

## COMPARATIVE STUDY ON DENTAL SIZE ANOMALIES AT CHILDREN WITH DOWN SYNDROME AND WITHOUT THIS DISEASE

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### **Abstract**

*By the complications that generates, the permanent dentition abnormalities are a major threat to the physical, psychosocial and emotional development of the child. These abnormalities can affect individual physiognomy, and other functions of the maxillary. The objectives of this study was to identify and to compare the abnormalities size of the permanent dentition at both: children from schools (in the Bihor County) and children with Down syndrome. The survey was conducted to identify the size of dental abnormalities. Two groups of children were implied, first group included 566 children from schools, and the second group - consisting of 123 children - with Down syndrome.*

*Results showed that dental abnormalities size had a prevalence of 4.77% among children. In the case of children with Down syndrome, abnormal tooth size showed a prevalence of 27.64%.*

*It is obvious that the risk of abnormalities of the size in permanent dentition is greatly increased at children with Down syndrome compared to children belonging to the population without this pathology.*

**Key words:** children, abnormalities, microdontia, macrodontia

### **INTRODUCTION**

Abnormalities of the permanent dentition is an important chapter, with great practical relevance in pediatric dentistry. The frequency of the phenomenon suggest that these abnormalities correspond to some universally recognized public health problems.

This pathology has a wide spectrum of clinical manifestations. By complications that it generates, is a major threat to the physical, psychosocial and emotional development of the child (Țeț, 2014).

Dental anomalies occur at different stages of morphological differentiation. The genetic factors are the first incriminated, alongside etiological elements of pre- and postnatal period during tooth morphogenesis. As result, all these factors may lead to anomalies of number, size, shape and structure of dentition (Gupta et al., 2012; Baydaş et al., 2005; Pemberton et al., 2005; Cobourne et al., 2013). Permanent teeth with smaller dimensions than normal (Rusu et al., 2008; Koch et al., 2006; Severin et al., 1998; Ionescu et al., 2005) are observed immediately after

they erupt at the level of arcades or can be identified using dental radiographies.

Microdontia can also be found in some genetic syndromes: Down syndrome, ectodermal anhidrotic dysplasia, Ellis van Creveld Syndrome, Goldenhar syndrome (Rusu et al., 2008; Severin et al., 1998; Jones et al., 1997; Pasnicu et al., 2006).

In localized microdontia, the abnormality affects a single tooth: usually the maxillary lateral incisors and the third molar (Rusu et al., 2008), the central incisor or the lateral mandibular one, and sometimes supernumeraries teeth are involved (Severin et al., 1998; Farhat et al., 2011; Sharma et al., 2001).

The purpose of this study is to identify and compare the size anomalies of the permanent dentition at children from the schools in Bihor County, as well as at children with Down syndrome.

## **MATERIAL AND METHOD**

The study was conducted in the 2008-2014 period. Casuistry is represented by patients divided in two groups: first group containing 566 children and adolescents, aged between 12-18 years; second group - of 123 children - with Down syndrome, which were registered within the Department of Genetics, at the Municipal Hospital *Gavril Curteanu*, Oradea (Țenț, 2014).

In first group, girls were predominant (53.00%), the ratio girls / boys being 1.1:1. After performing the anamnesis for each child, it was proceeded to the extraoral examination, followed by the intraoral examination, in a private dental cabinet, using specific instruments.

There were taken into account all the teeth present in the oral cavity, with all the coronary visible surfaces. The diagnosis was established by inspection, comparing the tooth with his counterpart from the opposite hemiarcade.

To complete intraoral clinical examination, we resorted paraclinical examination which consisted of panoramic radiographies. Photographic examination was used.

For statistical interpretation, the EPIINFO program of the CDC (Center of Disease Control and Prevention) from Atlanta, adapted at processing of medical statistics, was used.

In this study, we used the concept of relative risk (RR) - representing phenomena studied in terms of exposure or unexposure to the risk factors and the concept of attributable risk (AR) - expressing the difference between the incidence of a phenomenon within a populations exposed to a risk factor, compared to the value of this indicator at the non exposed population.

## RESULTS AND DISCUSSION

In the first group, dental size abnormalities were present in 27 cases, representing a prevalence of 4.77%, of which 15 cases (2.65%) had a single abnormality, and 12 cases (2.12%) - in combination with other anomalies (table 1).

Table 1.

The prevalence of dental size abnormalities						
Type of abnormalities	Girls		Boys		Total	
	Patients					
	No.	%	No.	%	No.	%
Localized macrodontia	3	1.00	3	1.13	6	1.06
Localized microdontia	9	3.00	7	2.63	16	2.83
Generalized microdontia	3	1.00	2	0.75	5	0.88
Total	15	5.00	12	4.51	27	4.77

The localized form of macrodontia was present at 6 patients (1.06%). 16 patients had localized microdontia (2.83%). Of these, 11 had localized microdontia of the lateral maxillary incisors preserving the coronary shape, and 5 had localized microdontia with cuneiform teeth (the involved teeth being the maxillary lateral incisors and the mandibular incisors).

In the case of the 11 patients with lateral maxillary incisors microdontia: 7 had affected both lateral incisors, 2 had interested right incisor, 2 on the left. In the case of the 5 patients with cuneiform teeth: 2 of them were with both lateral maxillary incisors interested, 1 case with the damage of the twelfth tooth and 1 case with the damage of the twenty-second tooth. One of the patients presents the thirty-first and thirty-second tooth cuneiform.

Generalized microdontia was recorded at 5 patients (0.88%).

Abnormalities of size had a prevalence of 5% for girls, insignificantly higher than for boys (4.51%) ( $p=0.351$ ).

Localized macrodontia had a prevalence of 1% for girls and 1.13% for boys. Localized microdontia had a prevalence of 3% for girls and 2.63% for boys. Generalized microdontia was of 1%, respectively 0.75% (figure 1).

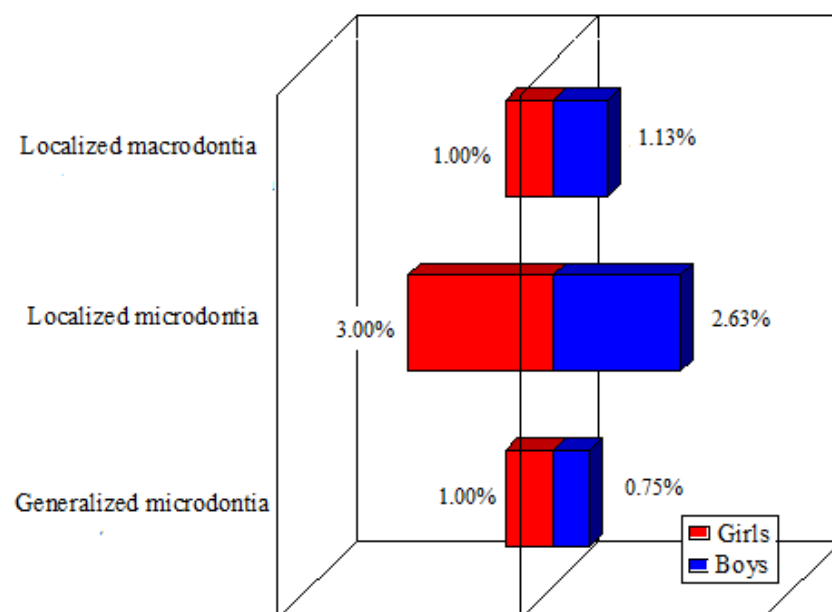


Fig. 1. The prevalence of the dental size abnormalities based on gender

At children with Down syndrome, dental size abnormalities were identified at 34 children, with a prevalence of 27.64%. It were represented by the localized microdontia, with a prevalence of 4.07% (5 patients) and by generalized microdontia retrieved at 29 patients (23.58%).

Localized macrodontia was registered only in students. The prevalence of the localized macrodontia was of 1.06%. Specialized studies reported values of the prevalence between 1-3.1% (Severin et al., 1998; Tofangchiha et al., 2013; Vibbute et al., 2013). In this study, the macrodont teeth were the central maxillary incisors, the anomaly being also recorded at the second mandibular premolars after some authors (Brook, 2009; Groper, 1987; Fuenes et al., 2011).

The distribution by gender indicates a slightly higher prevalence in boys compared to the girls (1.13 vs. 1%), in agreement with other authors (Severin et al., 1998; Tofangchiha et al., 2013; Vibbute et al., 2013).

There were no cases of macrodontia in the group of children with Down syndrome.

The prevalence of microdontia is higher at subjects with Down syndrome, compared with the same abnormality of the first constituted group (27.64% vs 3.61%). Other studies also report the presence of microdontia at patients with Down syndrome, with a prevalence of 35-55% (Rusu et al., 2008; Severin et al., 1998; De Faria et al., 2013).

The risk of localized microdontia is 1.4 times higher at children with Down syndrome (RR=1.438, RA=0.012)

## CONCLUSIONS

In our study, the prevalence of size abnormalities in the permanent dentition of the children with Down syndrome recorded the value 27.64%.

The prevalence of size abnormalities in the permanent dentition of the children without this pathology is 4.77%.

The children with Down syndrome present a risk of generalized microdontia of over 26 times higher than the same risk at general population (RR=26.689, RA=0.227).

Also, the risk of size abnormalities at children with Down syndrome is 5.8 times higher than the same risk at general population (RR=5.795, RA=0.229).

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