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IMPACT OF INCORRECT ORAL HABITS ON MASTICATION ANOMALIES IN CHILDREN AND ADOLESCENTS – LITERATURE REVIEW AND OWN OBSERVATIONS

WPŁYW NIEPRAWIDŁOWYCH NAWYKÓW U DZIECI I MŁODZIEŻY NA POWSTAWANIE WAD NARZĄDU ŻUCIA – PRZEGLĄD PIŚMIENNICTWA I OBSERWACJE WŁASNE

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Abstract
Incorrect oral habits, such as dysfunctions and parafunctions, may lead to the development of mastication anomalies. The present analysis covered 15 publications from the years 2005-2015, examining the impact of harmful oral habits and dysfunctions on the development of mastication anomalies. Based on the literature review, it can be stated that malocclusion is common in populations worldwide, irrespective of the racial background. The malocclusion severity is related to harmful habits and dysfunctions co-occurring during individual development. The prevalence of malocclusion and dental anomalies related to parafunctions and dysfunctions has been observed to have a tendency to grow.

Key words: incorrect oral habits, dysfunctions, parafunctions, malocclusion, malocclusion prevention

Streszczenie
Obecność nieprawidłowych nawyków: dysfunkcji i parafunkcji może doprowadzić do powstania wad narządu żucia. Analizie poddano 15 publikacji z okresu 2005-2015 autorzy badali wpływ szkodliwych nawyków i dysfunkcji na powstawanie wad narządu żucia. Na podstawie przeprowadzonego przeglądu piśmiennictwa można stwierdzić, że występowanie wad zgryzu jest powszechne w populacjach na świecie, niezależne od rasy. Nasilenie wad zgryzu jest związane z istniejącymi w czasie rozwoju osobniczego szkodliwymi nawykami i dysfunkcjami. Obserwowana jest tendencja wzrostowa w częstości występowania wad zgryzu oraz nieprawidłowości zębowych pod wpływem parafunkcji i dysfunkcji.

Słowa kluczowe: nieprawidłowe nawyki, dysfuncje, parafunkcje, wady zgryzu, profilaktyka wad zgryzu

INTRODUCTION

The masticatory apparatus, also called the stomatognathic system, is a muscular and skeletal system of the head, neck and pectoral girdle, characterised by close functional and morphological connections. The morphological elements of the system comprise: the teeth, periodontium, alveolar processes, bones of the craniofacial area, temporomandibular joints, salivary glands, oral mucosa, the muscular and nervous system and the system of vascular and lymphatic vessels. The stomatognathic system is involved in the following functions: mastication, preliminary digestion processes, deglutition, breathing, speech articulation and facial expressions conveyed by means of the facial muscles. The development of the masticatory apparatus is connected with the growth of the craniofacial area. An incorrect function or morphology of the masticatory apparatus may lead to anomalies in the craniofacial area, reversible at first thanks to well-conducted prophylaxis. In the case of more advanced and persistent abnormalities, orthodontic therapy is recommended.

The objective of this work is to demonstrate the role of harmful oral habits in the development of mastication anomalies.

MATERIAL AND METHODS

The analysis covered the data from medical databases in Poland and abroad, selected from articles whose authors studied the impact of bad oral habits (dysfunctions and parafunctions) on the development of mastication anomalies. For the purposes of this study, 15 publications from the years 2005-2015 have been selected.

RESULTS AND DISCUSSION

Harmful oral habits, which may lead to the development of malocclusion during the growth of the masticatory apparatus, include dysfunctions (incorrect physiological functions, e.g. incorrect swallowing, incorrect articulation and mastication, habitual mouth breathing) and parafunctions (stereotypical activities performed unknowingly, e.g. sucking on a pacifier, nail biting, bruxism). Studies on the connection between malocclusion and speech dysfunction have shown that there is an important and complex relation between the two. Interdisciplinary orthodontic and speech therapy is recommended in the treatment of speech dysfunctions and malocclusion, whereas in the case of subjects with skeletal anomalies in the craniofacial area, orthodontic and speech therapy needs to be complemented with orthognathic procedures. Malocclusion most often associated with speech defects is Angle class II and III, teeth spacing and anterior open bite – the latter being the most severe type. Among numerous dysfunctions of the masticatory apparatus, incorrect swallowing has been attributed the highest importance in terms of etiopathogenesis of malocclusion and speech disorders.

Bruxism (habitual, involuntary teeth clenching and grinding) is one of the most damaging parafunctions for the masticatory apparatus, as it is auto destructive. The etiopathogenesis of bruxism is complex and personality-related: individual and psycho-emotional factors are of great importance here. Bruxism has a negative impact on the masticatory apparatus both during and after the growth stage [3, 4].

Digit sucking, i.e. sucking of the thumb/finger(s), is also a common parafunction in small children. Observations - both own and conducted by numerous authors - indicate that a long-lasting sucking habit may lead to malocclusion and anomalies in mastication, speech and facial aesthetics. A severe sucking habit has an adverse effect on the forming of occlusion and may result in open bite, distocclusion, protrusion of the upper incisors, retrusion of the lower incisors, increased overjet and class III malocclusion if the finger touches the lower teeth [5, 6, 7]. The duration of any parafunction or dysfunction also matters. Habits observed after the 48th month of life almost always lead to malocclusion [6]. Hence the important role of the paediatrician, next to the dentist, or orthodontist in the early detection of incorrect oral habits, since paediatricians see the child most often during the development of deciduous dentition.

Research was conducted among pre-school children in the city of Wrocław on bad oral habits and dysfunctions. Incorrect habits were observed in 50.8% of the subjects, evenly distributed among girls and boys. The most common parafunctions included digit sucking and nail biting, and the most frequent dysfunctions were persistent infantile type of swallowing and mouth breathing. Malocclusion was identified in 43.4% subjects. The prevalence of malocclusion in children with parafunctions and/or dysfunctions was higher than in children without such disorders. A statistically significant dependence was found between the open bite and the habit of digit or pacifier sucking, as well as between the open bite and persistent infantile type of swallowing [8]. The prevalence of parafunctions was assessed, depending on the criteria applied, as 44% to 80% [9].

In Białystok studies were conducted among junior high school students aged 13-15 on the dependence between malocclusion and occlusal and non-occlusal parafunctions. Occlusal parafunctions (teeth clenching and/or grinding) were identified in 45.3% of the analysed subjects with malocclusion and in 41.8% of the subjects without occlusal anomalies. Such parafunctions were particularly related to distocclusion (23%), dental abnormalities (19.4%) and closed bite (16.6%). Non-occlusal parafunctions (habitual movements of the masticatory apparatus which do not involve the contact of the opposed teeth) were observed in 99.2% of the teenagers with malocclusion and in 98.5% of the subjects with correct occlusion. The most frequent parafunction was chewing gum [10, 11].

Digit or pacifier sucking, persistent infantile type of swallowing and mouth breathing are the most serious risk factors in the development of open bite in children with deciduous dentition. At the stage of mixed dentition (when permanent teeth start to erupt) risk factors behind open bite include: pacifier or lip sucking, mouth breathing and persistent infantile type of swallowing [12]. In 2014, a group of children aged 9-12 was studied in terms of parafunctions and their influence on malocclusion. Parafunctions were observed in 72% of the subjects, the most frequent ones being: biting of objects (61.1%), nail biting (52.8%), biting of the lower lip (33.3%), biting of the upper lip (25%), biting of the buccal mucosa (19.4%) and digit sucking (8.3%). Statistically significant dependence was found between

dental abnormalities and object or nail biting, as well as between a defect from the cross bite group and biting of buccal mucosa [13]. A long-term assessment of harmful oral habits acquired in childhood and leading to malocclusion was conducted in southern Brazil. The assessment involved 80 pairs of subjects (mother and child) who were observed from the beginning of the pregnancy until the child was 30 months old. The most common habit observed in the 12th, 18th and 30th month of life was bottle feeding (87.5%, 90% and 96.3% respectively), followed by pacifier sucking (42.5% in the 12th month of life and relatively lower i.e. 38.8% in the 18th and 30th month of life). Children with digit or pacifier sucking habits were more frequently found to have increased overjet, increased overbite or open bite [14].

In India epidemiological studies were carried out on the prevalence of bad oral habits leading to malocclusion. The studies covered 832 children aged 6-12. Bruxism was identified as the most common damaging habit (17.3%), followed by bottle feeding (10.1%), thumb sucking (8.7%) and nail biting (5.8%). As far as dysfunctions are concerned, persistent infantile type of swallowing and mouth breathing were detected to be the most frequent ones (4.9% and 4.3% respectively). Most often one or more than one damaging habit was observed (51.1%), whereas an isolated habit was identified in 18.7% cases. Digit sucking and bruxism were more often seen in younger children, whereas nail biting and mouth breathing was characteristic of older subjects. Parafunctions were demonstrated to have a direct influence on the quality of life and to be an adverse factor contributing to the development of malocclusion [15].

SUMMARY

Malocclusion is a common anomaly which affects patients irrespective of the racial background. Malocclusion severity is related to damaging habits co-occurring during individual development. It is important that during the clinical examination of children, paediatricians check not only for dental or occlusal anomalies, but also verify if the child has any incorrect oral habits. This is a vital issue, as the upward trend observed in the prevalence of malocclusion in children may be connected to parafunctions and dysfunctions.

Detection of incorrect oral habits in a child patient provides grounds for a paediatrician to refer such a patient to a specialist for orthodontic consultation.

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