

ORAL HEALTH AND DIETARY HABITS IN CHILDREN WITH AUTISM

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Abstract

The aim of the study is to assess both the intensity of dental caries and its relationship with eating habits in children with autism, as well as malocclusions in such children. The study includes 60 children with autism, aged 7 to 15 years and a control group of healthy children. Dental caries has been assessed using the D1MFT index, whereas diet has been evaluated using a food diary. The data have demonstrated that most children reported frequent intake of carbohydrate foods. The results have shown that their daily diet includes a number of high-risk foods responsible for the development of dental caries, such as junk foods. High values of the D1MFT index have been reported. A part of the children experience sensitivity to the consistency of food, its appearance, taste, and smell. Among the examined children, there is a predominance of children with ANGLE Class I – 57, both autistic and healthy. ANGLE Class II (distal occlusion) is observed in 50 of them. There are a few children with ANGLE Class III occlusion. High intensity of dental caries and unhealthy eating habits have been established in children with autism, and a mandatory control of the diet is therefore required.

Key words: oral health, dental caries, autism, diet, malocclusions

Introduction. Children with developmental disabilities have poorer oral health and greater treatment needs resulting from their disability, medical, economic, or social reasons compared to healthy children [1–3].

The American Academy of Pediatric Dentistry (AAPD) recognizes that individuals with special health needs may be at increased risk of developing dental caries, gingivitis, periodontitis, enamel hypoplasia, dental caries, dental developmental abnormalities, bruxism, and tooth fractures or trauma [4].

Autism is one of the most severe neuropsychiatric disorders in childhood. It is becoming the fastest-growing serious developmental disorder among individuals worldwide. Autism spectrum disorders are characterized by various behavioural manifestations and severity related to social communication and social interaction, as well as restricted, repetitive, and stereotypical patterns of behaviour [5,6]. It is regarded as a major health and educational problem, affecting many areas of daily living, including eating [7].

The aim of the study is to assess the oral health and peculiarities of the eating habits of children with autism.

Material and methods. The study includes 60 children with autism, aged 7 to 15 years and a control group of 60 healthy children. Their oral health has been assessed regarding dental caries incidence using the D1MFT index at an initial diagnostic threshold D1 corresponding to early carious lesions in the enamel, their orthodontic status, and peculiarities of their eating habits following the analysis of a food diary reflecting their diet within 3 days, as the dietary assessment applying a food diary is the most reliable tool for assessing their dietary intake.

Results. Table 1 shows the values of the D1MF index (T+t) of the studied children with autism, compared with those of healthy children from the control group.

The obtained results indicate that children with autism have a significantly lower number of teeth affected by caries compared to healthy children. Probably, the lower frequency of carious lesions in some children with autism results from limited consumption of low-molecular-weight carbohydrates. An interesting association has been established considering the generally lower value of the D1MFT index in autistic children compared to healthy children, and lower values of caries complications D4 have been found, though without a significant difference. There

T a b l e 1
Intensity of dental caries in children with autism and healthy children

D1MF (T+t)	Children with autism	Healthy children	t	p
D1 mean ± SD	4.23 ± 1.04	2.30 ± 0.63	2.61	<i>p</i> < 0.05
D2 mean ± SD	3.16 ± 2.67	4.96 ± 0.41	1.43	<i>p</i> < 0.05
D3 mean ± SD	2.29 ± 0.58	3.35 ± 0.72	0.48	<i>p</i> > 0.05
D4 mean ± SD	1.15 ± 0.25	2.92 ± 0.77	1.59	<i>p</i> > 0.05
M mean ± SD	1.75 ± 0.64	2.0 ± 0.64	2.52	<i>p</i> > 0.05
F mean ± SD	2.67 ± 0.64	4.0 ± 0.64	2.23	<i>p</i> < 0.05
D1MF(T+t) mean ± SD	6.88 ± 2.63	8.9 ± 1.38	1.16	<i>p</i> > 0.05

are also fewer reversible D2 lesions in autistic children, supported by a statistically significant difference.

At the same time, significantly more initial carious lesions in stage D1 have been found in these children compared to healthy ones. This interesting fact can be attributed to time. Since children do not take large amounts of carbohydrates in relation to the specificity of the disease early in their lives, the carious process develops more slowly, and the more advanced stages of carious lesions in stage D3 are relatively less common, even compared to healthy children.

As time progresses, the cariogenic condition develops and deepens. Obturated teeth have been found to be reasonably less common in children with autism compared to healthy individuals, although they generally have fewer carious lesions.

The results presented in Table 2 show that the intensity (frequency) of dental caries is high in children with autism with frequent carbohydrate intake, especially in between meals, resulting in an increased risk of developing caries in them. An analysis of the consistency of food consumed reveals unhealthy food preferences.

The results indicate that their daily diet includes many risky foods of the “junk food” type, which are highly sticky and have a high cariogenic potential: chocolate, candies, snickers, sweets, lollipops, ice cream, potato chips, etc. Too much added sugar in foods raises substantial concerns, as the risk of tooth decay will be high.

In the majority of children, a very worrying trend of frequent consumption of non-alcoholic carbonated and fruit beverages with added sugar has also been found. Due to their high sugar content, they pose a serious risk of caries development, and therefore prevention is required.

Figure 1 shows the factors influencing food intolerance in children with autism: the consistency of food, its appearance, taste, and smell. After the analysis of the obtained results, the studied children have been divided into two groups depending on their food preferences:

Children with a “typical diet” – 42 of the studied children. They eat a variety of foods with different consistencies, show interest, and demonstrate willingness to touch and try new foods that are served to them.

T a b l e 2

Correlation between dental caries intensity and eating habits in children with autism

Eating habits	≤ 2 times/ weekly	3–6 times/ weekly	1–6 times/ weekly	Spearman's correlation		K-W test
	D1MFT	D1MFT	D1MFT	rho	p-value	p-value
Sugar confectionery items	2.72 ± 3.34	4.98 ± 2.19	5.44 ± 4.12	−0.39	p < 0.05	p < 0.05
Junk food	3.32 ± 4.26	4.59 ± 3.21	4.61 ± 2.19	0.15	0.1034	0.236
Nonalcoholic beverages	2.86 ± 3.48	3.75 ± 2.19	5.61 ± 2.12	0.38	p < 0.05	p < 0.05
Beverages containing sugar	2.69 ± 2.74	3.54 ± 1.52	4.45 ± 2.25	0.37	p < 0.05	p < 0.05

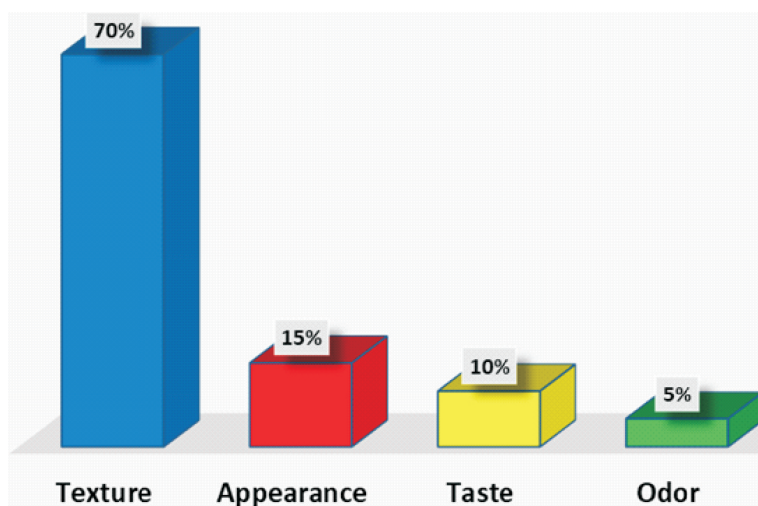


Fig. 1. Factors influencing food selectivity for children with autism

Sensory factors such as smell, texture (consistency), and colour contribute to food selectivity (sensory sensitivity) related to foods in some of the children with autism, and these children have been assigned to a separate group.

Children with “sensory integration dysfunction” (SID) – 18 of the studied children. In these children, a lack of variety in food choices and repeated preferences for a certain texture have been reported. According to the psychologists, such children are hyposensitive and look for consistency, which brings them pleasant sensory sensations. They prefer crunchy foods: dry cereals, biscuits, oatmeal, cornflakes, salted sticks, crackers, chips, cubes, pellets, popcorn, snacks, apples, peppers, carrots, broccoli, corn, and cauliflower.

The majority of children prefer soft foods: French fries, sandwiches, cheese, pizza, KFC breaded chicken nuggets, McDonald’s food, mashed potatoes, macaroni, yogurt, creams, baby pureed foods, starch creams, pickles, ice cream, and jellybeans.

Considering occlusal relationships observed in children with autism and healthy controls, 57 of the examined children have normal occlusion (Class I according to Angle), with 70% (42) of them being children with autism, whereas 25% (15) are from the healthy control group, with statistical significance of the result (Table 3). ANGLE Class II (distal occlusion) was observed in 50 of the examined children. Healthy children occupy the largest share of them (63.33%, 38), with a statistically significant difference between autistics and healthy controls. There are very few children with ANGLE Class III occlusion without statistical reliability of the result.

Discussion. Studies on the oral health of autistic children have been scarce. The assessment of the eating habits of this group of children with special needs

T a b l e 3

Distribution by type of occlusion according to the Angle's classification in children with autism and healthy children

Indicators	Total number of examined children		χ^2 <i>p</i> -value
	(n = 120)		
	Children with autism (n = 60)	Healthy children (n = 60)	
ANGLE Class I	70% (42)	25% (15)	$\chi^2 = 15.321$ ($p < 0.05$)
ANGLE Class II	20% (12)	63.34% (38)	$\chi^2 = 5.138$ ($p < 0.05$)
ANGLE Class III	10% (6)	11.66 % (7)	$\chi^2 = 1.316$ ($p > 0.05$)

is difficult due to the complexity and particularities of their neuro-psychological disability, expressed in stereotypical behaviour, impaired communication, and socialization [8].

Dental caries is a common oral disease in children with ASD [9–12]. It is noted that the dental caries intensity in children with ASD may be similar or even lower compared to the general population [9].

Our results have higher values compared to the data reported in the meta-analysis conducted by DA SILVA et al. [8].

Many children with autism have co-occurring behavioural problems. In 46–89% of these children, there are problematic eating habits [13] compared to about 13–32% of typically developing children [14].

Children with autism are unique as far as their eating patterns and habits are concerned. Several research teams have reported that autistic children have whimsical eating patterns [13]. The most common eating problems in children with ASD include food selectivity based on type, texture, or appearance, and disruptive behaviour during mealtimes [13, 15].

Children with autism have been reported to prefer soft food, a risk factor for a higher incidence of dental caries, as they hold the food in their mouths instead of swallowing it due to poor tongue coordination, resulting in an increased incidence of dental caries [8, 16].

This risk is further increased in children with ASD because they have difficulty performing oral hygiene practices [16].

Results obtained by other authors who report that autistic children enjoying frequent snacking two or more times a day have more dental caries compared to children with limited snack frequency are similar to our results [17, 18].

Children with ASD are more prone to certain types of malocclusions, such as anterior open bite [19]. ALKHADRA [20], in his study covering five rehabilitation centres in and around the city of Riyadh, established that children with ASD had a higher rate of ANGLE Class I malocclusion (40–41%) and a lower rate of ANGLE Class III malocclusion (3–4%), which we also confirmed in our study.

Conclusion. The unhealthy eating habits established are an essential oral health-related risk factor for children with autism and should be limited by mandatory food control. Parents should receive training in how to maintain optimal oral health for their children by providing an adequate diet, appropriate oral hygiene, and regular dental visits in order to ensure that these children have long-term good dental health.

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