Behavior Management of Children with Autism

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ABSTRACT

Background: Pervasive Developmental Disorder (PDD) is a term refers to the overarching group of conditions to which autism spectrum disorder (ASD) belongs .

Objective: This study was designed to determine the existing behavior of children with autism in dental sitting, the behavior improvements in recall dental visits and evaluate the improvement in oral hygiene with using specific visual pedagogy chart.

Type of the study: Cross-sectional study.

Methods: Forty children of both genders, ages ranged from 4 – 6 years having primary teeth only were selected whose medical history included a diagnosis of autism. The behavior of the children in dental sitting were assessed according to the Frankel scale. The dmft index in the first visit was measured, with codes and criteria established by the WHO(1997).Behavior management method used was one or more of the followings: (physical restraint, "Tell-Show-Feel and Do" technique, verbal and non – verbal communication, reinforcement, parent present / absent).

Results: The samples represent by 22 males and 18 females autistic children with no statically significant difference (p> 0.05).The dmft index of autistic children in the first visit. The dmft (mean ± SD) for males was (7.818 ± 0.98) while for females was (6.922 ± 1.09).The frequency of children showed treatment acceptance without difficulty was increase in the recall visits.

Conclusions: The dental professional should be flexible to modify the treatment approach according to the individual patient needs.

Key Words: Behavior, Children, Autism.

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Pervasive developmental disorder (pdd) is a term refers to the overarching group of conditions to which autism spectrum disorder (asd) belongs.[1]pdd consists of five subtypes: autism disorder,asperger's disorder, rett's disorder, childhood disintegrative disorder and pervasive developmental disorder-not otherwise specified (pdd-nos).(2) the autism spectrum disorder was first described in 1943 by the american child psychologist, leo kanner. asd refers to a group of neurodevelopmental disabilities with a core set of defining criteria that comprise impaired social interaction, communication, and restricted or repetitive behavioural stereotypes.[2,3]the symptomatology of asd initiates before the third year of age and generally undergoes a steady course without remission through ageing.(4,5) individuals with asd vary widely in abilities, intelligence, and behaviors. symptoms may include problems using and understanding language; difficulty relating to people, objects, and events; marked impairment in the use of multiple non-verbal communications; unusual play with toys and other objects; difficulty with changes in routine or familiar surroundings; and repetitive body movements or behavior patterns.(1)also asd showedpotentially coexisting with sensory disabilities, mental retardation or epilepsy(6,7), may hinder professionally delivered and home dental care placing individuals with asd at high risk for oral diseases. there are a limited number of studies that address basic behavior management techniques and procedural modifications with regard to dental treatment of children with asds. one such behavior management technique is the d-termined program for repetitive tasking and familiarization in dentistry.[8]anecdotal reports suggest that there are beneficial results from using the program. Its effectiveness, however, has not been established through long-term scientific studies. Behaviour management techniques that facilitate the delivery of treatment in a safe, efficient and compassionate manner are an integral component in the practice of pediatric dentistry. Dental visits are a major source of anxiety and a significant stressor for many people. In those children with Autism Spectrum Disorders this anxiety is exacerbated and is due, in part, to the inherent communicative dysfunction associated with the disorder[9]. Previous studies have pointed out the difficulties that can be encountered when attempting to treat children with ASD[10], while others have focused on predictors of their behaviour in the dental setting[11].

To modify problematic behaviors of patients with ASDs while facilitating the improvement of skills they need to undergo dental treatments, this study was designed to determine the existing behavior of children with autism in dental sitting, the behavior improvements in recall dental visitswere gained with different behavior management methods used, and evaluate the improvement in oral hygiene with using specific visual pedagogy chart.

Methods: Forty children of both genders,ages ranged from 4 – 6 years having primary teeth only were selected from patients referred to the Private Pediatric Dentistry Center in Baghdad / Iraq (between January to June / 2016), whose medical history included a diagnosis of

autism. Full detailed treatment plans were explained to the children's parents and written consents were obtained for including the children in this study. Thorough general information about child's name, age, family address, and family phone number was obtained. The Autistic children were not on any medications at the time and had no history of drug allergies,exclusion those suffering from other systemic diseases. All the work carried out by the same dentist. The behaviour of the children in dental sitting in the first visit (baseline) and the follow ups after two weeks, one month, three months and six months were assessed according to the Frankel scale[12](Table 1). The dmft index in the first visit was measured, with codes and criteria established by the WHO(1997) (d: decayed teeth, m: missing teeth due to caries, f: filled teeth due to caries). [13]

The following assessments were recorded by the dentistin the first visit and the follow ups after two weeks, one month, three months and six months:

1. The Oral hygiene was recorded according to debris index of the Simplified Oral Hygiene Index[14]was used. The labial surfaces of the 54, 61, 82 and the lingual surface of 75 were selected. Calculus was excluded. Table (2) demonstrated the criteria for classifying debris.Debris Index **=** (The buccal scores) **+** (The lingual scores) **/** (Total number of examined buccal and lingual surfaces). Furthermore, to give clinical relevance to the index, the oral cleanliness is considered as: the average between 0.0to0.6 represents a good oral hygiene, between 0.7to1.8, a fair oral hygiene, and 1.9 to 3.0 a poor oral hygiene. Specificvisual pedagogy (Figure 1) was given for each child and asks the parent to put in front of child where he/she brushes his/her teeth to evaluate the improvement in oral hygiene.Simple demonstration was given to the child about teeth brushing method. Thorough instructions were given to parent about the importance of teeth brushing, diet counseling and sweet restriction.

2. Behavior management method used was one or more of the followings: (physical restraint, "Tell-Show-Feel and Do" technique, verbal and non – verbal communication, reinforcement, parent present / absent). Pharmalogical behavior management (diazepam behavior modification) or general anesthesia may be needed to use.

3. The dental treatments: extraction, permanent filling, pulpotomy or pulpectomy.

4. The feasibility of dental treatment: 1) Treatment without any difficulty. 2) Treatment with some difficulty and need of preventive holding from the parent. 3) Treatment with extreme difficulty.

The data were summarized and described using relative frequencies and percentages for categorical variables. When the outcome variables were categorical t-test was used to examine differences between groups for statistical significance. Data were analyzed using SPSS software, version 12·0 (SPSS Inc., Chicago, IL, USA) for Windows. Statistical significance was set at p≤0.05.

Results: Forty autistic children of both genders were included in this study. The mean age of children was 5.2 years (ranges 4 years to 6 years). Table (3) demonstrated the distribution of autistic children classified according to age and gender. The samples represent by 22 males and 18 females autistic children with no statically significant difference (p> 0.05). Meanwhile, Fombonne[15] stated that autism disorder is a male dominated condition and male : female ratio was 4:1. However in the more severe forms, as measured by IQ score, males outnumber females by only 2:1, with the ratios approaching equality in most severe cases.

Table (4) demonstrated the behavior of Autistic Children in Dental sitting according to Frankel Scale in the 1st (baseline), 2 weeks, 1 month, 3 months and 6 months visits. In all visits the majority of children were represented Rating (2) those withnegative behavior attitude throw reluctance to accept treatment; uncooperative; some evidence of negative attitude but not pronounced. Meanwhile with progression of dental visits the children those showed positive behavior increased. The smallest number of children showed definitely negative behavior and no one of children showed definitely positive behavior. There was significant difference between children's behaviors at each dental visit at p≤ 0.05. That's agreed with Loo *et al.*,[4] those found that specific autistic disorder showed decreased Frankel behavior scores and for every year increase in age with proper behavior modification there was a concurrent 8% increase in cooperation even it was significantly less than the 26% increase noted in healthy population.

Table (5) demonstrated the dmft index of autistic children in the first visit. The dmft (mean ± SD) for males was (7.818 ± 0.98) while for females was (6.922 ± 1.09). There was no significant difference between genders at p> 0.05.Lindemann and Lowe[10] reported that children with autism had a higher caries index in the primary dentition than normal children. In contrast, Loo et al[16] stated that through logistic regression analysis it was determined that patients with autism were 70.5% less likely to have a positive caries history the control group. Concerning the oral hygiene of autistic children at different visits recall, Table (6) illustrated thatthe level of oral hygiene was judged to be fair in the majority of children at different visits. However, frequency of childrenwere developed good oral hygiene increased in recall visits. The smallest frequency of children showed poor oral hygiene that decreased in recall visits.Significant differences were found between the

frequencies of children in each visit with regard to oral hygiene that's demonstrated the effective of parent motivation about guidance child's oral hygiene with the effective use of visual pedagogy chart. Lindemann and Lowe[10] found that children with autism have lower oral hygiene level than healthy peers. Concerning the behavior management method used for behavior modification of children, Table (7) showed the frequency of autistic children involved in different non pharmacological behavior management methods.

Table (1): Frankel Scale[12] for Behaviors

Score	Criteria
Rating 1	Definitely negative: Refusal of treatment; crying forcefully, fearful, or any other evidence of extreme negativism
Rating 2	Negative: Reluctance to accept treatment; uncooperative; some evidence of negative attitude but not pronounced, i.e., sudden withdrawal
Rating 3	Positive: Acceptance of treatment; at time of cautious; willingness to comply with the dentist, at time with reservation, but patient follows the dentist's directions cooperatively
Rating 4	Definitely positive: Good rapport with dentist; interested in the dental procedures; laughing and enjoying the situation

Table (2): Criteria for classifying debris[14]

Scores	Criteria
0	No debris or stain present
1	Soft debris covering not more than one third of the tooth surface, or presence of extrinsic stains without other debris regardless of surface area covered
2	Soft debris covering more than one third, but not more than two thirds, of the exposed tooth surface.
3	Soft debris covering more than two thirds of the exposed tooth surface.

Table (3) demonstrated the distribution of autistic children classified according to age and gender.

	Gender			
Age (years)	Male No. (%)	Female No. (%)	t-test (P value)	Total No. (%)
4 - 5	10 (45.5)	9 (50)	1.409 (0.821)	19 (47.5)
5 - 6	12 (54.5)	9 (50)	1.296 (0.981)	21 (52.5)
Total	22 (55)	18 (45)	1.127 (0,657)	40 (100)

p> 0.05 = no statically significant difference

Table (4) Demonstrated the behavior of Autistic Children in Dental sitting according to Frankel Scale in the first, 2 weeks, 1 month, 3 months and 6 months visits.

	Frankel Scale No. (%)				T - test(P value)
Visits	Rating (1)	Rating (2)	Rating (3)	Rating (4)	
1st	4 (10)	28 (70)	8 (20)	0 (0)	9.242 (0.021)
2 weeks	2 (5)	28 (70)	10 (25)	0 (0)	7.243 (0.050)
1 month	2 (5)	27 (67.5)	11 (27.5)	0 (0)	5.098 (0.035)
3 months	1 (2.5)	24 (60)	15 (37.5)	0 (0)	4.488 (0.034)
6 months	1 (2.5)	22 (55)	17 (42.5)	0 (0)	4.321 (0.041)

Table (5) demonstrated the dmft index of autistic children in the first visit.

Gender (no. 40)	Mean ± SD			
	d	M	f	dmft
Male (no. 22)	5.511± 1.46	2.226± 0.45	0.081± 0.98	7.818 ± 0.98
Female(no. 18)	5.449± 0.99	1.168± 1.08	0.305± 2.11	6.922 ± 1.09
			t - test (P value)	0.273 (1.22)

≤ 0.05 = statically significant difference

Table (6)The Oral hygiene was recorded according to debris index of the Simplified Oral Hygiene Index for autistic children in different dental visits.

	Oral Hygiene No. (%)			T - test(P value)
Visits	Good	Fair	Poor	
1st	5	17	18	6.980 (0.021)
2 weeks	6	25	9	4.552 (0.050)
1 month	10	25	5	7.500 (0.033)
3 months	11	27	2	0.133 (0.019)
6 months	17	20	3	4.557 (0.023)

p≤ 0.05 = statically significant difference

Table (7) The frequency of autistic children involved in different non pharmacological l and pharmacological behavior management methods.

	No. of children (%)				
	1st visit	2 weeks	1 month	3 months	6 months
Physical restraint	40 (100)	40(100)	40(100)	40(100)	40(100)
"Tell-Show-Feel and Do" technique	10 (25)	13 (32.5)	15 (37.5)	15 (37.5)	20 (50)
Verbal communication	17 (42.5)	17 (42.5)	18 (45)	18 (45)	18 (45)
Nonverbal communication	32 (80)	33 (82.5)	40 (100)	40 (100)	40 (100)
Reinforcement	40(100)	40(100)	40(100)	40 (100)	40 (100)
Parent present	40(100)	40(100)	40(100)	40(100)	40(100)
Parent absent	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Pharmacological management	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
General anesthesia	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

p≤ 0.05 = statically significant difference.

Total No. = 40 child in each visit.

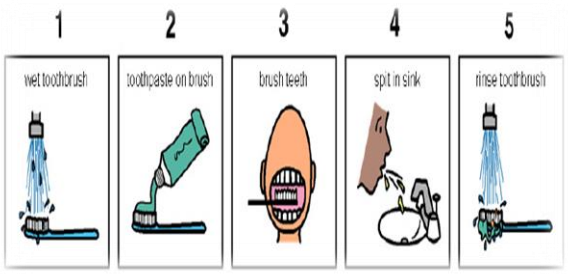

Figure (1)Visual pedagogy chart demonstrate the teeth brushing steps.

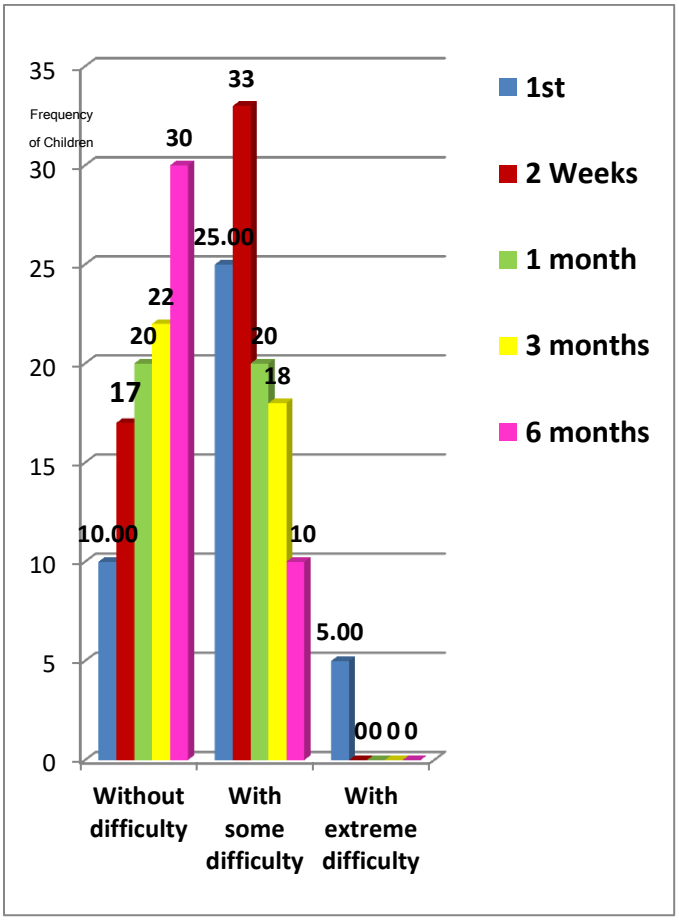

Figure (2)Distribution of treatment acceptance of autistic children in dental sitting in different visit recalls assessment by the dentist.p≤ 0.05 between groups.

Discussion:: Physical restraint, reinforcement and parent present were used with all children in all visits that's agreed with Carret al.,[17] who found a relatively high frequency of use of restraint or stabilization with autistic dental child. Meanwhile, Marshall et al.,[18] reported that in their study the parents least in favour of restraint and protective stabilization by dental staff. Medina et al.,[19] reported that reinforcement alone may be sufficient, meanwhile, Lindemann and Henson[20] mentioned that

the restraints can be effective with a positive reinforcement. The parent present with child agreed with Marshall et al.,[18] who stated that the best behaviors were observed in patient who were treated regularly with the same dentist with the parents present in the operatory.

In this study, non – verbal communication was used more than verbal communication that's agreed with Mesibovet al.,[21] who mentioned that children with autism have limited verbal skills and non – verbal communication was considered effective. Tell-Show-Feel and Do" technique only was used with some children that's agreed with Adair et al.,[22] who described this as classical behavior modification method.

Pharmacological behavior modification and general anesthesia were not need to use in this study. Figure (2) demonstrated the distribution of treatment acceptance of autistic children in dental sitting in different visit recalls assessment by the dentist. The treatments with some difficulty with the help of parents holding were performed in the majority of autistic children, meanwhile, the treatments were performed with extreme difficulty only present in the first visit and disappeared in recall visits. The frequency of children showed treatment acceptance without difficulty was increase in the recall visits. There was significant different between treatment acceptance in different visits at $p \leq 0.05$.

Conclusions: Behavior management of an autistic child requires in-depth understanding of the background of the autism and available behavioural guidance theories. The dental professional should be flexible to modify the treatment approach according to the individual patient needs.

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