

ENAMEL DEVELOPMENTAL DEFECTS AND DENTAL CARRIES FREQUENCIES IN 8 - 11 Y OLD CHILDREN

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Abstract. The purpose of the study was to compare the dental caries frequencies in children with enamel deficiency, in primary and permanent teeth, in order to show their importance as a health problem. In the studied group the percent of dysplasia of the damaged primary teeth reached a maximum value of 9.1% in ten-year-old girls and 31.4% in boys of the same age. Due to the physiological exfoliation of deciduous teeth, the proportion decreased to 0 near the age of 11 y. At the permanent teeth, a change of the pattern diseases appeared because the age of 8-11 is the period of mixed dentition. The eruption of permanent teeth being in progress, the cavities at these teeth are less and the weight of dental dysplasia is higher within the total number of damaged teeth.

Key words: primary and permanent dentition, caries, defects of enamel development

Rezumat. Scopul lucrării a fost compararea frecvențelor cariilor dentare la copii cu defecte de dezvoltare ale smalțului, atât la dinții temporari cât și cei permanenți, pentru a ilustra dimensiunea acestor afecțiuni ca problemă de sănătate publică. La lotul studiat, frecvența displaziei în cadrul dinților temporari afectați are un maxim de 9,1% la 10 ani la fete și 31,4% la aceeași vârstă la băieți. Ea scade la 0 către 11 ani, când dinții temporari dispar de pe arcadă prin exfolierea fiziologică. La dinții permanenți se observă o schimbare a structurii pe afecțiuni (cariile la acești dinți sunt mai reduse și frecvența displaziei dentare apare mult mai mare în cadrul numărului total de dinți afectați), datorită faptului că la 8-11 ani dentiția este mixtă, erupția dinților permanenți fiind în dinamică.

Cuvinte cheie: dinți temporari, dinți permanenți, carii, defecte de dezvoltare ale smalțului

INTRODUCTION

The epidemiological studies regarding the morbidity of dental caries conducted in many countries show a high incidence of this disease, its tendency of growing and the early age of appearance.

Next to the dental caries, the deficiency of enamel develops; even if it has a small frequency, it constitutes a real problem for the child oral health and, in the most recent studies, is increasing significantly from 19% to

45% (1,2). Therefore, WHO recommends the elaboration and implementation of some preventive programs for the children health, which need some indispensable steps like the analysis of the general health status.

The developmental defects of the enamel have been associated with a lot of etiological factors, like systemically, genetically, local and the environment conditions. Recent studies have shown that the frequency of developmental defects of enamel is growing in the

areas with a high concentration of the flour in potable water (3).

The epidemiology of developmental defects of the enamel is very important for a community or country and for comparison between countries; so, the International Dental Federation (FDI) introduced a descriptive index i.e. Developmental Defects of the Enamel (DDE) (4).

Some studies have shown that the fluorisation decreased the dental carries and there was an inverse relationship between the dental carries and the developmental defects of the enamel (5). However, the majority of studies of enamel developmental defects have been confined to North America, Australia and some European developed countries (4,6); there are scarce information on these defects or on their relationship to caries in children living in less developed countries such as Brazil (7).

The purpose of the study was to evaluate the frequency of enamel development deficiency and to compare it with that of dental caries, both in damaged primary and permanent teeth.

MATERIAL AND METHOD

The randomized sample consisted of 532 children between 8-11 age, the huge majority being of 8 and 9 y old: 192 subjects of 8 y; 214 subjects of 9 y; 46 subjects of 10 y and 80 of 11 y. 49.6% of them were girls and 50.4% boys. The dental examination was done in standard condition, in natural light. The deficiency of enamel development and the dental caries were diagnosed without a previous cleaning or drying of the teeth.

RESULTS AND DISCUSSION

In primary affected teeth the dysplasia occurs at the maximum level of 9.1% in girls 10 years old and 31.4% in boys 10 years old (fig 1 and 2).

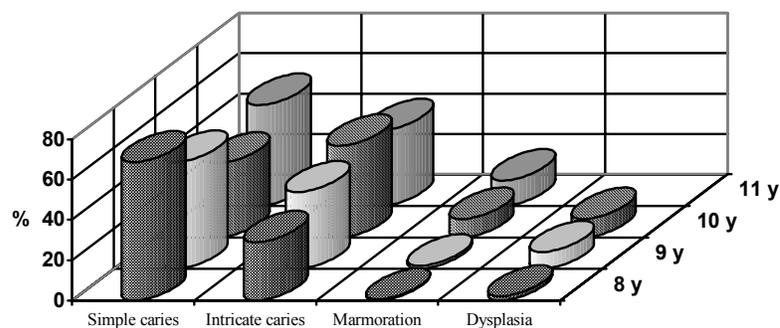
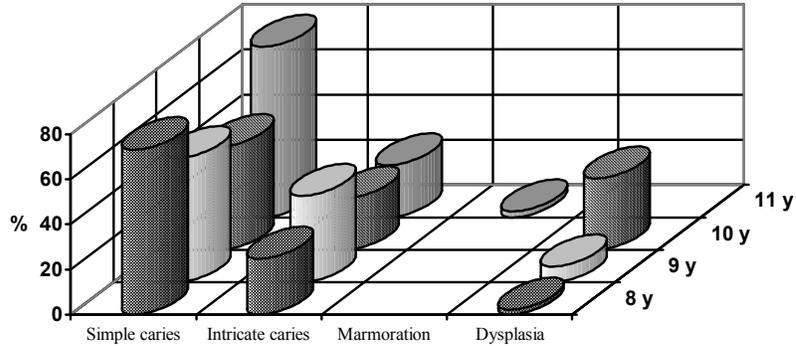


Fig. 1 Frequencies of dental caries, marmoration and dysplasia
Girls – temporary teeth

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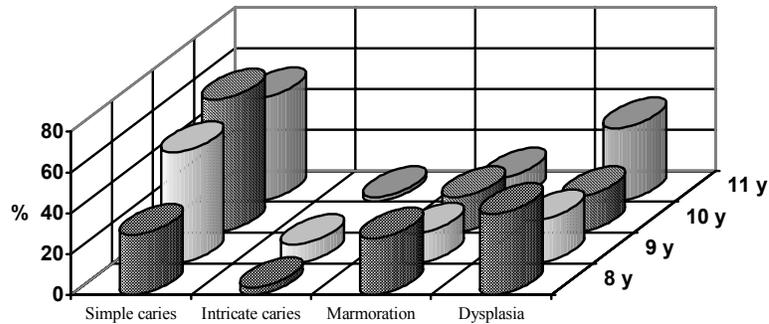
**Fig. 2 Frequencies of dental caries, marmoration and dysplasia
Boys – temporary teeth**

Due to the physiological exfoliation of deciduous teeth, close to age of 11 the frequencies decreased to 0 (8). For each age group, the level of enamel development deficiency associated with the high levels of dental caries and the low ones of dysplasia.

In permanent teeth a change of disease pattern appeared, due to the fact that the 8-11 years age period represents the mixed dentition; the eruption of

the permanent teeth is in progress and the number of the dental caries (simples and complicated ones) of these teeth dropped (excepting girls of 9 y age). So, the dental dysplasia frequency is more evident in the total of affected teeth (fig. 3 and 4).

An analysis of the sequence of dental eruption by age and sex groups helps the understanding of data (6).



**Fig. 3 Frequencies of dental caries, marmoration and dysplasia
Girls – permanent teeth**

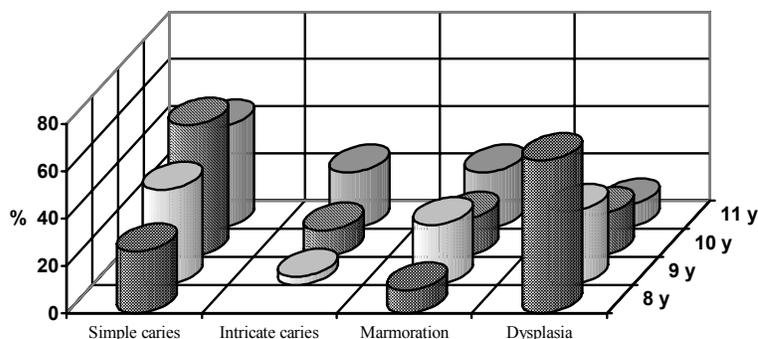


Fig. 4 Frequencies of dental caries, marmoration and dysplasia
Boys – permanent teeth

The figure 5 shows that the eruption of permanent teeth extends on a long period and the appearance of different dental groups present a special distribution. One can see that at the permanent teeth, mode of statistic distribution is at 12 permanent teeth, the huge majority of examined children having 10 to 14 permanent teeth. At this age, they do not have the

premolars and second molars, and the dental caries develop especially in the first permanent molars. The prevalence of the dental disease at this age, explored by us, has similar values with those reported in Spanish studies (8), for areas with flour low levels, like our city – Iasi (9).

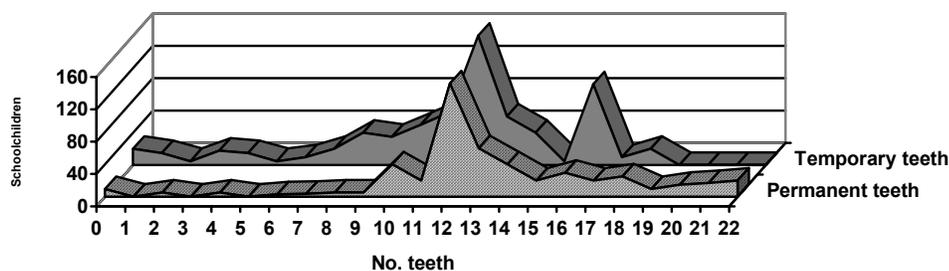


Fig. 5 The sequence of dental eruption

Concerning the number of erupted teeth, the majority of the children have 10 to 14 temporary teeth. We found a

bimodal statistical distribution of temporary teeth number, fact that suggest delayed eruption for a lot of

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children (7%), particularly for boys. Because 90% of the children have all the four upper incisors erupted, we can use the SCOTS index (10).

Figure 6 illustrates the sequence of the eruption by sex and age between 8 and 11 year. At 8 year age there is no

difference between the average number of permanent erupted teeth for both sexes (the average and the mode are very close), that means that the process of eruption have a Gaussian distribution and in normal limits in our population.

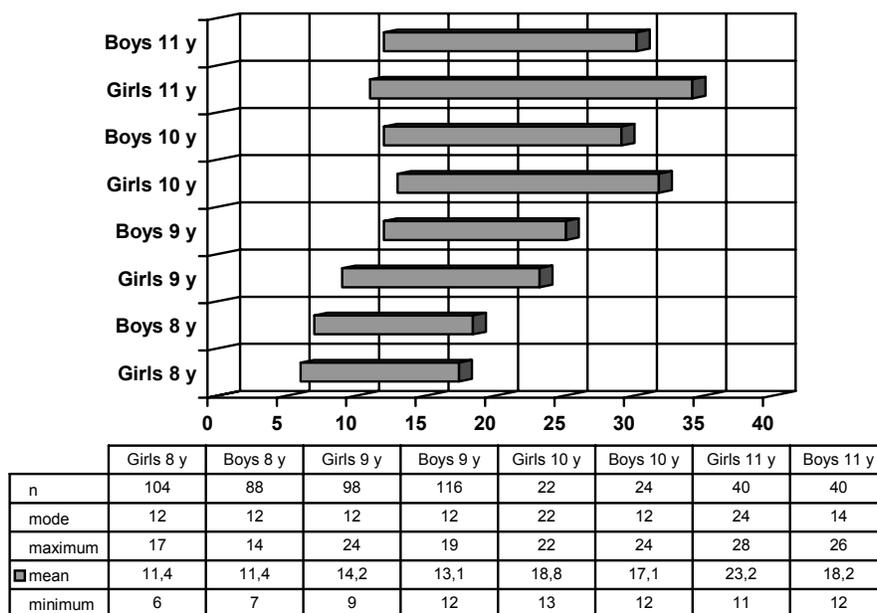


Fig. 6 The dental eruption sequence by gender and age

At the age of 9 a difference between girls and boys appears; the average for girls is 14.2 erupted teeth, instead of 13.1 erupted teeth for boys; also, the maximum number of permanent erupted teeth for girls is 24, instead of 19 for boys.

Beginning at 10 years, the girls have an accelerated eruption. The average for girls is 18.8 instead of 17.1 for boys, but with a mode of 22 for girls and only 12 for boys. At 11 year old

the differences become bigger, 23.2 for girls and 18.2 for boys; the mode is 24 for girls and 14 for boys. These analyses confirmed the results of others studies. E Bratu in 1982 showed that the eruption at girls precede with several month that of the boys. The difference is related to the faster general development of the girls after 10 years old (11).

The results of this study (12) are similar to those made by E. L. Dini, R.

D. Hold and R. Bedi from Brazil (5,7); however, the direct comparison between the studies is difficult due to the different conditions and the used indexes.

CONCLUSIONS

1. The dental dysplasia in temporary dentition ranged from 9.1% for girls to 31.4% for boys at the age of 10 y.
2. The disease pattern changed in permanent dentition due to the particularities of teeth eruption process.
3. Although the dental dysplasia is not a serious health problem, in comparison with dental carries, it must be carefully evaluated for an effective prevention and interception of disease.

REFERENCES

1. Nunn JH, Murray JJ, Reynolds P, Tabari D, Breckon J: *The prevalence of developmental defects of enamel in 12-16 years old children residing in three districts (natural fluoride, adjusted fluoride, low fluoride) in the North East of England*. Community Dent Health 1992; 9: 235-247.
2. Dummer PMH, Kingdon A, Kingdon R: *Prevalence and distribution by tooth type and surface of developmental defects of dental enamel in a group of 15 to 16-years old children in South Wales*. Community Dent Oral Epidemiol 1990; 7: 360-377.
3. Hiller KA, Wilfart G., Schmaltz G: *Developmental enamel defects in children with different fluoride supplementation – a follow-up study*. Caries Res 1998; 32: 405-411.
4. Federation Dentaire International: *Commission on oral health, research and Epidemiology: a review of developmental defects of enamel index (DDE)*. Int. Dent. J., 1992; 42: 411-426.
5. Holt RD, Morris CE, Winter GB, Downer MC: *Enamel opacities and dental caries in children who used a low fluoride toothpaste between 2 and 5 years of age*. Int Dent J 1994; 44: 331-341.
6. Levine RS, Beal JF, Fleming CM: *A photographically recorded assessment of enamel hypoplasia in fluoridated and nonfluoridated areas in England*. BDJ 1989; 166; 249-252.
7. Dini EL, Holt RD, Bedi R: *Prevalence of caries and developmental defects of enamel in 9-10 year old children living in areas in Brasil with differing water fluoride histories*; B.D.J. 2002; 188(3).
8. Alvarez-Arenal A, Alvarez-Riesgo JA, Pena-Lopez JM, Fernandez-Vasquez JP: *DMFT, dmft and treatment requirements of schoolchildren in Asturias, Spain*. Community Dent. Oral Epidemiol., 1998, 26: 166-169.
9. Danilă I, Vataman R, Iliescu A et al.: *Profilaxie stomatologică*. Ed. Didactică și Pedagogică, București, 1998.
10. Păsăreanu M, Maxim A: *The prevalence of the developmental enamel defects at the infantile population in Iași*. Medicina Stomatologică, 2000, 4: 4.
11. Bratu E, Grivu O, Voinea C: *Erupția dentară normală și patologică*, Ed Helicon, Timișoara, 1995.
12. Păsăreanu M, Florea C: *Risk factors involvement in enamel dental displasya*. J. Prev. Med., 2001, 9(1): 13-18.