (1.1), Norway (1.5), UK (1.1), United States (1.4), Mexico (2.5) and Iran (2.0). Unlike other reports (Dash et al., 2002; Van Wyk et al., 2004), it was observed in this study that the prevalence of dental caries increased with children's age [19]. Consequently, the here calculated DMFT index values are comparable with those recorded in other countries of Eastern Europe, but they are 2 or 3 times higher than in developed countries such as Germany, Italy, Switzerland, Norway, Denmark.

Scientific research continues to make progress in identifying the best practices for the diagnosis, treatment and prevention of tooth decay. Traditional approaches for treating cavity lesions in a surgical manner are replaced by new techniques of prevention and preservation of tooth structure. Given the objectives of WHO, the results of the recent studies conducted in our country show an insufficient concern for the dental health of preschool children.

CONCLUSIONS

The outcome of the study stated that the mean indices for carious experience within temporary dentition decrease with age, due to the progressive disappearance of milk teeth. The most significant contribution to the values of carious experience is the number of teeth affected by active carious processes at the expense of the blocked ones.

The mean value of DMFT index = 1.87 is lower than in other studies conducted in our country, but remains high compared to that reported for developed countries (USA, Italy, Denmark, Germany, Switzerland). The DMFT index values are given, in particular, by components that indicate the number of caries-affected teeth and not of the blocked ones. The first permanent molars are the most affected by caries, the lesions occurring one year after their eruption on the arcade.
The results here obtained emphasize the need for dental health education programs at national and community level, the kindergarten and school having a great potential to influence dental health care habits in children. It also emphasizes the need for regional prevention programs, as part of an overall national program, which has to consider the socio-economic and cultural factors.

References