COMPARISON OF ORAL HEALTH STATUS AND TREATMENT NEEDS IN AUTISTIC AND NON-AUTISTIC CHILDREN

ABSTRACT:

Background:

Dental treatment need is identified as the greatest neglected health need of children with developmental disabilities. The most commonly known developmental disorder is autism, and there is a recent increase in the diagnosis of autism cases. The aim of this study is to bring to light that providing quality dental care and inculcating dental education programmes can significantly improve the oral conditions of institutionalized autistic children, thereby improving their lifestyle.

Materials and methods:

We conducted an institutionally based case-control study on 50 children with autism, selected from two special schools in Chennai, India. The total number of decayed, missing, and filled teeth was assessed for the institutionalized autistic group undergoing dental education programme and the non-autistic group selected from our general hospital. Oral Hygiene Index-Simplified (OHI-S) and the DMF score were also calculated for both groups.

Results:

There was a statistically significant difference in OHI scores between institution trained autistic children and non-autistic controls, but we found no significant difference in decayed, missing, and filled teeth.

Conclusion:

Autistic children exhibit good cooperation and good response to Dental education programmes, significantly improving their oral health conditions.

Keywords: Autism, OHI, Dental education

INTRODUCTION:

The word autism is derived from Greek words: "Autos," means self, and "ismos," is a state of being (Thomas NA et al.,2016). Prater and Zylstra defined autism as a "pervasive developmental disorder defined behaviourally as a syndrome consisting of abnormal development of social skills (e.g., withdrawal, lack of interest in peers), limitations in the use of interactive language (speech as well as non-verbal communication), and sensorimotor deficits (e.g., inconsistent responses to environmental stimuli) (American Psychiatric Association. Diagnostic and statistical manual of mental disorder, 1994)." While the etiology of autism is currently poorly understood, many causes have been implicated, such as genetics, environmental poisons, neurologic psychopathy, etc. The current treatment for autism is composed of behavioural therapies and medications like antidepressants, antipsychotics, anticonvulsants, and central nervous system stimulant drugs. These medications cause systemic and oral side effects affecting oral hygiene. The oral manifestations include bruxism, tongue thrusting, dental caries, periodontal diseases, delayed tooth eruption, trauma, and injury (Srinivasa J,2018). This study focus on the pertinent dental education programs can significantly alleviate dental issues and improve the quality of autistic kids.

AIM AND OBJECTIVES:

This study aimed to evaluate the oral manifestations of autistic patients in institutions undergoing dental education training programme with assisted oral hygiene instructions. To assess their gross motor skills and overall dental status compared to normal patients. To stress the importance of Dental education program for Autistic children.

MATERIALS AND METHODS:

We performed an institutionally based case-control study on 50 children with autism, selected from two special schools in Chennai, India. The children were made to undergo a dental education programme and given assisted oral hygiene instructions for 3 months before

the study. Ethical clearance was obtained to conduct the study. Both male and female children aged 6 to 14 years were included. The oral manifestations in relation to their motor skills, brushing habits, diet were assessed and compared with the non-autistic age-matched and gender-matched control group. The control group consisted of 50 normal children without autism.

The parents or caregivers of the subjects were detailed with the study, information sheet and informed consent form. We also gathered additional patient information via a questionnaire. The motor skills were graded and compared with that of normal kids. The caregivers, as well as the participants, underwent an oral hygiene education program for 3 months with dental professionals, after which the evaluations were done. The results were compared with that of the non-autistic groups.

Oral hygiene was rated using the Simplified Oral Hygiene Index (OHI-S). The index criteria are related to the sum of Debris Index Score (DI-S) and Calculus Index Score (CI-S). We examined the vestibular surfaces of 11, 16, 26, and 31, and we examined the lingual surfaces of 36 and 46. The DMFT index was also assessed between the groups.

STATISTICAL ANALYSIS:

The data collected were statistically analysed with SPSS software version 16 (IBM, Chicago, IL). Simple descriptive statistics were used to describe the distribution of the data collected. We used the Pearson's chi-square test to assess the statistically significant difference in oral manifestations between the test and control groups.

RESULTS:

Medical history of autistic children elicited conditions involving cardiac problems, cerebral palsy, downs syndrome, and Seizures (Figure: 1). However, the majority of autistic kids did not have any significant medical problems.

Gross motor skills (GMS) of children with and without Autistic Spectrum Disorder (ASD) were assessed using simple grading criteria.

Grade 0: No Contraction

Grade 1: Flicker / Trace of Contraction

Grade 2: Active Movement with Gravity Eliminated

Grade 3: Active Movement against Gravity

Grade 4: Active Movement against Gravity Resistance

Grade 5: Normal Power (Minimal Weakness)

There is a significant difference in the motor skills of autistic and normal kids.G0, G2 G3 was found only in autistic kids, whereas G4 was significantly higher in healthy kids compared to autistic kids. G5 is completely absent in autistic kids, showing that normal power to carry out regular activities was completely lacking compared to normal kids. The p-value is found to be less than 0.05 (Figure: 2).

In between meal snacking was slightly more in autistic children when compared to their normal counterparts (Figure: 3)

The cooperation levels in terms of following instructions and executing on it were almost the same with both the groups. No statistically significant difference was evident between both the groups (Figure: 4) in this aspect.

The OHI scores were statistically significantly higher ($p < .001$) in the autism group when compared to the OHI scores in the control groups (Figure: 5). However, we found no significant difference in decayed, missing, and filled-teeth values between the two groups ($p = 0.82$).

DISCUSSION:

Certain essential parameters like the gross motor skills, intermediate snacking habits, the cooperation levels of the kids, to various instructions were evaluated for both the study group and the normal individuals. These parameters helped us assess the study group's developmental and behavioral patterns.

A statistically significant difference was found in GMS. The autistic kids had lesser motor skills than the normal, according to the studies done by Lloyd M et al.,2013 and Ting Liu et al.,2014. This definitely calls for timely intervention to improve brushing techniques and impart dental education programmes.

The difference between snacking was also slightly higher in autistic, which correlates with the studies done by Blomqvist M et al. in the year 2015. The correlation between meal snacking and increased prevalence of dental caries was evaluated in several studies done by Verma S et al. in 2016, Blomqvist M et al. in 2015, Cermak SA et al. in 2010, and Downs A et al. in 2004. This aspect shows a necessity to inculcate healthy eating criteria and proper food habits to prevent increased caries occurrence.

To our surprise, it was found that autistic kids exhibited good cooperation levels and had an excellent ability to follow instructions and execute, which was positively correlating with studies done by Downs A et al. in 2004 and Liebal K et al. in 2008. This gives a varied scope for educators to incorporate awareness programs and a structured dental education program in autistic institutions.

Our study found no significant difference in the prevalence of caries between the two groups. However, Jaber MA et al., 2011, Loo CY et al., 2008, and Namal et al., 2007 reported a lower prevalence of caries in autistic children compared to control groups. This gives evidence that lower caries in autistic children in our study group may be due to the high level of supervision by adults in the child's life (such as parents and school teachers), where activities like teeth brushing and other oral hygiene instructions were imparted. In a similar study, Shapira J et al., 1989 concluded that the lower caries in autistic children was due to a less cariogenic diet, regular behavior at meals, and the autistic children being less partial to sweets.

Brushing techniques like bass can remove the sensitivity issues and help them have better oral status. Their cooperation with oral hygiene instructions and adept learning abilities show it is very easy to train autistic kids and improve their oral condition and overall lifestyle.

Dental caries was also not higher in autistics showing clearly that imparting healthy habits can reduce dental caries in autistics

Our study found a significant difference in OHI scores between the autistic group and the control group. The oral hygiene of the trained autistic group was significantly higher, clearly shedding light on the fact that training can be of paramount help to autistic kids. Shapira et al. also reported an unexplained high incidence of periodontal disease and a low caries incidence in autistic patients. Similarly, Luppanapornlap et al. in 2010 stated that poor hand coordination leads to difficulty in maintaining good oral hygiene in people with autism, thus increasing gingival diseases.

The literature has reported that dentists experience considerable barriers in providing Dental training. In a study conducted by Thomas et al. in 2016, looking at barriers to dental care in children with autism, 80.5% of the autistic children in the study had unmet dental

needs, of which the most frequently reported barrier was a lack of communication (74.2%) and behavioral problems (61.3%). The lack of confidence among dental professionals to treat children with special needs may be due to a lack of training or exposure to children with disabilities in the formal education setting. The inclusion of formal training in the dental curriculum to manage such children would improve dentists' competence in working with special needs children (Casamassimo PS et al., 2004) (Orellana et al., 2012).

Our study was limited by its small sample size, selected from special local schools. A similar potential study can be pursued in the future by including other indices and various parameters like the Gingival Index, Community Periodontal Index, .etc.

CONCLUSION:

Autistic kids exhibit great cooperation and compliance with dental education programs. Timely intervention through oral education programmes can greatly help these kids improve their oral conditions despite lesser motor skills and slightly poor eating habits. Apart from dental health care professionals have a social, moral, and ethical responsibility towards all children, especially those with special needs. There is also a definite lack of oral health knowledge among primary health care professionals, which can be bridged.

With care, concern, and formulating relevant educational programs, dentists can help children with autism achieve adequate oral hygiene and reduce the cumulative burden of their condition.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and

country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

REFERENCES:

1. American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders, 4th ed. Washington, DC: American Psychiatric Association,65-78.[cited 2018 Mar 5]; https://justines2010blog.files.wordpress.com/2011/03/dsm-iv.pdf
2. Blomqvist M, Bejerot S, Dahllöf G (2015). A cross-sectional study on oral health and dental care in intellectually able adults with autism spectrum disorder. BMC Oral Health,15,81.
3. Casamassimo PS, Seale NS, Ruehs K(2004). General dentists perceptions of education and treatment issues affecting access to care for children with special health care needs. J Dent Educ,68(1),23-8.
4. Cermak SA, Curtin C, Bandini LG (2010). Food selectivity and sensory sensitivity in children with autism spectrum disorders. Journal of the American Dietetic Association,110(2),238-246.
5. Corbett BA, Schupp CW, Levine S, Mendoza S(2009). Comparing cortisol, stress, and sensory sensitivity in children with autism. Autism Res,2,39-49.
6. Dávila JM, Jensen OE (1988). Behavioral and pharmacological dental management of a patient with autism. Spec Care Dentist,8,58-60.
7. Downs A, Smith T (2004). Emotional understanding, cooperation, and social behavior in high-functioning children with autism. Journal of Autism Developmental Disorder,34(6),625-35.
8. Ferrando-Lucas MT, Martos-Pérez J, Llorente-Comí M, Freire-Prudencio S, Ayuda-Pascual R, MartínezDíez-Jorge C,Navarro GA(2002). The autistic spectrum. An epidemiological study and analysis of possible subgroups. Rev Neurol,34; Suppl1,S49-53

9. Jaber MA, Sayyab M, Abu Fanas SH (2011). Oral health status and dental needs of autistic children and young adults.J Investig Clin Dent,2,57-62.
10. Kamen S, Skier J (1985). Dental management of the autistic child. Spec Care Dentist,5,20-3.
11. Klein U, Nowak AJ (1998). Autistic disorder: a review for the pediatric dentist. Pediatr Dent,20,312-7.
12. Liebal K, Colombi C, Rogers SJ, Warneken F, Tomasello M(2008). Helping and cooperation in children with autism. J Autism Dev Disord,38,224–238
13. Liu T, Hamilton M, Davis L, Garhy SE (2014). Gross Motor Performance by Children with Autism Spectrum Disorder and Typically Developing Children on TGMD-2. Journal of Child & Adolescent Behavior,2,123.
14. Lloyd M, MacDonald M, Lord C(2013). Motor Skills of Toddlers with Autism Spectrum Disorders. Autism : The international journal of research and practice,17(2),133-146.
15. Loo CY, Graham RM, Hughes CV(2008). The caries experience and behavior of dental patients with autism spectrum disorder. J Am Dent Assoc,139,1518-24.
16. Luppanapornlarp S, Leelataweewud P, Putongkam P, Ketanont S (2010). Periodontal status and orthodontic treatment need of autistic children. World J Orthod,11,256-61.
17. Nagendra J, Jayachandra S(2012). Autism Spectrum Disorders: Dental Treatment Considerations. J Int Dent Med Res,5(2),118-121.
18. Namal N, Vehit HE, Koksal S(2007). Do autistic children have higher levels of caries? A cross-sectional study in Turkish children. J Indian Soc Pedod Prev Dent,25,97-102.
19. Orellana LM, Silvestre FJ, Martínez-Sanchis S, Martínez-Mihi V, Bautista D (2012). Oral manifestations in a group of adults with autism spectrum disorder. Medicina Oral, Patología Oral y CirugíaBucal,17(3),e415-e419.
20. Shapira J, Mann J, Tamari I, Mester R, Knobler H, Yoeli Y, Newbrun E (1989). Oral health status and dental needs of an autistic population of children and young adults. Spec Care Dentist,9,38-41.
21. Srinivasa J. Autism Spectrum Disorders (ASD): Guide to Educators and Parents. [cited 2018 Mar 5]; Available from: http://www.med-ed-online.org
22. Swallow JN (1969). The dental management of autistic children. Br Dent J,126,128-31.

23. Thomas NA, Shetty P, Sowmya B, Kodgi V (2016). Barriers to dental care for children with autism spectrum disorder: A pilot study abstract. IOSR J Dent Med Sci,15(9),100-105.
24. Verma S, Mallaiah P, Kadalur UG, Sharma R (2016). Indian Dietary Habits in Relation to Dental Caries among 12-15 year old School Children in Bangalore City. International Journal of Oral Health and Medical Research,(3)1,44-47.

FIGURES:

Figure 1: Medical history

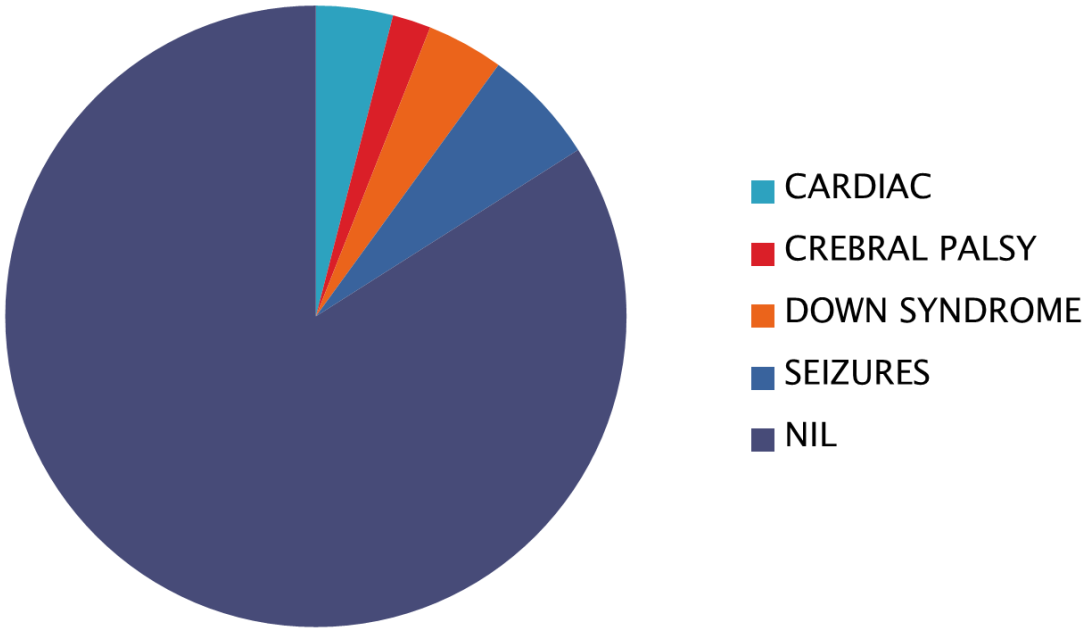

Figure 2: Motor skills

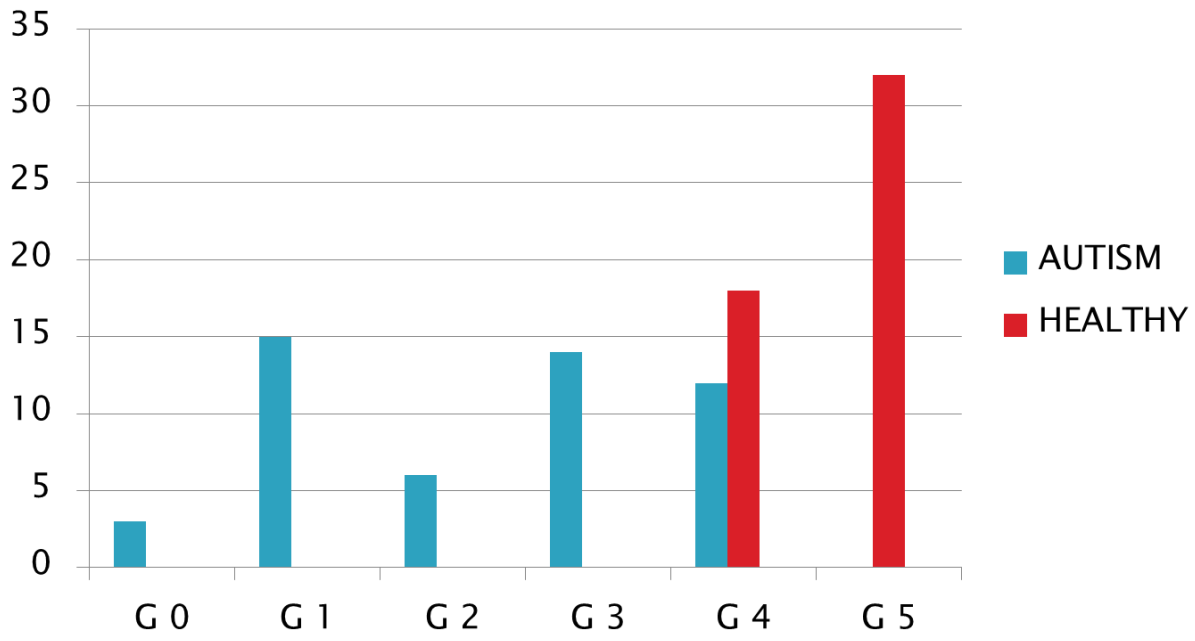

Figure 3: In-between Meal Snacking

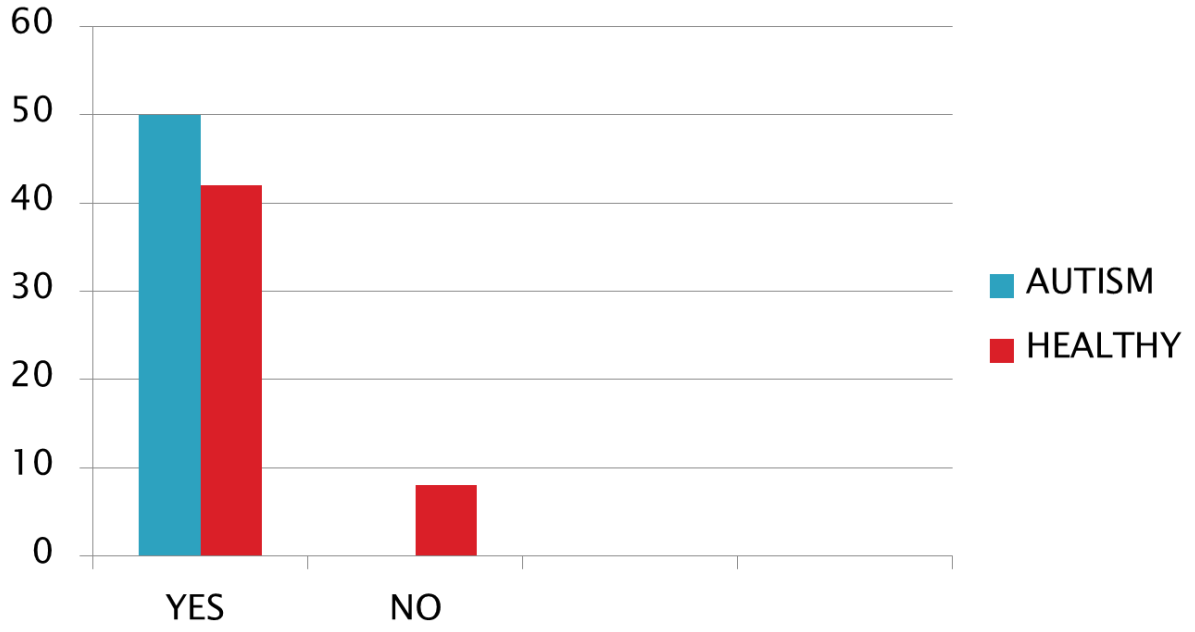

Figure 4: Cooperation levels

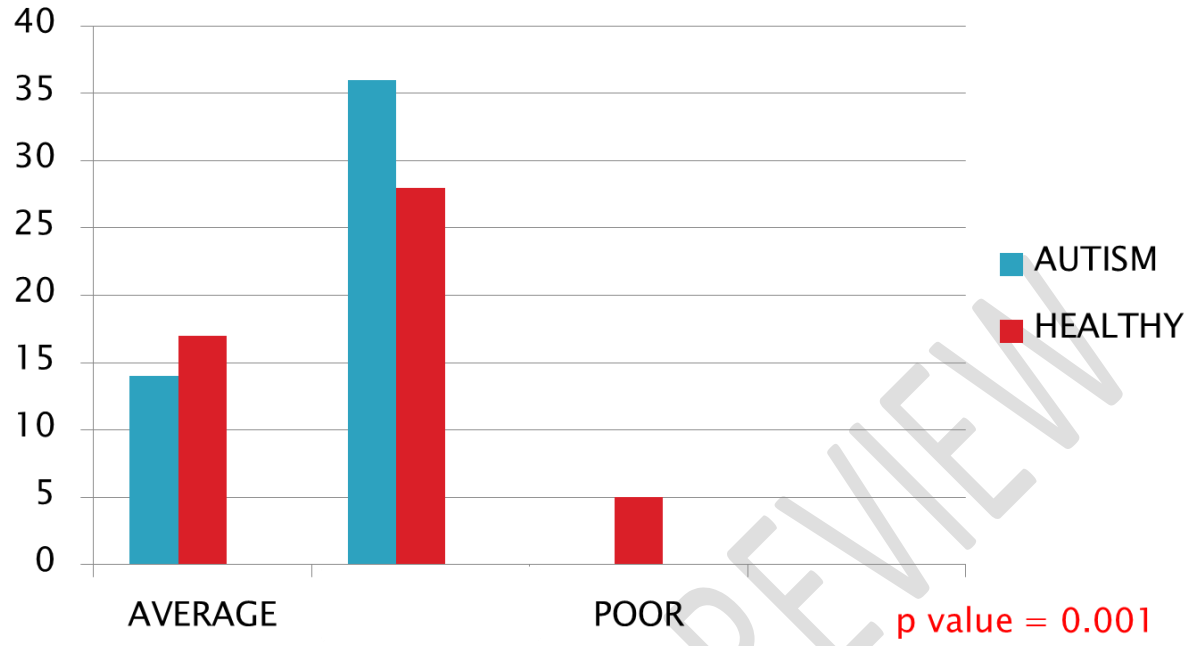

Figure 5: OHI scores