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ORAL HEALTH AND PROPHYLACTIC-THERAPEUTIC NEEDS OF CHILDREN AGED 6 YEARS IN POLAND IN 2012

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BACKGROUND. Irrespective of the fact that in developed countries, a reduction of dental caries incidence is observed, it still remains the most common chronic disease affecting children in Poland.
OBJECTIVES. In the paper, the results of nationwide epidemiological studies conducted in Poland in 2012 within the framework of the Nationwide Dental Health Monitoring Programme were presented.
MATERIAL AND METHODS. The children aged 6 years were enrolled into the study. Clinical assessment of oral health status of children was made in accordance with WHO recommendations.
RESULTS. The percentage of healthy children aged 6 years, who did not have any signs of dental caries manifested with cavity, tooth filling or tooth loss was only 14.4%. On average, only one tooth per child was filled due to dental caries and four out of five teeth affected by dental caries required invasive treatment. Index of conservative treatment was very low and amounted to 0.23 ± 0.24.
CONCLUSIONS. The results demonstrate high caries prevalence and significant prophylactic-therapeutic needs.

Key words*: oral health, dental caries, children*

INTRODUCTION

Irrespective of the observed decrease in dental caries prevalence in developed countries, it still remains the most common chronic disease in children. Correspondingly, it is an important problem affecting many industrialized countries (1,2,3). The improvement of oral health in population result from implementation of population and individual patient-oriented prophylactic programmes. Based on the results of prophylactic-therapeutic programmes, the strategies were determined (4,5,6). Among these strategies, monitoring of oral health in children aged 6 years is especially important due to the fact that dental caries prevalence in primary dentition significantly affect the oral health later in life (7).

The collected data on oral health in children aged 6 years enabled to verify the completion status of global oral health objectives in Poland in relation to this age group and establish the actions aimed at reducing the inequalities in oral health of children and adolescents between Poland and other EU countries.

MATERIAL AND METHODS

The objectives of the study were to estimate the prevalence and severity of dental caries in children aged 6 years, assess the current trends in dental caries prevalence in this age group and determine the degree to which their therapeutic needs are met.

In the paper, the final report data from epidemiological studies conducted within the framework of Nationwide Dental Health Monitoring Program were employed. Poland 2012 (8). The Bioethics Committee of Warsaw Medical University approved the study; No. AKBE/551/12 as of 24 July 2012.

In particular regions, the voivodeship specialist in the field of conservative or paediatric dentistry was responsible for organization and supervision of study.

The field examinations were performed by teams which were generally composed of two dentists who were adequately trained, including calibration process, in the Department of Conservative Dentistry of Warsaw Medical University. The credibility of clinical assessment of persons performing examinations was verified by re-examinations of 10% of study sample. Afterwards, the obtained results were subject to statistical analysis.

In the epidemiological studies of 2012, a total 1,968 children aged 6 years living in 7 voivodeships (dolnośląskie, kujawsko-pomorskie, lubelskie, lubuskie, mazowieckie, podkarpacki warmińsko-mazurskie) were selected on a basis of multistage sampling.

The examinations were conducted in identical settings, with the usage of mouth mirror and probe (WHO/FDI probe). The oral health of examined persons was assessed in accordance with WHO recommendations, including criteria suggested by this organization (Oral Health Surveys. Basic Data. WHO Geneva 1997).

RESULTS

Analysis of $d_3$mft index components in study group of children aged 6 years

From the analysis transpires that the examined 6-year-old children had 17.6 primary teeth in oral cavity on average.

The study results suggested that the percentage of healthy children aged 6 years in whom the dental caries, manifested with cavity, tooth filling or tooth loss due to dental caries was not observed, amounted to 14.4% on average. Its value was slightly higher in girls (15.7%) compared to boys (13.2%) and among persons living in urban than rural areas. Based on analysis of the distribution of d3mft index, it was stated that 64.4% of children aged 6 years had 4 and more teeth damaged by dental caries, of whom 37.6% had 7 and more teeth affected by this disease (Tab.I).

Table I. The percentage of dental caries-free primary teeth in children aged 6 years ($d_3$mft = 0) and the value of $d_3$mft 1-3, 4-6 and ≥ 7.

	$d_3$mft =0	$d_3$mft =1–3	$d_3$mft =4–6	$d_3$mft ≥7	Comparison (chi-square test)
Boys	13.4%	20.8%	27.7%	38.1%	p = 0.37
Girls	16.1%	21.0%	25.9%	37.0%	
Urban area	15.6%	21.2%	27.1%	36.1%	p = 0.42
Rural area	13.6%	20.6%	26.5%	39.3%	
Total	14.7%	20.9%	26.8%	37.6%	-

Furthermore, the results indicated that the highest percentage of children, i.e. ca 30% and 27.8% had about 3-6 teeth and more than 7 teeth with untreated dental cavities, respectively (Tab.II).

Table II. Distribution of d_3t component in children aged 6 years by gender and place of residence.

	d_3t =0	d_3t =1	d_3t =2	d_3t =3–6	d_3t ≥7	Comparison (chi-square test)
Boys	21.5%	9.9%	9.4%	29.5%	29.8%	p = 0.18
Girls	24.8%	10.3%	8.5%	30.8%	25.6%	
Urban area	24.8%	10.8%	8.8%	30.1%	25.5%	p = 0.06
Rural area	20.9%	9.2%	9.2%	30.0%	30.6%	
Total	23.1%	10.1%	9.0%	30.0%	27.8%	-

In the analyzed group of 6-year-old children, the mean value of $d_3$mft was 5.4±4.1 and was higher in boys (5.6±4.2) than girls (5.2±3.9) and slightly higher among children living in rural compared to urban areas (Fig. 1).

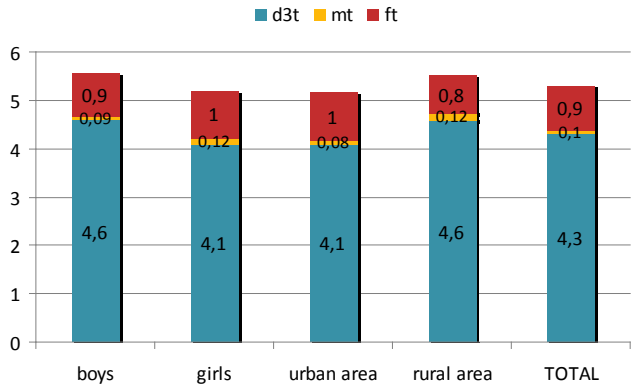

Fig. 1. The values of $d_3$mft and its components in children aged 6 years.

Having analyzed the particular $d_3$mft index components, it was determined that d_3t component, i.e. the number of decayed primary teeth was 4.3. Its value was higher in boys than girls and children living in rural than urban area. The mean value of d_3t component suggested that 4 out of 5 decayed teeth per child on average re-

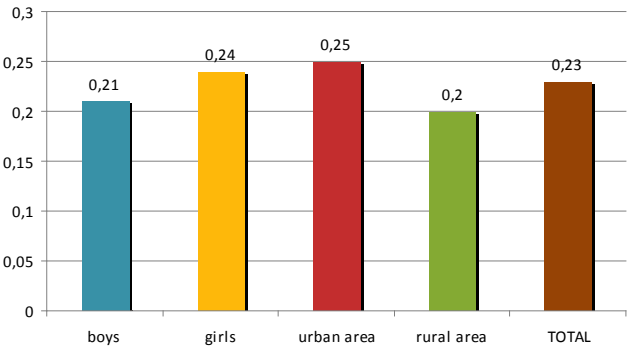

Fig. 2. The values of conservative treatment of primary teeth affected by dental caries in children aged 6 years.

quired invasive treatment aimed at tooth repairing. The examined children had 0.1±0.55 primary tooth removed on average and only one tooth filled due to dental caries.

The conservative treatment index was very low and amounted to 0.23±0.24 on average. Its value did not vary significantly in children living in urban 0,25±0.35 and rural areas 0.2±0.32 (Fig. 2).

To assess the severity of dental caries in 6-year-olds, SiC index was applied, which describes the number of decayed teeth in child belonging to the group with the most serious course of this disease. The obtained data indicated that this child had more than 10 decayed teeth, i.e. more than a half of dentition with advanced dental cavities. The remaining 2/3 of 6-year-oldchildren had about 3 teeth affected by dental caries (Fig. 3).

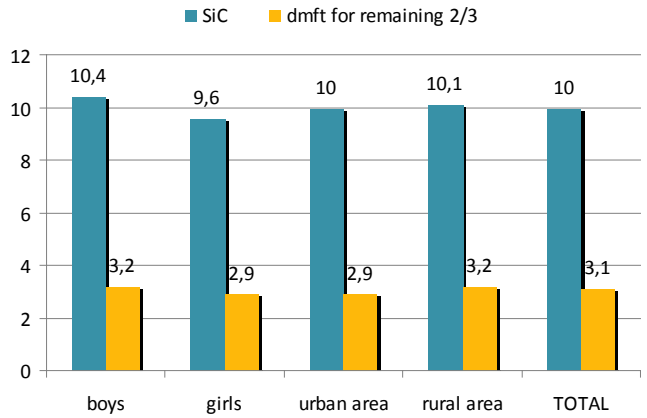

Fig. 3. The values of SiC in studied population of children aged 6 years.

Assessment of therapeutic needs of children aged 6 years

Figure 4 presents therapeutic needs of examined children. No needs or the need for at-home fluoride treatment in caries prevention was declared in 14.2% of examined children. Nearly 48% of children required sealing of fissures as well as putting the filling covering single surface of decayed tooth. This filling was required significantly more frequently in children living in rural compared to urban areas. In 62.2% of examined children, putting the complex filling covering more than single surface was needed. The need for treatment of dental pulp disease and dental extraction were required in nearly 16% and 24% of children, respectively.

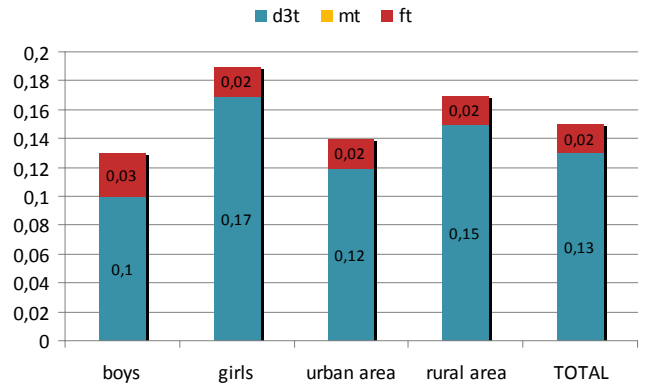

Fig. 4. Distribution of d3mft index in children aged 6 years.

DISCUSSION

The epidemiological studies on oral health in children aged 6 years, which were conducted in 2012, indicated high dental caries prevalence in this age group.

The results of the aforesaid study were compared to the findings of study which was conducted on the same age group in 2008 (9). The percentage of healthy, dental caries-free children was 14.6%, which was higher by 0.2 compared to the study of 2012 (14.4%). From the data transpires that in the period of 5 years the number of dental caries-free children declined by 0.2%. Having analyzed the data by gender and place of residence, no disparities in 6-year-old children, with no dental caries history, were determined. However, the significant differences in the percentage of dental caries-free children were observed among the voivodeships. The lowest values were obtained in dolnośląskie voivodeship (8.1% of dental caries-free children) while the highest values were observed in warmińsko-mazurskie and mazowieckie voivodeships (18.3% and 18.7%, respectively).

The analysis of $d_3$mft index in 6-year-olds indicated that severity of this disease is very high and its value remains stable in recent years.

From the analysis transpires that $d_3$mft index in children examined in 2012 was 5.4 and its value is higher by 0.34 compared to the one obtained in 2008 ($d_3$mft =5.06). The mean value of d_3t component suggested that four out of five teeth on average affected by dental caries required invasive treatment aimed at tooth repairing.

Furthermore, the results of current studies showed that teeth of 6-year-olds in Poland are not subject to treatment in general. The number of primary teeth with dental cavities was 4.3 on average. The conservative treatment index of primary dentition in examined children was very low and amounted to 0.23. Its value is slightly higher, i.e. by 0.07 compared to the one obtained in the studies conducted in 2008 and 2010 (0.16). Only in less than a half of children, the sealants on masticatory surfaces were present and merely about 1/3 of children aged 6 years were included in the programme of supervised brushing. The examined children reported very high therapeutic needs. The treatment of extensive 2-surfaces cavities, treatment of dental pulp and dental extraction were required in more than 60%, 16% and almost 1/4 of examinees, respectively.

Based on the presented data, it may be stated that oral health of children aged 6 years has not been im-

proved and still remains at alarmingly poor level. The high prevalence of dental caries and its significant severity in 6-year-old-children explained the high prevalence of this disease in children aged 3 years, which was observed in earlier epidemiological studies (10). In Poland, nearly a half of 3-year-olds already have teeth affected by dental caries. On average, in a child of this age about 3 teeth requiring conservative treatment are present. From the gathered data implied that fluoride treatment in caries prevention in small children is not adequately employed. Furthermore, the fact that the treatment of dental caries in small children is not undertaken explains high prevalence of this disease in children aged 6 years and no visible tendency in reduction of pathogenicity and dental caries severity. Dental caries is a disease caused by pathogens which, i.a. move from one tooth to another. The presence of nearly 4 decayed and untreated teeth in 6-year-old child and even 4 and more teeth affected by active dental caries in 1/3 of 3-year-olds constitute certainly the significant bacterial burden for erupting permanent teeth at 5-6 years of age. Thus, they are affected by dental caries in short time following the teeth eruption.

The results of studies suggest the necessity for nationwide health promotion campaigns in primary schools and introduction of everyday supervised brushing with fluoride toothpaste. From the analysis transpired that only 34.8% of children aged 6 years are included in the programme of everyday supervised brushing with fluoride toothpaste in kindergarten/ school. In some voivodeships, e.g. dolnośląskie or warmińsko-mazurskie such a programme is not conducted.

The experience of many countries presented by WHO together with country's experience suggest that health-promoting schools play a crucial role in health education of families, local societies and children (11). School is considered to be a place which may be and should be engaged in simple prophylactic activities aimed at maintaining the health with the example being supervised brushing. Polish experience regarding the implementation of dental health education programme in schools indicated high effectiveness of such action and its acceptance by teachers and tutors.

The analysis of results of study conducted in 2012 confirmed poor oral health of children at pre-school age. Furthermore, the oral health is not improving and prophylactic-therapeutic needs of the analyzed age group are not met. This well-known fact was also indicated in previous studies. The needs vary according to voivodeship and place of residence. Taking into account the presented observations, it may be concluded that no actions aimed at reducing the risk factors or modulating the disease in pre-school children are undertaken.

Since many years, the percentage of dental caries-free children remains low in this age group and does not exceed 15 %. According to the global goals for oral health, which were proposed by WHO for Europe, the percentage of dental caries-free 6-year-olds in 2010 and by 2020 would be 50% and 80%, respectively (12,13). In 2012, dental caries is observed in more than 85% of Polish children aged 6 years. Thus, the global goal for oral health of children aged 6 years for even 2010 has not been achieved.

SUMMARY AND CONCLUSIONS

1. Oral health of children aged 6 years is poor and has not been improved since many years.
2. Mean value of d3mft of primary dentition, with fluctuations of a few decimals, remains very high in children aged 6 years, i.e. its value exceeds 5 teeth.
3. In 2012, the value of conservative treatment index is still very low, which suggests that the majority of teeth affected by dental caries still remain untreated.
4. Merely approximately 1/3 of 6-year-olds in Poland are included in the programme of everyday supervised brushing with fluoride toothpaste in kindergarten/school which indicates insufficient dental care and underestimation of prophylactic actions.

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