

# Dental Management of Patients with Autism Spectrum Disorders

## SUMMARY

*Dental treatment of patients with Autism Spectrum Disorders (ASD) can be complicated because of the presence of behavioural unpredictability. This article reviews the present literature on the issues dealt with children with autistic spectrum disorder from the dental perspective. The prevalence of autism is rising worldwide. Consequently, dentists will find an increasing number of such children in their routine practice, whose treatment will require special considerations in their dental management. Knowledge regarding the oral health status of autistic children is essential for the paediatric dentists. Negative behaviour toward dental treatment was very clear in autistic children. Self-inflicting trauma/habits were observed in autistic children. It was concluded that the autistic children do not have a higher dental caries score compared to that of normal children. Their oral hygiene was fair; however, they exhibited more debris deposits than normal children.*

**Keywords:** Autism; Dental Management; Oral Health

**Iosif-Grigorios Al Mochamant,  
Ioannis Fotopoulos, Lampros Zouloumis**

Department of Hospital Dentistry  
Aristotle University, School of Dentistry  
Thessaloniki, Greece

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## Introduction

Dental anxiety, affecting approximately 20% of the adult population, is a feeling that something dreadful is going to happen in relation to dental treatment and is connected to a sense of losing control. Autism spectrum disorder (ASD) refers to a group of neuro-developmental disabilities based on a particular set of defining criteria that include impaired social interaction, communication, and restricted or repetitive behavioural stereotypes. It is associated with dental caries and missed appointments and may extend to a total avoidance of dental care, reported by approximately 5% of the general population<sup>1-3</sup>.

The etiologic background of ASD, though not yet completely understood, is considered to implicate both genetic and environmental factors. It is characterized by persistent impairments in social interaction and communication and restricted, repetitive patterns of behaviour, interests, or activities and unusual sensory interests or sensitivities. In the recently revised American classification system for psychiatric disorders, the DSM-5, ASD now includes previously separate diagnostic categories such as autistic disorder, Asperger disorder, and

pervasive developmental disorder, not otherwise specified, specified (PDD-NOS) in the DSM-IV-TR<sup>2-4</sup>.

The symptomatology of ASD initiates before the third year of age and generally undergoes a steady course without remission through ageing. Established features in the autistic child, such as marked impairment in the use of multiple non-verbal communications, failure to develop social relationships and share experiences and interests, delay or complete lack of linguistic development, as well as inflexible adherence to rituals; potentially coexisting with sensory disabilities, mental retardation or epilepsy, may render professionally delivered and home dental care inadequate, placing individuals with ASD at high risk for oral diseases. People with ASD commonly report abnormal responses to sensory stimuli. Over-reaction to sound and under-reaction to pain was stated by more than 40% of children with ASD. Sensory abnormalities affect to a greater extent those with more severe autistic traits compared to those with less autistic traits. Sensory sensitivities in children with ASD are also related to behaviour difficulties in the dental office. There are still no studies on behaviour and experiences of dental care in adults with ASD<sup>3,5,6</sup>.

Children with ASD exhibit more dental behaviour management problems (uncooperative behaviours) compared to typically developing children, with research indicating that approximately 50-72% of children with ASD exhibit uncooperative behaviour during dental treatment. Uncooperative and aggressive behaviour during dental treatment have the potential to impede, change, or reduce access to care for children with ASD. For instance, the greatest barrier to general dentists' willingness to treat children with disabilities is the child's behaviour, with 60-80% of dentists stating that they were unwilling to treat patients with developmental disabilities because of their resistive behaviours. Additionally, such behaviour may be the determining factor in deciding if restraint or pharmacologic methods are required and if treatment can occur in the dental office setting or needs to be completed elsewhere (e.g., in a hospital, under general anaesthesia)<sup>4-6</sup>.

## Oral Health and Dental Patients with ASD

Patients with ASD do not present very specific oral disorders. High, otherwise paradoxical, oral health standards observed elsewhere might be also attributed to the dental hygiene routine of children with ASD, supervised or performed on a regular basis by parents and caregivers. As for dental caries, it was found that institutionalized autistic individuals exhibited lower caries rate than institutionalized schizophrenics. In the primary dentition, the patients with ASD demonstrated a significantly higher caries rate (dmf) than the controls during initial examination, but at recall examinations, dmf values were comparable. In patients with permanent dentition, both at baseline and recall, DMF scores were not different between the groups. In a recent study, autistic individuals were compared with non-autistic healthy controls and they were found to have neither a higher salivary flow rate nor a better buffer capacity of the saliva and similar dental caries experiences were observed in both primary and permanent dentitions. In general, children with autism prefer soft and sweetened foods and they tend to pouch food inside the mouth instead of swallowing it, due to poor tongue coordination, thereby increasing the susceptibility to caries. Furthermore difficulties in brushing and flossing can worsen the above mentioned situation. Oddly, there have merely been 2 controlled studies with unaffected counterparts that announced statistically significant caries susceptibility for autistic samples, either higher or lower<sup>1,7-10</sup>.

Gingivo-periodontal pathology is more prevalent in patients with ASD compared to healthy control groups. These differences are explained by the poorer levels

of oral hygiene seen in ASD patients. They could also be caused by lack of the necessary manual dexterity of autistic children, which may have resulted in inadequate tooth brushing. Furthermore, poor dental awareness, a lack of dental education and deficiency in receiving oral hygiene instructions from dental staff seem to be contributing factors for periodontal diseases. Another possible explanation for the presence of generalized gingivitis might be the side effects of medications which were used to control the manifestations of autism, such as psychoactive drugs or anticonvulsants, with the most common drug classes being antidepressants, stimulants, and antipsychotics<sup>11-14</sup>.

Harmful oral habits are common, which consist of bruxism, tongue thrusting, picking at the gingiva and lip biting. Bruxism or forceful grinding of teeth is one of the sleep problems which are commonly observed in children with autism. Dentist can recommend a mouth guard to stop this self-injurious behaviour. Even though the communication and behavioural problems in children with autism pose challenges for the dentist, treatment given with proper planning and a lot of patience can definitely make a difference<sup>15,16</sup>.

The rate of dental injuries is higher among autistic children. The most common dental injury was enamel fracture and the most frequently injured teeth were the permanent maxillary central incisors<sup>15,17</sup>.

Tooth eruption may be delayed due to phenytoin-induced gingival hyperplasia (phenytoin is commonly prescribed for people with autism)<sup>15,18</sup>.

Presumably, the compromised dental status in conjunction with harmful habits including bruxism, tongue, thrusting, and lip biting often displayed by children with autism may result in certain malocclusions<sup>10,15</sup>.

## Management of the ASD Patient in Dentistry

People with ASD may be unable to cooperate in the dental clinic due to their difficulties with social interaction and communication. The failure to develop joint attention, which means lack of curiosity for the environment and incapability of the child to share information using spoken language, gestures and eye contact, represent a big challenge for a dentist. Therefore, treatment approaches that may produce a positive outcome in one patient may prove to be ineffective for another. Most importantly, the dental professional during examination should bear in mind that autistic individuals exhibit wide variation in abilities, intelligence, and performance. It is conceivable that lack of responses to demonstrations and inability to establish personal contacts with the personnel may impede

professional oral care proceedings. Thus, malfunction in interpretation of stimulus intake may result in aberrant responses to visual, auditory, tactile, olfactory and gustatory signals. Practitioners may need to target their therapeutic approach to the unique characteristics of each presenting child<sup>5,15,19</sup>.

Several basic behaviour guidance methods have been recommended to accommodate dental therapy of autistic patients, including the presence of parents, the use of tell-show-do technique, short, clear commands, and differential verbal reinforcement. Autistic children may respond better to certain management techniques, such as positive reinforcement<sup>5,15,19,20</sup>.

**Appointment Structure:** Duration of the dental visit, and sensory sensitization should be kept to a minimum. Because of the limited attention span of ASD patients short, well-organized appointments should be planned and the waiting time should not exceed 10-15 minutes, to avoid upsets<sup>21</sup>.

**Dental Environment:** Environmental factors in determining the comfort level of children with ASD during stressful medical events are very important. Discussion of any aspect of the actual work should be avoided during the course. Light and music might be beneficial. Distraction, aversive reaction and behavioural difficulties may be invoked by loud, unexpected, nearby noises. Anyone participating in the procedure should minimize movements, because an autistic child can be easily distracted<sup>15,22</sup>.

**Visual Pedagogy:** Stimulation of aversive behaviour may contribute in establishing favourable conditions for the autistic child to cooperate at the dental practice. A study that showed a structured method and technique of tooth brushing was made by Bäckman and Pilebro<sup>23,24</sup>. Pictures were placed in the bathroom or wherever tooth brushing was performed. 14 children with autism, aged between 5 and 13 years, were involved. After 12 months, the amount of visible plaque was reduced. After 18 months, most of the parents found maintaining good oral hygiene easier than they had found it before the study and concluded that visual pedagogy was a useful tool for helping people with autism in improving their oral hygiene. A gentle introduction to tooth brushing using alternatives, such as a washcloth, toothbrushes of different texture and design or an electric toothbrush may enhance the acceptance of toothbrush by the child with ASD. As a final point, child's self-protectiveness may be eliminated by intensive behaviour programming, instructed by parents familiar with reinforcement-based teaching<sup>20,23</sup>.

**Applied Behaviour Analysis (ABA):** Applied behaviour analysis is a branch of psychology that is focused on the analysis and modification of human behaviour, the environment intends to modify behaviours to achieve desired effects. Procedures based on ABA are evidence based and they have been accepted by the American Academy of Paediatrics in the management

of ASD. In dentistry, the use of these procedures has the potential to improve the results of traditional behaviour management procedures. ABA principles have been also adopted in young autistic patients with needle phobia and diabetes to permit medical monitoring of their blood glucose levels. Using shaping and reinforcement as per case requirements may be beneficial in founding communication with a child with ASD. By increasing the likelihood of patients who accept simple and routine dental procedures dentists can decrease the need for more intrusive procedures, such as restraints and sedation<sup>5,6,22</sup>.

**Communicative Behaviour Management Techniques:** Techniques that are commonly used in patients with ASD are the same as those that are used for non-autistic individuals: tell, show, do and immediate, frequent positive and negative reinforcement, paired with firmness, wherever necessary. However, higher rate of flexibility is required to comply with quickly changing patient needs. Other recommendations, which are again based on the modelling effects of constant positive reinforces, are immediate verbal praise after each accomplished step of a procedure and a prize at the end of a dental session. The oral communication should be carried out in clear, short, and simple sentences. Also, the Internet has become nowadays the second most popular source of health care consultation for families, dental professionals should post on the practice Web site controlled, user-friendly, and reliable data regarding dental treatment of patients with special care needs together with evidence-based education materials<sup>15,23,24</sup>.

**Pharmacological Behaviour Management Techniques:** The presence of adverse effects on the oral cavity from medicines have also been described, particularly hypo-salivation (paroxetine, fluoxetine, imipramine), oral ulcers (carbamazepine), delayed scarring (valproic acid) or gingival enlargement (phenytoin). The drugs were administered in different dosages and regimens, as a sole agent or in various combinations. In some patients, several different regimens and combinations were attempted in order to be successful.

A lengthier administration and higher concentrations of nitrous oxide than usual were required to achieve the desired level of sedation in patients with ASD. Giving treatment in the operating room by using general anaesthesia was considered only if all other approaches had failed<sup>25-27</sup>.

## Concluding Remarks

Patients with ASD do not present very specific oral disorder; however, they may be unable to cooperate in the dental clinic due to their difficulties with social interaction and communication. Several basic behaviour guidance methods have been recommended to accommodate

dental therapy of autistic patients, including the presence of parents, the use of tell-show-do technique, short, clear commands, and differential verbal reinforcement. Giving treatment in the operating room by using general anaesthesia was considered only if all other approaches had failed. The dental management of a child with ASD requires in-depth understanding of the autistic behavioural profile. Based on well-established behavioural guidance techniques, the therapeutic approach should be individualized for each patient. The role of continuous education of dental professionals and parents is essential in overcoming the difficulties encountered by the autistic child in the dental chair.

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Correspondence and request for offprints to:

Al Mochamant IosifGrigorios  
 Department of Hospital Dentistry  
 Aristotle University, School of Dentistry  
 Thessaloniki, Greece  
 E mail: Iosif.89@hotmail.com