

Oral Manifestations In Children Of The Autistic Spectrum Disorder: Literature Review

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Abstract

Autism spectrum disorder (ASD) is a neurological and developmental disorder which affects how people communicate with others, learn, and behave. It is described as a “developmental disorder”, because symptoms generally appear in the first two years of life and cause delays in many different ways. As a psychoneurological disorder, autism is characterized by self-isolation as a characteristic feature, as well as the presence of repetitive and stereotyped activities and interests, with a particular focus not on people, but on inanimate objects. This article aims to summarize and combine the latest information, available in scientific literature, in order to establish how ASD impacts the oral health of these patients. The search was conducted using PubMed, Web of Science and Google Scholar. Out of 250 articles, 45 are considered eligible.

Results: Various studies have investigated the relationship between the oral status of children with autism compared to healthy children, finding poor oral hygiene and periodontal disease in children with autism. It is expected that caries prevalence as well as gingivitis is higher in patients with ASD, due to difficulties in adequate brushing and flossing, as well as the lack of manual skills. Unusual oral habits include bruxism due to hyperactivity of the lower jaw, gingival picking, tongue thrusting, non nutritive chewing on objects such as gravel, cigarette butts, or pens tooth erosion due to regurgitation.

Conclusion: Children with ASD are more prone to the development of caries lesions, periodontal disease and other oral manifestations. All of these can be reduced by making a personalized prevention programme and treatment plan.

Keywords: caries, periodontal disease, children, autism specter disorder

Introduction

Autism spectrum disorder (ASD) is a neurological and developmental disorder which affects how people communicate with others, learn, and behave. It is described as a “developmental disorder”, because symptoms generally appear in the first two years of life and cause delays in many different ways. The first person to describe autism was a psychologist named Leo Kanner. He published an article called “Autistic Disturbances of Affective contact” in 1943, describing the behavior of 11 children. He observed their behaviour and lack of social contact. (1) This article was the first to demarcate Kanner’s syndrome, later called childhood autism. Infantile autism was treated as a disorder, which resulted from the abnormal development of the autistic child’s brain. Due to the variety of the symptoms and the complexity of providing a definition, autism is referred to as Autism Specter Disorder (ASD) including a range of behavioral characteristics and varying intensity. (2) Possible considered causes for autism are prenatal factors, genetic factors, brain biological factors, coexisting medical conditions. (3) According to estimates from CDC’s Autism and Developmental Disabilities Monitoring (ADDM) Network, 1 in 44 children has been identified with ASD. Autism is a developmental disorder that includes difficulties in the establishment and development of social contacts, imagination, communication, etc., and due to its confirmation in the autism spectrum, some of the children may have different degrees and combinations of disorders. As a psychoneurological disorder, autism is characterized by self-isolation as a characteristic feature, as well as the presence of repetitive and stereotyped activities and interests, with a particular focus not on people, but on inanimade objects. (4,5).

According to literature the population with ASD experiences similar health problems as that of the typical population, but due to different factors, including poor diet, specific behaviours and the incapacity to take care of themselves independently, as well as selfinjurious behaviour or drugs, this population is more susceptible to developing chronic oral health conditions. (6, 7, 8, 9) Since these oral conditions are preventable with the correct prophylaxis, education and treatment plan, by establishing the connection between oral pathologies and ASD an adequate preventive plan can be composed in order to improve the oral health of these patients.

Aim

The aim of this review article is to summarize and combine the latest information, available in scientific literature, in order to establish how ASD impacts the oral health of these patients.

Materials and Methods

The search was conducted using PubMed, Web of Science and Google Scholar. The key words that were used were ASD, oral health, children, autism, dental caries, dental treatment, parodontal problems. The criteria for inclusion were: evaluation of the oral health status of children with ASD, connection between ASD and dental caries/periodontal disease, evaluation of different strategies and methods for dental treatment of children with ASD. Out of 250 articles, 47 are considered eligible.

Results

Various studies have investigated the relationship between the oral status of children with autism compared to healthy children, finding poor oral hygiene and periodontal disease in children with autism. (10) The analysis of the results of the studies shows as the main cause of poor oral hygiene in children with autism, both the side effects of various medications taken and an insufficiently varied diet, hyposensitivity to dental pain and hypersensitivity to external stimuli, as well as neglect by parents of the need for timely dental treatment due to the attention being directed to the main disease, as well as the difficult access to dental services, due to the specific manifestations in the children's behavior. (7,11, 12, 13, 14) In fact, a recent study showed that about 25% of the analyzed ASD children do not do any brushing during the day. (15)

Correlation between ASD and caries risk

It is expected that caries prevalence is higher in patients with ASD, due to difficulties in adequate brushing and flossing, as well as the lack of manual skills. (16) In general, children with autism prefer soft and sweetened foods, which they tend to put in their mouths and hold for a longer than normal time before swallowing, due to the lack of good coordination of the tongue, which increases their susceptibility to tooth decay. (17, 18, 19) In a study conducted in Bangladesh, the results showed a significantly higher prevalence of carious lesions and gingivitis in children on the autism spectrum compared to the control group. (20, 21, 22, 23) This is also confirmed by other authors, according to whom children with autism have a significantly higher dmft index, with low oral hygiene observed in 59% of the examined children and satisfactory oral hygiene in 37.8 %. Furthermore, children with ASD exhibited a higher caries prevalence in primary teeth than in permanent ones with a ratio of 1:2.51. (24) Children with ASD are more likely to develop more and more carious lesions with each passing year.(25) Salivary pH and buffering capacity are lower in children with ASD, with a related dental caries incidence higher in ASD children when compared to their healthy siblings. (26)

Correlation between ASD and periodontal disease

Most of the ASD children have poor oral hygiene, which results in gingivitis in most of them. (27) Children with ASD are known to have a physical disability that usually prevents them from performing independent oral hygiene practices, including tooth brushing. They may need extensive training or help from their parents/guardians to carry it out and make it a daily routine. For parents/caregivers, efforts to help children with ASD adopt proper oral hygiene practices can be stressful in terms of time and energy required. (28) Another possible explanation for the presence of generalised gingivitis might be the side effects of medications, which were used to control the manifestations of ASD, such as psychoactive drugs or anticonvulsants like phenytoin, correlated to an increasing of hypertrophic-hyperplastic gingivitis and an eruption delay. Other drugs used in these patients are antidepressants, stimulants, and antipsychotics that may have oral side effects. (29)

Correlation between other oral manifestations and ASD

Unusual oral habits include bruxism due to hyperactivity of the lower jaw, gingival picking, tongue thrusting, non nutritive chewing on objects such as gravel, cigarette butts, or pens tooth erosion due to regurgitation (30, 31, 32, 33). Children with ASD quite often show a tendency to suck and bite the lips, which leads to the development of ulcerations.

ASD and therapeutic/preventive approach

A high percentage of children with ASD do not cooperate during dental interventions, and their behavior is expressed in hyperactivity, tension and irritation. (11, 34, 35, 36, 37) Any dental procedure in these children is difficult or impossible to perform, increasing the need for extractions. To preserve the dental health of these patients, an individualized approach must be taken for each patient. (38) Children with ASD are more prone to agitation, self-injurious behaviour, and emotional dysregulation, hypersensitivity to sensory input. (39) This makes it difficult for dentists to examine and treat children with ASD; they tend to interfere with dental care and constitute a wall against it, in fact, most of them should be treated under general anesthesia or sedation. (40) It is important to take into account the fact that parents of children with autism are subjected to significantly greater financial and psychological burdens than parents of other children, and the lack of easy access to dental services leads to the deterioration of the oral health of their children. (41) Due to the limited attention span of AD patients, short and well organised appointments should be planned and the waiting time should not exceed 10-15 minutes, to avoid upsets. (42) Visual pedagogy is a technique which uses a series of images, showing a structured method and a tooth brushing technique. They were placed in the bathroom or wherever tooth brushing was performed. The study showed that, after 12 months, the amount of visible plaque in ASD children was reduced. After 18 months, most parents felt their children maintained good oral hygiene easier than they had found before the study and concluded that visual pedagogy was a useful tool to help people with ASD to improve their oral hygiene. (43) Another effective method of improving ASD children's brushing techniques is using video materials, resulting yet again in bettering their oral hygiene. (44) The purpose of a recent literature review was to summarise the interventions available to reduce dental anxiety in children with ASD, and to determine which strategies are best suited for implementation. This study used three types of interventions: cards with pictures, video technologies and mobile applications. (45) A survey conducted by Doichinova et al. shows improvement of the oral hygiene after implementing a program, consisting of pictures showing the sequence of actions involved in maintaining oral hygiene. After comparison with the baseline oral hygiene status, improvement was observed as early as the third month. Further, the statistical analysis showed that the oral hygiene index was significantly improved at the ninth and the twelfth months. (46) For children with autism, it is desirable to establish a routine that includes informing the child in advance that it will be time to brush his teeth at a certain time. The child should be given a few minutes to transition from what he is doing to entertaining the idea of brushing his teeth. Using a song or visual timer is recommended so the child knows how long the task will take. In children with hyposensitivity, it is advisable to use an electric toothbrush, as it makes sufficient movements to clean the teeth and helps to provide additional stimulation in these patients. (9) Brushing should be ensured with a suitable toothpaste, and for some children with autism, in order to avoid overloading the senses, it is recommended that the paste does not contain sodium lauryl sulfate, which leads to the formation of foam. It is recommended to monitor the child's reaction to the paste, and it may take several attempts to find the right paste. (47)

Conclusion

As shown in the observed literature, children with ASD tend to be more prone to the development of caries lesions, periodontal disease and other oral manifestations, including dental trauma. All of these can be reduced by making a personalized prevention program and treatment plan, as well as educating the child and the parents, using psychological models and visual pedagogy. If this is started from an early age, it could contribute to minimizing the development of oral manifestations as well as improve the child's quality of life.

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