

PREVALENCE OF ANTERIOR OPEN BITE IN SAMPLE OF PESHAWAR POPULATION — A STUDY

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ABSTRACT

Anterior open bite is said to exist when there is an actual vertical gap between the upper and lower incisors with the teeth in centric occlusion. The etiology of anterior open bite is multifactorial and can be attributed to genetic and environmental traits, reflected in pathologic (muscular dystrophy and cleft lip/palate) and developmental factors.

The objective of this study was to determine the prevalence of anterior open bite in sample of Peshawar population.

Three hundred patients reporting to the department of orthodontic for treatment were included in the study. After taking detailed history and clinical examination an impression of each patient was recorded in alginate impression material and models were poured in dental stone. Measurements were done on dental casts for anterior open bite in millimeters (mm) with vernier caliper having least count of 0.01 mm. SPSS (16.0) was used to analyze the data statistically. Frequencies and percentages were tabulated for each variable.

The chronological age range of the sample was 15-30 years with a mean age of 16.2±5.2 years. Female are more in number i.e. 56.6%. Anterior open bite was present in 14(4.6%) patient. Less severe open bite (<1mm) was more common {9(3%)} than severe (>1mm-2mm) one {5(1.6%)}.

Key Words: Anterior open bite, centric occlusion, orthodontic.

INTRODUCTION

Anterior open bite is said to exist when there is an actual vertical gap between the upper and lower incisors with the teeth in centric occlusion.¹ Anterior open bite as defined by Subtelny and Sakuda² is the deviation in the vertical relationship of the maxillary and mandibular dental arches with a definite lack of contact in the vertical direction between opposing segments of teeth. It was also defined by McSherry³ as a vertical occlusal anomaly with no vertical overlap of the upper and lower incisors.⁴ Anterior open bite is also described as a condition in which the upper incisor teeth crowns fail to overlap the incisal third of the lower incisor crowns when the mandible is brought into

full occlusion. This can be also described as a vertical discrepancy.⁵

The incidence of anterior open bite varies among races and with dental age. It is more common in Americans (6.6%) than in Caucasians (2.9%) or Hispanics (2.1%).⁶ Other studies in different countries show 8% in Kenya,⁷ 6.6% in Saudi Arabian adolescents,⁸ 9% in Columbia, 94% in Pakistan.¹⁰ In Bangladesh a study report states 1% incidence of open bite malocclusion in 1994 and another study reports 4.5% in 2007.¹¹ Chronologically, as children develop dentally, the incidence of anterior open bite decreases, as it tends to self-correct during the mixed dentition phase.

The etiology of anterior open bites is multifactorial and can be attributed to genetic and environmental traits, reflected in pathologic¹² (muscular dystrophy and cleft lip/palate) and developmental factors.¹³ The latter comprises the following broad categories: habits (digit sucking); respiratory alterations (nasal airway obstruction, including sleep apnea¹⁵ — the extreme condition is the long face syndrome or adenoid facies); abnormal size and function of the tongue (including tongue thrusting, which is also classified as a habit); and a vertical growth pattern. While habits are thought to be mostly acquired, factors related to the tongue and skeletal problems can be of innate or environmental origin.

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Treatment of anterior open bite malocclusion is complex and challenging because of the potential for relapse and the possibility of compromised esthetics.¹⁵ Treatment ranges from correction of etiologic habits to control of hyperdivergent growth and dentoalveolar vertical hyperplasia. Technological advances (plates and screws) have expanded the sphere of success, but long-term studies and controlled clinical trials are needed.¹⁶ Limitations of treatment include the persistence of known etiologic factors and 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. Judgment of the individual conditions defining the malocclusion and non-heroic mechanics should guide the clinician in the attainment of stable and esthetic results.¹⁷

The objective of this study was to determine the prevalence of anterior open bite in sample of Peshawar population.

METHODOLOGY

This descriptive cross-sectional study was done in Department of Orthodontics, Khyber College of Dentistry, Peshawar. A total of 300 patients (both males and females) were included in the study from May 2014 November 2014 by convenient sampling technique. The purpose, procedures, risk and benefits of the study were explained to patients. An informed consent and their willingness and participation in the study were ensured. They were assured of maintaining confidentiality of their personal and other data collected from them. Sampling was done according to criteria given in Table 1.

After taking detailed history and clinical examination an impression of each patient was recorded in alginate impression material and model was poured in dental stone. Twenty sets of study casts were randomly selected from the main sample and were reassessed 7 days after the initial assessment for Intra and Inter-examiner reliability.

Measurements were done on dental cast for anterior open bite in millimeters (mm) with vernier caliper having least count of 0.01 mm. 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.¹⁰ SPSS (16.0) was used to analyze the data statistically. Frequencies and percentages were tabulated for each variable.

RESULTS

The chronological age range of the sample was 15-30 years with a mean age of 16.2 ± 5.2 years. Age distribution is given in Table 2. Female are more in number i.e. 56.6% (Table 3). Anterior open bite was present in 14(4.6%) patient. Less severe open bite (<1mm) was more common {9(3%)} than severe (>1mm-2mm) one {5(1.6%)}. (Table4)

DISCUSSION

Sample of 300 sets of study casts for this study were selected from the pool of patients reporting to the Orthodontics Department. Only 14(4.6%) had anterior Openbite. The prevalence of 4.6% of anterior open bite is similar to the findings of Hameedullah et al.¹⁰ It is nearest to Abu Alhaija et al¹⁸ study in north Jordanian school which reported prevalence of 3.9% in patients from 13-15 years. While the results was more than Abdul Jabbar¹⁹ 13 study in Thiqr Governorate who reported that prevalence of anterior open bite is (3.5%). Al-Emran²⁰ who found 6.6% prevalence of anterior

TABLE 1: INCLUSION AND EXCLUSION CRITERIA

Inclusion criteria	Exclusion criteria
• Undamaged study casts	• Previous orthodontic treatment
• Permanent dentition	• History of serial extraction
• Between 15 – 30 years of age.	• History of extraction of any permanent tooth
	• Cleft lip and palate patients
	• Craniofacial syndrome
	• Trauma to anterior region of jaws

TABLE 2: AGE DISTRIBUTION OF THE SAMPLE

Age (years)	N	%
15-20	155	51.66
21-25	100	33.33
26-30	45	15.01
Total	300	100

TABLE 3: GENDER DISTRIBUTION OF THE SAMPLE

Gender	Frequency	Percentage
Males	130	43.33
Females	170	56.66
Total	300	100.00

TABLE 4: GENDER DISTRIBUTION OF ANTERIOR OPEN BITE

Gender	Anterior Openbite		Total
	<1mm	>1mm to 2mm	
Males	4 (1.33%)	2 (0.66%)	6 (2%)
Female	5 (1.66%)	3 (1%)	8 (2.66%)
Total	9 (3%)	5 (1.66%)	14 (4.6%)

open bite in Saudi Arabian adolescents and Naganga⁷ reported 8% in Kenya.

More females (56%) in the current study denote greater awareness than males. Greater number of females reporting for orthodontics treatment has been reported in other studies as well.^{10,21,22} Al-Tae²³ reported 60% , Naeem et al²¹ 69% females in their studies.

Open bite can be skeletal or dental in origin. Skeletal open bite can be diagnosed clinically and verified cephalometrically. A patients having skeletal open bite the mandibular plane angle(SN-Mandibular) greater than 370. In many patients, in spite of having large mandibular plane the anterior teeth supra-erupt and established overbite.¹³ The aim of the current study was to know about just the prevalence of anterior Openbite, so no demarcation was done skeletal and dental Openbite.

Anterior open bite can be physiologic when the anterior teeth are not fully erupted. Such Openbite are closed by itself and need no treatment. Other less common causes are which not considered in prevalence of anterior Openbite are trauma, craniofacial anomalies and cleft of lip and palate.²⁴ In the current study only patient having age above 15 years were included to allow fully eruption of incisors and canines. Other above mentioned causes were placed in exclusion criteria for controlling confounding factors.

In contrary to the current results some studies shows higher prevalence of anterior openbite. Otuyemi et al²⁵ carried out a study in rural and suburban Nigerian school children. They reported 7 and 7.3% anterior open bite in preadolescents respectively. In another study carried out by Peter M Nganga et al⁷ in Kenyan preadolescent sample found 8% of anterior open bite. Eva Tausche and Winfried Harzer²⁶ in his study found 17.7% of anterior open bite in preadolescent sample in Germany. Likewise in Pelotas, Southern Brazil the frequency of anterior open bite in a sample of 359 children was found 46.2%.²⁷ This is because of differences in sample size, population and the methodology being used.

Many limitations are associated with current study. The sample is small and the study had been conducted in hospital so not showing the population prevalence. Many etiologies can be detected in Openbite patients like abnormal habits, mouth breathing, airways problems, and skeletal patterns which give more information about anterior open bite; which not studied in this study.

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