EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

PREVALENCE OF ORTHODONTIC ANOMALIES IN INTELLECTUALLY DISABLED PATIENTS IN A TERTIARY CARE HOSPITAL IN INDIA

Dr. Navneet Kaur Bhatia*[1], Dr. Navleen Kaur Bhatia[2] and Dr. Rajiv Ahluwalia[3]

[1]Department of Dental Surgery, Dr. R.M.L. PGIMER & Hospital, New Delhi-110001.
[2]Department of Dentistry, AIIMS, Jodhpur, Rajasthan.
[3]Department of Orthodontics, Santosh Dental College & Hospital, Ghaziabad, U.P.

*Corresponding Author: Dr. Navneet Kaur Bhatia

Department of Dental Surgery, Dr. R.M.L. PGIMER & Hospital, New Delhi-110001.

ABSTRACT

About 3% of all children across the world are "special." Several studies reported that malocclusion is more common in intellectually disabled individuals compared to the general population. Malocclusion is common in intellectually disabled individuals, there is scarce data regarding the same from India. The present study was undertaken to find the prevalence and type of malocclusion in Intellectually Disabled (ID) patients. 63% of patients were Dolicocephalic. Mouth breathing, Class I molar relation and Class I canine relation were the most common. 42% reported mandibular crowding, 33% had lip protrusion, 8% of patients reported TMJ clicking, 54% had caries and 46% scored poor in OHI index. As per DAI, 4% reported severe malocclusion and 3% handicapping. Lip protrusion and upper arch spacing were significantly more among males. Caregivers should be educated regarding the benefits of good oral hygiene and orthodontic treatment at an early age. This will help in the prevention of development of malocclusion and other dental anomalies.

Keywords: Intellectual disability, Malocclusion, Oral habits, Lip protrusion, OHI, DAI

INTRODUCTION

About 3% of all children across the world are "special."[1] Several studies reported that malocclusion is more common in intellectually disabled individuals compared to the general population. Malocclusion plays an important role in the overall oral health as it is associated with periodontal disease, temporo-mandibular disorders, and may be complicated by an individual's disability. Although the epidemiology of malocclusion is extensively studied in mentally disabled individuals worldwide, there is scarce data regarding the same from India.[2] Asdaghi Mamaghani et al. 2008 stated that children with special needs normally undergo dental examination at an older age.[3] Care offered by health professionals is integral and multidisciplinary in encouraging parents/guardians to seek dental care for younger children, when preventive procedures and education are still possible.[4]

AIM AND OBJECTIVES

- To find the prevalence of malocclusion in Intellectually Disabled (ID) patients.
- To identify type of malocclusion and habits causing malocclusion in ID patients.

MATERIAL AND METHODS

100 (74 males and 26 females) Intellectually disabled patients between the age 6 – 40 years, attending the disability clinic in a tertiary care hospital in the capital territory of Delhi. Informed consent was taken. Sociodemographic profile of cases was recorded in a semi-structured proforma. Detailed history was taken from the guardians accompanying the patients. All the cases were thoroughly examined for orthodontic anomalies. Data pertaining to head shape, molar and canine relation, TMJ analysis, habits, soft tissue analysis, oral hygiene status using simplified oral hygiene index (OHI) and Dental Aesthetic Index (DAI) was recorded. DAI was developed by Joanna Jenny and Cons in 1986.[5] The Dental Aesthetic Index (DAI) is an orthodontic index based on socially defined aesthetic standards. It is useful in both epidemiological surveys to identify unmet need for orthodontic treatment and as a screening device to determine priority for subsidized orthodontic treatment. The recommended cut-off point (values above this point indicate malocclusion for which treatment is mandatory) of DAI is 31.[5]

RESULTS

Sociodemographic profile: 40% of ID patients were in the age group of 6 – 10 years, 74% were males and 41% belonged to semi urban background (Table 1). Among etiological factors, most common causes of ID were birth anoxia (44%), family history (15%), Down syndrome (9%) and antenatal drug exposure (5%).

Table I: Socio-demographic profile of Intellectually Disabled.

Age	Percentage
6-10	40
11-15	18
16-20	20
21 onwards	22
Gender	
Male	74
Female	26
Religion	
Hindu	63
Muslim	36
Sikh	1
Background	
Urban	34
Semi urban	41
Rural	25

Orthodontic profile of ID patients

63% patients were Dolicocephalic, 4% had unsymmetrical face, 15% showed midline shift. Among habits mouth breathing was the commonest in 41% followed by digital sucking (13%) and bruxism (12%). Class I molar relation (84%) and class I canine relation (85%) were the most common. 42% reported mandibular crowding and 34% showed maxillary spacing. In soft tissue analysis, 33% shown lip protrusion, followed by lip incompetency 26% and short upper or lower lip 23%. In TMJ analysis 8% patients reported clicking and 1% deviation. 54% reported caries and 46% scored poor in OHI index. As per DAI, 4% reported severe malocclusion and 3% handicapping malocclusion (in which treatment is mandatory).

Table II: Prevalence of Orthodontic Parameters in ID patients.

Orthodontic Parameters	Percentage
1.*Head shape*	
Dolicocephalic	63
Mesocephalic	17
Brachycephalic	20
2. *Symmetry*	
Yes	96
No	04
Midline	
No	85
Yes	
shift to right	09
shift to left	06
3. Habits	
Mouth breathing	41
Tongue thrusting	08
Nail Biting	08
Digital Sucking	13
Bruxism	12
Cheek Biting	01
Clenching	03
Tobacco/Bidi smoking	07
4. Molar relation	
Class I	84
Class II	07
Class III	05
End on	04
6. Canine relation	
Class I	85
Class II	07
Class III	04
End on	04
7. Crowding	
Upper arch	16
Lower arch	42
8. Spacing	
Upper arch	34
Lower arch	14
9. Dental Caries	

Yes	54
No	46
10. Soft tissue analysis	
Lip protrusion	33
Lip incompetency	26
Short upper or lower lip	23
Large lip	01
11.TMJ analysis	
Clicking	08
Deviation	01
12. *Oral Hygiene Index (OHI)*	
Good	11
Fair	43
Poor	46
13. *Dental Aesthetic Index (DAI)*	
Below and equal 25	80
26 – 30	04
31 - 35	04
36 and above	03

Distribution of Orthodontic parameters according to gender

The distribution of the orthodontic profile was compared between males and females using chi-square test (Table III). There was no significant difference in the prevalence of type of facial asymmetry, habits, molar relation, Canine relation, caries, OHI score, DAI score between males and females. There was no significant difference in the prevalence of lip incompetency, short upper/lower lip and large lip between males and females. The lip protrusion was significantly more among males. There was no significant difference in the prevalence of TMJ disorder and crowding between males and females. Spacing in the upper arch was significantly more among males. There was no significant difference in the prevalence of lower arch spacing between males and females.

Table III: Distribution of orthodontic parameters according to gender.

Orthodontic parameters	Male	Female	p-value
1.Head shape			
Dolicocephalic	51	14	
Mesocephalic	10	5	0.335
Brachycephalic	12	8	
2. Facial asymmetry	1		
3. Habits			
Mouth breathing	30	10	0.852
Tongue thrusting	6		0.178
Nail biting	5	5	0.080
Digital sucking/pacifier	9	5	0.413
Bruxism		3	0.885
Cheek biting	9	1	0.551
Clenching	1		0.551
Tobacco chewing	4	1	0.727
4. Molar relation			
Class I	53	24	
Class II	7	1	0.634
Class III	5	1	
End on	3	1	
5. Canine relation			
Class I	49	24	
Class II	9	1	0.477
Class III	4	1	
End on	3	1	
6. Caries	41	13	0.634
7. OHI			
Good	6	1	

Fair	33	13	0.736
poor	34	12	
8. Soft tissue analysis lip incompetency	21	6	
short upper/lower lip	13	9	0.135
large lip	5	3	
lip protrusion	24	3	
9. TMJ disorder Clicking	8	1	0.267
deviation	1		0.544
10. Crowding upper arch	9	6	0.208
lower arch	28	12	0.548
11. Spacing upper arch	30	4	0.015*
lower arch	12	4	0.864
12. DAI < 25	55	26	
26-30	3	1	0.356
31-35	4		
>36	3		

DISCUSSION

Dental Aesthetic Index (DAI)
DAI has been adopted by the WHO as an attempt to establish simple and universally acceptable orthodontic index for use in epidemiological surveys and has been reported reliable for determination of orthodontic needs. Hence it was used in our study.

In our study, in 80% of ID patients required no/slight treatment. The definite malocclusion was in 4%. Another 4% indicated treatment highly desirable, 3% had handicapped malocclusion and the need for orthodontic treatment was similar to a study by Dinesh et al which stated 53% required no/slight orthodontic treatment need, 24% definite malocclusion, 12% was considered to be 'highly desirable'. The remaining subjects (11%) had a handicapping malocclusion where treatment was considered mandatory. Dinesh et al also reported 13% severe malocclusion in special patients.[6] In a study by Vellappally et al,[7] a total of 123 (50.6%) participants (74 males and 49 females) had DAI scores of 36 and above, which indicated a handicapping malocclusion requiring mandatory orthodontic treatment.

Family history
In our study, 15% has positive family history for the intellectual disability which was similar to a study by Shukla et al[2] that stated 7% of positive family history.

Head shape
In our study, 63% were dolichocephalic whereas a study by Jayaraj and Manjunath[8] reported when subject is Indian, dolicocephalic may show higher intelligence. Their study reported mild mental retardation in 50% males and 100% females as compared to other categories.

Crowding and spacing
Crowding in upper arch has been reported in 9.2% and in lower arch in 17.7% of handicapped (physically and mentally) children. Our study found crowding in upper arch in 16% and in lower arch in 42% of ID patients.[9] Spacing in upper arch has been reported in 51.2% and in lower arch in 39.6% of handicapped (physically and mentally) children. Our study found spacing in upper arch in 34% and in lower arch in 14% of ID patients.

TMJ clicking was found in 8% and in soft tissue analysis lip protrusion was found in 33% followed by lip incompetency in 26% and short upper lip or lower lip in 22%. The various studies had shown the prevalence of TMJ clicking in 17%,[10,11] 22%[12] or 29%[13] in normal population.

Malocclusion
In (84%), class I malocclusion was found followed by class II (7%), class III (5%) and end on (4%) but in a study by Muppa et al[1] Class I was in 14.34%, anterior spacing in 12.9%, Class II in 9.95% and Class III in 5.33%. Khandelwal et al[14] reported an incidence of class I (69.15%), Class II division1 (18.9%), Class 1 division2 (27.69%) class III (3.98%) in 201 males subject hailing from Indore.

Habits
In our study mouth breathing was found in 41% followed by digital sucking 13% followed by bruxism 12%. The prevalence of bruxism and lip biting was found to be 0.4%. Some studies had reported low prevalence of bruxism and lip biting.[15,16] However, the previous literature on the oral habits also suggests highest prevalence of bruxism from 6.2% to 30.2% and lip biting from 1.2% to 6%.[9,16-18] In our study, nail biting was

seen in 8 % whereas Shetty and Munshi,[17] reported nail biting in 12.7% normal children.

CONCLUSION

Antenatal exposure to drugs such as antiepileptics is known to cause intellectual disability in addition to genetic causes and should be avoided. Birth anoxia needs prevention as it is the most common etiological factor in causing ID. Since malocclusion is common in ID patients, there is a great need for the strengthening of oral health promotion/ awareness programs that will ensure the availability of comprehensive preventive and oral health care for these risk groups. It is imperative that preventive measures to be initiated at an early age. Special measures can be taken e.g. team work under the guidance of a psychiatrist. Care givers should be educated regarding the benefits of good oral hygiene and orthodontic treatment at an early age. This will help in prevention of development of malocclusion and other dental anomalies.

REFERENCES

1. Muppa R, Bhupathiraju P, Duddu MK et al. Prevalence and determinant factors of malocclusion in population with special needs in South India. J Indian Soc Pedod Prev Dent, 2013 Apr-Jun; 31(2): 87-90.
2. Shukla D, Bablani D, Chowdhry A, Thapar R, Gupta P. Craniometry and malocclusion in mentally disabled subjects in India. Anthropol, 2014; 2: 134.
3. Asdaghi Mamaghani SM, Bode H, Ehmer U. Orofacial findings in conjunction with infantile cerebral paralysis in adults of two different age groups: A cross-sectional study. J Orofac Orthop, 2008; 69: 240-56.
4. Clark CA, Vanek EP. Meeting the health care needs of people with limited access to care. J Dent Educ, 1984; 48: 213-6.
5. Joanna Jenny EDD, Cons NC. Establishing malocclusion severity levels on the Dental Aesthetic Index (DAI) scale. Australian Dent J, 1996; 41(1): 43–46.
6. Dinesh RB, Amitha HM, Munshi AK. Malocclusion and orthodontic needs of handicapped and normal individuals in South Canara India. India Int Dent J, 2003, 53(1): 13-18.
7. Vellappally S, Gardens S, Al Kheraif et al. Prevalence of malocclusion and its association in dental caries among 12-18-year-old disabled adolescents. BMC Oral health, 2014; 14: 123.
8. Jayaraj MS, Manjunath KY. Cephalometry of mentally challenged subjects and correlation with Intelligence Quotient. Anatomica Karnataka, 2011; 5(2): 60-65.
9. Onyeaso CO. Malocclusion pattern. Nigerian J Clin Prac, 2002; 5(1): 57-60.
10. Solberg WK, Woo MW, Houtson JB. Prevalence of mandibular dysfunction in young adults. J Am Dent Assoc., 1979; 98: 25–34. [PubMed]
11. Spencer AJ. The estimation of need for dental care. J Public Health Dent., 1980; 40: 311–327.
12. Yadav S. A Study on Prevalence of Dental Attrition and its Relation to Factors of Age, Gender and to the Signs of TMJ Dysfunction. J Indian Prosthodont Soc., 2011 Jun; 11(2): 98–105.
13. Pullinger AG, Seligman DA, Solberg WK. Temporomandibular disorders. Part II: occlusal factors associated with temporomandibular joint tenderness and dysfunction. J Prosthet dent., 1988; 59: 363–367.
14. Khandelwal A, Jalili VP, Jain S. Incidence of malocclusions in males of Indore, Malwa. JIDA, 2010; 4(10): 357-58.
15. Shetty RM, Shetty M, Shetty NS, et al. Oral Habits in children of Rajnandgaon, Chhattisgarh, India- A prevalence study. Int J Public Health Dent, 2013; 4(1): 1-7.
16. Kharbanda OP, Sidhu SS, Sundaram KR, Shukla DK. Oral habits in school going children of Delhi: a prevalence study. J Ind Soc of Pedo Prev Dent, 2003; 21(3): 120-124.
17. Shetty SR, Munshi AK. Oral habits in children - a prevalence study. J Ind Soc of Pedo Prev Dent., 1998; 16(2): 61-66.
18. Onyeaso CO. Oral habits among 7-10-year-old school children in Ibadan, Nigeria. East African Med J, 2004; 81(1): 16-21.