THE ADVENT OF DENTO-MAXILLARY ABNORMALITIES DUE TO EARLY TOOTH ERUPTION

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Abstract
At the body level the accelerated tooth eruption leads to a disproportion between the teeth and maxillofacial skeleton deficiencies timing of dentition and skeleton, two dental and skeletal systems are completely independent. Objectives: Analyze dental-alveolar abnormalities in subjects with and without malocclusions with different rate of tooth eruption. Methods: The study included 258 children, aged 9-12 years, male and female, 2010-2013.Results: At children with abnormal arch there is a significant disparity dental-maxillary demonstrated by assessing dental-alveolar indices. In subjects with early tooth eruption demonstrated a lack of space, those with malocclusions compared with those without abnormalities.

Key words: eruption, malocclusion, indices

INTRODUCTION

Tooth eruption is one of the most important indicators for assessing the maturity of the organism and can be used as a criterion for assessing the State of the organism morpho-functional. In multiple studies was highlighted the relationship between morphological and tooth eruption age (Graber, 2005; Kuswandari et al., 2006; Uysal et al., 2005) and between morphological, physiological ages and dental health (Zarnea, 1993; Rasheed 2009). Delaying bone age in relation to dental and skeletal age is causing development of dental-maxillary anomalies (Luca, 2003; Stanciu, 2012).

At the body level accelerated tooth eruption leads to a disproportion between the teeth and maxillofacial skeleton deficiencies timing of dentition and skeleton, the two systems are completely independent dental and bone (Hardy et al., 2012; Cattoni, Fernandes, 2004; Giussepina et al., 2013).
This prospective epidemiological study, examines the development of dental-maxillary anomalies at the dental eruption early subjects, by evaluating indexes of dental-alveolar and dental-dental subjects with or without dental-maxillary anomalies with different speeds of the dental eruption (Glăvan et al., 2008, Warren et al., 2003, Less et al., 2005).

MATERIALS AND METHODS

The study was conducted by prospective descriptive epidemiological investigation, which was based on clinical and laboratory data recorded in a selected population group in the general population.

The study took place at two middle schools and one high school in Oradea, 2010-2013.

The study included 258 children aged 9-12 years. Children were divided into groups of interval 1 academic year (classes V-VIII), male and female, as well as examination were divided into groups with and without abnormalities malocclusions (Figures 1 and 2).
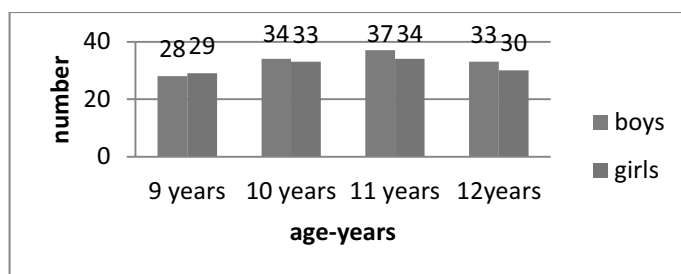

Fig.1. Batch distribution according to age and sex group

The study included 132 boys (51.16%) and 126 girls 49.84 percent). By age group the lot was distributed as follows: 9 years-children (57%), the 10-year 22,09-children (67 per cent), eleven 25,96-71 27,51%) children (12 years old children (63%) 24,41 Predominant age groups 10 and 11 years old, where numbers of children were higher in classes taken in the study.
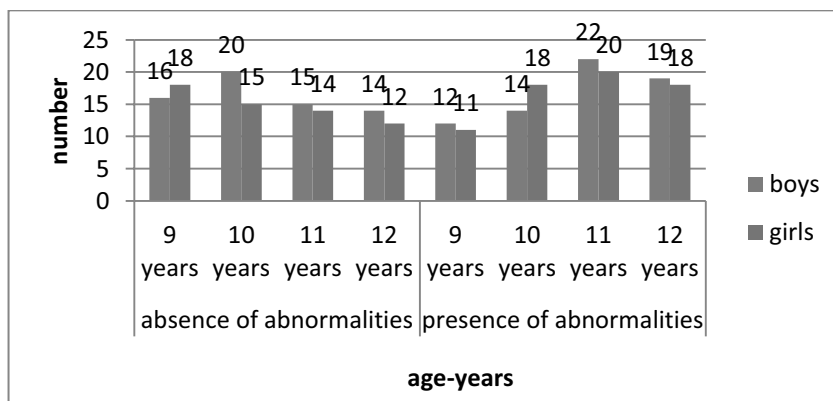

Fig.2. Classification of subjects by age, sex, absence / presence of abnormalities

All children were subjected to examination on: assessing dental-alveolar indices (distance inter premolar and inter molar intraoral), assessing

the amount of upper incisors mesiodistal size, inferior sagittal assessment prior upper arch segment (method Korkhauz).

The dental eruption was determined visually. Tooth eruption has been assessed at all permanent teeth, including those who were at the stage of eruption, which were classified as erupted.
The data was processed without dividing the dental eruption on the upper or lower maxillary. Also to all subjects regardless of age or sex, were calculated arithmetic average data relating to permanent teeth.
Statistically, the data were processed through the computerized descriptive analysis methods, variations and regression.

RESULTS AND DISSCUSIONS

Of the 258 children aged 9-12 years, 78 children (30.23) showed dental-maxillary abnormalities. The share of children with dental-maxillary abnormalities of children without dental-maxillary abnormality represents 43.33%. The share of the group in the dental-maxillary study is smaller than the data reported in the literature, where we find a frequency of 50-60% of abnormal dental eruptions through early dental-maxillary.
Distribution of the study group by gender revealed no significant discrepancies in existence malocclusions, retrieving malocclusions in 41.93% of boys and 44.82% of girls.
Accelerated somatic development in groups ages of 11 and 12 years old children is related to the existence of an increased number of malocclusions in these age groups, so we find malocclusions at 11 years old children group - 65.11% of children with malocclusions and at 12 years old children group - from 57.5% of children with malocclusions. In younger age groups the percentage of children with malocclusions of all children with malocclusions, is smaller: 9 years- 18.75%, in 10 years - 36.73% (Figure 3.)
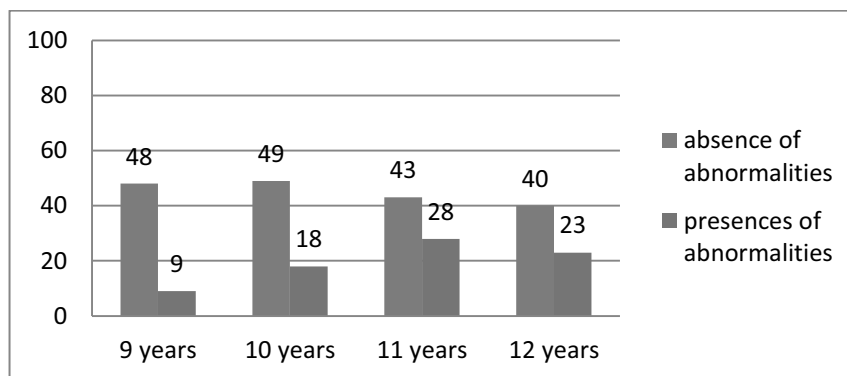

Fig.3. Batch distribution by age and presence / absence of dental-maxillary malocclusions.

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Having regard to the share of dental-maxillary abnormalities present in children aged 11 and 12 years old, in these age groups were the measurements have been analyzed a number of parameters for the analysis of subjects with early tooth eruption in batches of dental-maxillary abnormalities.

Upper inter molar distance: Measurements and analysis of the results of the study it was shown that the boys of 11 and 12 years, with dental-maxillary abnormalities, there is a decrease in the cross-sectional parameters and sagittal compared to boys with no abnormalities. So at age 11, upper inter premolar distance measured was 36.43 ± 2, 46 mm at the boys with abnormalities and those without abnormalities of 37.68 ± 2.43 mm. At 12 years old, the boys with the abnormalities was 36.23 ± 3, 12 mm, and to those without abnormality, inter premolar upper distance was 38,47 ± 5.14 mm (fig. 4).
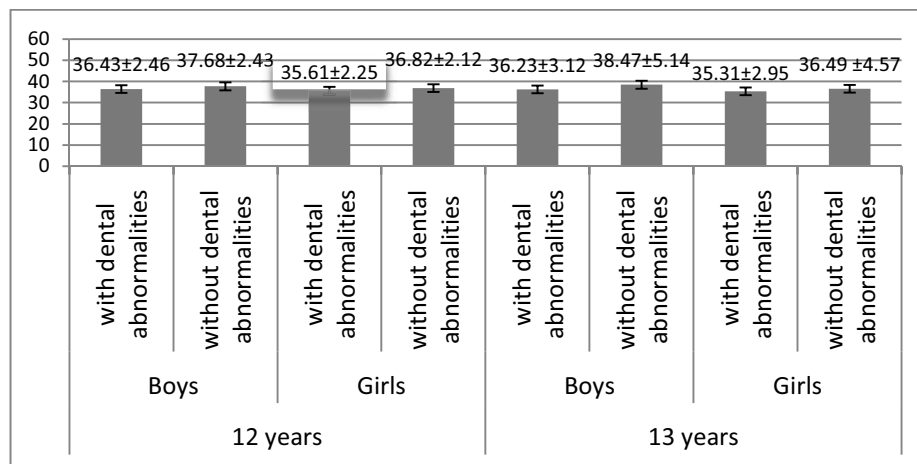

Fig. 4. Comparative values of the upper inter premolar distance (calculated in mm) of the erupted teeth by age (11 to 12 years), sex, with and without dental-maxillary malocclusions.

At the girls with the abnormalities, the study results analysis showed the same tendency to decrease the distance the upper inter premolar age group 11 years, and the 12 years. Inter premolar distance values peculiar to the girls age 11 years was 35.61 ± 2.25 mm, and 12 years ± 2, possibility of using 35.31. The girls did not show dental-maxillary abnormalities, inter premolar upper distance was 36.82 ± 2.12 mm to 11 years and 36.49 ± 4.57 mm at 12 years of age (Figure 6).

Lower intermolar distance. Another index of dental-alveolar review was inter- premolar lower distance. Both boys and girls, the age groups 11 and 12 years, has measured a distance inter premolar lower in those with dental-maxillary abnormalities to those without abnormality.

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At the 11 years old boys the lower inter premolar distance values in those with abnormalities was 34.78 ± 2.15mm and 12 years 34.83 ± 2.69mm, while in those without abnormalities was higher: 36.55 ± at 11 years group 1.72mm and 12 years group 36.51 ± 2.13mm.

The same downward trend of the lower inter premolar distance and dental abnormalities with both girls at age 11 and at age 12 can be noticed as far as concerned those who do not have dental abnormalities. To measure this parameter values were obtained of 35.76 ± 2.22 mm and 34.23mm ± 2,14 at girls with dental abnormalities for 11 years and 12 years respectively, 36,14±1,86 mm and 35.62 ± 1,53 mm to girls 11 and 12 years without dental abnormalities.

Superior inter molar distance. Comparative values of superior intermolar distance to the study group of boys aged 11 and 12 years with abnormalities also showed a significant difference. The boys with dental-maxillary abnormalities, at 11 years old, to measure the distance of the upper intermolare was noticed a value of 45.26 ± 3.21 mm, while to those without abnormalities was noticed a value of 47.93 ± 3.56 mm. At 12 years old the boys the IS values were 45.11 ± 2.86 mm, in case of those with abnormalities and to those without abnormality 48.21 ± 4.12 mm (Figure 5).
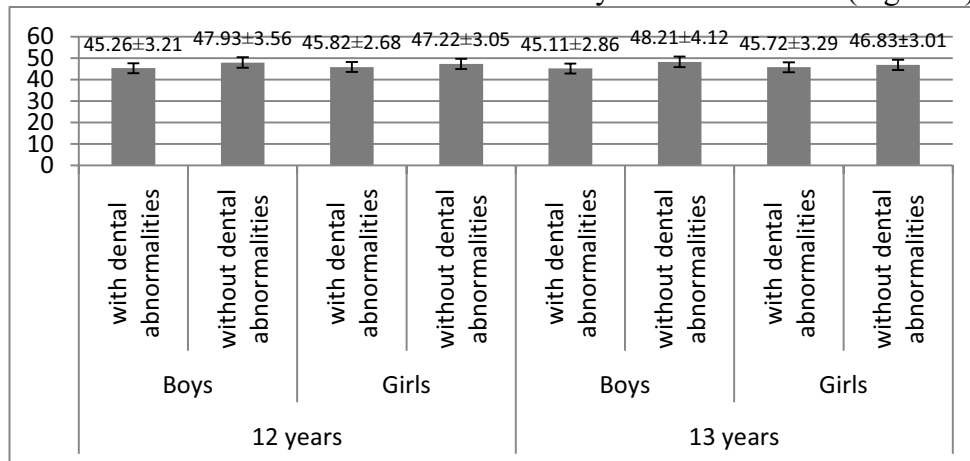

Fig. 5 Comparative values of superior inter molar distance (expressed in mm) of the erupted teeth by age (11 to 12 years), sex, with and without dental-maxillary malocclusions.

The superior inter molar distance at girls is lower, at 11 years and 12 years for those with dental-maxillary malocclusions, values are similar to those obtained in the group of boys. In girls of 11 years with abnormalities, the measured values were 45.82 ± 2.68mm and at 12 years 45.72 ± 3.29mm. The girls with no abnormalities, the upper inter molar distance measured at 11 years was 47.22 ± 3,05mm and 46.83 ± 3,01mm at 12 years (Figure 5).

Lower intermolar distance. The same downward trend of the lower inter premolar distance and dental abnormalities with both girls at age 11

and at age 12 can be noticed as far as concerned those who do not have dental abnormalities. At the boys with abnormalities, at 11 years the measured lower inter molar distance was 47.23 ± 3.11mm and at those without abnormalities of 48.56 ± 3.42mm. At 12 years, the values obtained were 47.89 ± 2,84mm for those with abnormalities and 48.92 ± 3.47mm for boys without abnormalities. The girls aged 11 and 12 years without any abnormalities also was found the same trend as in the group of boys of 11 to 12 years (11 years in girls with abnormalities 47.57 ± 2.73mm, and for those without abnormalities 48 49 ± 3.12mm and for 12 years old girls with abnormalities 47.82 ± 3.15mm and for those without abnormalities 47.92 ± 3.49mm).

The length of the anterior segment of the upper dental arch
Index anterior segment of the upper dental arch demonstrated a slightly enlarged slightly, both boys and girls in both age groups.

In this study group, the boys with malocclusions was established to increase the length of the anterior segment of the upper dental arch at 11 and 12 years and 17.73 ± 1.06mm, 17.65 ± 0.85mm compared to the boys with abnormalities at 11 years 17.59 ± 0.96mm and at 12 years 17.66 ± 0.98mm. Girls aged 11 or 12 years with abnormalities the results of the study showed the same slight increase in the length of the anterior segment of the upper dental arch - 17.23 ± 11 years and 12 years 0.99mm 17.42 ± 0.97mm. The girls without abnormalities these values were 17.19 ± 1.01mm at 11 years and 16.94 ± 1.0 mm.

Mesiodistal dimensions of the upper incisors. The upper arch was established to increase the amount mesiodistal the upper incisors in subjects with malocclusions. So the boys from 11 to 12 years, with abnormal values mesiodistal size of upper incisors were higher 3.07 ± 0.16mm, 3.05 ± 0.18mm respectively, and in those without abnormalities - 11 years - with 2.93 ± 0.11 mm and 2.91 ± 0.12mM at 12 years.

Analysis of results from the study of abnormalities in girls aged 11 to 12 years showed the same trend of increasing the amount of upper mesiodistal incisors - 11 years 2.92 ± 0.19mm and 3.88 ± 0.15 mm at 12 years. Girls aged 11 to 12 years without abnormalities also found the same trend as in the group of boys aged 11 and 12 years, respectively 2.18 ± 0.15 mm at 11, 3.11 ± 0.13 mm at 12 years. It can be observed an increasing trend more pronounced for girls compared to boys with dental abnormalities at the same age group.

In 2011, Lakshmappa A. shows that girls have a rash earlier than boys, mandibular teeth erupt earlier than the maxillary, in both sexes, and arcade on the right and left symmetrical eruption occurs. Also, Bruna M. del Cojo (2013) found no significant differences between the two arcade and just found that erupt before the lower arch top and the eruption is early in

girls than in boys. Analysis eruption of permanent teeth is very important in orthodontic treatment planning.

Another study by Cocârlă demonstrates an eruption earlier at girls than at boys, earlier in urban than rural areas (Cocârlă, 2000).
Normally the ratio between the size of the teeth and dental-alveolar arches size should be proportionate, so teeth can erupt and fall smoothly. In the mixed dentition, two skeletal disharmony and dental disharmony manifests as maxillary, most often crowding, over 70% (Cocârlă, 1995; Hassan, Akb, 2007).

The lateral region by early eruption of premolars, second premolars especially, dental crowding may occur. In a study we have obtained lower values both in the arcades and inter molar or inter premolar area.
We noticed an earlier eruption at girls than at boys, which corresponds with the literature (Cocârlă, 2000; Lakshmappa et al., 2011). Most of the dental-maxillary teeth are the result of premature eruption, occupying successional abnormal arch position, due to insufficient space for classification proper (Fratu, 2001; Shahraki et al., 2012).

CONCLUSIONS

The decisive factor in the emergency of dental-maxillary abnormalities is disproportional between growth and development of maxillary dental-system triggered the development of accelerated somatic and accelerate the dental eruption. Somatic growth accelerated in age groups of 11 and 12 years is correlated with an increased number of dental-maxillary abnormalities to these age groups, so we find dental-maxillary abnormalities to 11 years- of 65.11 percent of children without dental-maxillary abnormalities, and 12 years- of 57.5% of children without dental-maxillary abnormalities.

At children with abnormalities there are a significant disproportional which do not correspond to conserved dental-maxillary proved by dental-alveolar evaluation. Subjects with early tooth eruption were shown a deficiency of blank space in patients with dental-maxillary abnormalities in relation to those without any abnormality.

Analyzing the dental-alveolar indices was obtained an early eruption at girls than at boys.

The upper/lower inter molar distance-is lower in those who present anomalies dental- maxillary in relation to those without abnormality.

There is an imbalance between alveolar arch dimensions and perimeter dental coronary appreciated by increasing the size mesiodistal tooth eruption in children with early dental malocclusions compared with those without abnormalities.

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