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*Evaluation of state of deciduous dentition in children
in Lublin day nurseries*

Despite continuous and considerable progress that has been made in dentistry in recent years, the problem of early caries in children is still present. Treatment of early caries is a hard task for a dentist. Children themselves present difficulty as they usually do not cooperate with a dentist. A precondition for good prognosis is an early detection of the disease. An acute course of caries usually does not produce characteristic discoloration of the affected tooth tissues, which is the reason why parents cannot spot it in the initial period. Because of that children are treated too late, when the disease process is already very much advanced.

The purpose of the study was to evaluate the state of dentition and oral hygiene level in children aged 1–4 attending Lublin day nurseries.

MATERIAL AND METHODS

408 children aged 1–4 were selected for the study including 200 boys and 208 girls attending Lublin day nurseries. Average age of the group was 33.7 months (SD = 9.9). Clinical dental examinations were performed using a mirror and a probe in artificial lighting. The examinations involved: 1) status of dentition, 2) oral hygiene status. The status of dentition was evaluated by estimating caries frequency, as well as mean def and dmf_d .

Oral hygiene was evaluated on the basis of OHI-S index according to Green and Vermillion modified for deciduous teeth. For better plaque visibility Plaviso, a staining solution from Voco containing erithrosine, was applied to teeth surfaces. Dental deposit was evaluated on labial surfaces of 51 and 71 teeth, buccal surfaces of 55 and 65 teeth and glossal surfaces of 75 and 85 teeth. The following evaluation criteria were used: 0 –

no deposit, 1 – deposit covering up to 1/3 of tooth surface, 2 – deposit covering more than 1/3 but less than 2/3 of tooth surface, 3 – deposit covering over 2/3 of tooth surface.

The results obtained for single teeth were summed up and divided by the number of the examined teeth to calculate mean OHI-S indexes for each patient in the range of 1 to 3. On the basis of mean OHI-S values the children were divided into 3 groups: 1) children with good hygiene ($OHI-S \leq 1$), 2) children with bad hygiene ($1 < OHI-S \leq 2$), 3) children with very bad hygiene ($2 < OHI-S \leq 3$). Among the children's parents a questionnaire survey was performed concerning the frequency and ways of hygienic procedures in the children. The results were statistically processed using a non-parametric independence test χ^2 and a double t-Student test.

RESULTS AND DISCUSSION

The values of caries frequency in the studied population of the children were researched in relation to their age and gender. In children aged 1-2 it was 17.7% and was higher in boys (23.7%) than in girls (12.2%). The frequency of caries increased with age. In children aged 2-3 it reached 49.7% and again it was higher in boys (51.6%) than in girls (47.9%), although the differences were smaller. The highest caries frequency of 74.3% was observed in 3-4 year-old children and in this group it was higher in girls (76.7%) than in boys (71.8%). The frequency of caries in the whole studied population reached a value of 52.2% and was slightly higher in boys (53.5%) than in girls (51.0%). The statistical analysis performed using χ^2 test displayed significant differences ($p < 0.05$) in caries frequency depending on the age of children. The relationship between gender and caries frequency was not statistically significant.

Statistical analysis using t-Student test displayed significant differences in mean def value in relation to age ($p < 0.05$). The lowest mean value of dmf of 0.6 was observed in children aged 1-2. Higher mean value of def of 0.9 was observed in boys than in girls (dmf = 0.4). In children aged 2-3 mean value of dmf increased to 2.3 and was higher in boys (dmf = 2.4) than in girls (dmf = 2.1). The highest value was observed in 3-4 year-old children (dmf = 5.0) and in this age group it was higher in girls (dmf = 5.3) than in boys (dmf = 4.8). Mean dmf in the whole studied population was 2.9 and was slightly higher in boys (dmf = 3.0) than in girls (dmf = 2.9). The differences in mean value of dmf in relation to gender were not statistically significant ($p > 0.05$).

It should be stressed that the main ingredient of mean value of dmf was the mean value of d. Among all the examined children there were only 16 fillings, out of which 3 had secondary caries. 2 teeth were extracted due to caries.

Mean value of dmf_s for the whole studied population was 4.2 and was higher in boys ($dmf_s = 4.6$) than in girls ($dmf_s = 3.9$). The lowest mean value of dmf_s was observed in the youngest children aged 1-2. It was 1.2 and was higher in boys ($dmf_s = 1.9$) than in

girls ($dmf_s = 0.5$). Significantly higher ($p < 0.05$) mean value of dmf_d of 3.2 was observed in older children aged 2-3. In this age group mean value of dmf_d was also higher in boys ($dmf_d = 3.7$) than in girls ($dmf_s = 2.7$). The highest mean value of dmf_d of 7.3 (the differences were also statistically significant with $p < 0.05$) was observed in the oldest children aged 3-4 and in this age group, contrary to younger children, it was higher in girls ($dmf_s = 7.5$) than in boys ($dmf_s = 7.2$). The differences in mean value of dmf_s in relation to gender were not statistically significant ($p > 0.05$).

In an analysis of oral hygiene index in relation to gender and age was found that the level of oral hygiene changes with age of the examined children. The worst hygiene condition was observed in 2-3 year-old children, among which only 7.1% had good oral hygiene status ($OHI-S \leq 1$), 61.0% had bad oral hygiene status ($1 < OHI-S \leq 2$) and 31.9% had very bad oral hygiene status ($2 < OHI-S \leq 3$). Better results were observed in older 3-4 year-old children. In this age group 12.1% had good oral hygiene status, 63.8% – bad and 24.1% – very bad. The best oral hygiene status was found in the youngest children. In this group oral hygiene status was good in 20%, bad in 56% and very bad in 24%. The statistical analysis using χ^2 test showed a significant relationship between hygiene status and age of studied population ($p < 0.05$) but did not indicate any relationship with gender ($p > 0.05$).

An analysis of questionnaires showed that in 36.2% of 1-2 year-old children's mothers did not perform any hygienic procedures, 25.9% did it once every few days and 27.6% once a day. Only 10.3% of mothers from the youngest group cleaned their children's teeth twice a day. Tooth brushing was better in the older group of 2-3 year-old children. Among them 25.6% brushed their teeth twice a day, 44.7% once a day and 22.3% once every few days. However, comparatively many children (7.4%) did not brush their teeth at all. In the oldest group of 3-4 year-old children the most correct tooth brushing routine was observed. 40.0% brushed their teeth twice a day and 42.2% – once a day. But also in this group we found children who brushed their teeth only once every few days (15.6%) and those not brushing at all (2.2%). From the survey performed among mothers we found that 37.3% of the examined children brush their teeth without adults' help. Percentage of the children who were sometimes helped by the parents was 16.0%. 46.7% of surveyed mothers always help their children with brushing their teeth.

DISCUSSION

From the results of examinations performed for this study it turns out that the status of dentition of the youngest population of children from the city of Lublin is not satisfactory. The caries frequency among all the studied children is 52.2% and mean dmf and dmf_s is 2.9 and 4.2 respectively. These parameters change in relation to age. The lowest are observed in 1-2 year-old children (caries frequency = 17.7%, mean dmf value = 0.6

and $dmf_s = 1.2$), higher in 2-3-year olds (frequency = 49.7%; $dmf = 2.3$; $dmf_d = 3.2$) and the highest in 3-4 year olds (frequency = 74.3%; $dmf = 5.0$ and $dmf_s = 7.3$).

In literature it can be found that incidence of deciduous teeth caries among children in the whole world is very variable (2, 3, 4, 5, 6, 9, 11, 12, 13). Milnes from the University of Toronto claims that incidence of early caries varies from 1% to 12% in developed countries and up to 70% in developing countries (11).

In the presented studies it was found that caries incidence is higher in boys younger than 3 years old. Differences related to gender are most evident among the youngest 1-2 year-old children. In this age group the frequency of caries was 23.7%, mean dmf value was 0.9 and mean dmf_s value was 1.9 in boys while in girls these values were lower - 12.2%, 0.4 and 0.5 respectively. In older, 2-3 year-old children the differences were less significant and in the oldest group of 3-4 year-olds higher incidence of caries was observed in girls. On the basis of the study it can be deduced that deciduous teeth in boys may be more susceptible to caries. Higher incidence of caries in boys was also found by: Sasahara and Kawamura in 3-year-old Chinese children (14), Evans et al. (5) in children from Hong-Kong, and Fetkowska-Mielnik (6, 7) in day nursery children from the city of Lublin.

Most authors indicate low index of deciduous teeth treatment. It is most probably related to difficulties connected with treating young patients who very often do not accept the suggested procedures. It is also a result of low health awareness of parents and lack of knowledge about the results of failure to treat deciduous teeth. Own studies confirmed this trend. Among the 408 examined children only 16 fillings were found with mean dmf value of 2.9, which means that on average each child had almost 3 teeth with caries.

Comparing the results of own studies presented in this work with the studies of Fetkowska-Mielnik et al. performed 15 years ago an alarming increase in caries incidence among the youngest children from Lublin was observed. Caries frequency among children attending day nurseries increased from 42% in 1983 to 52.2% in 1998 and mean dmf value from 1.5 to 2.9 (6,7). An increase in the number of children with caries in recent years was also noticed by Moss who analyzed the results of epidemiological studies performed in different countries (12). However, some authors have reported decrease in caries incidence. Davies, who examined children in Queensland (Australia), found a significant decrease in deciduous teeth caries incidence compared to years 1948 and 1965 (5). A similar tendency was observed by Murray who performed studies in England and Wales. In the 70s mean value of dmf in the region was 4.0 while in 1993 it decreased to 2.0. In accordance with dmf value decrease the number of caries-free children increased from 29% to 57% (13).

The removal of bacterial plaque during daily oral hygiene routine is one of the basic hygienic procedures preventing the creation of caries. Meanwhile most authors report bad oral hygiene status in the youngest children in Poland (1, 7, 24, 28). It is confirmed by own studies results. Good oral hygiene among the studied children ($OHI \leq 1$) was

found in only 11.3% children, bad ($1 < \text{OHI} \leq 2$) in 61.7% and very bad ($2 < \text{OHI} \leq 3$) in 26.7% of children. According to Borysewicz-Lewicka and Koralewska the period of early childhood should be used by parents not only for appropriate teeth brushing but for teaching the child and implementing the habit of tooth brushing (3). Responsibility for oral cavity condition and implementation of habits rests with the parents and guardians, however, high percentage of 1-2 year-old children (36.2%) who do not brush their teeth at all means that many people within our society do not understand this problem.

The age at which children start brushing their teeth by themselves is not clearly defined. Acquiring satisfactory technique of tooth brushing can be expected at the age of 5-7 years or even later. Kaczmarek et al., while performing survey among parent, found that 61.1% of parents think that children below 10 years of age require adult help in tooth brushing (9). It is assumed that tooth brushing by children in early age should be actively accompanied by parents. However, according to the information from the survey among mothers, only 37.3% of the examined children always brush their teeth by themselves, without any help from adults, and 16.86% of mothers helps them only from time to time, which accounts for doubtful results of the procedure. Only 46.7% of mothers always help their children with tooth brushing.

CONCLUSIONS

1. Dentition status of children aged 1-4 attending Lublin day nurseries is unsatisfactory as can be seen from high percentage of children affected with caries.

2. The level of mothers' awareness in the scope of dental prophylaxis is not sufficient.

3. A large scale prophylactic campaign should be undertaken to inform future and young mothers how to care about their children's teeth.

4. In health education of mothers it is necessary for dentists to cooperate with obstetricians and pediatricians.

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SUMMARY

408 children aged 1-4 years from Lublin nurseries were examined. The paper aimed at evaluation of the mean number of dmf and the level of oral hygiene in these children. The studies confirmed high caries frequency as well as high OHI index.

Ocena stanu uzębienia mlecznego u dzieci ze żłobków lubelskich

Zbadano 408 dzieci w wieku od 1 do 4 lat z lubelskich żłobków. Celem pracy była ocena średniej liczby puw i poziomu higieny jamy ustnej u tych dzieci. Badania stwierdziły, że frekwencja próchnicy i wskaźnik OHI były wysokie.