



PREVALENCE AND TREATMENT NEEDS OF MALOCCLUSION IN 3-5 YEAR OLD CHILDREN OF KASHMIRI POPULATION USING BABY ROMA INDEX

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ABSTRACT

Preventive orthodontic treatments are performed in the primary or mixed dentition period which in turn provide a proper development of occlusion to avoid dentofacial anomalies. Aim of the study was done to determine the prevalence of malocclusion in 3-5 year old children of Kashmiri population. Design: this study was done for 1 Year on 5432 children aged 3-5 years visiting the OPD of department of Paediatric and Preventive dentistry GDC Srinagar. Results maximum of the affected children presented with Score 2 thus needed only routine follow ups to monitor the occlusion. Conclusion The Baby ROMA index presented good reliability and ease of use for evaluating early orthodontic treatment needs in primary dentition of Kashmiri population.

KEYWORDS : Malocclusion, primary dentition, Baby ROMA index.

INTRODUCTION

Malocclusion is an abnormality of the teeth or a mal-relation between the two dental arches. It depicts a developmental irregularity involving craniofacial complex due to which it defined as "handicapping dentofacial anomaly" by WHO (World Health Organization)¹. Malocclusion is considered one of the three main oral diseases that affects the jaws, facial muscles and tongue compromising dento-facial function. Furthermore, it may have negative effects on children's self-esteem, emotional and social well-being².

The etiology of malocclusion is multifactorial it includes environmental factors and hereditary factors. Dental problems such as pulpal and periapical lesions, dental caries, and dental trauma statistically contribute to malocclusion. Genetic factors have been found to be significantly related to skeletal deformities and malocclusion.³ Environmental factors, such as deleterious oral habits, also play an important role in the development of malocclusion.⁴ The purpose of preventive orthodontic treatments, in particular in the primary or early mixed dentition period, is to provide a proper development of the occlusion by avoiding the progression of malocclusion⁵. To evaluate and determine the oral health status of population and to check different changes in occlusion in growing stages of children, the role of various epidemiological studies is highly important. Very few literatures is available on the occlusal characteristics and discrepancies of primary teeth in India, as most of the literature is available on children above 6 years of age⁶. Furthermore, children who have occlusal discrepancies in their deciduous dentition were suggested to be at increased risk of developing malocclusion in their mixed and permanent dentition. Therefore, the early detection of occlusal discrepancies in deciduous dentition may not only aid in preventive or interceptive orthodontics, employing child's growth potential to reduce symptoms and functional limitations, but also result in better occlusion development in the mixed and permanent dentition⁷. Thus, this present study was undertaken to obtain baseline information about

occlusion and its characteristics in 3-5 years old children in Kashmiri population.

MATERIALS AND METHODS

The present study was conducted in the Department of Pedodontics and Preventive Dentistry, Govt dental college and associated hospital Srinagar after it was thoroughly reviewed and approved by the Institutional Ethical Committee. The study was done for a period of 1 year and was based on clinical examination of 5432 children aged 3- 5 years visiting to the OPD of department. Only 3439 presented with the malocclusion traits and out of the included children 1683 were males and 1756 were females. After taking consent to take part in study, demographic details were obtained from the parent of each child and it was followed by the clinical examination of teeth using mouth mirror and probe by the single examiner. Children with full set of primary dentition were included in the study however children with any of the permanent tooth erupted were excluded in the study. The teeth examined were recorded in the relevant table for each participant according to the index guidelines i.e, the data was were collected using Baby ROMA index.

The ROMA was developed to evaluate the prevalence of malocclusion in permanent and mixed dentition periods. This index has been modified to the new Index of Baby-ROMA, primarily characterized for primary dentition, approved by Grippaudo et al. (2007)⁸. In addition, early diagnosis and correction of different maxillofacial anomalies results in increase of oral health-related quality of life for the children who usually spent many years of their childhood having craniofacial anomalies with very low self-esteem⁹.

Baby-ROMA index is divided into four main groups i.e, systemic, craniofacial, dental, and functional which in turn is divided according to occlusal parameters, skeletal and fu of malocclusion. The orthodontic treatment is in a form of scale with different scores with scores of 4 and 5 requiring immediate orthodontic treatment, a score of 3 indicating the

presence of a malocclusion which can persist or worsen with time. Scores of 1 and 2 need only routine follow-ups to monitor developing occlusion; score 2 is more exposed to the action of risk factors as compared to score 1.^{10,11}

RESULTS:

Medical and auxological conditions were the major systemic problem accounting to 5.76 % followed by Congenital syndromes/malformations (4.73%). In case of craniofacial problems maximum of children had overjet of >6 mm (10.41%) followed by overjet 3 mm < OVJ <6 mm (6.54%). In case of dental problems majority of children i.e.16.51% had open bite >2 mm, followed by Caries and early loss of deciduous teeth 8.14% and >1 mm-absence of diastema in 8.81%. In case of functional problems majority of children had poor oral hygiene accounting of about (8.40%) followed by thumb sucking habit (8.37%) as in Table 2 and Figure 1.

There was no significant difference between males and females in case of congenital syndromes, malformations, inheritance of malocclusion, maxillofacial trauma, caries and early loss of tooth, poor oral hygiene and thumb sucking habit. However there was statistically significant (p value less than 0.05) difference between males and females in relation to auxological conditions (males more than females), maxillary hyper/ mandibular hypoplasia (males more than females), cross bite (females more than males), Absence of diastema (males more than females), open bite (females more than males). Regarding the age of children, malocclusion was more prevalent in 5 years of age with statistically significant difference with P value of < 0.05). However in age group between 3 and 4 years the results were almost comparable. (Table 2). Also maximum of children had 1 and 2 grading thus no intervention was required however few children needed the intervention to prevent the severity of malocclusion in mixed and permanent dentition.

The overall prevalence of malocclusion in the age group of 3 to 5 years using Baby ROMA index: 11.13% had systemic problems, 21.72% had craniofacial Problems, 44.43% had Dental problems and 22.71% had functional problems (Table 3, Figure 2).

Table 1: depicting the frequency and percentage distribution of study population

S.NO	PARAMETERS	GRADING	N (3439)	%
1 SYSTEMIC PROBLEMS				
1a	Maxillofacial trauma With condylar fracture	5a	1	0.03
1b	Maxillofacial trauma Without condylar fracture	2a	12	0.34
1c	Congenital syndromes/malformations	5b	163	4.73
1d	Postural/orthopedic problems	2c	0	0
1e	Medical or auxological conditions	2d	198	5.75
1f	Inheritance of malocclusion	2e	9	0.26
2 CRANIOFACIAL PROBLEMS				
2a	Facial or mandibular asymmetries	4f	59	1.71
2b	TMJ dysfunctions	4g	2	0.05
2c	Outcomes of trauma or surgery of the craniofacial region	5j	12	0.34
2d	Maxillary hyperplasia/mandibular hypoplasia			
2e	OVJ <0	4k	19	0.55

2e	OVJ >0	2k	72	2.10
	Maxillary hyperplasia/mandibular hypoplasia			
2f	OVJ >6 mm	3h	358	10.4
2g	3 mm < OVJ <6 mm	2h	225	6.54
3 DENTAL PROBLEMS				
3a	Caries and early loss of deciduous teeth	4l	280	8.14
3b	Scissor bite	4m	3	0.08
3d	Crossbite >2 mm or lateral shift	4n	103	2.99
3e	<2 mm or no lateral shift	2n	62	1.80
3f	Displacement >2 mm displacement	3o	10	0.29
3g	>1 mm-absence of diastema	2o	303	8.81
3h	Open bite >4 mm	3p	186	5.40
3i	>2 mm	2p	568	16.5
3j	Hypodontia Up to 2 teeth	3q	8	0.23
3k	> 2 teeth	4q	5	0.14
4 FUNCTIONAL PROBLEMS				
4a	Supernumerary teeth	4q	5	0.14
4b	OVb >5 mm	2r	92	2.67
4c	Poor oral hygiene	2t	289	8.40
4d	Parafunctions (bruxism, jaw clenching)	2v	25	0.72
4e	Thumb/finger sucking habit	2w	288	8.37
4f	Oral breathing/OSAS	2x	82	2.40

Inference: OVJ=Overjet, TMJ=Temporomandibular joint, OVb=Overbite, OSAS=Obstructive sleep apnea syndrome

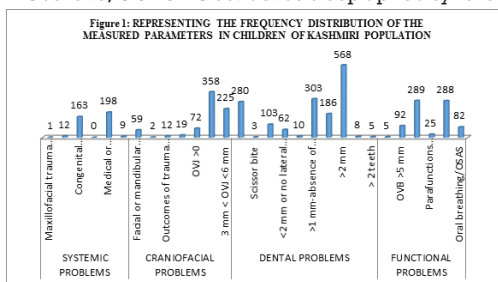


Table 2: representing the frequency distribution of measured parameters according to gender and age

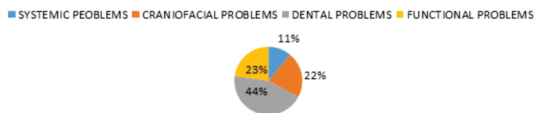
parameter	grading	Gender (n=3439)		P value	Age (n=3439)			p-value
		Male (n=1683)	Female (n=1756)		3 (n=1060)	4 (n=120)	5 (n=1259)	
Congenital syndromes/malformation (n=163)	Yes	58/3.44	99/5.63	0.14	36/0.34	23/0.05	92/7.95	0.19
	No	4/0.23	2/0.11		0/0	0/0	12/0.95	
Medical or auxological condition (198)	Yes	85/5.05	77/4.38	0.03	42/3.96	25/2.23	112/8.90	0.05
	no	12/0.71	24/1.36		3/0.28	4/0.35	12/0.95	
Inheritance of malocclusion (9)	Yes	2/0.12	4/0.22	1	1/0.09	1/0.89	6/0.47	0.44
	no	1/0.05	2/0.11		0/0	0/0	1/0.07	
Maxillofacial trauma (13)	Yes	10/0.59	2/0.11	0.28	2/0.19	1/0.89	9/0.71	0.03
	No	0/0	1/0.05		1/0.09	0/0	0/0	
Maxillary hyperplasia/mandibular hypoplasia (583)	Yes	257/15.27	245/13.95	0.01	144/13.58	126/11.25	220/17.47	0.001
	No	29/1.72	52/2.96		45/4.24	16/1.2	32/2.54	

Caries and early loss of tooth (280)	Yes	136/8.08	130/7.4	0.33	60/5.66	83/7.41	132/10.487	0.0	
	No	9/0.53	5/0.28		2/0.19	0/0	3/0.23		
Crossbite (165)	Yes	4n	22/1.30	50/2.84	0.0001	18/1.69	12/1.07	78/6.19	0.0
		2n	19/1.13	56/3.18		9/0.84	5/0.44	10/0.79	
	No	15/0.90	3/0.17	16/1.50		15/1.33	12/0.95		
Absence of diastema (303)	Yes	200/1.89	89/5.06	0.03	145/13.67	18/1.60	56/4.45	0.0	
	No	8/0.47	6/0.34		29/2.73	17/1.51	219/17.40		
Open bite (754)	Yes	3p	216/2.83	250/14.23	0.0001	88/30	170/15.17	302/23.98	0.0
		2p	125/42	112/6.37		12/1.13	74/6.60	80/6.35	
	No	66/3.92	25/1.42	9/0.84		19/1.69	0/0		
Poor oral hygiene (289)	Yes	120/7.13	98/5.58	0.08	44/15	33/2.94	163/12.94	0.0	
	No	40/2.37	31/1.76		20/1.88	16/1.42	13/1.03		
Thumb/finger sucking (288)	Yes	88/5.22	128/7.28	1.05	42/3.96	69/6.16	128/10.16	0.0	
	No	45/2.67	83/4.72		12/1.13	9/0.80	28/2.22		

TABLE 3: REPRESENTING THE TOTAL FREQUENCY DISTRIBUTION OF THE MEASURED PARAMETERS IN CHILDREN OF KASHMIRI POPULATION

SYSTEMIC PROBLEMS	383	11.13
CRANIOFACIAL PROBLEMS	747	21.72
DENTAL PROBLEMS	1528	44.43
FUNCTIONAL PROBLEMS	781	22.71
OVERALL PREVALENCE (n = 5432)	3439	63.31

Figure 2: REPRESENTATION OF THE TOTAL FREQUENCY DISTRIBUTION OF THE MEASURED PARAMETERS IN CHILDREN OF KASHMIRI POPULATION



DISCUSSION

At the age of 3 years, the deciduous teeth are completely erupted and establishing their occlusal relationship which last till the age of 6 years with the eruption of first permanent tooth in the oral cavity.¹² The transition from primary to early mixed dentition is often susceptible to changes which can be get affected by a variety of factors thus may interfere with a normal occlusion. A correct timing when to start an orthodontic treatment is essential for the treatment to be most effective in shorter period of time that too with the lowest cost possible. Various longitudinal studies predict that occlusal discrepancy observed in primary dentition can fairly predict the malocclusion developing in mixed or permanent dentition. According to literature, some of the occlusal characteristics in primary teeth persist in mixed dentition such as children with a malocclusion in primary dentition such as posterior crossbite, increased over-jet, increased overbite etc, present higher risks of having a malocclusion in early mixed dentition. However various cases of an anterior open bite may spontaneously improve with time.⁹ In our study majority of the affected children had openbite of about 2mm (16.21%) this was in accordance to the study done by C.Grippaudo, E.G. Paolantonio, F.Pantanali, G.Antonini, R.Deli. A 2mm open bite is a self-correcting anomaly and doesn't require any interceptive treatment during deciduous dentition period⁹. An

ideal overjet is considered to be around 1.5-2.5 mm, and in our study overjet of >6mm was also prevalent malocclusion and it was attributed to most of cases by the thumb sucking habit. The results of our study were in accordance to the study done by Asiry and Alshahrani¹³

Considering the problems, 11.3% of the study subjects had systemic problems, 21.72% had craniofacial problems, 44.43% had dental problems, and 22.71% had functional problems, this was in accordance to the study done by Grippaudo et al. in which maximum i.e. 38.5% had dental problems¹⁴. Also the study done by Fatemeh Jahanimoghadam in which the most prevalent malocclusion was related to the dental cause¹⁵. There was a significant correlation between age and gender in most of the children of Kashmiri population (P = 0.05)

CONCLUSION

It is important to identify the risk of developing a malocclusion with the aim to determine if the patient needs an interceptive orthodontic treatment at early age or if it is possible or necessary to wait till the time when maxillofacial growth and the dentition are fully erupted and completely developed. Moreover The Baby-ROMA index assesses the risk that a malocclusion observed in very young children may worsen over time and affect oral health and function in later stages of life.

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