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Research Article

COMPARISON OF THE OCCLUSION AND MALOCCLUSION TRAITS BETWEEN THE DISABLED AND THE NORMAL CHILDREN OF 4-6 YEARS

Bhayya Deepak P^{1*}, Shetty Pramod², ShyagaliTarulatha R³, Sudhanshu Saxena⁴, Sonia Tiwari⁵ Pradeep Vishnoi⁶

¹BDS, MDS, DNHE, PhD Scholar, Department of Paediatric and Preventive Dentistry, Pacific Dental College and Hospital, Udaipur, India

²BDS, MDS, Professor, Department of orthodontics and dentofacial orthopedics, Pacific Dental College and Hospital, Udaipur, India

³BDS, MDS, DNHE, DCE, Professor and Head, Department of orthodontics and dentofacial orthopaedics, Hitkarini Dental College and hospital, Jabalpur, M.P, India

⁴BDS, MDS, Reader, Department of public health and community dentistry, Hitkarini Dental College and hospital, Jabalpur, M.P, India.

⁵BDS, MDS, Resident, Department of Paediatric and Preventive Dentistry, Hitkarini Dental College and hospital, Jabalpur, M.P, India.

⁶BDS, MDS, Resident, Department of Orthodontics and dentofacial Orthopaedics, Darshan Dental College and hospital, Udaipur, India.

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*Corresponding Author: **Dr. Deepak P Bhayya**

PhD Scholar, Department of Paediatric and Preventive Dentistry, Pacific Dental College and Hospital, Udaipur, India. Contact no. 9928413378

ABSTRACT

Aim: The study aimed to compare the occlusion and malocclusion traits between the disabled and the normal children of 4-6 years old of Udaipur city.

Materials and methods: A cross sectional study was conducted on 400 normal children and 100 disabled children. The disabled physical children included in this study belonged to following categories; Speech defect, Hearing Impairment, Visual defect and Physically Dexterity. All the children were examined for the occlusion and the malocclusion traits like molar relationship, canine relationship, developmental spaces, crowding, midline diastema, cross bite, over jet, overbite, lateral profile and the lip competency. The collected data was subjected to chi square statistical test to check the difference between the normal children and the disabled children.

Results: there existed significant difference between the normal and the disabled children for the developmental spaces ($P = 0.010$, $P = 0.005$) and the overjet ($P = 0.012$). The overjet more than 2-4 mm was more prevalent in disabled children (21%) than the normal children (10%). The developmental spaces were more prevalent in the normal children group in both maxilla and mandible.

Conclusion: the occlusion and the malocclusion traits in the present disabled and the normal children was similar except for the overjet and the developmental spaces.

Keywords: Disabled Children, Normal Children, Occlusion, Malocclusion.

INTRODUCTION

Physical disability is the major barrier for maintaining the proper oral health.¹ Oral health being the integral part of general health, needs to be given a prioritized importance in the disabled children because of their inability to maintain the daily routine of maintaining the oral cavity. Inability to maintain the daily oral care can increase the incidence of dentacaries, periodontal diseases and the malocclusion traits^{1, 2, 3, 4, 5}. This can affect the very quality of life which one cherishes and the oral health care is most commonly ignored health issues in the disabled children.

Even the adverse oral habits which are seen among these children like the lip biting, tongue thrusting, finger sucking and the bruxism add to the problem of the ill effects on the oral health⁶. Malocclusion particularly can cause poor communication skills, poor oral hygiene status and can affect

the masticatory function too^{7, 8}. Apart from this, the primary dentition is continuously changing and will adopt to the future functional needs of the individuals and as the functional needs in these children are different from the normal children, this can lead to the development of malocclusion as well⁹.

Several studies have highlighted the greater incidence of malocclusion in the handicapped children^{10, 11}. However, there is paucity in the literature pertaining to the malocclusion and occlusion traits seen in the 4-6 years in the disabled and the normal children. The present study is undertaken with the aim to compare the occlusion and malocclusion traits in the 4-6 year old disabled and the normal children of the Udaipur city.

MATERIALS AND METHODS

A cross sectional study was conducted on 500 children of 4-6 years old in Udaipur city, out of 500 children, 400 children belonged to the physically disabled category whereas, 100

children were normal. The selection of the sample was done using the stratified cluster sampling. The ethical clearance was obtained by the institutional ethical committee. The purpose of the study was explained to the parents and the informed consent was obtained for the same. The children who had not undertaken orthodontic treatment and the children who had intact occlusion without caries and the faulty fillings were included from the study. The examination of the children was carried out by the single examiner (DP). ADA type III examination was carried out. The children were examined for the following occlusion and malocclusion parameters; Molar relationship, canine relationship, developmental spaces, primate spaces, crowding, midline shift, anterior cross bite, posterior cross bite, scissor bite, overjet, over bite, lateral profile and the lip competency.

The intraexaminer reliability was checked by examining the 10 patients twice within the span of one week and the kappa statistics account for 80%. The collected data was tabulated and was subjected for the statistical analysis and the difference between the normal and the disabled children was checked using the chi square test.

RESULTS

Table 1 shows the distribution of the sample. The sample included 400 disabled and the 100 normal children. The disabled children included in this study were having either the speech defect or hearing impairment or visual defect or physical dexterity.

Table 1: Distribution of the Study Sample.

Age (years)	Normal Children n (%)	Disabled Children				Total n (%)
		Speech Defect n (%)	Hearing Impairment n (%)	Visual Defect n (%)	Physically Dexterity n (%)	
4	30 (30.00)	05 (5.00)	00 (0.00)	02 (2.00)	15 (15.00)	52 (10.40)
5	35 (35.00)	39 (39.00)	36 (36.00)	38 (38.00)	26 (26.00)	174 (34.80)
6	35 (35.00)	56 (56.00)	64 (64.00)	60 (60.00)	59 (59.00)	274 (54.80)
Total	100 (100.00)	100 (100.00)	100 (100.00)	100 (100.00)	100 (100.00)	500 (100.00)

$\chi^2 = 71.571, df = 8, P = 0.000 (<0.001),$ Significant difference

The comparison of prevalence of occlusal parameters between the disabled and the normal children is depicted in table 2 and the table 3. All the examined parameters showed statistically insignificant difference except for the developmental spaces in both the maxilla and mandible. The developmental spaces was

more prevalent in normal children (Table 2). The overjet of 0-2 mm and the 2-4mm also showed the statistically significant difference with 0-2mm overjet being more prevalent in normal children and overjet of 2-4mm more prevalent in disabled children.

Table 2: Comparison of prevalence of Occlusal Parameters in the Primary Dentition in Children between Age 4-6 Years (n=500).

Occlusal Parameter	Particulars	Normal Children n (%)	Disabled Children n (%)	Chi-square test
Molar Relationship	Flush Terminal	55 (55.00)	188 (47.00)	$\chi^2 = 2.050, df = 1, P = 0.152 (>0.05),$ Not Sig.
	Mesial Step	30 (30.00)	105 (26.25)	$\chi^2 = 0.571, df = 1, P = 0.450 (>0.05),$ Not Sig.
	Distal Step	05 (5.00)	37 (9.25)	$\chi^2 = 1.878, df = 1, P = 0.171 (>0.05),$ Not Sig.
	Asymmetric	10 (10.00)	70 (17.50)	$\chi^2 = 3.348, df = 1, P = 0.067 (>0.05),$ Not Sig.
Canine Relationship	Class I	65 (65.00)	249 (62.25)	$\chi^2 = 0.259, df = 1, P = 0.611 (>0.05),$ Not Sig.
	Class II	25 (25.00)	101 (25.25)	$\chi^2 = 0.003, df = 1, P = 0.956 (>0.05),$ Not Sig.
	Class III	04 (4.00)	25 (6.25)	$\chi^2 = 0.741, df = 1, P = 0.389 (>0.05),$ Not Sig.
	Asymmetric	06 (6.00)	25 (6.25)	$\chi^2 = 0.009, df = 1, P = 0.924 (>0.05),$ Not Sig.
Developmental Spaces	Maxillary	75 (75.00)	245 (61.25)	$\chi^2 = 6.565, df = 1, P = 0.010 (<0.05),$ Sig. Diff.
	Mandibular	62 (62.00)	185 (46.25)	$\chi^2 = 7.939, df = 1, P = 0.005 (<0.01),$ Sig. Diff.

Primate Spaces	Maxillary	67 (67.00)	229 (57.25)	$\chi^2 = 3.149$, df = 1, P = 0.076 (>0.05), Not Sig.
	Mandibular	38 (38.00)	122 (30.50)	$\chi^2 = 2.068$, df = 1, P = 0.150 (>0.05), Not Sig.
Crowding	Maxillary	20 (20.00)	107 (26.75)	$\chi^2 = 1.924$, df = 1, P = 0.165 (>0.05), Not Sig.
	Mandibular	32 (32.00)	169 (42.25)	$\chi^2 = 3.496$, df = 1, P = 0.062 (>0.05), Not Sig.
Midline Discrepancy	Shift in Maxillary	06 (6.00)	32 (08.00)	$\chi^2 = 0.456$, df = 1, P = 0.499 (>0.05), Not Sig.
	Shift in Mandibular	40 (40.00)	190 (47.50)	$\chi^2 = 1.812$, df = 1, P = 0.178 (>0.05), Not Sig.
	Shift in both	00 (0.00)	02 (0.50)	$\chi^2 = 0.031$, df = 1, P = 0.860 (>0.05), Not Sig.
Cross Bite	Anterior Single	00 (0.00)	01 (0.25)	$\chi^2 = 0.564$, df = 1, P = 0.453 (>0.05), Not Sig.
	Anterior Multiple	00 (0.00)	03 (0.75)	$\chi^2 = 0.112$, df = 1, P = 0.738 (>0.05), Not Sig.
	Posterior Unilateral	00 (0.00)	01 (0.25)	$\chi^2 = 0.564$, df = 1, P = 0.453 (>0.05), Not Sig.
	Posterior Bilateral	00 (0.00)	01 (0.25)	$\chi^2 = 0.564$, df = 1, P = 0.453 (>0.05), Not Sig.
Scissors Bite	-	00 (0.00)	03 (0.75)	$\chi^2 = 0.112$, df = 1, P = 0.738 (>0.05), Not Sig.

Table 3: Comparison of prevalence of Occlusal Parameters in the Primary Dentition in Children between Age 4-6 Years (n=500).

Occlusal Parameter	Particulars	Normal Children n (%)	Disabled Children n (%)	Chi-square test
Open Bite	Anterior	01 (1.00)	03 (0.75)	$\chi^2 = 0.337$, df = 1, P = 0.562 (>0.05), Not Sig.
	Posterior Unilateral	00 (0.00)	01 (0.25)	$\chi^2 = 0.564$, df = 1, P = 0.453 (>0.05), Not Sig.
	Posterior Bilateral	00 (0.00)	01 (0.25)	$\chi^2 = 0.564$, df = 1, P = 0.453 (>0.05), Not Sig.
Overjet	0-2 mm	85 (85.00)	273 (68.25)	$\chi^2 = 11.038$, df = 1, P = 0.001 (<0.01), Sig. Diff.
	2-4 mm	10 (10.00)	84 (21.00)	$\chi^2 = 6.341$, df = 1, P = 0.012 (<0.05), Sig. Diff.
	>4 mm	05 (5.00)	43 (10.75)	$\chi^2 = 3.048$, df = 1, P = 0.081 (>0.05), Not Sig.
Overbite	0-2 mm	82 (82.00)	290 (72.50)	$\chi^2 = 3.791$, df = 1, P = 0.052 (>0.05), Not Sig.
	2-4 mm	11 (11.00)	60 (15.00)	$\chi^2 = 1.051$, df = 1, P = 0.305 (>0.05), Not Sig.
	>4 mm	07 (7.00)	50 (12.50)	$\chi^2 = 2.396$, df = 1, P = 0.122 (>0.05), Not Sig.
Lateral Profile	Straight	32 (32.00)	104 (26.00)	$\chi^2 = 1.454$, df = 1, P = 0.228 (>0.05), Not Sig.
	Convex	68 (68.00)	287 (71.75)	$\chi^2 = 0.546$, df = 1, P = 0.460 (>0.05), Not Sig.
	Concave	00 (0.00)	09 (02.25)	$\chi^2 = 1.195$, df = 1, P = 0.274 (>0.05), Not Sig.
Lip Incompetency		03 (3.00)	30 (7.50)	$\chi^2 = 2.628$, df = 1, P = 0.105 (>0.05), Not Sig.

DISCUSSION

The disability can sometimes pave a path for the debilitating malocclusion because of the inability to maintain the proper oral hygiene. The primary dentition with its ever changing nature gives the idea of how well the permanent dentition in the future. This study was undertaken with the aim to evaluate the primary dentition for the occlusion and malocclusion traits. Most commonly found molar relationship in this group of sample was flush terminal plane which was followed by the mesial step and the distal step. But the distal step was more prevalent in the disabled children than in the normal children. This might be the indication that the disabled children have greater chance of acquiring class II malocclusion in the permanent dentition stage. The results of the current study were in accordance to the previous studies on the cerebral palsy children^{12, 13, 14}. Contrasting results were reported in the spastic cerebral palsy children, where the found class I molar relationship to be more prevalent¹⁵. However, the difference found was statistically insignificant. Similarly, the class I canine relationship was more prevalent in both the normal and disabled children group.

Both maxillary and mandibular developmental spaces and the primate spaces were more prevalent in the normal children than the disabled children. It shows that the chances of crowding in the future dentition is at store for the disabled children group. Again the difference noted was statistically insignificant. Adding to this the percentage of crowding found in the disabled children was greater than the normal children, which again, is indicative of definitive crowding in the future. The mandibular midline shift was noted in limited number of children in both the groups, the percentage was rather high in the disabled children. Even the cross bite and the scissor bite tendency were seen in the disabled children, which were absent in the normal children. In agreement to this finding, several of the previous studies have reported the increase in the tendency for the cross bite in the handicapped children^{12,14,15}.

The open bite tendency was seen more in disabled children in comparison to the normal children. The adverse oral habits in the disabled children might have been the reason for this increase in the tendency for the open bite. Similar increase in the anterior open bite was noted in higher proportions in the mental retard children^{2,10,11,16}. The over jet between 0-2mm was seen more in the normal children than the disabled children, whereas, the overjet between 2-4mm was more prevalent in the disabled children than the normal children. In both the cases the difference noted was statistically significant. Similar increase in the overjet was noted in the cerebral palsy children¹⁷.

When the soft tissue examination is considered both the convex profile and the lip incompetency prevailed more in the disabled children than in the normal children. The lip incompetency might lead to the tendency for the increased overjet in the disabled children. Similar reports related to lip incompetency and the orbicularis oris muscle dysfunction are mentioned in the previous studies^{17, 18, 19}.

CONCLUSION

The increase in the prevalence of the increased overjet in the present group of disabled children indicates the need of educating the parents and the care takers about the probable traumatic injuries and the existence of other malocclusion traits needs to be addressed as well through proper preventive orthodontic measures.

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