Retrospective Evaluation of Oral Health Status in Children with Autism Spectrum Disorder

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Abstract

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by impairments in speech, social interaction, and behavioural regulation. Sensory sensitivities and restricted interaction may hinder oral hygiene practices and access to expert dental treatment in affected children. As a result, individuals might be at an increased risk of oral diseases and unaddressed treatment requirements. This study aims to compare and assess the oral health condition of children with Autism Spectrum Disorder (ASD) with healthy controls.

Materials and Method

A retrospective analysis was carried out in the Department of Oral Medicine, Radiology and Special Care Dentistry. The electronic dental records of children aged 6–14 years from 2021 to 2025 were reviewed. A total of 210 participants, consisting children diagnosed with ASD and age- and gender-matched healthy controls, were included. Data on oral hygiene status, dental caries, periodontal conditions, medication history, and treatment requirements were collected. IBM SPSS Statistics Version 29.0 was used for statistical analysis, employing suitable descriptive and inferential tests.

Results

Children with ASD exhibited comparatively poorer oral hygiene and a higher prevalence of gingivitis and dental treatment needs than healthy controls. A greater proportion required restorative procedures, extractions, and root canal therapy. Antipsychotic medications were the most commonly reported drugs among children with ASD, and caries prevalence was higher among those receiving long-term medication. Increased referrals for dental procedures under general anaesthesia were also noted in the ASD group.

Conclusion

Children with ASD demonstrated greater vulnerability to compromised oral health and increased treatment requirements compared to healthy peers. These findings highlight the need for interdisciplinary cooperation, personalized management plans, and preventative dental care to improve oral health outcomes in this population. Additionally, the findings highlight how inclusive health activities within public health systems might improve dental healthcare for children with special education needs and autism spectrum disorder.

Keywords: Autism spectrum disorder, Oral health, Dental caries, Gingivitis, Paediatric dentistry, Special care patients, General anaesthesia.

How to cite this article: Sankaranarayanan S, Umamaheswari TN. Retrospective Evaluation of Oral Health Status in Children with Autism Spectrum Disorder. Int J Drug Deliv Technol. 2026;16(71s): 275-280. DOI: 10.25258/ijddt.16.71s.34

Introduction

Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder marked by specific and repetitive patterns of behaviour and interests, alongside persistent issues with social communication. Those with ASD frequently struggle with social interaction, verbal and nonverbal communication, and behavioral flexibility [1-3]. Over the past several decades, ASD has gained substantial research attention, evolving from a condition once considered rare in childhood to a widely recognized lifelong neurodevelopmental disorder with a strong genetic component. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), Asperger's syndrome, autism disorder, childhood disintegrative disorder, and pervasive developmental disorder are all included in the spectrum of ASD [4]. The management of ASD usually entails a multidisciplinary strategy that

combines behavioral interventions, educational initiatives, and pharmacological assistance. It is thought that the development of ASD results from a complex interaction between genetic predisposition and environmental circumstances. [5,6]. The World Health Organization estimates that the prevalence of ASD is around 0.76% worldwide, but this number only includes data from a small portion of children worldwide. According to the Centers for Disease Control and Prevention, around 1.68% of eight-year-olds in the United States of America have an ASD diagnosis [7]. It is estimated that over two million people in India, where children under the age of 15 make up nearly one-third of the population, may have ASD, highlighting the significant public health impact and the need for increased awareness, early diagnosis, and easily accessible intervention strategies [8].

Even though the healthcare needs of people with autism spectrum disorder (ASD) are becoming more well acknowledged, there is still a significant lack of dental literature that addresses how to effectively manage their oral health. By enhancing functional abilities and reducing behavioural and sensory difficulties through interdisciplinary interventions, the key objective of ASD management is to improve overall quality of life [9]. ASD can significantly influence oral health, particularly due to difficulties with communication, sensory hypersensitivity, repetitive behaviours, and limited cooperation during dental procedures. These elements could lead to poor oral hygiene, which increases the risk of periodontal disease, tooth trauma, and dental caries [10].

The complex interaction between ASD and oral healthcare necessitates further research to develop evidence-based, patient-cantered dental management strategies tailored to this population. Despite the growing recognition of the oral health concerns of people with ASD, there is no agreement in the dentistry literature about the best preventive and therapy strategies. Addressing this knowledge gap is crucial for improving oral health outcomes and overall well-being in individuals with ASD [11]. Dental professionals need to acquire a comprehensive understanding of ASD and its related behavioural and sensory features in order to manage and avoid oral issues. Such knowledge enables clinicians to modify treatment techniques, create supportive dental environments, implement behaviour guidance strategies, and collaborate with caregivers and healthcare providers to deliver individualized care [12]. To support long-term oral health in people with ASD, early intervention, preventative dentistry programs, and routine oral health monitoring are crucial [13]. Thus, the purpose of this study is to assess and compare the oral health outcomes of people with ASD with those of healthy controls in order to shed light on the particular dental care requirements of this population.

Materials and Methods

To evaluate and compare the oral health status of children with autism spectrum disorder (ASD) and healthy controls, a retrospective observational study was conducted in the Department of Oral Medicine, Radiology, and Special Care Dentistry at Saveetha Dental College and Hospitals, Chennai, India. The Clinical records were retrieved from the electronic database for the study period extending from year 2021 to 2025. A convenience sampling technique was used to include 105 case records of children with ASD diagnoses and 105 records of children in good health. Participants between the ages of 6 and 14, both male and female, were considered eligible for the study.

Training and Calibration

Two investigators underwent a structured training and calibration phase lasting two months before data collection. This process involved familiarization with the study protocol, eligibility criteria, and oral health parameters. Calibration was performed under the supervision of experienced faculty members to ensure consistency and reliability in data selection and extraction.

Sample Size Calculation

The statistical program G*Power was used to estimate the sample size, based on effect sizes reported in previous literature with comparable objectives. A simple random sampling approach was adopted to ensure adequate statistical power and representativeness of the sample.

Inclusion and Exclusion Criteria

The study included children under routine medical supervision who had been diagnosed with autism spectrum disorder. Healthy children without any known systemic conditions served as controls. Both groups included male and female participants aged 6–14 years. Exclusion criteria included children with other systemic illnesses, those undergoing long-term medication that could influence oral health, children receiving chemotherapy or radiotherapy, and those with additional neurodevelopmental or genetic disorders. These criteria were applied to minimize confounding variables and isolate the impact of ASD on oral health outcomes.

Statistical Analysis

Data were compiled using Microsoft Excel 2016 (Microsoft Corporation, Redmond, Washington, USA) and analysed using IBM SPSS Statistics for Windows, Version 29.0 (IBM Corp., Armonk, New York, USA). Descriptive statistics, including frequency and percentage distributions, were used to summarize and interpret the findings.

Results

The study had 210 participants, with comparable numbers of males and females in the ASD and control groups. There were 56 girls and 44 boys in each group, ensuring gender parity. More reliable comparisons of oral health outcomes between children with ASD and those in good health are supported by this uniform distribution (figure 1).

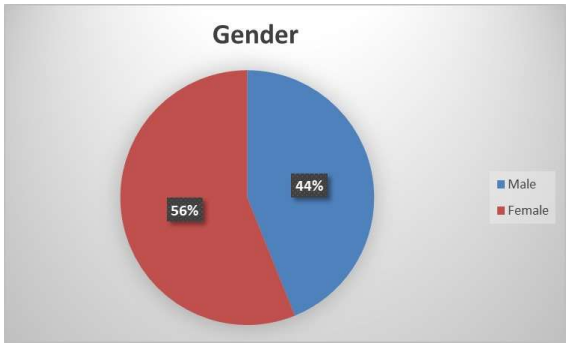

Figure 1- Gender distribution among the included participants

Approximately all the Parents of children with Autism Spectrum Disorder (ASD) reported that their child was receiving one or more prescribed medications (Figure 2). The distribution of prescribed medications among children with ASD is illustrated in Figure 2. Antipsychotics were the most commonly reported medications, accounting for 45% of prescriptions, followed by anticonvulsants at 27%. Antidepressants comprised 18% of the medications, while psychostimulants were the least prescribed, representing 10%. This distribution indicates that behavioural and mood-regulating medications form the major component of pharmacological management in children with ASD within the studied population.

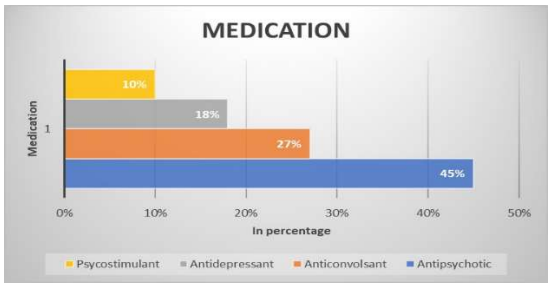

Figure 2- Medications taken by ASD group participants

The assessment of oral hygiene status among the ASD group showed that 47% of participants had poor oral hygiene (see Figure 3). Around 35% had fair oral hygiene, while only 18% of the children were classified as having good oral hygiene. Overall, these findings suggest a higher prevalence of inadequate oral hygiene within the study population.

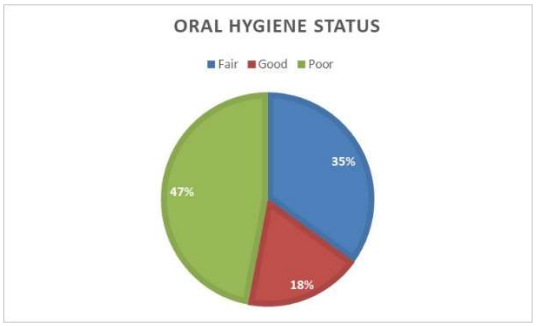

Figure 3- Oral Hygiene Status of the ASD group

Figure 4 shows the distribution of oral conditions among the ASD study participants indicates that gingivitis was the most prevalent finding, affecting 26% of the population. This was followed by the need for extraction (21%) and root canal therapy (18%), suggesting a considerable burden of untreated or advanced dental disease. Dental caries was observed in 16% of participants, while malocclusion accounted for 12%. Periodontitis showed the lowest prevalence at 7%, indicating comparatively fewer cases of advanced periodontal involvement.

Overall, the results reflect a high occurrence of oral conditions, particularly gingival inflammation and treatment needs requiring extractions in 21% cases and endodontic therapy in 18% cases. The pattern suggests inadequate oral hygiene practices and delayed dental intervention within the study group. These findings emphasize the importance of early preventive care, routine dental screening, and timely management to reduce disease progression and the need for more invasive procedures.

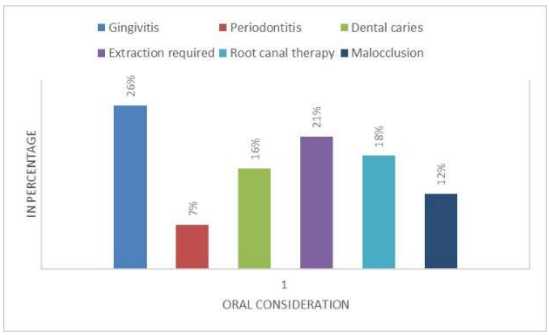

Figure 4- Oral manifestations and Dental considerations for the ASD group

Discussion

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that persists for a lifetime and is characterized by specific and repetitive behavioural patterns as well as continuing difficulties in social communication and interaction. Its reported prevalence has increased considerably over recent decades, leading to heightened research interest across multiple healthcare disciplines. Early detection and timely intervention are essential for enhancing developmental outcomes and general quality of life [14,15]. Dental research continues to produce conflicting results about the severity of oral disorders and the need for treatment in children with ASD, despite growing knowledge of the disorder [16,17]. In the present study, children with ASD presented at a significantly older age for their initial dental visit, demonstrated reduced brushing frequency, exhibited higher caries experience and severity, required more comprehensive dental treatment, showed a greater prevalence of Class II malocclusion and bruxism, and had an increased likelihood of referral for treatment under general anaesthesia (GA), even after adjusting for other influencing factors.

The delayed first dental visit observed in children with ASD is clinically significant. It is commonly known that early dental care is essential for enhancing preventative results and slowing the onset of disease. Establishing a dental home at an early age enables timely risk assessment, preventive counselling, and guidance, thereby decreasing extensive treatment needs and reducing the necessity for GA [18]. The postponed dental visits noted in this study may be attributed to caregiver-related concerns, including uncertainty regarding appropriate timing for the first visit, anxiety about anticipated behavioural challenges, financial constraints, transportation issues, or difficulty locating dental professionals experienced in managing children with special healthcare needs. These findings emphasize the importance of encouraging early and preventive dental care for children with ASD [19].

In comparison to comparable controls, children with ASD in this study were more likely to present with Class II Division I malocclusion and less likely to have Class I occlusion. This observation aligns with earlier reports and may be related to the higher frequency of parafunctional habits observed in this group, including bruxism, pica, lip biting, tongue thrusting, mouth breathing, and prolonged pacifier use. Such habits can influence craniofacial development and contribute to malocclusion [20,21].

Another important finding was the significantly greater referral rate for dental treatment under GA among children with ASD. Although increased caries burden, more extensive treatment needs, and behavioural management challenges may justify GA in selected cases, children with ASD remained more likely to receive GA referrals even after controlling for these variables. Autism is frequently cited as a reason for GA utilization; however, GA involves substantial financial costs and potential medical risks [22]. The higher referral rate may reflect provider reluctance to attempt chairside management, sensory sensitivities in affected children, or limited training in advanced behaviour management strategies. These results highlight the need to strengthen preventive care efforts and enhance clinician training in special care dentistry to reduce dependence on GA.

As a retrospective study, the severity levels of ASD were not categorized, which may have limited the ability to assess variations in oral health status across the spectrum. Additionally, the patient population attending a tertiary care centre may represent a higher-risk group, thereby restricting generalizability to the broader community. The Future research should focus on prospective longitudinal studies and multicentre designs to improve representativeness and strengthen evidence quality. Stratification according to ASD severity, along with evaluation of caregiver education, socioeconomic factors, and healthcare accessibility, may provide more comprehensive insight into determinants of oral health disparities. Interventional research focusing on preventive protocols, caregiver training programs, and enhanced behaviour guidance techniques would contribute to the development of evidence-based, patient-centered management strategies. For children with ASD to have better long-term dental health outcomes, interdisciplinary collaboration and special care dentistry education must be improved.

Conclusion

This retrospective study among South Indian children indicates that those with autism spectrum disorder (ASD) have poorer oral health outcomes than the healthy control group, with greater unmet treatment needs, particularly in the primary dentition. Increased referrals for dental treatment under general anaesthesia highlight the challenges posed by behavioural and sensory sensitivities. These findings emphasize the need for individualized preventive and therapeutic dental strategies focused to children with ASD.

Integrating special care dentistry into routine health management, along with early preventive interventions, regular dental monitoring, and customized oral hygiene programs, is essential to reduce caries and periodontal disease risk. Training dental professionals to recognize ASD-specific challenges and adopt behaviour-guided approaches can further improve care delivery. Overall, the study supports the need for interdisciplinary collaboration to enhance access to dental care and improve oral health–related quality of life in children with ASD.

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