Review Article

Dental health in Autism Spectrum Disorder: A review.

Abstract:

Autism Spectrum Disorder is the fastest growing neurodevelopmental condition in the world . Children on the autism spectrum are prone to multiple oral health problems. The core symptoms of Autism cause difficulties in the identification and treatment of these conditions. This review highlights the frequent problems and details of management for the same.

Keywords:

Oral health, toothbrushing, dental problems, Autism spectrum disorder.

Introduction:

Autism Spectrum disorder(ASD) is a neurodevelopmental condition characterized by persistent difficulties with social interaction and communication, and restricted, repetitive patterns of behaviours.[1]Children on the Autism spectrum may also experience altered sensory responsivityacross all senses.This might include under or over sensitivity resulting in sensory seeking or avoidance behaviours in different contexts. The prevalence of ASD is 1 in 36 according to the Centre for Disease Control and Prevention (CDC) and 1 in 100 according to World Health Organization (WHO).[2]ASD is four times more common in boys compared to girls.

Common oral health problems in ASD.

Children with ASDpresent with a high prevalenceof plaque, caries, gingival hyperplasia, gingivitis,malocclusion, and periodontal disease.[3]The percentage of decayed, missing and filled teeth increases with advancing age. Traumatic ulcerated lesions and auto extraction (self-removal of teeth) occur frequently

aconsequence of self-injurious behaviours like such as head banging, face tapping, and gingival picking. Unusual oral habits include bruxism (teeth grinding), tongue thrusting, non-nutritive chewing on objects such as gravel, toys etc and repeated regurgitation could lead to temporomandibular joint pain, excessive wear of the dental enamel, tooth avulsion and attrition. Increased over jets, deep and open bites, and Angles class 2 malocclusion with proclinations were also higher in patients with ASD.

Reasons for poor oral hygiene in ASD

Irregular brushing habits may be because of oral sensory tactile avoidance which is a core symptom of ASD. The child dislikes the touch of toothbrush in the oral cavity and does not allow brushing. Lack of the manual dexterity of autistic children, might also result in inadequate tooth brushing.[4]ASD children also have difficult mealtime behaviours and food refusal based on the texture and taste of the food. They have a very restricted diet which usually does not include healthy vegetables and fruits.[5]They prefer soft and sweetened foods and tend to pocket the food inside the mouth instead of swallowing it due to poor tongue coordination, thereby increasing the susceptibility to caries.[6]

ASD children have less frequent dental clinic visits due to behavioural challenges, elevated levels of distress and anxiety that may be associated with multiple sensory stimuli in a typical dental office. The physical environment of a dental clinic is generally not conducive to treating individuals with ASD. The waiting room with neurotypical toys, the extended waiting times, being surrounded by strangers in a busy area might lead to behavioural outbursts. Their care is not necessarily easily accommodated in a typical dental practice setting.[7]

Nonverbal ASD children might not be able to communicate their oral problems to their caregivers.Having intellectual disabilities might also affect their activities of daily living like brushing. Poor knowledge and oral practices in the

care givers might add to the cause of poor oral health. Parental exhaustion and burnout because of continuous dependence makes oral care a low priority compared to other essential tasks like feeding. Thus,children with ASD face significant barriers when accessing oral care and present with many unmet needs, decreasing their overall quality of life.

Tips to maintain oral health in ASD children:

Tooth Brushing: A small headed manual toothbrush with soft bristles to minimise irritation can be used initially.[8] Modifications can be made to the toothbrush handle to improve comfort and handling, e.g., velcro hand straps, pencil grips etc. Modified toothbrushes with double heads which can brush two surfaces at once can also be bought at specialised shops/websites. Electric oscillating toothbrushesare easy to use, remove more plaque than a manual toothbrushand have a chunky handle for comfort.

Brushing should start as soon as the first baby tooth erupts. Teeth should be brushed twice daily. To minimise anxiety, the toothbrush should be introduced gradually, allowing the child to touch it and play with it until they are comfortable.They can be familiarised by massaging their gums with the parents' finger and allow them to do the same. Once familiar with the toothbrush, gentle brushing movements a little at a time should be initiated andit should be gradually increased. If the child clamps down on the brush, a prop and a second brush can be used to clean the teeth. Some may not tolerate the use of an electric toothbrush due to the sound and vibrations, others may not.

Small circular strokes should be used to brush all the teeth and gumline ensuring that all surfaces are brushed (the outside, inside and biting surface) for 2 minutes using a visual timer. After brushing, childmust spit out the excess toothpaste. Rinsing once is recommended as excessive rinsingwashes away the

protective fluoride paste. A mouthwash can be used at a different time to brushing for maximum effect. Children should be supervised and should never be allowed to eat toothpaste.

Toothpaste containing 1350-1500ppm (parts per million) fluoride should be used to help protect against tooth decay. For children under 3 years: a smear (a thin film covering less than ¾ of the brush) of paste should be used. For children aged 3-6 years: a small pea-sized amount of paste should be used. Toothbrushing must be done at the same time each day, in a familiar comfortable room using the same technique so that it becomes part of the routine. Adults can brush their teeth at the same time to make children copy them or demonstrate on a “teddy’s tooth” first. Research shows that picture /visual aids and a visual schedule of the different steps of brushing help to improve oral hygiene in autistic children. Continuous praise, encouragement and a positive reinforcement reward system can also be used.

Acid erosion is the loss of tooth surface, caused by the dissolving action of acids over time, and can progress to the underlying dentine layer causing sensitivity, increasing the risk of tooth decay and possibly death of the tooth nerve. Common causes of erosion are the acids such as phosphoric, citric, malic, and ascorbic found in fruit, fruit juices, sweets, fizzy drinks, sports drinks, aspirin and fruit teas. Hydrochloric acid from the stomach during gastric reflux, vomiting, regurgitation can also cause erosion. To reduce acid erosion,limit the frequency of acidic drinks/foods and consume them at mealtimes. Milk and water can be used as a substitute. A straw can be used when drinking acidic drinks and swishing inside the mouth before swallowing should be discouraged. The use of fluoride mouthwash and toothpaste can help strengthen enamel and reduce sensitivity.

Oral trauma caused by self-injurious behaviour and accidents can be common. Any unusual traumarequires urgent doctor /dental attention.

To reduce the risk of tooth decay it is recommended to decrease the food/drinks that contain sugar. Sugar consumption is to be restricted to a maximum of 4 times a day. Sugars should be avoided before bed as the reduced saliva flow during sleep cannot help repairing the damage caused by the acids. Brushing twice daily with a high fluoride toothpaste is recommended. Dietary supplements and medicines containing sugar/glucose should be ingested at mealtimes and not last thing at night. Sugar should not be added to weaning foods. Food/drink labels should be read as many contain 'hidden sugars' like sucrose, glucose, maltose, dextrose, syrup, honey, treacle, invert sugar, dextrin, maltodextrin. Juices that say 'no added sugar' still contain natural sugars that can help to cause decay. These drinks should be substituted with water or cow's milk.

Bruxism which is excessive grinding and clenching of the teeth during the day and night can cause gradual wear of tooth surface, pain, tooth loss and jaw problems. It can be caused by stress, irregular biting position, medication side effects, epilepsy, seizures, developmental tooth defects and missing teeth. The dentist may produce a custom-made mouth guard to help reduce wear. The dentist may also be able to modify the way in which the teeth bite together if appropriate and repair the teeth to reduce pain and restore function. Topical fluoride treatments/high fluoride toothpaste may be used to help reduce the sensitivity. Relaxation/stretching techniques like stretching and massaging the jaw muscles may help. Dry mouth (xerostomia) due to a reduction in saliva flow can often be a side effect of certain antidepressant, antipsychotic and anticonvulsant medication. Dry mouth can result in discomfort, reduced taste, increased risk of tooth decay, gum disease and oral infections. It can affect speech, chewing and swallowing. Frequent sips of water, sprays, gels, pastilles, tablets and mouthwashes and avoiding spicy food may be useful.

Visiting a dentist: An initial trial visit to meet the staff would familiarise the child to the environment, smells, noises, and equipment. Either the first or the last appointment is recommended to avoid waiting and a busy waiting room. If required, the treatment should be spread across multiple short appointments, to avoid prolonged discomfort and to develop familiarity and trust with the dental environment and staff. The child should be informed about the dental visit a few days prior to decrease anxiety and resistance. The use of picture story books e.g., 'My First Trip To The Dentist' and 'autism social stories' can help explain what will happen, what to expect and why we need to go to the dentist. A disposable mouth mirror can be used to practice at home before the visit. A favourite toy/blanket should be taken along for comfort and to help occupy. Hands can be held throughout the appointment to provide support and to avoid flapping/rocking during treatment. Calming music can help to relax the child andreduce the noise of the equipment. Praise and encouragement before, during and after the appointment and areward after the appointment can be used for positive reinforcement.

Use of physical restrainers is controversial and are to be used onlyas a protectively supporting device in selective situations after proper informed consent. Conscious sedation can be used as a treatment plan after proper evaluation and no contraindications. The drugs most used are: Versed, Vistaril, Demerol, Chloral Hydrate, and Nitrous Oxide.[9]During sedation, the child must be monitored for their vital signs by a second assistant. Management of autistic patients under general anaesthesia is effective and it will help the patients to tolerate conventional treatment.[10] The dentist should be provided with as much information as possible about the child's medical history, needs, behaviour and sensitivities so they are fully aware and prepared.

Conclusion: Dental health in Autism is a complex problem. Its increasing prevalence will lead to more direct and regular visits of autistic children at the dental clinic. It is important to increase awareness among the parents about the need for regular oral health check-ups and to sensitize dental professionals about the divergent needs of these children.

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