

Autism Speaks, Listen Carefully and Act Accordingly: A Review for Pediatric Dentist

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ABSTRACT

Autism is a complex set of behaviorally defined condition with a wide variation of symptoms, coming under the same umbrella of Autism Spectrum Disorder. Owing to the unpredictability of their behavior, the dental needs of the patient with Autism spectrum disorder often go unmet. With all the fear and confusion surrounding what may and may not help in managing dental needs of autistic patients, many dentists expect a clear cut protocol. This article reviews the dental literature discussing various aspects from the characteristic of autism spectrum disorder, their oral health status, and self-injurious behavior, to the modifications we may need to apply to our traditional clinical behavior management techniques.

KEYWORDS: Autism spectrum disorder (ASD), Autism, Oral health needs, Behavior management

INTRODUCTION

Children affected with Autism spectrum disorders, a developmental condition characterized by impaired social interaction, abnormalities in communication, restricted interests, and repetitive and obsessive behavior, represent one such population at high risk for poor oral health.¹

The term autism is based on the Greek (autos) or Latin (autismus) for self, which Paul Eugen Bleuler felt was one of the symptoms of schizophrenia.² It was in 1912 in the American journal of Insanity, Bleuler first used the term autism for patients who appear to lose contact with the reality, have their own fantasy world and were incapable of normal communication with other people.^{2,3,4} In 1943 Dr. Leo Kanner of the Johns Hopkins Hospital studied a group of 11 children and introduced the term early infantile autism.^{2,5,6} At around the same time Dr. Hans Asperger, a German scientist, described a milder form of the disorder which was named after him as "Asperger syndrome".^{2,7} The continuous state of confusion and controversies has been the frequent changes in nomenclature, from the term autism by Bleuler to Leo Kanner's early infantile autism to Asperger's autistic psychopathy in 1944.²

The American Psychiatric Association's DSM in their first and second editions used the term childhood schizophrenia.² The 1980 edition included autism as a separate condition, It was the fourth edition (1994) that provided the current nosology of the 5 types in autistic spectrum disorders also known as pervasive developmental disorder: a) autistic disorder, b) pervasive developmental disorder not otherwise specified, c) Rett syndrome, d) Asperger syndrome, and e) childhood disintegrative disorder. The International Classification of

Diseases in their 1992 edition provided a similar list. Thus, these disorders were described and are today listed in the Diagnostic and Statistical Manual of Mental Disorders DSM-IV-TR as the five pervasive developmental disorders (PDD), more often referred to as autism spectrum disorders (ASD).^{2,8}

CHARACTERISTICS OF PATIENTS WITH AUTISM SPECTRUM DISORDER

Despite the broad range of severity, all ASDs share common deficits in 3 areas of functioning:

first 'Language', Second 'Social skills and activity', third 'Restricted, repetitive, and stereotyped patterns of behavior, interests, and activities'.⁹

It has been seen that some children diagnosed with ASD remain mute throughout their lives. Others may show a delay in developing language as late as age 5 to 9. Some children with ASD may learn other ways, like use of pictures or sign language for communication.

The children who do speak often combine words in an unusual way. They couldn't formulate words into meaningful sentences. Some may mumble only single words, while others may play over the same phrase multiple times. Some Autistic children repeat or parrot what they hear, this condition is known as *echolalia*.¹⁰

From the start, the typically developing infants are social beings, they gaze at people, grasp a finger, turn toward voices, and even smile. In contrast to normal, most

How to cite this article:

Dua R, Jindal R, Saini N. Autism Speaks, Listen Carefully and Act Accordingly: A Review for Pediatric Dentist. *Int J Oral Health Med Res* 2016;2(6):198-202.

children with ASD feel difficulty in learning this give and take of everyday social interaction. The PDD-NOS and Asperger syndrome, are a less severe form of developmental disorders. Individuals with PDD-NOS have more social activity, show higher empathy and greater interaction than those with autism.¹¹ Those with Asperger syndrome have many autistic-like symptoms but present relatively normal language skills and intelligence.¹¹ Although autistic children are attached to their parents, but their expression of this attachment is quite unusual and difficult to “read.”

Children with ASD also are slow in learning to interpret what others are feeling and thinking. Subtle social cues; whether a smile, a wink or a grimace—may have little meaning to them. To compound their problem, they have difficulty seeing things from others’ perspective.

Although not universal but it is common for people with ASD to have difficulty regulating their emotions. They may “lose control,” especially when they are angry or are frustrated or when they find themselves in a strange or overwhelming environment. Sometimes unable to manage or cope up with the situation they may at times break things, attack others, or even hurt themselves in the process. In their frustration, some children bang their heads in the wall, pull their hair, and may even bite their arms out of anger.

Other conditions associated with ASD are epilepsy, mental retardation, cerebral palsy, fragile X, tuberous sclerosis, untreated phenylketonuria, neurofibromatosis, and congenital rubella.^{12,13,14}

Without meaningful expressions or the verbalization to ask for things and inability to socialize, people with “Autism spectrum disorder” are at a loss to let others know what they need.

ORAL HEALTH STATUS AND DENTAL NEEDS

Generally, children with ASD present with good oral health and the rates of periodontal disease and caries similar to that of the general population. Poor oral hygiene (as a result of the refusal to allow the caretaker to brush the child’s teeth) and side effects from some medications used for behavioral control and management may cause a problem. Many oral side effects of commonly used drugs in ASD have been listed (Table 1)¹⁵. Habits like Bruxism, tongue thrusting, and self-injurious behaviors (SIBs)^{16,17,18} are commonly seen especially in lower-functioning individuals. SIBs can include hitting of jaws and chin, picking at gums and lips¹⁷, and eating nonfood objects. Regarding diet, ASD children are notorious for having limited diets. Unfortunately, they are often given sweets as rewards for their cooperative behaviors. It has been suggested to encourage teachers, parents to use nonfood rewards, such as computer time or other favorite activities, to reduce the risk of caries and obesity.

Drug	Side Effect
CNS Stimulants	Xerostomia
Antihypertensive (clonidine)	Xerostomia, dysphagia, sialadenitis
Antidepressants (Fluoxetine and Sertaline)	Xerostomia, dysphagia, sialadenitis, dysgeusia, stomatitis, gingivitis, glossitis
Anticonvulsants (carbamazepine and valproate)	Xerostomia, Stomatitis, glossitis and dysgeusia. Excessive bleeding can result when either medication is combined with aspirin or NSAID
Antipsychotics (Risperidone, clozapine, olanzapine, quetiapine, Ziprasidon)	Xerostomia, sialorrhea, dysphagia, dysgeusia, stomatitis, gingivitis, tongue edema, glossitis, discoloured tongue

Table 1 : Oral side effects of commonly used drugs in ASD¹⁵

CLINICAL MANAGEMENT CONSIDERATIONS

ASD has a wide range of expression. Therefore, treatment approaches that might yield a positive outcome in one patient may prove ineffective for another patient

Communicative behavior management techniques: It is a known fact that in pediatric dentistry communication is the key to behavior management. Therefore, the inability to communicate with an autistic child makes it hard for practitioners to provide comprehensive care to the patient. Kamen et al. stated that autistic patients are probably the most difficult for any dentist to manage and treat.¹⁹ C.Y.Loo et al. stated that with every one year increase in age there is associated an 8% decrease in the likelihood of being uncooperative.¹¹ It has been noted that patients with a diagnosis of PDD-NOS were 42% less likely to behave uncooperatively during their routine dental appointment compared to patients with autism.

Chew *et al.* state that the better we understand the effects of autism on the behavior of an affected individual the easier it is for the dental practitioner to deliver oral health care in an empathetic and appropriate manner. It is important for the dental practitioner to know about the patient’s peculiarities concerning behavior and communication and previously applied conditioning and management methods before initiating any procedure. Techniques that are commonly advocated and used for behavior modification and management in autistic patients are the same as for normal individuals: tell show-do and immediate, frequent positive and negative reinforcement paired with firmness where ever necessary.^{20,21}

However, a higher rate of flexibility is advised to comply with quickly changing patient needs and behavior pattern.²⁰

One of the main shortcoming of an ASD patient is impaired language comprehension and processing verbal information. However, the information received visually is comprehended quickly and is retained longer by the patient than information received verbally. Visual supports include visual schedules and visual social stories. The Visual schedules break down large tasks into small separate steps, thereby allowing the child to perform each task before he proceeds on to the next. Schedules can range from showing various activities that

will happen during the day, to teaching specific tooth-brushing techniques and steps.⁹

A *social story*, one of the best visual tools, is a short story that is written from a child’s perspective (Table 2).⁹ The parent and teacher are advised to read the story repetitively so that it becomes a routine or rule for the child that may be applied to the specific social situation especially stressful situations example they should be prepared beforehand for their first dental visit. Other recommendations, is the use of constant positive reinforces, like immediate verbal praise after each accomplished step of a procedure and a prize at the end of every dental session. Non-Pharmacological methods suggested to cope with sensory defensiveness in ASD patients in the dental environment have been illustrated in Table 3.²³ The dentist should ignore any inappropriate behavior and be calm. Handover- mouth is not considered an appropriate technique for patients with ASD.

Statements for Dental Visit Social Story
Title: My Trip To The Dentist*
1. "I go to the dentist to clean my teeth and make them strong."
2. "First, I sit in the waiting room, where I can draw on my paper and play with my toys."
3. "When the hygienist calls my name, I go with her and sit in a big chair that leans back and goes up and down. My mom sits next to me."
4. "There is equipment in the room, and I can ask about the tools and machines, but I do not put my hands on them. I keep my hands folded together in my lap and stay in my seat."
5. "There is a light that shines on my mouth so that the hygienist can see everything."
6. "The hygienist puts a napkin around my neck to keep my shirt clean and dry."
7. "When she says 'open up,' I will open my mouth and she will put tools in there to clean my teeth."
8. "Water may splash on my face and in the air when she rinses my mouth. The hygienist will use the napkin on my neck to dry any spills. The hygienist wears a mask on her mouth and nose so she can stay clean."
9. "She will use a special vacuum to suck out any water and toothpaste that is left over. When the hygienist says 'close,' I will put my lips around the vacuum until she tells me to open my mouth again."
10. "Sometimes, she will put special film in my mouth and take pictures so the dentist can see if anything is broken and fix it. When a tooth is broken, the dentist calls it a cavity."
11. "When my mouth is clean, the dentist will come into the room and look at my teeth. She will talk to my mom and give me my own new toothbrush, toothpaste, and floss."
12. "Then I get to go in to the treasure box and pick a toy."
13. "We will stand at the counter and talk to the lady behind it."
14. "Then we will get in the car and go home."
Figure as Provided by Toni Boucher, BSW, Autism Consultant, Coastal Autism Division, South Carolina Department of Disabilities and Special Needs. ⁹

Table 2: Statements for Dental Visit Social Story

Restrains: There is controversy regarding the use of physical restrains for an autistic patients. While several authors advocate a restraint board and consider deep pressure technique helpful, others disapprove the idea. Many have described the relaxing effects of deep touch pressure for children with Autistic disorder. The Calming effects on using a restraint board and wraps on patients in a dental setting were also noted by some dentists²⁰. Lindemann considered the use of physical restraint in the

Dental situations causing sensory defensiveness	Non-Pharmacological methods to decrease sensory defensiveness
High sped drills or suction high pitched noises Sensitive to tooth polishing	-Use hand instruments to clean teeth and remove decay Visual schedule/pictures -Allow child to listen to calming or favourite music with headphones during treatment and while waiting in waiting room -Have parent/guardian do deep pressure orally with electronic toothbrush
Dental chair changinging position	-Inform parent of what is about to happen Keep Xray coat on patient to act as deep touch pressure Use pictures and visual schedule to show patient what is going to happen Visual schedule/pictures
Taste of polishing prophy paste or local anaesthetic gel	-Give patient choice of paste flavor by saying "Which flavor do you want,mint or buble gum,pick one"
Dental light is too bright	-give patient tinted protected glasses -inform patient of what is about to happen -visual schedule/pictures
Overreactive gag response	-Avoid areas that cause gagging -inform patient of what is about to happen Deep touch pressure
Generalized noises of the dental office are distressing(i.e.phone ringing,doors closing)	-Allow child to listen to calming or favourite music with headphones during treatment while waiting in waiting room
Generalized anxiety	-Keep x-ray coat on or have child chew something very chewy prior to appointment(deep touch pressure) -Short appointments -Use firm touch whenever touching the child -Allow child to bring favourite toy to appointment -Give rewards to child to reinforce positive behaviour

Table 2: Non-Pharmacological methods to cope with sensory defensiveness in ASD patients in the dental environment²³

context of self-injurious behavior and noted that some Autistic children appeared to be comforted by the physical restraint.²³

Pharmacological behavior management techniques: In many situations, dental treatment of patients required the use of advanced behavior guidance techniques, including nitrous oxide oxygen conscious sedation to oral conscious sedation techniques, and use of general anaesthesia.^{24,25,26,10}

According to C.Y. Loo et al. ASD patients without any severe behavioral problems were able to cooperate well during dental treatment with the use of basic behavior guidance and modification techniques, and when necessary, nitrous oxide–oxygen sedation helped. The Results do indicate that in case the patient is unable to cooperate use of oral sedative agents may be required, while long and extensive treatment procedures are best performed under GA.¹¹

Braff and Nealon reviewed the use of sedation in the successful management of a small group of autistic dental patients. They concluded that a number of sedative agents may be effective alone or when used in combination. In their study, Good sedative effects were noted with the use of a combination of diazepam and chloral hydrate or hydroxyzine.^{27,28} The cases studied by Lowe and

Jedrychowski also reported similar results recommending the effectiveness of a diazepam and hydroxyzine combination with nitrous oxide/oxygen sedation technique for autistic dental patients.^{28,29}

Fukuta et al. studied the effect of combining intranasal and inhalational technique for dental treatment of handicapped children, including autistic patients. Intranasal midazolam 0.2 mg/kg in combination with nitrous oxide/oxygen inhalation was used. Successful sedative effect was seen at the beginning of dental treatment after administration of midazolam. The technique was convenient to use and was effective without presenting any serious adverse effects.^{28,30}

CONCLUSION

Marshall et al. studied factors predicting uncooperative behaviors in autistic patients and listed the following: Type of appointment (routine dental checkup or an emergency care); associated medical diagnoses; verbal and communication abilities; language skills; inability to follow a multistep directions; difficulty in daily skills; special education; inability to sit for a long time; and inability to read at age of 6 or more years. Simple questions asked prior to the visit regarding developmental age, any coexisting medical issues, their language and hygiene skills, and achievement can provide insight into the child's ability to tolerate a routine dental examination and other dental care procedures.

Although autism is not curable, its symptoms and dental needs can be addressed with appropriate interventions. Evidence-based behavioral management approaches for children with ASD need to be developed to improve compliance with oral care procedures so parents, caregivers, and oral health care providers will have more efficient ways to promote oral health in children with an ASD. Still one needs to remember that "Each child's work up should be unique to that child: no protocol fits all."

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Source of Support: Nil
Conflict of Interest: Nil