

Review Article

An Update on Oral Health Management in the World of Autism- A Review

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Globally 1 in every 68 children is diagnosed with Autism. Autism spectrum disorder (ASD) or Autism is a group of neurodevelopmental disorders, affecting the normal development and functioning of the brain in three core domains reciprocal social interactions, verbal and non-verbal communication and the presence of restricted or repetitive behaviors. Typically, it appears in the first three years of life and affects males four times more than females but females are more likely to show more signs of mental retardation. Other medical problems can co-exist along with Autism such as psychiatric illnesses, epilepsy; sleep disturbances, feeding problems, gastrointestinal problems and voiding problems [11]. Autism specifically affects brain function in the areas responsible for the development of communication and social interaction skills. When developing a protocol for the dental treatment of children and adults afflicted with an autistic disorder, it's important for the dental team to establish a set of parameters to be applied to the behavioral management and clinical treatment of these special patients [12]. Providing oral care to children with autism requires patience and a thorough understanding of the patient's degree of mental disability. The purpose of this review is to describe the various dental related problems and their management protocol in autistic patients.

Keywords: Autism; ASD; Disorder; Oral health**Introduction**

Every child is unique. Children are emotionally and physically immature and cannot independently meet their social and cultural exceptions. ASDs consist of five subtypes, which include autistic disorder, Asperger syndrome, Rett's syndrome, childhood disintegrative disorder (CDD) and pervasive developmental disorder—not otherwise specified (PDD-NOS), as defined by the DSM IV-TR [6]. Autism is a neurodevelopmental disorder in which special interaction, language, behavior and cognitive functions are impaired severely. Autism is an organically based neurodevelopmental syndrome associated with abnormality of brain structure and function, especially the limbic system and cerebellum. It manifests during the first 3 years of life [5]. It is a highly variable brain developmental disorder. An individual with autism will have difficulty with three domains: language and communication, socialization and repetitive behavior [10].

Definition

Autism was first described in 1943 by the American Child psychiatrist Leo Kanner. Autism Disorder is also known as Kanner's autism, childhood autism, or early infantile autism. Autism or autistic disorder is a severe lifelong neurodevelopment disability distinguished through major impairment in communication skills, mutual social interactions, and cyclic stereotypes of interests or behaviors [1]. Autistic disorder is categorized in the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders, 4th Ed.) Under the section Pervasive Developmental Disorders (PDD) and is characterized by abnormal emotional and social behavior and

linguistic development [2]. With the publication of the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders in May 2013, all Autism disorder subtypes were merged under one definition of Autism Spectrum Disorder (ASD) or Autism. Autism spectrum disorder (ASD) is defined by the DSM-V as involving deficits in two major areas:

- 1) Social communication and social interaction, and
- 2) Restricted / repetitive behaviors, interests or activities [1].

In addition to the core symptoms, children with autism often have severe behavioral disturbances, such as self-injurious behavior, aggressiveness, hyperactivity and hysterical crises in response to routine environmental demands. Children with autism also lack manual dexterity and usually require assistance in brushing their teeth. Thus, patients with ASD clearly must have a special attention in Dentistry, and the dentist must be aware of the several characteristics of this condition, always seeking the best form to embrace and improve the behavior of these patients [3].

Autism can severely impair the patient's ability to communicate, interact with others and maintain normal contact with the outside world. Symptoms can range from very mild to very severe. One in 150 individuals is diagnosed with autism, with more than 24,000 children diagnosed each year. There is as yet no definitive etiology for autism. It is important that dental professionals seek out patients with autism and be able to recognize the signs and symptoms of autism spectrum disorders, both to refer patients to appropriate medical care, if necessary, and to enable dental treatment of these patients. Treating patients with autism can be both challenging and rewarding



Figure 1:



Flattening of the teeth as a result of bruxism

Figure 2:

for dental professionals. It is crucial to introduce the patient to the dental environment and patient-appropriate care in a slow and gentle manner that builds trust and cooperation [4].

There should be paradigm shift from etiology oriented approach for autism to management of autism; therefore this review analyzes oral health status, dental needs, and management of dental disorders in autistic children (Figure 1).

Epidemiology

Autism is four times more common in boys than in girls. According to the systematic review of epidemiological surveys of autistic disorder and pervasive developmental disorders worldwide conducted in 2011 by Mayada Elsabbagh et al under the commission and support of WHO, the Global prevalence estimate of Autism disorder since the year 2000 is a median of 17/10,000, in 2002 the prevalence estimate was 7 in 10000 and in 2014 it has been estimated to be 1 in 68 [11]. The preponderance of males with the disorder suggests an X-linked disorder, and recent genome-wide screenings have found evidence of linkage to the female chromosome. The prevalence of autism appears to be unrelated to race, socio-economic status or level of parental education [12].

Aetiology

The exact etiology of ASD is still unclear. However, it seems to be caused by a complex interaction of genetic, environmental, parental and psychosocial risk factors [7]. The etiology of autism is

multifaceted, and no one particular item has been proven to be “the” cause. The Centers for Disease Control and Prevention (CDC) has called autism a national public health crisis whose cause and cure remain unknown[4].

Results of neurochemical, neuro-pathological, neuroimaging and genetic studies all show that Autism spectrum disorders (Autism) are disorders of neuronal-cortical organization, connectivity and brain structure. These disorders are most probably influenced by genetic and environmental factors where the environmental factors affect the biological process in the body or modulate gene expression within the nervous system. Documented causes of Autism include genetic mutations and/or deletions, viral infections, and encephalitis following vaccination. Therefore, Autism is the result of genetic defects and/or inflammation of the brain”. A defective placenta, undeveloped blood-brain barrier, and the immune response of the mother to infection while pregnant could cause the inflammation. Other risk factors can be advanced parental age, fetal exposure to valproate, a premature birth, and encephalitis in the child after birth, or a toxic environment [11].

Possible Factors in the Etiology of Autism-

- Genetic
- Environmental
- Smoking
- Air pollution
- Vaccination
- Physiological
- Autoimmune link
- Stress related
- Autoimmune link
- Physiological
- Intrauterine viral infections
- Amino acid level
- Metabolic disorders
- Ultrasound frequency
- Vit.A deficiencies
- Prenatal aspartame exposure
- Home chemical exposure
- Fetal exposure to elevated level of cytokines.
- Neuropathology of various structures of brain.

Characteristic features: Autistic children exhibit three clinically significant features, which are impairment in their social interactions, impairment in communication and restricted or repetitive actions or behaviors. The most noticeable feature is the impaired social interaction where they may resist cuddling in infancy, avoid making friends and engaging in social activities.

- Mental retardation is observed with almost 70% autism



Figure 3:

cases. The behavioral symptoms in children include hyperactivity, short attention span, temper tantrums, impulsivity, anger, agitation, moreover propensity for aggressive and self-injurious behaviors. Disorders of language and social communication, poor response to external stimulation, tendency to isolate themselves, and poor eye-to eye contact are well-recognized symptoms.

- Ritualistic behavior and stereotypes, such as arm-flapping and toe-walking, are two commonly observed patterns.

Dental Findings

- Higher susceptibility to caries – this may be due to cariogenic foods, poor tongue control and inability to properly brush and floss.
- Gingivitis and poor oral hygiene due to heavy accumulation of plaque and influences of hormone are reasons of dental concern [6].
- AD children may have damaging oral habits such as bruxism, lip biting, and tongue thrusting, and which may cause certain malocclusions. A mouth guard may help to discontinue this self-injurious oral behavior. Anterior open bite, reverse over jet, spacing, dental crowding, high arched palate and Class II molar relationship tendencies were diagnosed more commonly in ASD patients.
- Phenytoin is generally prescribed for AD children; tooth eruption may be delayed because of phenytoin-induced gingival hyperplasia [1].
- The risk of traumatic dental injury is higher in children with ADHD. This could be due to malocclusion.
- Higher fear and dental anxiety on initial visit
- Self-injury, erosion, xerostomia, hyper-gag reflex.
- Pica or mouthing may be part of a patient’s behavior. Pica refers to the intentional ingestion of non-food items. Mouthing occurs when nonfood items are chronically manipulated in the patient’s mouth. Both these activities have been associated with a vitamin B deficiency and may result in fractured or mobile teeth [10].
- Another behavior with dental consequences is chinning. This refers to the tendency of the autistic patient to press the chin into an object or another person’s leg to apply pressure to the

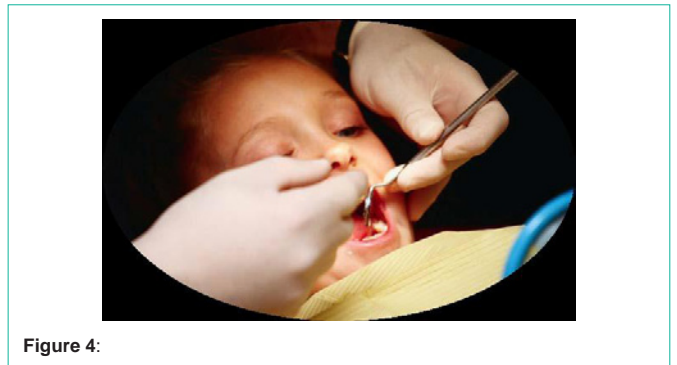


Figure 4:

mandible or temporomandibular joint. It has been observed that this deep pressure seems to relieve the symptoms of gingival or carious condition (Figure 2) [10].

- Genetic
- En1viron Fl Flattening of the teeth as a result of bruxism
- Methods of birth Methods of birth induction
- It is also important to recognize that individuals with a diagnosis of ASD often have many positive qualities also and are-
Honest, kind, reliable, Observant of details, determined and liked by adults

As individual as those without an ASD

Can express love or affection

Often have a desire for friends

Are not usually dangerousund frequency

Are nonverbal, can still hear and may understand quite a bit

Have low cognitive skills in only about 30-51% of cases. Hemposure, **Smoking, Air pollution.**

Dental Treatment for Patients with Autism

To treat ASD patients, one needs an open mind and heart, and emotional skills more than intellectual and clinical skills. To make the dental visit as successful as possible, the entire office staff should be aware of how to work with patients with an ASD diagnosis. From check-in to check-out, there will be techniques and strategies that can be used to make everyone involved feel good about the visit [13]. An interdisciplinary approach including medication, psychotherapy, speech therapy and parental counseling, would help pediatric dentists to understand the behavior of these children and deliver optimal preventive and restorative care [10].

The dentist treating a patient with an ASD should be aware of various behavior management techniques. Standard behavior techniques used in pediatric dentistry may be applied successfully. Due to the inadequate attention span of autistic patients, short, well organized appointments must be planned and the waiting period should be less than 10-15 min, to prevent upsets.

Dental environment- The dental clinics are characterized as an anxiety-provoking environment with bright fluorescent lights, devices generating loud, unexpected noises, and materials

of unfamiliar smell, taste, and texture. Emotional distress caused by these distracting stimuli may be reduced by sensory adaptation of the clinical environment. AD Children may continue to cover their eyes or squint under light. The experimental introduction of rhythmic music, relaxing light conditions, and deep pressure reduced unpleasant patient reactions and better positive participation in dental prophylactic cleaning. Parents may be requested to carry the child's favorite music video or music media. A sole dental operating room may be kept for autistic child treatment (Figure 3). Conversations of any procedure should be avoided during the course. During procedure, movements should be minimal, as an AD child may be easily distracted. Light background music may be useful [1].

Napse connectivity

The Initial Appointment--The initial appointment's primary goal is to establish trust and allow the family to understand that you are a caring dental professional and are interested in their well-being. It is important to learn what the patient is capable of doing versus learning what the patient is not able to do. -The appointment should not be rushed, and the parent/ caregiver should be present during the appointment and should choose the location for the visit. The initial appointment with a patient with autism should include an interview; an orientation to the dental practice, including staff and facility as warranted; and a brief exam.

(Approximately 20 minutes). Prior to the initial appointment (and reinforced as necessary at subsequent appointments), photos of the office or a dental story can be sent to the parent/ caregiver to familiarize the patient with the office [4]. -All previous dental experiences should be discussed, including daily oral hygiene care, tolerance levels, homecare likes and dislikes, and overall dental expectations.--uropathology of various structures of the brain.

Autoimmune link

Communication with the ASD Patient- Understanding how an ASD patient communicates is an important goal of the interview process. Many patients may exhibit hearing or speech/language difficulties. The ability to follow directions, learn new things, and articulate wants and needs may be difficult for some patients with autism. Many rely on verbal and nonverbal cues; others do not understand nonverbal language. Therefore it is essential for the dental professional to be aware of the manner in which the ASD patient communicates. Some require assistive communicative devices such as an Alpha Smart (portable word processor), Augment Comm Device or PECS (Picture Exchange Communication System) [4].

Following the interview, the patient orientation may take place. This will involve the "tell-show-do" method of communication and engagement. A brief examination without dental instruments can also be performed if the patient is cooperative. The patient should be allowed at this appointment to determine where the exam will take place. This allows a trust-building relationship between the patient and the dental professional to begin. The dental professional should "reward" the patient at the end of the appointment with an appropriate product. This also enhances the trust relationship, no matter how much the patient may have "misbehaved" or been uncooperative. xASD patients enjoy receiving rewards and will feel comfortable in seeing the dental professional at a future date if the first experience

has been positive for him or her posture to elevated levels of cytokines.

Amino acid levels

Prenatal aspartame exposure: The Second Appointment- The next appointment should be based on what was learned during the initial visit. The second and subsequent appointments should be kept short while treatment is provided in a timely manner. A smile and a sense of playfulness, while understanding the patient's developmental age, will help in the treatment process iDental professionals should focus on the patient's abilities rather than disabilities in order to determine what will work during treatment. Keeping instruments out of sight until needed, keeping lights out of the patient's eyes and keeping distracting noises to a minimum add to the confidence and trust factor. Use of the "tell-show-do" technique of treatment allows familiarization and confidence. Children with autism can be very cooperative with dental treatment if an approach based on trust, tailored communication and appropriate appointment length is developed tamin A deficiencies.

Psychiatric ultrasound frequency:

Important steps to be followed

- 1) The first appointment should be short and positive. The parents and child must be offered a tour of the dental office where the child may be allowed to bring items that comfort him like a toy.
- 2) The child must always be dealt with or at least approached in a non-threatening manner.
- 3) Autistic infants show an intense desire to maintain a consistent environment. Thus parental suggestions are of utmost importance.
- 4) It must always be kept in mind that even the smallest changes in the environment may trigger extreme anxiety in the child.
- 5) When autistic children are held they show extreme resistance to the same and react inappropriately to fearful situations. They are extremely sensitive to loud noises and movements that maybe felt.
- 6) The child must be allowed to sit on the dental chair in order to properly familiarize with the dental operatory environment.
- 7) The dentist must talk calmly and in short phrases. The autistic children are prone to tantrums and aggressive behavior. The light must be kept out of the eyes.
- 8) Consider prescribing a mouth guard for higher functioning children with severe bruxism or self-injurious behavior.
- 9) Moderate pressure such as wrapping a child with a papoose board can be used to calm autistic children.
- 10) Despite all such measures some children must still need general anesthesia or sedation so that proper pediatric dental therapy can be delivered (Figure 4).

Behavior management strategy-ysiological

1. Pre-clinical evaluation (Personal details, medications, previous experiences)
2. Pre-clinical behavioral preparations (verbal/non-verbal, interests, signs of behavioral change, parental inputs, rewards)

3. Setting the stage (teaching tools, social story, increase familiarity and understanding)
4. Reproduce the story (attention to detail – use the same staff and dental environment for all the appointments if possible)
5. Clear instructions (one at a time) and positive reinforcement
6. Short appointments with frequent breaks, minimize distractions
7. Tell-show-do (TSD) technique (avoid excessive language, stress the aspect that works best for the individual child), direct observation, maintain eye contact if appropriate.
8. Rewards and reinforcements for the next visit. Nerve synapse connective.

Home care for patients with autism- ASD patients and parents/ caregivers need to be educated about the importance of home care therapies. It is crucial that the parent/ caregiver be provided with hands-on training, and issues of accountability should be discussed. Daily full-mouth disinfection rather than tooth brushing should be discussed. The dental professional needs to think of toothpastes and mouthwashes as medications and the toothbrush as the device used to deliver the medication [4]. To reduce caries rates it is crucial to teach primary caregivers how to provide optimal home care. Follow a daily plan to take care of your child's teeth: brush teeth twice a day with fluoride toothpaste. Use any aids recommended by the dentist or hygienist to keep teeth and mouth clean. Special toothbrush instruction for parents and children. Show parents how to gain access and control their child during the daily oral hygiene regimen.

Conclusion

Since the prevalence of Autism has increased in the recent years it is important for the medical and dental professionals to have a knowledge of the medical and oral health characteristics of the Autistic child, understand the experiences and challenges encountered by these children in order to be able to overcome these challenges and

facilitate the provision of the best medical and dental care to them [11]. It is essential to adapt proper oral hygiene measures and also need for regular dental visit in future. Oral hygiene maintenance and preventive dental treatments should be emphasized; so, proper oral health education programs must be targeted to these special children.

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