ORIGINAL ARTICLE

PREVALENCE OF MALOCCLUSIONS AMONG CHILDREN WITH SPECIAL NEEDS

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Abstract: The etiology of malocclusions is multifactorial, with general somatic conditions, hereditary factors and the presence of behavioral disorders acting on their development and formation. Children with special needs develop vicious oral habits, which adversely affect the period of growth and development of both the jaws and the facial skeleton, as well as the soft tissues. Objective. The purpose of this study is to determine the prevalence of malocclusions in a group of children with special needs from Craiova, Romania. Materials and method. The study group comprised 286 special needs children, who were enrolled in a school from Craiova, Romania. Results. Following data collection and centralization, 56.29% of the subjects included in the study presented malocclusions, with female students being more affected than male students. Conclusions. Malocclusions among children with special needs have a higher prevalence. Thus, such patients require special oral care measures due to poor motor coordination, limited learning abilities and sensory problems.

Keywords: children with special needs, malocclusion, prevalence.

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1. Introduction

Any deviation from the range of what is considered normal in terms of tooth alignment and relationship during dental occlusion is referred to as malocclusion [1,2]. The World Health Organization (WHO) ranks malocclusions as the third most serious oral health condition, behind dental caries and periodontal disease [3-5]. Mastication, phonation and deglutition are among the dento-maxillary apparatus' functions that are disrupted [6-9].

Children with special needs present difficulties in communication and social interaction, accompanied by repetitive and restrictive behavior. These impediments lead to the impossibility of achieving adequate oral hygiene. Disabilities represent an obstacle for the dentist and not only by limiting the possibilities of cooperation [10]. These children also require special dental treatments due to their systemic conditions. Poor oral health, associated with an increased affinity for sweets, increase the risk of developing dental caries and periodontal diseases [11].

Malocclusions have a complex etiopathogenesis that involves local, loco-regional and general causes [12]. Children with special problems develop vicious oral habits, such as bruxism and Pica, which adversely affect the period of growth and development the craniofacial structures. Vicious habits are considered pathological and are determined by certain unconditional actions, which are closely related to the child's psychological development. Thus, malocclusions, even minor ones, are significant elements in many syndromes. These manifestations produce changes in conformation and relationships at the level of the various components of the dento-maxillary apparatus, having negative consequences on its functions and oral hygiene. Alteration of mastication leads to the installation of gastrointestinal disturbances, such as gastro-esophageal reflux, constipation and abdominal pain. The presence of such a condition can be an indicator of the syndromic diagnosis, having clinical variations from one case to another [10-13].

In the case of malocclusions, the periodontal damage occurs later, but is much more severe. Therefore, the histopathological studies revealed the presence of gingival hypertrophy, with a tendency towards acanthosis. Extensive and deep epithelial erosions were also observed, often affecting the basement membrane and thus putting the gingival chorion in contact with the external environment, via the oral cavity. In the chorion, a chronic inflammatory infiltrate is found, rich in lymphocytes, plasma cells and macrophages [14].

The study aimed to find out the prevalence of malocclusions among a group of schoolchildren with special needs from Craiova, Romania.

2. Materials and method

The Ethics Committee of the University of Medicine and Pharmacy of Craiova, Romania approved the current study (approval reference no. 56/29.01.2024), in compliance with the ethical guidelines for research

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involving human subjects. All the legal guardians of the children participating in the study gave informed consent.

We studied the prevalence of malocclusions in a group of special needs children from Craiova, Romania, using cross-sectional epidemiological methods.

The research was conducted in collaboration with a school from Craiova, Romania and the Dolj County School Inspectorate.

The following requirements had to be met for the children to be included in our study: they must be enrolled in the designated school, have special needs, have their legal guardians' informed consent obtained, have to be cooperative, have verbally consent to being examined and their participation must be voluntarily. Children without special needs, children who didn't have their legal guardians' informed consent and uncooperative children were all excluded from our study.

Following the application of the aforementioned criteria, 286 students were included in the study group. For the classification of malocclusions, we chose the one stated by Edward Angle in 1899, as it is the most used globally even today. He based his classification on the relative position of the permanent upper first molars. He believed that the mesio-distal dental base relationship could be assessed reliably from first permanent molars relationship, as their position remained constant following eruption. In case where the first molars were missing, canine relationship is used. Angle class I, Angle class II (with divisions 1 and 2) and Angle class III (with divisions 1 and 2) are the three classes of malocclusions that are part of this classification [15,16].

Microsoft Excel 365 was the software used to process and record the data that came from the clinical evaluation. Therefore, sample graphs were used to represent the study's results. Numerical values and percentages were used to express categorical variables.

3. Results

Of the 286 children participating in the study, 161 presented malocclusions, so a prevalence of 56.29%. Among the 286 children participating in our study, 98 girls and 63 boys were diagnosed with malocclusions (so a prevalence of 34.27% and 22.03% respectively).

Among the 98 girls with malocclusions we identified:

- 76 girls with Angle class I malocclusions, so a prevalence of 26.57%;
- 16 girls with Angle class II division 1 malocclusions, so a prevalence of 5.59%;
- 5 girls with Angle class II division 2 malocclusions, so a prevalence of 1.75%;
- 1 girl with Angle class III division 2 malocclusion, so a prevalence of 0.35%.

Among the 63 boys with malocclusions we identified:

- 49 boys with Angle class I malocclusions, so a prevalence of 17.13%%;
- 12 boys with Angle class II division 1 malocclusions, so a prevalence of 4.20%;
- 2 boys with class II/2 Angle malocclusions, so a prevalence of 0.70%.

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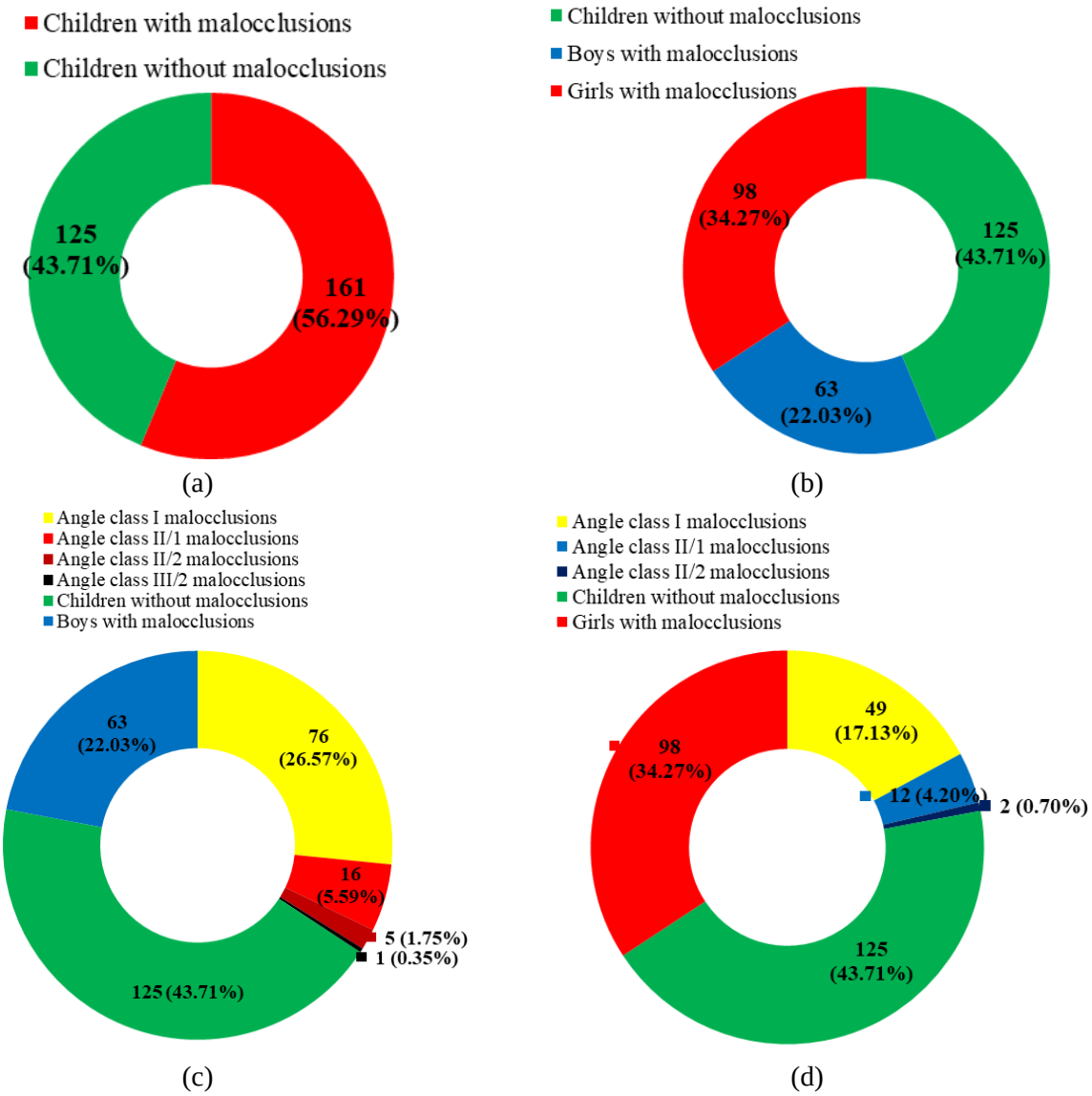

Figure 1. Figure description. (a) Statistics of children with malocclusions; (b) Statistics of children with malocclusions according to gender; (c) Statistics on types of malocclusions according to Angle's classification in female gender; (d) Statistics on types of malocclusions according to Angle's classification in male gender.

4. Discussions

Petrescu SMS et al. conducted a recent epidemiological study in the same county, but on schoolchildren without disabilities. The results of this research showed a prevalence of malocclusions of 43.98% [17].

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Following another research also carried out in southwestern Romania (Gorj county), a prevalence of malocclusions of 35.35% was obtained [4]. In Olt county, which is situated also in southwestern Romania, a comparable epidemiological study discovered a prevalence of malocclusions of 40.47% [5]. After conducting another study in southwestern Romania (Vâlcea county), a prevalence of malocclusions of 28.76% was obtained [18]. All these previously mentioned studies undertaken in the same geographical region of Romania demonstrated a much lower prevalence of malocclusions among schoolchildren without disabilities compared to the results of our current study conducted on children with special needs.

Between 2012 and 2014, Poștaru C et al. conducted an epidemiological study on children with special needs (physically/motor, visually and auditory impairments) from different temporary placement centers, auxiliary schools and special gymnasiums from Hîncești, Soroca and Orhei districts, Republic of Moldova. The results of this research showed a prevalence of malocclusions of 67.5% [19].

In another epidemiological study, the researchers used the Dental Aesthetic Index (DAI) to determine the association of malocclusions with dental caries and to assess the prevalence of malocclusion among disabled adolescents from Chennai, Tamil Nadu, India. 50.6% of the participants had DAI scores of 36 and above, which indicated handicapping malocclusions requiring mandatory orthodontic treatment. However, there was no correlation between the severity of malocclusions and dental caries among the disabled adolescents from the study group [20].

A research was conducted by the Department of Paediatric Neurology from ,,Sf. Maria" Iași Emergency Hospital for Children on a group of children aged between 2 and 18 years old, diagnosed with various forms of cerebral palsy. Malocclusions were observed at 55.04% children with cerebral palsy [21].

The prevalence of malocclusions among children with special needs was found to be high in all the aforementioned studies and including in our current study (>50%).

5. Conclusions

The research showed that over half of the children included in the study group had malocclusions, which emphasizes the need for both preventative and specialist care.

The problem of dento-maxillary pathology in children with special needs is a major concern of modern dentistry. Therefore, it must be considered that, in the treatment of such patients, a series of aspects determined by both the morpho-functional development and the age-specific psychological state arise. The priority direction of modern medicine is represented by prophylactic methods, which provide for the determination and reduction, in all ways, of risks to oral health, especially of children with special needs.

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Author contributions

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Conflict of interest statement

The authors declare no conflicts of interest concerning this study.

Data availability statement

Will be provided on request.

Ethics statement

Approved by the Scientific Ethics and Deontology Commission of UMF Craiova (no. 56/29.01.2024).

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