ORIGINAL ARTICLE

PREVALENCE OF ANTERIOR OPEN BITE IN SAMPLE OF MULTAN POPULATION

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ABSTRACT

Anterior open bite is defined as the absence of vertical overlap between the upper and the lower incisors when posterior teeth are in centric occlusion. The causes of anterior open bite depend upon multiple factors and can be attributed to environmental and genetic traits, reflected in pathologic (muscular dystrophy and cleft lip / palate) and developmental factors. The aim of this study was to determine the prevalence of anterior open bite in the permanent dentition in a sample of patients visiting Out Patient Department(OPD) of the Nishtar Institute of Dentistry, Multan. Research data was acquired by clinical examination of 249 patients (124 males and 125 females) having ages between 14-33 years with a mean age of 22.7±4.5 years. Detailed history and clinical examination measurements were made for anterior open bite. An edge-to-edge incisor relationship was recorded if the maxillary and mandibular incisors occluded on their incisal edges. Statistical Package for Social Sciences (SPSS) program (version 20.0) was used for descriptive analysis of data. Overall the prevalence of Anterior open bite was present in 19(7.6%) patients while in females (8%) was found to be slightly higher than males(7.2%) having a ratio of 1.138:1. Out of these, 9(3.6%) patients had dental open bite while 10(4.0%) patients had skeletal open bite. Less severe open bite (<1mm) was more common, as observed in 16(6.4%) patients, than severe (>1mm) as observed in 3(1.2%) patients.

Keywords: *Anterior open bite, Occlusion, Orthodontics*

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INTRODUCTION

Anterior open bite is a major occlusal disorder in the vertical relationship[1], defined by several authors as the absence of vertical overlap between the upper and the lower incisors when the posterior teeth are in centric occlusion.[2]

Anterior open bite has been classified in several ways in literature.[3,10] Moyer's classification is the most commonly used, depends on the severity of the anterior open bite which is either simple dental origin or complex skeletal origin and it is usually associated with Class I, II or III skeletal discrepancies.[10] According to McNamara, open bite is either dental or skeletal; the dental open bite is localized to the anterior teeth and the surrounding soft and hard tissues without presenting any skeletal defect in cephalometric radiograph. While, skeletal open bite shows vertical disharmony.[3] Aetiology classifications are inconstant and author dependent, but mostly differentiated into genetic and environmental causes.[34] Non-nutritive sucking habit and type of feeding are important contributing factors in the development of anterior open-bite in deciduous dentition.[11]

Studies have shown that the aesthetic appearance of open bite individuals are unpleasant and has a direct impact on their social life and communication skills.[12] Enhancement in aesthetic satisfaction by treating such cases will progress oral health– related quality of life and establishing a better oral hygiene, mainly by diminishing psychological discomfort and disability.[16]

Numbers of epidemiological studies regarding the prevalence of anterior open bite have given a vast amount of information on it's occurrences at different dental stages, its prevalence and distribution in various part of the world. Camilleri and Mulligan reported only 1% of open bite among Malta Population.[17] In contrast Tschill reported a prevalence of 37.6% among Caucasian.[18] Other studies in different countries show 8% in Kenya,[19] 6.6% in Saudi Arabian adolescents,[20] 9% in Columbia,[21] 4% in Rawalpindi, Pakistan,[22] 4.6% in Peshawar, Pakistan,[23] 4.5% in Bangladesh,[24] and

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4.1% in Yemini adults.[10] Chronologically, with dental development of children, the incidence of anterior open bite decreases, as it tends to self-correct during the mixed dentition phase.

Treatment of anterior open bite malocclusion is complex and challenging because of the potential for relapse and the possibility of compromised esthetics. Technological advances (plates and screws) have expanded the sphere of success, but long-term studies and controlled clinical trials are needed.[26-30] Limitations of treatment include the persistence of known etiologic factors and the initial growth pattern, the difficulty to accurately predict the individual course of development or the response to treatment, lack of knowledge of biological mechanisms behind open bite development, periodontal and mechanical considerations, and the increased risk of iatrogenic effects. Treatment ranges from correction of etiologic habits to control of hyper divergent growth and dental alveolar vertical hyperplasia. Orthognathic surgery is the last and only resort for complicated cases.[31]

Recently, the demand for orthodontic treatment has increased in many countries. The number of patients seeking orthodontic treatment has increased markedly from one year to another in Pakistan. Therefore, Knowledge about the prevalence of anterior open bite is essential in assessing resources that are required, and for setting up of efficient orthodontic services in the society. Therefore, the present study was designed to determine the prevalence of anterior open bite in patients visiting the Nishtar institute of dentistry.

METHODOLOGY

The present cross-sectional study was done in the Out Patient Department(OPD) of Nishtar Institute of Dentistry, Multan. Research data was acquired by clinical examination of 249 patients (124 males and 125 females) during the period from August 2018 to January 2019 by convenient sampling technique. The chronological age range of the sample was 14-33 years. Patients having no previous orthodontic and orthognathic treatment and having a full complement of dentition were included in the study while those who were not willing to participate in the study and having some skeletal deformity or abnormality were excluded from the study. The purpose, procedure, and benefits of the study were explained to patients. An informed consent and their willingness for participation in the study were ensured. They were assured of maintaining confidentiality of their personal and other data collected from them.

Detailed history and clinical examination measurements were made for anterior open bite in millimeters (mm) with the help of divider tool and scale having a least count of 1.0 mm. An edge-to-edge incisor relationship was recorded if the maxillary and mandibular incisors occluded on their incisal edges. A person was labeled as having an anterior open bite if there was a lack of vertical overlap of upper incisors on the labial surface of lower incisors in centric occlusion. All the clinical examinations were performed by the main researcher.

Statistical Package for Social Sciences (SPSS) program (version 20.0) was used for descriptive analysis of data. Frequencies and percentages were tabulated for each variable.

RESULTS

In the current study 249 patients were clinically examined with a mean age of 22.72±4.55 years. Table 1 shows the age distribution of the sample.

Table 2 shows that Anterior open bite was present in 19(7.6%) patients. Out of these, 9(3.6%) patients had dental open bite while 10(4.0%) patients had skeletal open bite.

Table 3 shows that less severe open bite (<1mm) was more common, as observed in 16(6.4%) patients, than severe (>1mm) as observed in 3(1.2%) patients. Also the prevalence of open bite in females (8%) was found to be slightly higher than males(7.2%) having a ratio of 1.138:1

DISCUSSION

A descriptive cross sectional study was conducted which aimed to determine the prevalence of anterior open bite among a sample of patients visiting Out Patient Department(OPD) of the Nishtar Institute of Dentistry, Multan. Sample data from 249 patients (124 males and 125 females) was collected having ages ranging between 14-33 years.

Different results have been achieved by several

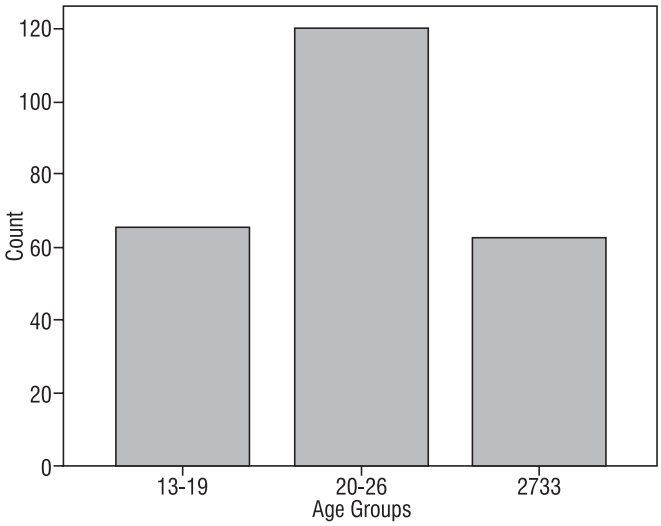

Fig 1: Age Groups

TABLE 1: AGE DISTRIBUTION OF SAMPLE

Age range	Number	Percentage
14-19	66	26.5
20-26	120	48.2
27-33	63	25.3
Total	249	100

authors showing the wide range of variety in the prevalence of anterior open bite among different population, ages and ethnic groups.[17-24] Our results show that the overall prevalence of anterior open bite is 7.6%. The results show that less severe open bite is more common than severe open bite as found by Chughtai et al.[35] A higher prevalence of anterior open bite was found than the findings of Marwat et al. who found it to be 4% in

TABLE 2: OPEN BITE TYPE

	Frequency	Percentage	Valid Percentage	Accumulative Percentage
Dental	9	3.6	3.6	3.6
Skeletal	10	4.0	4.0	7.6
Nil	230	92.4	92.4	100.0
Total	249	100.0	100.0	

TABLE 3: SEVERITY OF OPEN BITE

			Gender		Total
			F	M	
Open Bite	0.5 mm	Count	1	0	1
		% within Gender	0.8%	0.0%	0.4%
	0mm	Count	3	5	8
		% within Gender	2.4%	4.0%	3.2%
	1mm	Count	3	4	7
		% within Gender	2.4%	3.2%	2.8%
	2mm	Count	1	0	1
		% within Gender	0.8%	0.0%	0.4%
	5mm	Count	2	0	2
		% within Gender	1.6%	0.0%	0.8%
	No OP	Count	115	115	230
		% within Gender	92.0%	92.7%	92.4%
Total		Count	125	124	249
		% within Gender	100.0%	100.0%	100.0%

Rawalpindi.[22] This result is also higher than the findings by Ali Khalid et al. who found the prevalence of open bite to be 4.6% in Peshawar.[23] Results are also higher than 1% among Malta Population,[17] 4.5% In Bangladesh,[24] and 4.1% in Yemini adult.[10] This shows that there is an immense need to spread awareness among masses of the South Punjab region regarding open bite, the etiological habits leading to it and its direct impact on their social life and communication skills. Patients with severe facial deformity show a significantly higher prevalence of emotional instability, introversion, anxiety, psychological distress, depression, adverse psychological reactions, and unsociability.[13] In addition, the stomatognathic function may be affected such as speech impediments and difficulty incising food.[14,15] Anterior open bite was associated with a negative impact on the quality of life among preschool children and their families.[33] Although, the results are comparable to the findings of Ng'ang'a et al. who reported 8% open bite prevalence in Kenya,[19] Al Emran et al. who found it to be 6.6% in the Saudi Arabian adolescents,[20] and Thailander et al. who reported 9% in Columbia.[21]

Also the prevalence of open bite in females(8%) was found to be slightly higher than males(7.2%) having a ratio of 1.138:1. The results are consistent with study by Ahmed et al. who found that anterior open bite was more common in females than males.[32] While the results are in conflict with the findings of Abuaffan et al. who reported that anterior open bite is more common in males (11.77%) than females (5.23%) approximately the ratio was 2:1.[25] Results also show that skeletal open

bite is more common which is in line with the findings of Hayat et al.[36] However, the trend is same, there is quite an evident difference between percentages. This difference can be attributed to smaller sample size.

However, it very hard to compare between the current results and other findings due to small sample size, varying methods used for conducting these studies and other variables such as differences between the age group of each population sample.

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1 Rabia Anwar:	Topic selection, Data collection, Data interpretation, Statistical analysis, Manuscript writing.
2 Zubair Hassan Awaisi:	Supervision of the study, Critical review of manuscript.
3 Hira Khalid:	Data collection, Data compilation.