



Research Article

PREVALENCE OF DENTAL CARIES IN CHILDREN WITH AUTISM SPECTRUM DISORDER IN KOLKATA AND ITS ASSOCIATION WITH DIFFERENT VARIABLES

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ABSTRACT

Autism is a neuro psychiatric disorder in children. Maintaining oral hygiene is difficult for children with ASD because of lack of cooperation, communication and understanding which leads to dental diseases specially dental caries.

Aim: To assess the point prevalence of dental caries in children with ASD in Kolkata, West Bengal and its correlation with dietary and oral hygiene habits of the children and sociodemographic variability of parents.

Materials and Methods: Special schools dealing with autistic children were selected randomly from the list of schools obtained from the internet and permission of respective authorities were obtained. Caries status of the children were obtained using ICDAS II. A questionnaire form was distributed among the parents. The data was collected and subjected to statistical analysis.

Results: 83.2% children with ASD had dental caries as seen from the results and statistically significant relations were seen to be associated with socioeconomic status of the parents and dietary habits and oral hygiene habits of the children.

Conclusion: The study focusses on the need of conducting awareness programmes regarding maintenance of oral hygiene for the parents and caregivers of these children.

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INTRODUCTION

Autism, or Autism Spectrum Disorder (ASD), refers to a broad range of conditions characterized by challenges with social skills, repetitive monotonous behaviors, problems with speech and difficulty in communication which starts before the age of 3 years.^{1,2} According to Centers for Disease Control and Prevention 2014, 16.8 per 1,000 (one in 59) children aged 8 years have ASD. In India, study from the rural setting showed a pooled percentage prevalence of 0.11 in children aged 1-18 years; and, four studies conducted in the urban setting showed a pooled percentage prevalence of 0.09 in children aged 0-15 years.³

Worldwide, people with ASD are often subjected to stigma, discrimination and human rights violations. Children with ASD are unique in their diet pattern, dietary habits and their oral hygiene habits leading to a compromised intraoral condition. They are attracted to a particular texture or brand of food and also are provided rewards in the form of sweets and chocolates.^{4,5} Oral hygiene maintenance becomes difficult for these children due to poor manual dexterity and altered sensitivity.

Dental caries being a multifactorial disease, all these factors play an important role for occurrence of dental caries in children with ASD.⁶⁻⁸ The aim of the study is to assess the prevalence of dental caries in children with ASD in Kolkata, West Bengal and its correlation with different variables.

MATERIALS AND METHODS

Institutional Ethical Committee clearance was obtained. 6 Special schools of Kolkata, West Bengal, dealing with children with ASD were selected randomly and permission of respective authorities were obtained. 184 children with different degrees of Autism were included in the study after obtaining consent from their parents. Children with ASD have difficulty engaging and communicating with others and they tend to avoid making eye contact with unknown people. Keeping in mind these characteristics, the caregivers of the selected schools had been explained about preparing the children by creating social stories and role playing so that they cooperate better during the dental check up. In fact social stories are cited as having success in reducing inappropriate behaviors such as aggression, tantrums and other disruptive and socially isolating behaviors during the check up.⁹⁻¹²

Firstly the parents were asked to fill a multiple choice, closed ended, validated, bilingual questionnaire form with 14 questions which consisted of details about the demographic data, diet preferences, dietary and oral hygiene habits of the

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children. The parents were explained the details by the volunteers while filling the questionnaire.

The consumption of specific diet related to dental caries was evaluated and was assessed with this questionnaire. This part of the questionnaire was focused on the consumption of soft diet, confectionaries, soft drinks, fruits and vegetables. The response options were regular or occasional. The dietary habits included food rewards, frequency of sugar intake, fast food and snacks. Oral hygiene habits included were the frequency of brushing, ease of brushing and supervision during brushing the child's teeth.

After that the children with ASD were examined seated on a comfortable chair, under natural light using sterile portable equipment which included mouth mirror, explorer and cotton pellets.^{1,2} Tell-Show-Do (TSD) technique along with active/passive physical restraints were used for behavior modification of these children. ICDAS II (International Caries Detection And Assessment System) was used to quantify the dental caries present. An interactive session was also conducted among the parents and caregivers regarding the maintenance of oral hygiene at the end of the screening programme.

Data Collection and Statistical Analysis

Categorical variables are expressed as Number of patients and percentage of patients and compared across the groups using Pearson's Chi Square test for Independence of Attributes/ Fisher's Exact Test as appropriate. The statistical software SPSS version 20 has been used for the analysis. An alpha level of 5% has been taken, i.e. if any p value is less than 0.05 it has been considered as significant.

RESULTS

It was seen that 26.6% children were in the age group less than or equal to 5 years, 45.1% in the group 6-10 years and 28.3% above 11 years. 83.2% children had dental caries. Dental caries was seen to be more, that is 87.76% in the first age group though not statistically significant (p=0.594) Number of male children with ASD was much more than females. There were 76.1% male and 23.9% female participants. Caries prevalence was also more in male children (86.43% with p value of 0.034 which is statistically significant). [GRAPH 1]

Most of the parents of these children belonged to lower middle (67%) and middle class (63%) socioeconomic strata calculated according to the modified Kuppaswamy scale. Dental caries rate was seen to be more in the lower socioeconomic status groups compared to the upper classes with p value of 0.049 which is statistically significant. [GRAPH 2] TABLE 1 shows the demographic values.

It was observed that children with ASD preferred soft diet (83.7%) making them more susceptible to caries though not statistically significant (p=0.574).

Other healthy foods included in our study are fruits and vegetables in which the caries is slightly increased in children who consume these occasionally (84.06%) compared to a group having it regularly (82.61%). The results are not significant (p=0.799)

Sugar intake per day was a significant factor considering that these children have a preference for sweet food and confectionaries and also were provided food rewards in the

form of sweets and chocolates which was highly the occurrence of dental caries. (p=0.008) [GRAPH 3] Exposure to sweets and snacks between meals play an important role. Some of them also had a habit of keeping the food in the mouth for a prolonged period of time or pouching habits making them susceptible to dental caries though not significant. (p=0.187) TABLE 2 denotes the dietary preferences and habits related to dental caries.

In this study the frequency of brushing and supervision during brushing did not show any significant results. Dental caries was seen to be the highest in children whose parents thought that brushing was moderately difficult for them (88.06%) and in parents who thought it to be difficult (84%) which was statistically significant. (p=0.026). [GRAPH 4] TABLE 3 denotes the oral hygiene habits related to dental caries.

Table 1 Demographic Data Related To Dental Caries

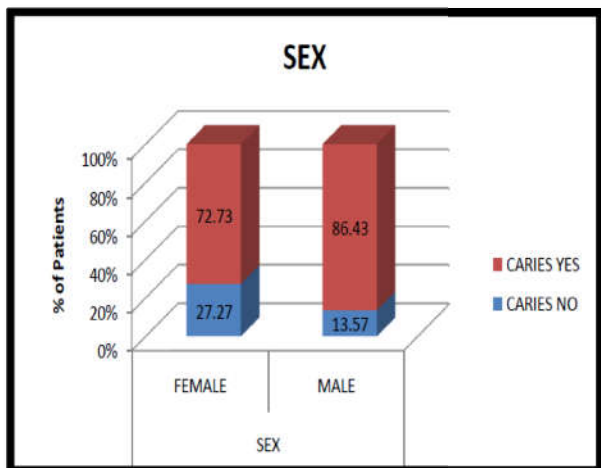
Sl no.	Demographic data	Groups	Percentage	Dental caries percentage	P value	Significance
1	AGE	• <=5	26.6	87.76	0.594	not significant
		• 6-10	45.1	81.93		
		• 11-15	28.3	80.77		
2	SEX	• FEMALE	23.9	72.73	0.034	significant
		• MALE	76.1	86.43		
		• LOWER	14.1	84.62		
3	Socioeconomic Status	• LOWER MIDDLE	36.4	89.55	0.049	significant
		• MIDDLE	34.2	84.13		
		• UPPER MIDDLE	8.7	68.75		
		• UPPER	6.5	58.33		
		• UPPER	6.5	58.33		

Table 2 Dietary Preferences And Habits Related To Dental Caries

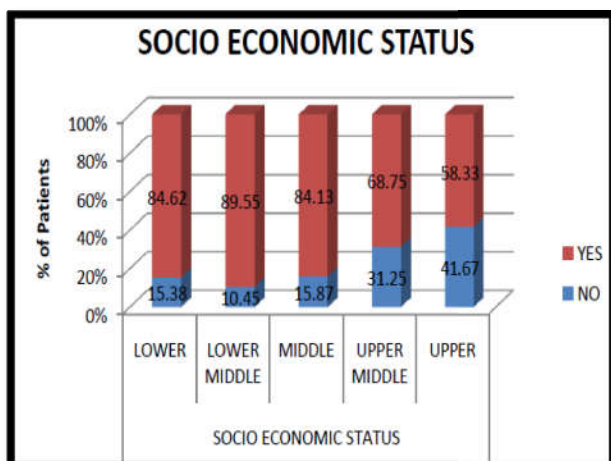
Sl no	Dietary habits	Groups	Percentage	Dental caries percentage	P value	Significance
1	Soft Diet	• YES	83.7	82.47	0.547	Not Significant
		• NO	16.3	86.67		
2	Fruits and Vegetables	• REGULARLY	62.5	82.61	0.799	Not Significant
		• OCCASIONAL LY	37.5	84.06		
3	confectionaries	• REGULARLY	89.1	83.54	0.751	Not Significant
		• OCCASIONAL LY	10.9	80.00		
4	Sugar/day	• 1-2 SPOONS	34.2	73.02	0.008	Significant
		• > SPOONS	65.8	88.43		
5	Sugar Exposure in Between Meals	• YES	61.4	83.19	0.988	not Significant
		• NO	38.6	83.1		
6	Pouching Habit	• YES	25.5	89.36	0.187	Not significant
		• NO	74.5	81.02		

Table 3 Oral Hygiene Habits Related To Dental Caries

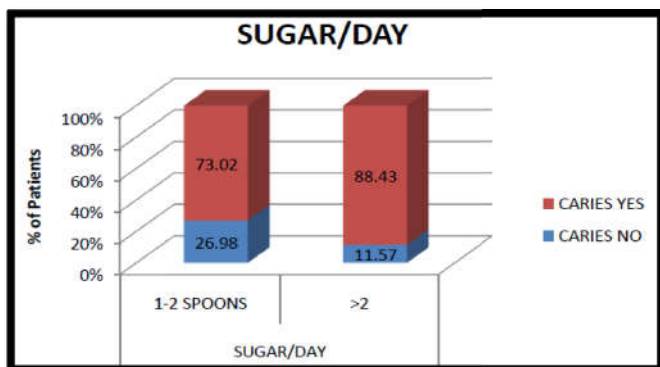
Sl.no	Oral hygiene habits	Groups	Percentage	Dental caries percentage	P value	Significance
1	Frequency of brushing	• ONCE	51.1	81.91	0.647	Not Significant
		• TWICE	48.9	84.44		
		• EASY	9.2	58.82		
2	Ease of brushing	• MODERATELY DIFFICULT	36.4	88.06	0.026	Significant
		• DIFFICULT	54.3	84		
		• FATHER	16.8	90.32		
3	Brushing supervised by	• MOTHER	67.9	82.4	0.415	Not Significant
		• CAREGIVER	13	75		
		• SELF	2.2	100		



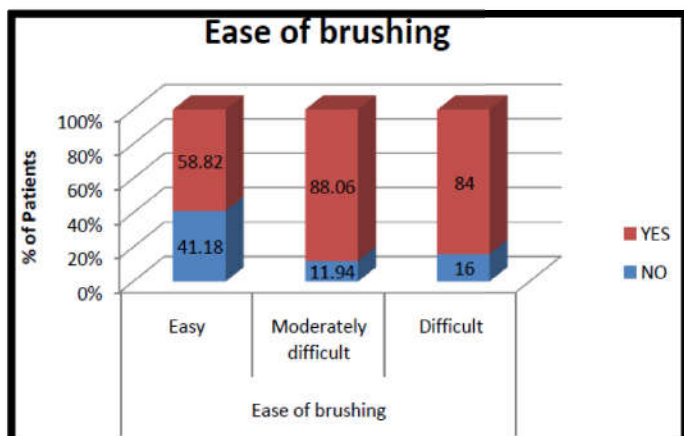
Graph 1 Dental Caries Percentage According To Sex



Graph 2 Dental caries percentage in different socioeconomic status



Graph 3 dental caries percentage related to per day sugar consumption



Graph 4 Dental Caries Percentage Related To Ease Of Brushing

DISCUSSION

The dental care for children with cerebral palsy and Down's syndrome are handled better because these conditions are diagnosed at birth unlike autism resulting in less direct involvement of the dentists to give instructions and warn about the factors that affect the maintenance of oral hygiene.

The reason for choosing these institutions as the place of study because schools are the best site for the children to cooperate as they are acquainted with this environment ,also parental or caregivers presence was allowed.¹⁻³

The mean prevalence of dental caries in normal children is almost similar at 5 years and 12 years at 49% while it shows steady increase from 15 years (60%) whereas caries prevalence in our study was 83.2% in par with studies conducted by Md.Jaber in 2011 which stated that the overall prevalence of dental caries among the autistic children was 77.0%.¹³

In this study, male predilection is more compared to the females in par with previously reported researches most probably because of high level of fetal testosterone and potential genetic/ chromosomal effects.^{8,14}

The parent's education helps the children maintain their oral hygiene as they comprehend the significance of good oral habits and so pass on to their children . Parental income is related to a socioeconomic status where the parents of the autistic children with higher income, will have lower dental caries because the parents can provide good facilities to maintain their oral hygiene in par with our study where dental caries rate was seen to be more in the lower socioeconomic status groups compared to the upper classes with p value of 0.049 which is statistically significant.¹³⁻¹⁵

It is evident that the autistic children prefer soft food which increases the incidence of dental caries (p=0.574) which is not significant in this study though and as they prefer to pouch the food in the oral cavity instead of swallowing due to poor tongue coordination leading to increased occurrence of dental caries have similar results though not significant (P-value = 0.187) in the present study.

These children are given rewards in the form of sweets and chocolates which had a profound effect on the increase in caries rate due to increased per day sugar consumption with p value of 0.008 which is highly statistically significant .

Our examination did not research the complexities of what kinds of snacks were consumed in between meals . Gluten free and casein free diet as prescribed by physician for these children were followed by some which may reduce caries rate in few children.¹⁶⁻¹⁸

Most of the children with ASD because of their physical impairments and poor manual dexterity within them needed help from their parents or caregivers during brushing . Though caretakers take the major role, in our study mothers (67.9%) took the major responsibility.

Brushing was seen to be difficult or moderately difficult in most of the cases due to short attention span, altered sensory stimuli and hyperactivity which increased the rate of caries in these children (p=0.026) which was significant.¹⁷⁻²⁰

CONCLUSION

It is concluded that the parents and caregivers should be educated on how to maintain the good oral hygiene for children with ASD which is an integral part of the optimal dental health via proper diet, dietary habits and adequate oral hygiene by regularly visiting the dentist to have a long-term good oral health. Through this study a small effort was taken to reach out to this part of the society to provide awareness to the parents, caregivers and teachers of these children to preserve their beautiful smiles.

AUTISM Doesn't Come With An Instruction Guide. It Comes With A Family Who Will Never Give Up...

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