ORIGINAL RESEARCH

sciendo

DOI: 10.2478/asmj-2019-0004

Prevalence of primary and secondary dental dystrophies on a group of preschool and school-age children from Tîrgu-Mureş.

Daniela Esian[1], Cristina Bica[1], Ana Petra Lazar[1], Oana Stoica[1]

[1]George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures, Romania

Abstract

Introduction: Pediatric Dentistry offers a completely different approach compared to that of adults especially in terms of patient cooperation, problems with growth and development and problems related to dental restoration in the context of a developing dentition.

Aim of the study: The purpose of this study was to assess the prevalence of primary and secondary dental dystrophies among preschool and school-age children.

Material and Methods: The group of 113 subjects with ages between 3 and 11 years was selected from two primary and preschool education establishments from Târgu-Mures. Simultaneously with the clinical examination of dental surfaces, 150 questionnaires were distributed to the parents of the subjects. The dystrophies determined clinically were arranged in a certain category of number, form, volume and structure and were correlated with the answers to the questionnaires.

Results: According to the data most cases of dental dystrophies are represented by dental fluorosis followed by severe early childhood caries S-ECC, and in equal percentages are present dyschromia, imperfect amelogenesis, MIH hypomineralization, dental fusion, macrodontia and hyperdontia.

Conclusions: There are significant correlations between the primary dental dystrophies and factors that intervened during pregnancy and in the post-natal period, both critical periods for dental formation and development.

Keywords: dental dystrophy, fluorosis, dental fusion, childhood caries, post-natal period.

Introduction

Pediatric Dentistry offers a completely different approach compared to that of adults especially in terms of patient cooperation, problems with growth and development and problems related to dental restoration in the context of a developing dentition. [1]

Tooth formation process begins in the prenatal period (in the 5th week by initiating dental lamina formation) and ends in the postnatal one, with the apical development of the last erupted tooth. Any time during the dental development process a number of extrinsic and intrinsic factors can interfere, that can disrupt the physiological process of odontogenesis. The intensity or nature of the disturbance depends on: the age at which the factor interfered, its duration of action and intensity, thus the dystrophic lesion may be lighter or more severe [2]. If the etiological factor acts for a prolonged period, the lesion will be more extended in surface and in depth. If it acts brutally, but for a shorter period, the lesion will not be extended in surface but only in depth. Among the clinical manifestations of dental dystrophies, we underline: the aesthetic disorders (anterior positioning), change in the position of the adjacent teeth (rotations, crowding) and nerve disorders like neuralgia or cystic degeneration (formation of tumours) [3].

Primary or secondary dental dystrophies are commonly found in pedodontic practice, therefore periodic clinical examinations are needed starting with a young age which offers the possibility of an early diagnosis and also a greater variety of therapeutic possibilities with favourable prognosis and minimal impact on permanent dentition.

Material and methods

In order to determine the prevalence of dental dystrophies among school children and pre-schoolers, a group of subjects was established from two primary and preschool education establishments from Târgu-Mureş, with ages between 3 and 11 years. The written consent from the management of the learning

units and the parents of the subjects, was obtained for this study.

A total of 131 children were examined, of which 68 girls and 63 boys. Simultaneously, 150 questionnaires were distributed to the parents of the subjects included in the study, of which 106 responded. The study was carried out in two stages: in the first stage, the clinical examination of selected subjects was performed and in the second stage a questionnaire was completed by the carriers of the children included in the study.

The clinical examination was performed in the medical offices of the educational institutions and at the Pediatric Dentistry Department from Faculty of Dental Medicine, UMFST under proper conditions, in natural light, without previous washing or drying of the teeth.

The clinical examination was performed using disposable gloves and dental instruments (probe, dental tweezers, mirror) when needed, special attention given to the morphology and affected dental structures.

The dental surfaces of the subjects selected for the study, were inspected through visual examination and those surfaces that were not intact and had structure changes were explored with a dental probe in order to detect the contour defects and their surface and depth expansion. After a brief diagnosis, the dystrophies determined clinically were arranged in a certain category of number, form, volume and structure.

The questionnaire had the purpose of detecting primary or secondary etiological factors that could have interfered with the process of dental development and determined the occurrence of tooth dystrophy.

The questionnaire chart included 5 clear, well-formulated questions and directly related to the objectives of the study regarding the age of the subjects, possible diseases and treatments of the mother during pregnancy, the natal and postnatal period.

For the analysis of the data obtained, elements of descriptive statistics were used, statistical analyses being carried out using Epi Info for Windows.

Results

The data obtained from this study were systematized in results obtained from the questionnaires and results obtained from the clinical exam.

The distribution of subjects by age categories was analysed initially, so the most representative group is that of subjects of 8 years (32% almost 1/3 of the total number of cases), followed by the age group of 9 years (29%), 10 years, 7 years, 11 years and 3 years with percentages of 15%, 11%, 8% and 5% respectively (figure1).

Results obtained from the clinical examination

Of the total of 131 subjects examined, 68 were female and 63 males, of whom 13% showed dental dystrophies (17 cases).

According to the data obtained it was observed that most cases of dental dystrophies are represented by dental fluorosis (4.58%), followed by severe early childhood caries S-ECC (3.81%). In equal percentages of 0.76% the presence of dyschromia, imperfect amelogenesis, MIH hypomineralization, dental fusion, macrodontia and hyperdontia was observed. (figure 2)

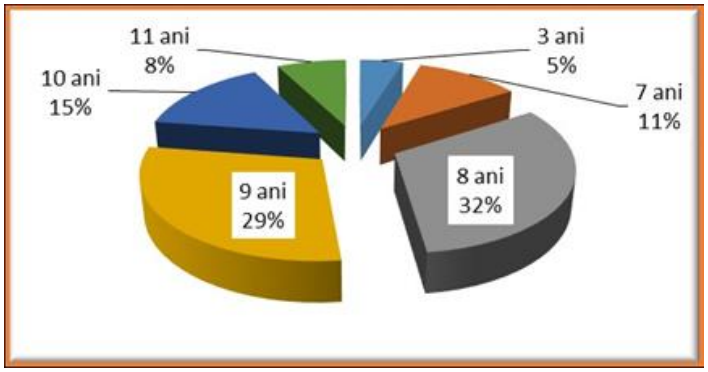

Figure 1. Distribution of cases depending on age

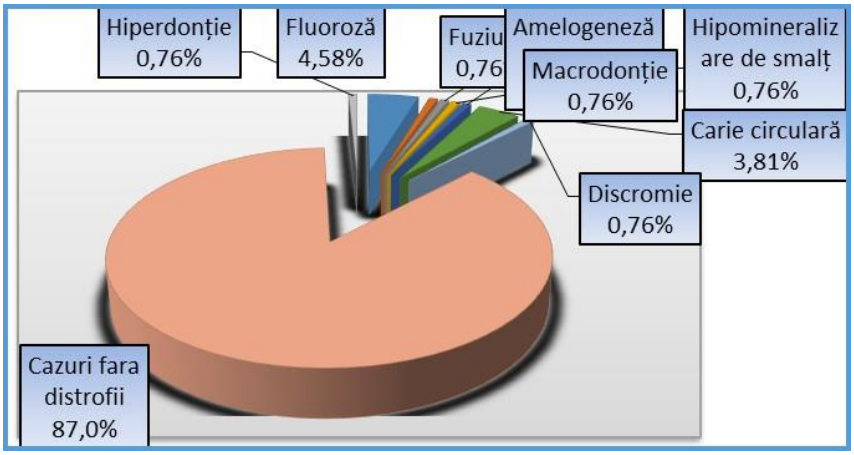

Figure 2. Distribution of cases depending on the clinical type of dystrophy

Of the total of dystrophies diagnosed on the study group, a higher degree of damage to the temporary teeth was observed compared with permanent teeth, which is due to the higher number of children with early mixed dentition respectively those aged 8 years compared to those with permanent dentition (Table 1).

Table 1.

NR.CRT.	DYSTROPHY	AFFECTED TEETH
1	Fluorosis	Temporary and permanent
2	Enamel hipomineralization	Permanent
3	Fusion	Temporary
4	Imperfect amelogenesis	Temporary
5	Circular caries	Temporary
6	Macrodontia	Permanent
7	Localized discoloration	Temporary
8	Hiperdontia	Permanent

Regarding the data analyzed after completion of the questionnaires, it was observed that, of the total of 106 mothers that completed the questionnaire only 2 presented, during pregnancy, severe conditions that needed a complex treatment that could have disturbed the dental development process. As far as the question about tetracycline is concerned, it wasn't given during pregnancy. At the question about accidents with dental trauma in children around the age of one, 3 mothers responded affirmatively.

The presence of dental issues (simple and complicated caries) in the family reported 25% positive answers and the other 75% were unsure which leads us to believe that the positive percent could be higher then indicated.

Discussions

The aim of the present study was to detect the prevalence of dental dystrophies in school children and preschoolers and to make a correlation between dental affections that appear during pregnancy and post pregnancy and possible dental dystrophies.

In the specialty literature there are a multitude of studies that make clear correlations between the dental dystrophies and the implication of the intrinsic and extrinsic factors that act during the period of dental development. In a study by Kanachanakamol V, Toungratanaphan S. and colab. for the study group were selected patients that suffered of acute and chronic malnutrition and it was observed that the prevalence of identified enamel defects was of 34,1% in boys and of 29,6% in girls. Also at least one tooth with enamel defects appeared in 31.9% of the children, enamel hypoplasia in 21,2% of teeth and 6,6% with enamel opacities. Prevalence of the defects according to sex was not observed. The study indicates that the

superior central incisives were more affected that the lateral incisives.[4]

In another study done in Scotland it was found that almost half of the examined children had enamel defects. The higher prevalence of fluorosis was found due to the high content of fluorine in drinking water. [5]

In the present study the most cases of dental dystrophies were also those of dental fluorosis, of which the most frequent causes are improper alimentation and medication (fluorine supplements) but also the use of tooth paste that is not proper for the child's age.

In a study done in 2002 the prevalence of dental anomalies of children with development disorders was evaluated. The study included 606 children and young adults with ages between 5 and 20 years (303 had development disorders and 303 represented the control group). Significant differences were found between the two groups regarding the prevalence of dental anomalies. Hypodontia was more frequent in children with development disorders (9,2%) then in the control group (2,0%). Diastema was also more frequent in children with development disorders then in the control group (20.8% and 11,6%). A significant association between hypodontia and microdontia was found in subjects from the control group. The study concludes that there is a significant correlation between the physical development disorders and dental anomalies.[6]

A study from Brazil showed that the prevalence of cases with enamel defects increases with the exposure to more fluorine. The prevalence of the defects in central incisives (the most affected od teeth) is between 19% and 45%.[7]

In a study published in Iran, in 2012 1224 patients were examined, of which 396 (32,4%) presented at least one dental anomaly, of which 38,1% were males and 61.9% were females. The number of cases with supernumerary teeth in boys were five times greater than in girls. The results of this study show a prevalence of position anomalies of 16.7%, followed by shape anomalies (taurodontia) 15,9%; size anomalies (microdontia) 3,8% and 1,1% number anomalies (supernumerary teeth).[8]

Another clinical study shows that the prevalence of hypodontia is the most spread in a group of subjects, 9,41%, followed by taurodontia 8,61%, microdontia 5,35% and diastema 4,46%. Hyperdontia represents 1,19% and macrodontia 0,5%.[9] Some studies suggested even a association between taurodontia and hypodontia.[10]

In China, the study of Li Y, Navia Y. M, Brian Y reports the following statistic data: 23.9% of the examined children presented enamel hypoplasia in permanent teeth, 1,6% presented opacity, and a percentage of 22,2% was represented by other enamel defects.[11]

In Bulgaria, the studies of Atanasov report a frequency of dental dysplasia of 11.4%.[12]

The present study presents a few deficiencies regarding the lack of complementary exams such as radiology (panoramic radiography) that are necessary in the complex diagnosis of dental anomalies, especially those of number (hypodontia and hiperdontia). Therefore, the number of number dental dystrophies (hypodontia) could be higher than those recorded for the study group.

A study published in 2014 indicates that there is an association between antineoplastic medication in children and dental dystrophies. Dental anomalies where observed as late effects of the antineoplastic therapy. Their prevalence and severity depend on the child's age, the type of chemotherapy agent used, the dose of radiation and the treated area. Also, the length and the aggressivity of the treatment are taken into account. The reported dystrophies are hipoplazia, microdontia, hypodontia and taurodontia. [13]

The distribution of dental anomalies was significantly greater in boys (2,9%0 than in girls (1,1%).[14]

Conclusions

Although the results and the information offered by this study are constrained because of the limited number of cases and the lack of complementary exams that would favor a complex diagnosis, it can be observed that there are correlations between the primary dental dystrophies present in the moment of birth and factors that intervened during pregnancy and in the post-natal period, both

critical periods for dental formation and development. Therefore, acute and chronic malnutrition, socio-economic conditions, the weight at birth, prematurity, the quantity of fluorine, antineoplastic therapy are in a significant direct correlation with the presence of dental dystrophies.

Conflict of interest: None to declare.

References

1. Cara M. Miyasaki C. Elemente clinice de stomatologie, Editura ALL EDUCATIONAL, 2001, 378.
2. Bica C. Pedodonţie. Diagnostic şi tratament (Paediatric Dentistry. Diagnosis and treatment). Editura University Press Tîrgu Mureş, 2013, ISBN 978-973-169-219-7
3. Pacurar M. Aspecte clinice si terapeutice ale anomaliilor dento-maxilare, Litografia U.M.F. Tg.Mures, 2002; 87-88.
4. Kanchanakamol V, Tuongratanaphan S. Prevalence of developmental enamel defects and dental caries in rural pre-school Thai children, Community Dental Health 1996;13(4): 23.
5. Fyffe HE, Deery C, Pitts NB. Developmental defects of enamel in regularly attending adolosecent dental patiens in Scotland: Prevalence and patient awareness, Community Dental Health 1996, 13(2): 76-80.
6. Jelka J, Sckrinjarie I, Glavina D. et al. The Prevalence of Oral and Dental Anomalies in Children with Developmental Disturbances, Acta Stomatol Croat, 2002;36(1):79 – 83.
7. Lunardelli SE, Peres MA. Prevalence and distribution of developmental enamel defects in the primary dentition of pre-school children, Pesqui Odontol Bras 2005; 19.
8. Somayeh N, Zahra D, Nastaran D. et al. Prevalence of Developmental and Acquired Dental Anomalies on Digital panoramic Radiography in Patients Attending the Dental Faculty of Rasht, Iran, Journal of Dentomaxillofacial Radiology, Pathology and Surgery 2012;1(2):24-32.
9. Hassan IG, Hani A, Nathanael OS. A clinical and radiographic survey of selected dental anomalies and conditions in a Saudi Arabian population, The saudi dental journal, 1999;11(1):.
10. Seow WK, Lai PW. Association of Taurodontism with hypodontia. A controlled study, Ped Dentistry 1989;11:214-219.
11. Li Y, Navia JM, Bian JY. Prevalence and distribution of developmental enamel defects in primary dentition of Chinese children 35 years old, Community Dent Oral Epidemiol 1995; 23(2): 72.
12. Atanassov N. Contribution to dental dysplasia classification, Acta Medica Bulgaria, Ix, I, 104 –107.
13. Kapdan A, Kustarci A, Buldur B. et al. Dental anomalies in the primary dentition of Turkish children, European Journal of Dentistry 2012; Vol.6: 178-183.
14. Haugland L, Storesund T, Vaska V.R. Prevalence of Dental Anomalies in Norwegian School Children, Open Journal of Stomatology, 2013;3:329-333.

Corresponding author:
Ana Petra Lazar
George Emil Palade University of Medicine, Pharmacy, Science and Technology of Tirgu Mures, 38 Gheorghe Marinescu street, Tirgu Mures, 540139, Romania
Email: analazar_mvfa@yahoo.com

Received: September 23, 2019 / Accepted: November 1, 2019