International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

Oral Habits in a Selected Population of Children and Adolescents with Special Health Care Needs

Joycelyn O Eigbobo[1], Chukwudi O Onyeaso[2]

[1]Senior Lecturer, Department of Child Dental Health, Faculty of Dentistry, College of Health Sciences, University of Port Harcourt, Port Harcourt, Nigeria

[2]Professor of Orthodontics, Department of Child Dental Health, Faculty of Dentistry, College of Health Sciences, University of Port Harcourt, Port Harcourt, Nigeria

Running title: Oral habits in Nigerian children with special needs

Abstract: ***Aim: To assess the prevalence of oral habits and occlusal characteristics among a selected population of children and adolescents with special health care needs. Methods: The study was carried out in a private educational institution for individuals with special health needs in Niger Delta, Nigeria. Information on demographics, the health condition and presence of oral habits were obtained from the teachers/minders. Other information obtained were the occlusal characteristics. Descriptive summary of the information and Chi square test for proportions was carried out and p value was set at ≤0.05 using SPSS Ver 20. Results: Fifty two (92.9%) children and adolescents participated; 28 (53.8%) males and 24 (46.2%) females aged 4 to 18 years with a mean age of 10.8 (± 4.3) years. Nineteen (36.5%) subjects had cerebral palsy, others had Down's syndrome 17 (32.7%), Autism 7 (13.5%), learning disability 8 (15.4%) and seizure disorders 1 (1.9%). The prevalence of oral habits was 23.1%. Majority [10 (83.3%)] of those who had habits were males and there was a significant difference between males and females (p=0.02). Tongue thrusting habit was the commonest (33.3%) oral habit. Twenty six (56.5%) subjects had Angles class I malocclusion, 12 (23.1%) subjects had anterior open bites and this was found in 4 (33.3%) subjects with oral habits and 8 (17.5%) subjects with no oral habits. Conclusion: Tongue thrusting was the commonest oral habit. Increase in dental awareness among parents/ caregivers and encouraging early dental visits to identify, intercept damaging habits that could affect developing occlusion are recommended.***

Keywords: oral habits; special health needs; occlusion; Nigerian children

1. Introduction

Childhood and adolescence are defining growth/ development periods that may further be complicated by the presence of congenital and developmental challenges occurring before, during or acquired after birth.[1] Those affected are referred to as children with special healthcare needs (CSHCN) and may have one or more chronic physical, developmental, behavioural, or emotional conditions which could impede their daily activities and limit their daily self maintenance and other major life activities.[2] CSHCN need specialized medical care, services and interventions beyond that required by children generally.[1-3] Often these conditions could alter, deform or cause defects in the orofacial region including the skeletal, facial structures and soft/hard tissues within the oral cavity.[4-8]

It has been observed that secondary to behavioural issues in this population, there could be acquisition of oral habits, which may be associated with dentoalveolar and/or skeletal deformation as a result of the pressure effects on the dental tissues.[9,10] The amount of dentoalveolar skeletal deformation is related to the frequency, duration, direction, and intensity of the habits.[11] These oral habits include digit sucking, lip sucking, cheek biting, nail biting, tongue thrusting, mouth breathing, lip biting, bruxism, gingiva picking and biting on objects such as pens/pencils.[12-14] The prevalence of oral habits in Nigerian children without SHCN have been reported to be between 7.4%-34%, [13, 15-19] while 17.9% was reported among those CSHCN.[7] Some of these habits are more commonly observed in some of these conditions. Bruxism and tongue thrusting habits have been found more among those with autism, cerebral palsy, Down's syndrome and intellectual disability. [14, 20-22]

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Globally, numerous reports abound on the oral care of children with Special Health Care Needs (CSHCN).[22-25] In Nigeria, several reports on the oral health status and dental care of the Nigerian CSHCN,[26-30] have been published. Studies [5-8,31, 32] on occlusal anomalies in CSHCN have been reported, however information on oral habits among this population is scanty.[7] Therefore the aim of this study was to determine the prevalence of oral habits among children and adolescents with Special HealthCare Needs and assess the occlusal characteristics that may be as a result of the oral habits in the Niger Delta region of Nigeria.

2. Methods

The study was carried out in a private educational institution for individuals with special health needs in South-South, Nigeria. Permission was sought and obtained from the head of the institution and parents of the subjects. Information on demographics, medical conditions and the presence or absence of oral habits were elicited from teachers and minders. The age as at last birthday, gender and the most severe medical condition was noted when there was more than one condition in a child.

Their oral cavities were examined in the school hall under natural light with sterile and disposable instruments. The lips were examined for competence with the masticatory and facial muscles at rest. Upper and lower lips were scored

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separately according to the method described by Jackson.[33] The occlusion was assessed by taking note of proclination of the teeth in the anterior maxillary segment, whether it was normal (2-4mm), increased (>4mm), reduced (<2mm) or reversed (-). The bite was noted as normal, deep, incomplete or open bites. The occlusion of the posterior segment was also noted.

Other occlusal features such as microdontia, hypodontia, supernumerary and retained teeth were noted as present or absent. Information obtained was entered into a data spreadsheet and analyzed using IBM SPSS (Statistical Package for Social Science) Version 20. Descriptive summary of the information and Chi square test and Fishers exact test for proportions was carried out and p value was set at ≤0.05.

3. Results

Fifty two (92.9%) children and adolescents participated; 28 (53.8%) males and 24 (46.2%) females aged 4 to 18 years with a mean age of 10.8 (± 4.3) years. Thirty two (61.5%) were between 11-18 years and 13.5% were 1-5years. Nineteen (36.5%) subjects had cerebral palsy, other subjects had Down's syndrome 17 (32.7%), Autism 7 (13.5%), learning disability 8 (15.4%) and seizure disorders 1 (1.9%). (Depicted in Figure 1)

Twelve (23.1%) subjects had oral habits. Majority [10 (83.3%)] of those who had habits were males and this was 37.0% of the males. Only 2 (8.3%) females had habits. there was a significant gender difference between those who had habits and no habits (p=0.02). one (14.3%), 5 (38.5%), 6 (18.8%) of the 0-5 years, 6-10 years and 11-18 years age groups had oral habits, respectively. Five (41.6%) and 3 (25%) subjects with cerebral palsy and learning disability had oral habits, respectively, oral habits were also found among 2 (16.7%) with Down's syndrome and 2 (16.7%) with autism. Among the conditions, 60%, 40% and 35.7% of those with learning disorders, autism and cerebral palsy had oral habits, respectively. (Details in Table 1)

The commonest habit observed was tongue thrusting which was observed in 4 (7.7%) subjects. (Details in Figure 2) Within the habits, tongue thrusting was found in a third of them, others were digit sucking (25%), nail biting (16.6%), lip sucking (16.6%) and bruxism (8.3%). There were no statistically significant differences between males and females who had habits (p=0.19) Table 2.

Occlusal characteristics

Nineteen (36.5%) had incompetent lips of which 6 (46.2%) had oral habits (Table 3) and 50% among those with oral habits. (Tables 3 and 4) Microdontia, retained primary teeth (with their successors erupting either lingually or palatally), hypodontia and supernumerary teeth were found in 10 (19.6%), 3 (5.8%), 1 (2%) and 2 (3.9%), respectively. However, among those that had oral habits, 2 (16.7%) had microdontia and 1 (8.3%) had supernumerary. Twenty six (56.5%) children and adolescents had Angles class I malocclusion, while the six subjects that had their second primary molars assessed had Flush Terminal Planes 3 (50%) and Mesial step 3 (50%). (Figure 3)

Only 2 (16.7%) of those with oral habits had normal overjet; while 25% of them had reduced overjet and 25% had increased overjet. Twelve (23.1%) children had anterior open bite and this was found in 4 (33.3%) subjects with oral habits and 8 (17.5%) subjects with no oral habits. (Table 3) Anterior and posterior cross bites were found in 6 (11.5%) and 4 (7.7%) subjects, respectively, however there were no cross bites in subjects with oral habits.

4. Discussion

Children with special health needs have challenges that impact on their daily activities consequently affecting their quality of life. This could further be complicated by presence of oral habits and the deleterious effects on orofacial tissues. This could have a considerable impact on CSHCN and their parents as the children may experience some measure of discrimination due to their appearance, pattern of swallowing and speech problems. [22,, 34]

In this study the prevalence of oral habits was 23.1%. This value is higher than the 9.9%[18]and 13-14%[o19] reported among Nigerian children without SHCN and 17.9% in Nigerian children with SHCN. [7] However it is lower than the 34.1% reported among 'normal' children and adolescents.[13] There were no significant differences between the presence and absence of oral habits among the medical conditions. More males had oral habits than females and this difference was significant (p=0.02). This finding has been reported among those who are 'normal' children though not significant in their studies. [13,18,19]

Athough reports [13,18] suggest that digit sucking is the commonest oral habit among children, in this present study tongue thrusting was the predominant habit found in 7.7% of the entire population. This may be because of the poor muscle tone/development and coordination of the tongue in some CSHCN and this finding corroborates what has been reported among CSHCN, though the proportion in our study is less than the 12.3% [7] reported. The difference may be as a result of the sample size and/or the age captured. However, oral habits were more predominant among those with cerebral palsy.

Also there were no significant differences recorded in occlusal characteristics (lip competence, inclination [normal, proclination, retroclination or reverse], and the overbite) of the subjects. We observed that 50% of those with oral habits had lip incompetence compared to 32.5% who had no habits. It was also observed the Angle's cllass1 molar relationship was the most prevalent relationship as has been previously reported in both 'normal' and in CSHCN.[7, 18, 19] In our study we observed that a third of those with oral habits had anterior open bite however, there were no cross bites reported among these individuals.

The proportion of individuals with special needs with anterior open bites was lower than the 46.4% reported by Oliveira et al among children with SHCN in Brazil [22] However, the value was higher than the 9.8% and 14% reported in Ibadan [5] and Lagos,[8] Nigeria, respectively. Anterior open bites seem to be the commonest occlusal anomaly and this finding is similar to reports on oral habits

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in normal children.[18]. Open bites have been reported more commonly in cerebral palsy and Down's syndrome this has been attributed to the positioning of the tongue against the teeth in these subjects, [22] AOB was found more commonly among Down's syndrome when the medical conditions were considered in present study. This could be as a result of mid face hypoplasia[26] which is a common presentation of individuals with Down's syndrome or the anterior tongue position.[22] There were no crossbites reported among those that had oral habits this is contrary to reports of Onyeaso and Utomi [8] this may be because of the sample size and probably because of the target age group.

The prevalence of microdontia and retained primary teeth in this study was higher than the 1.9% and 0.5%reported, respectively among CSHCN in Ibadan.[5] The prevalence of supernumerary teeth in this study was lower than the 4.7% but higher than 0.7% in normal population and higher than that observed by Onyeaso in CSHCN.[5]

Although early intervention could minimize the deleterious effect of the habits on the dento-facial structures, preventing such deformities could occur when parents/caregivers are exposed to the dental clinic and advised on good habit formation especially within the first year of life. However, the presence of the medical conditions probably overshadows their dental needs.

5. Recommendation

Increase in dental awareness among parents/ caregivers and encouraging early dental visits to identify, intercept damaging habits that could affect developing occlusion are recommended.

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Tables

Table 1: The association between the presence or absence of oral habits with Sociodemographic characteristics.

Demographic characteristics of the subjects		Oral habits		X^2	p value
		Present	Absent		
Sex	Males	10 (35.7)	18 (64.3)		
	Females	2 (8.3)	22 (91.7)	5.458	**0.02***
Age group	0-5 years	1 (14.3)	6 (85.7)		
	6-10 years	5 (38.5)	8 (61.5)		
	11-18 years	6 (18.8)	26 (81.2)	2.375	0.31
Medical conditions	Down syndrome	2 (13.3)	15 (86.7)		
	Cerebral palsy	5 (35.7)	14 (64.3)	2.694	0.61
	Autism	2 (40.0)	5 (60.0)		
	Learning disability	3 (60.0)	5 (40.0)		
	Seizure disorder	0	1 (100)		

Table 2: The association between the Socio-demographic characteristics and oral habits among the subjects

	ORAL HABITS					
	Digit sucking	Tongue thrust	Bruxism	Nail biting	Lip sucking	Total n (%)
Gender						
Males	2 (20)	4 (40)	1 (10)	2 (20)	1 (10)	10 (83.3)
Females	1(50)	0	0	0	1 (50)	2 (16.7)
Age group						
0-5 years	1 (33.3)	0	0	0	0	1 (8.3)
6-10 years	1 (33.3)	2 (50.0)	0	1 (50.0)	1 (50.0)	5 (41.7)
11-18 years	1 (33.3)	2 (50.0)	1 (100)	1 (50.0)	1 (50.0)	6 (50.0)
Medical condition						
Down syndrome	1 (33.3)	1 (25.0)	0	0	0	2 (16.7)
Cerebral palsy	1 (33.3)	1 (25.0)	1(100)	1(50.0)	1(50)	5 (41.7)
Autism	0	1(25.0)	0	1 (50.0)	0	2 (16.7)
Learning D	1 (33.3)	1(25.0)	0	0	1(50.0)	3 (25.0)
Seizure D	0	0	0	0	0	0
X^2 =9.37,p= 0.97						

*p<0.05 is significant

Table 3: The association between the presence or absence of oral habits with occlusal characteristics.

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Occlusal characteristics of the subjects		Oral habits		X^2 p value
		Present	Absent	
Lip				
	Incompetent	6 (50.0)	13 (32.5)	
	Potentially C	3 (25.0)	6 (15.0)	
	Competent	3 (25.0)	21 (52.5)	2.570 ;0.28
Overjet				
	Reversed	1 (11.1)	3 (7.5)	
	<2mm	3 (33.3)	18 (45.0)	
	2-4mm	2 (22.2)	9 (22.5)	
	>4mm	3 (33.3)	4 (10.0)	2.684 0.44
Overbite				
	Normal	3 (30.0)	26 (65.0)	
	Deep	2 (20.0)	6 (15.0)	
	Incomplete/Open	5 (50.0)	8 (20.0)	3.581 0.17
Anterior open bite	Yes	4 (33.3)	7 (17.5)	
	No	8 (66.7)	33 (82.5)	1.387 0.24

*p<0.05 is significant

Table 4: The association between the occlusal characteristics and oral habits among the subjects

	ORAL HABITS					
	Digit sucking	Tongue thrust	Bruxism	Nail biting	Lip sucking	Total n (%)
Lip						
Incompetent	1 (33.3)	3 (75.0)	0	1(50.0)	1(50)	6 (50%)
Potentially C Competent	0	1 (25.0)	1 (100)	0	1(50)	3 (25%)
X^2 =11.99, p=0.29	2 (66.7)	0	0	1 (50.0)	0	3 (25%)
Overjet						
<2 mm						
2-4mm	1 (50.0)	1 (33.3)	1 (100)	1 (50.0)	0	4 (44.4)
>4mm	1 (50.0)	1 (33.3)	0	0	0	2 (22.2)
AOB Yes	0	1 (33.3)	0	1 (50.0)	1 (100)	3 (33.3)
No	0	2 (50)	0	1 (50)	1(50)	4 (33.3)
$X^2$5.38; p=0.37	3 (100)	2 (50)	1 (100)	1 (50)	1 (50)	8(66.7)

*p<0.05 is significant

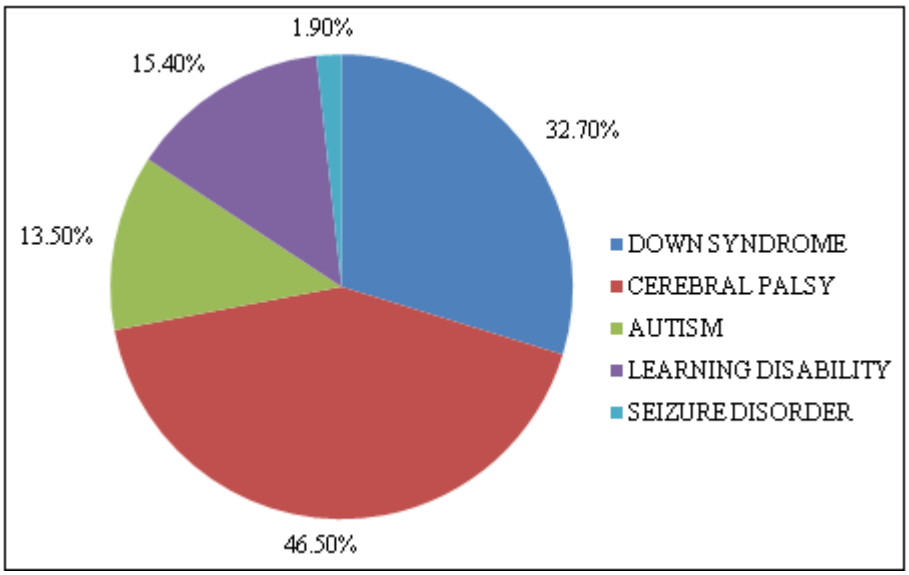

Figure 1: Medical conditions among the children and adolescents with special healthcare needs

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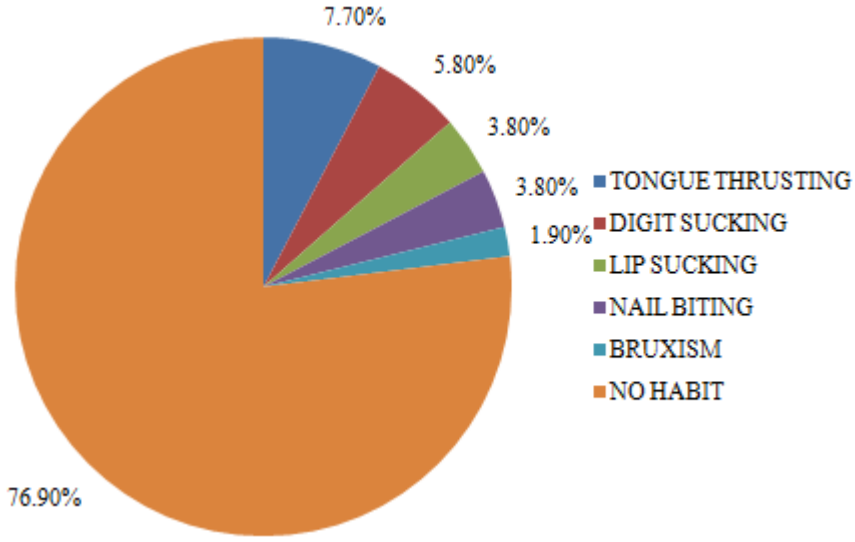

Figure 2: Distribution of the oral habits among the subjects with special healthcare needs

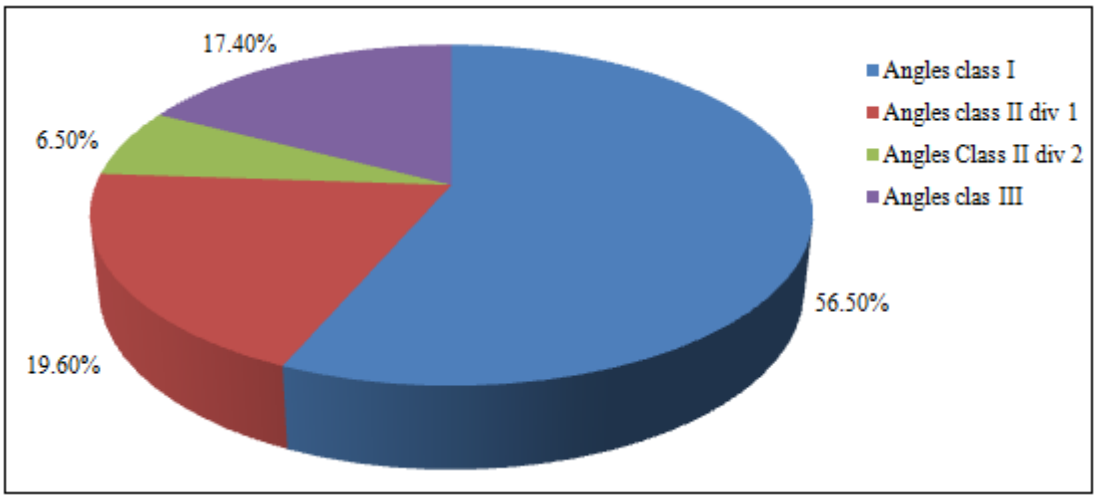

Figure 3: The distribution of malocclusion among the subjects

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