

MALOCCLUSION PATTERN AMONG HANDICAPPED CHILDREN IN IBADAN, NIGERIA.

C. O. Onyeaso

Orthodontic Unit, Department of Preventive Dentistry, College of Medicine, University of Ibadan, Ibadan, Nigeria

ABSTRACT

Objective: There is paucity of information in Nigeria concerning the occlusal characteristics of handicapped children, yet they need functional and aesthetic consideration comparable to that of 'normal' persons. The aim of this study was to investigate the pattern of malocclusion among the handicapped children in Ibadan, Nigeria.

Materials and Methods: An epidemiological survey of 412 handicapped children aged 6 – 18 years, 210 males (51%) and 202 females (49%) was carried out. All the children were examined in their classrooms under natural illumination with the assistance of the class teachers and the information obtained such as Angle's classification^{12,13,14}, overjet based on Jackson's method¹⁵, overbite and tooth – bone ratio were entered in a pre-structured data form.

Result: From the results, normal occlusion was seen in 13.8% children, Angle's class I malocclusion in 55.3%, 21.4% had Angle's class II while Angle's class III was seen in 9.5%. One case of Angle's class II div. 2 was seen. Females had statistically significant higher number of class III malocclusion cases ($P < 0.05$).

Spacing of the upper labial segment was observed to occur in 51.2% of children examined while spacing of the lower labial segment was noted in 39.6%. Crowding of these segments occurred in 9.2% and 17.7% respectively of the sample population.

Overbite 1 was observed in 54.6% of the children examined. Deep bite (overbite 3) occurred in 2.9% of those examined. Overjet values of less than 2 mm was the most prevalent occurring in 82.3% while 6.3% of the children examined had increased overjet.

Conclusion: The pattern of malocclusion among those handicapped children did not vary widely from their 'normal' counterparts.

KEYWORDS: Malocclusion pattern; Handicapped children; Ibadan – Nigeria.

INTRODUCTION

With increasing deinstitutionalization of handicapped children and more of them residing in the natural home settings, parents and guardians are taking up the challenge of caring for the dental health of these special children as they do for the 'normal' peers¹.

The World Health Organization in its declaration of the rights of the child, affirmed the right of children who are physically, mentally or socially handicapped to special treatment, education and care required by their particular condition². Children with disabilities need functional and aesthetic consideration comparable to that of 'normal' persons. The reality is that as they grow older periodontal disease becomes increased possibly with a maloccluded dentition. Malocclusions with severe aesthetic implications can compromise already difficult social relationships and potential employment opportunities. All too often children with mental retardation and developmental disabilities may have primary and secondary dentition difficulties resulting from untoward habit development (including finger sucking, mouth

breathing, tongue thrusting) and loss of teeth and space maintenance among others³.

Though the literature abounds with information on the 'normal' Nigerian children population^{4,7}, there is paucity of information on the occlusal characteristics of handicapped children in Nigeria. Previous reports⁸⁻¹¹ on handicapped children in relation to dentistry in Nigeria has only one¹⁰ which discussed malocclusion. There is, therefore, need for more information on the characteristics of the occlusion in this group of children with special needs because a systematic and well-organized dental care programme for children requires enough knowledge of the variation in occlusion within the target population. This could be useful as part of base line data and for further research.

The aim of this study was to investigate the pattern of malocclusion among the handicapped school children in Ibadan, Nigeria.

MATERIALS AND METHODS

In this study, the sample consisted of 412 handicapped school children aged 6-18 years from eight special educational institutions in Ibadan city of Western Nigeria. There were 210 males (51%) and 202 females (49%). The children examined hailed

*Correspondence: C. O. Onyeaso

from different parts of the country except from the northern part of Nigeria. They were of varied socio-economic background. None of those examined had previously undergone any form of orthodontic therapy.

Each child was examined with the assistance of the class teacher while seated on a classroom chair in a brightly-lit classroom. Instruments used for the examination were sterile mouth mirror, wooden spatula and ruler. Each child was examined clinically in two positions: open-mouthed and with the teeth in centric occlusion. Data obtained were recorded on a prepared questionnaire by a single operator. The following parameters were assessed:

1. Occlusion (Angle's classification)
2. Overjet
3. Overbite
4. Tooth-bone ratio in the incisal segments.

Standards of diagnosis.

Occlusion

Angle's classification^{12,13,14} was used to determine the occlusal (antero-posterior) relationship of the dental arches. This classification divided the occlusion into class I, class II (divisions 1 and 2) and class III using the first permanent molars as reference teeth. In the absence of these teeth for any reason, the canines and incisors were utilized for occlusal assessment.

Normal Occlusion: This term encompasses minor deviations from the ideal that do not constitute aesthetic or functional problems.

Overjet: This was measured from the top of the upper incisor to the labial surfaces of the lower incisors with the teeth in centric occlusion. In this study, the overjet was divided into the following categories.

- (a) Reversed overjet
- (b) Less than 2mm
- (c) 2-4mm
- (d) 5-8mm
- (e) 8-12mm

Overbite: This is the vertical measurement from the top of the crown of the upper incisors to the top of the lower incisors with the teeth in centric occlusion.

Jackson's classification¹⁵ of overbite was used in this study. Overbite 0-open bite in the incisor region. Overbite 1- upper central incisors meet edge or overlap up to 1/3 of the lower central incisor teeth. Overbite 2- Overbite greater than the incisal 1/3 of

the lower central incisors but does not exceed the middle 1/3 of the crown of the tooth. Overbite 3- any overbite greater than that defined as overbite 2. Reversed - overbite was classified as reversed when the upper incisors were biting in lingual occlusion.

Tooth- bone ratio: This is the relationship between tooth size and arch size and may result in a well- aligned arch, crowding or spacing. Tooth-bone ratio was estimated for the anterior segments of the maxillary and mandibular arches only.

Spacing: Spacing of a segment was said to occur when there was lack of proximal contact between teeth.

Crowding: A segment was diagnosed crowded when there was observed to be overlapping of teeth or insufficient space for unerupted teeth to erupt in the arch without overlapping.

Well aligned: A segment was said to be well- aligned when the adjacent teeth made proximal contact with each other without overlapping.

DATA ANALYSIS

The data was analysed using EPI INFO version 6 software statistical package. Chi-square test (X^2) was used for comparison of proportion of population and for testing significance of association. The critical level of statistical significance was set at $P < 0.05$.

RESULTS

Table 1 shows the distribution of the subjects by age and sex. Majority of the children (66%) was between ages 15 and 18 years while 1.7% were below 10 years of age.

Table 1: Distribution of subjects by age and sex

Age (Years)	Males	Females	Total	%
6-9	4	3	7	1.7
10-14	68	65	133	32.3
15-18	138	134	272	66.0
Total	210	202	412	100.0

Occlusal pattern of the children in the study population according to the different handicapping conditions is provided in Table 2. About 13.8% of the handicapped children had normal occlusion. Angle's class I malocclusion was observed in 55.3% of children while 21.4% and 9.5% had classes II and III respectively. Only the mentally handicapped children (8.7%) and the deaf ones (10.8%) had Angle's class III malocclusion while only the paralysed children showed no class I malocclusion.

Table 2: Occlusal Pattern of the children in the study according to type of Handicap.

Type of Handicap	No. of children		Normal		Class I		Class II		Class III	
	n	%	n	%	n	%	n	%	n	%
Mental handicap	92	(100)	15	(16.3)	144	(47.8)	25	(27.2)	8	(8.7)
Multiple handicap	21	(100)	2	(9.5)	12	(57.2)	7	(33.3)	0	(0)
Deafness	288	(100)	31	(10.8)	172	(59.7)	54	(18.7)	31	(10.8)
Paralysis	11	(100)	9	(81.8)	0	(0)	2	(18.2)	0	(0)

Table 3 shows the occlusal classification among the sample population in relation to gender. More males had normal occlusion, Angle's class I and II malocclusions than females but none was statistically significant ($P > 0.05$). Females had statistically significant higher number of class III malocclusion cases ($P < 0.05$).

Table 3: Occlusal classification among sample population

Classification of occlusion	Males (n = 210)		Females (n = 202)		X ²	P-value
	n	%	n	%		
Normal occlusion	34	16.2	23	11.4	1.99	0.16
Angle's class I	119	56.7	109	53.9	0.31	0.58
Angle's class II div. 1	45	21.4	42	20.8	0.03	0.87
Angles class II div. 2	0	0	1	0.5	-	-
Angle's III	12	5.7	27	13.4	7.03	0.008

When $P \leq 0.05$, difference is significant.

Table 4: Tooth: Bone Ratio (Anterior segment)

Arch	Males (n = 210)		Females (n = 202)		X ²	P-value
	n	%	n	%		
Upper						
Normal	91	(43.3)	72	(35.6)	2.55	0.11
Crowding	14	(6.7)	24	(11.4)	2.81	0.09
Spacing	105	(50.0)	106	(52.5)	0.25	0.62
Lower						
Normal	89	(42.4)	87	(43.1)	0.02	0.89
Crowding	36	(17.1)	37	(18.3)	0.10	0.76
Spacing	85	(40.5)	78	(38.6)	0.15	0.70

When $P \leq 0.05$, difference is significant.

Table 5: Oversite Values among Handicapped children examined

Overbite	Males (n = 210)		Females (n = 202)		X ²	P-value
	n	%	n	%		
0	17	(8.1)	25	(12.4)	2.06	0.15
1	113	(53.8)	112	(55.4)	0.11	0.74
2	66	(31.4)	52	(25.7)	1.63	0.20
3	7	(3.3)	5	(2.5)	0.27	0.604
Reversed	7	(3.3)	8	(4.0)	0.12	0.73

When $P \leq 0.05$, difference is significant.

Tooth - bone ratio of the children in the anterior segments shown in Table 4 did not reveal any statistically significant differences between the sexes ($P > 0.05$) though higher proportion of females had crowding in both arches. In the upper arch, 39.6% had normal tooth-bone ratio, crowding occurred in 9.2% and 51.2% accounted for spacing. In the lower arch, normal tooth-bone ratio was observed in 42.7% while 17.7% had crowding and 39.6% spacing. The most common degree of overbite in this study was overbite 1 (Table 5) accounting for 54.6%. Deep bite (overbite 3) was observed in 2.9% of children. There were no statistically significant differences in overbite degrees between sexes ($P > 0.05$).

Table 6 shows the overjet values among the children with values less than 2mm accounting for 82.8%. Increased overjet (i.e. overjet of 5mm and above) was noted in 6.3% of children examined while reversed overjet was noted in 3.6%. No statistically significant differences in overjet values were noted between males and females ($P > 0.05$).

Table 6: Overjet values among handicapped children examine

Overjet	Males (n = 210)		Females (n = 202)		X ²	P-value
	n	%	n	%		
Reversed	7	(3.3)	8	(4.0)	0.12	0.73
Less than 2mm	177	(84.3)	164	(81.2)	0.69	0.41
2-4mm	15	(7.1)	15	(7.4)	0.01	0.91
5-8mm	9	(4.3)	14	(6.9)	1.37	0.242
8-12mm	2	(1.0)	1	(0.5)	0.00	0.95

When $P \leq 0.05$, difference is significant.

DISCUSSION

In this present study, the occlusal pattern of the children was in the range of a previous study on handicapped children in Lagos, Nigeria¹⁰ and those of normal children^{4,5}. This study revealed that Angle's class I malocclusion (55.3%) was the most prevalent type of malocclusion in the population sample studied. The rarity of class II div.2 in our environment has been confirmed by this study as only one case (0.2%) was seen. This compares well with a report¹⁴ among 'normal' children in Nigeria where no case of class II div.2 was seen. Similar low values of class II div. 2 have been reported in East Africans^{16,17}.

The pattern of Angle's classes I, II and III noted in this study also agrees with the report of Brown¹⁸ that the occlusal pattern of the mentally handicapped do not differ widely from the 'normal' population provided children with Down's syndrome are excluded. In this present study, five children with Down's syndrome were noted and included among the mentally retarded cases because of the number. Three of these five cases had class III malocclusion while the remaining two had class II malocclusion. The percentage of mentally retarded children with malocclusions (83.7%) in this study supports a previous study¹⁹.

The statistically significant differences in the class III occlusal relationship between females and males noted in this study (Table 3) is interesting and further research might be desirable in this regard.

The results obtained for spacing in the sample studied were found to be comparable to the findings of daCosta¹⁴ on a sample of 'normal' Nigerian children though the prevalence (90.8 %) in this present study was higher. However this result obtained for spacing does not agree with a previous report.¹⁰ The obvious difference could be because the authors did not give details of the spacing in both upper and lower arches as their study was not centred on malocclusion mainly. Obviously, the prevalence of spacing among the handicapped children is expected to be as high as that among their 'normal' counterparts going by the prevalence of missing teeth noted among these handicapped children which the author hopes to publish.

The prevalence of crowding in this study (Table 4) was lower than the 33.6% reported by Otuyemi, et al²⁰ among 'normal' school children in Ibadan and Ile-Ife Nigeria. This shows a consistent pattern of more spacing and less crowding among the handicapped children in Ibadan.

With reference to overbite values, the present study shows the same pattern with previous studies on 'normal' Nigerian school children population.^{14,21} Prevalence of overbite 1 (54.6%) in this study was the highest and followed by overbite 2 (28.6%). When compared to the prevalent overbite 2 seen in Caucasians¹⁵, the present study shows that the Nigerian handicapped children follows the reduced overbite values of the 'normal' Nigerian children.

An overjet of less than 2mm was the most prevalent (82.2%) in this present study which agrees with the finding of Isiekwe²² on 'normal' population.

In conclusion, this study seems to suggest that the pattern of malocclusion among the handicapped children in Ibadan, Nigeria does not differ widely from their 'normal' counterparts. Reports on pattern of malocclusion among the handicapped children from other parts of Africa will be useful for purposes of comparison.

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