
Caries-experience, dental wearing and enamel developmental defect among autistic children aged 4-6 years

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Abstract

Background: Autism is developmental disorders characterized by severe defects in social interaction and communication. A wide spectrum of medical and behavioral symptoms is exhibited by children with autism, which make routine dental care very difficult in them.

Aims of this study: This study conducted to investigate the caries-experience, tooth wearing, in addition to developmental deformity of enamel among autistic children, in comparison to normal non autistic children.

Subjects, materials & methods: The study group included 43 autistic children, with an age range of 4-16 years. They were with confirmed diagnosis of autism. Children were divided into three groups according to the severity of the disease. The control group included 43 children matching with age and gender. Assessment and recording of caries — experience were through the application of decayed. Missing and filled teeth index (DMTT&dmft) WHO (1987), tooth wearing was recording according to Smith index (1984), and developmental deformity of enamel was recorded according to Modified Developmental Defect of Enamel index (DDE) (1989).

Results: A low level of dental caries was seen among autistic groups compared to the control, with differences were statistically highly significant in primary and permanent dentition. High mean values were recorded concerning teeth wearing (both dentition) among the severe autistic group compared with non autistic children with statistically highly significant difference. No developmental deformity of enamel was recorded among autistic and normal children.

Conclusions: Increase values of teeth wearing with low level of caries - experience was recorded among autistic children compared to healthy children.

Key words: Autism, dental caries, teeth wearing, enamel developmental defect.

Introduction

Autism known as “autistic disorder” and “classic autism, it is a neurodevelopmental disorder in which social interaction, language, behavior and cognitive functions are impaired severely^[1].

The majority of people with autism function in the ‘moderate’ range of mental retardation (MR)^[2]. The severity of MR is defined by a combination of the intensity of support needed for the person to cope with common life demands, how well they meet the standards of personal independence expected of them by age (level of adaptive functioning) and the results of intelligence quotient (IQ)^[3]. The diagnosis of autism is based on the patient’s developmental and medical history and on the identification of the aforementioned deficits^[4]. The cause of autism is not known, though evidence from family and twin studies suggests that it is an inherited disorder involving up to 20 interacting genes^[5].

The dentition also should be evaluated for evidence of bruxism. Parental reports indicate that between 20 and 25 percent of autistic children were brux during sleep^[6].

Determining the presence of dental disease by means other than inspection often is difficult in patients with autism.

The patients’ inability to communicate effectively often precludes obtaining an accurate dental history. Confirmation of clinical findings by use of dental radiographs often is frustrated by the patient’s inability to cooperate with the radiographic examination^[7].

The aim of this study is to compare the prevalence of dental caries experience, teeth wearing and developmental defect of enamel among study and control groups.

Subjects, Materials & Methods

The studied group included 43 children, with an age range of 4-16 years of both gender. Children were examined at Rami Center of Autistic Disorder in Baghdad City. The study was started at March 2010 and lasted for two months. They were all with confirmed diagnosis of autism and they were divided into two groups according to the severity of the disease (sever and moderate autistic children). The control group included 43 children matching with age and gender with the study groups. Oral examinations of children with autistic disorder (AD) were carried out in the classrooms of the Rami Autistic Center by using dental mirror and dental explorer, a portable source of light, with the aid of their schoolteacher. One examiner performed all examinations. The same oral examinations were carried out for control group in a primary school.

Assessment and recording of caries experience were performed through the application of Decayed, Missing and Filled Teeth Index (DMFS&dmfs) ^[8]. Recording of teeth wearing was

measured according to Smith index ^[9]. The Surface Codes Criteria for Tooth Wear Index (TWI) is as follows:

Code	Surface	Criteria
0	B/L/O/I	No loss of enamel surface characteristics. No changes of contour.
1	B/L/O/I	Loss of enamel surface characteristics. Minimal loss of contour.
2	B/L/O	Loss of enamel exposing dentine for less than one third of the surface
	I	Loss of enamel just exposing dentine
		Defect in contour less than 1 mm deep
3	B/L/O	Loss of enamel exposing dentine for more than one third of the surface
	I	Loss of enamel and substantial loss of dentine, but not exposing pulp or secondary dentine.
		Defect in contour 1 to 2 mm deep
4	B/L/O	Complete loss of enamel, or pulp exposure, or exposure of secondary dentine.
	I	Pulp exposure, or exposure of secondary dentine.
		Defect in contour more than 2 mm deep, or pulp exposure, or exposure of secondary dentine.

Developmental deformity of enamel was assessed through Modified Developmental Defect of Enamel index (DDE) ^[10].

The Statistical Package for Social Sciences (SPSS) version 10 was used to analyze data.

Results

Table (1) illustrated the distribution of samples. The result showed that autistic disordered affected males more than females. This study revealed that the percentage of caries- free autistic children was more than that recorded for the control group **Table**

(2). Also the table illustrates that no caries free was recorded among sever autistic group while moderate autistic groups exhibited the high percentage of caries-free children in compared to normal group.

Table (1): Distribution of the Study and Control Groups by Gender

Gender	Severe autistic children		Moderate autistic children		Total		Control children	
	No	%	No	%	No	%	No	%
Males	11	43	25	89	36	84	36	84
Females	4	27	3	11	7	16	7	16
Total	15	35	28	65	43	100	43	100

Table (2): Distribution of Caries Free Children among Study and Control Groups

Groups	No.	Caries free	
		No.	%
Severe autistic children	15	0	0.0
Moderate autistic children	28	9	20.9
Control children	43	3	6.9

Highest mean value was recorded concerning caries-experience of deciduous dentition among the control group compared with autistic group, with statistically highly significant difference. Regarding permanent dentition, caries experience showed a low level among study groups, statistically no

significant differences between study and control groups **Table (3)**.

Results showed that the mean values of caries-experience for primary and permanent dentition were the highest value among the severe autistic children, and the differences were statistically highly significant in both dentition **Table (4)**.

Table (3): Caries – Experience of Primary and Permanent Dentition (Mean and Standard Deviation) among Study and Control Groups

Variables	Autistic children	Control children	t-value	p-value
	Mean±SD	Mean±SD		
dmft	2.44±3.50	4.09±3.91	-2.062*	0.03
DMFT	1.19±1.66	2.00±2.97	NS	

*Significant, df=84

Table (4): Caries – Experience of Primary and Permanent Dentition (Mean and Standard Deviation) among Autistic Groups

Variables	Sever autistic children	Moderate autistic children	t-value	p-value
	Mean±SD	Mean±SD		
dmft	4.93±4.41	1.20±1.76	3.42**	0.002
DMFT	1.43±1.34	0.40±1.18	2.35*	0.02

**Highly significant, df= 41, *Highly significant, df= 41

Table (5) illustrated that the highest mean values were recorded concerning of tooth wearing among autistic children related with score (1 ,2&3) were more than that recorded for the control group, and statistically significant differences between groups with all scores.

Table (6) illustrated that the percentage of tooth wearing (score 1) was more than that recorded for

the score (2&3) among autistic groups and the lowest percentage was (score 0) among autistic children. This study revealed that no developmental deformity of enamel was recorded among autistic and normal children.

Table (5): Mean and Standard Deviation of Teeth Surfaces Affected with (Score 1, 2&3) of Tooth Wear Index

Variables	Autistic children	Control children	t-value	p-value
	Mean±SD	Mean±SD		
Score (1)	3.33±3.03	0.70±2.50	4.38**	0.001
Score (2&3)	1.40±2.80	0.33±1.84	2.08*	0.05

** Highly significant, df=84, * Significant, df=84

Table (6): Distribution of Autistic Children according to Tooth Wear Severity

Groups	Exposed dentin Score (2&3)		Non exposed dentin Score (1)		Normal tooth surface Score (0)	
	No	%	No	%	No	%
Autistic children	10	23.2	24	55.8	9	21
Control children	2	4.6	4	9.3	86.1	37

Discussion:

Children with autism have multiple medical and behavioral problems, which make their dental treatment extremely difficult, these children exhibit wide variations in their ability to cooperate during dental treatment^[11].

There are few publications dealing with dental conditions of children with AD and most of the research on them is in developed countries^[3].

The present study revealed that a low level of dental caries was seen among autistic groups compared to the control, differences were

statistically highly significant in the primary dentition. more caries- free; this could be attributed to absence of any retentive area (flat occlusal surface due to bruxism.), and open proximal contacts. This finding was also reported by Shapira et al..^[12] did find that autistic people had lower DMFT values than non-autistic individuals of the same age, while Moor and Martens^[13] Fahivik et al,^[14] found that there were no differences in dental caries between the autistic and non-autistic populations.

This study on the other hand, recorded that dental caries experience was a high level among sever autistic children compared to other autistic groups, this result may be attributed to the abuse of methamphetamine, which is therapeutically used by individuals with sever autistic disorder, has been reported to be related with dental caries, which lead to changes in the salivary physical proprieties involving the flow rate, as well as, buffering capacity^[15]. This results may give an indication that the duration and severity of the disease has an influence on oral health status among sever autistic children.

Bruxism is a nonfunctional, involuntary, forceful grinding or gnashing of teeth that affects children with autistic disordered and can result in excessive dental wear^[14]. In general, children with autism prefer soft and sweetened foods and they tend to pouch food inside the mouth instead of swallowing it due to poor tongue coordination^[11], thereby increasing the susceptibility to caries.

Data of the current study revealed no impact of autism on developmental enamel deformity, as results failed to detect any deformity among autistic children. It is not well understand whether the sample size may be not enough to demonstrated any enamel deformity, however, further studies are needed in regard to different autistic groups with large sample size.

When many factors may influence an individual's dental caries risk, there is not enough evidence to show whether AD is a risk factor for caries. This may be attributed to few studies on dental status and risk factors for caries in children with autism.

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