Prevalence of Anterior Open Bite among Yemeni Adults

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Introduction

Anterior open bite is a major occlusal disorder in the vertical relationship [1] had been 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 [2,3].

The etiology of anterior open bite is multi-factorial involving genetic, as well as environmental factors. The genetic factors had been studied by many authors and association had been reported [4,5]. This association is caused by a genetically determined anomaly of craniofacial development, rather than local factors influencing alveolar growth. Environmental factors such as tongue thrust, nasal obstruction, enlarged lymphatic tissue, hypertrophic tonsils, aberrant muscle function, supernumerary teeth, abnormal tongue posture, mouth breathing, lip, thumb, pipe, pencil, or finger-biting and sucking habits [4-9].

Several classifications of anterior open bite had been stated in the 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’s 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].

The parameters of the dental open bite are un erupted anterior teeth and proclaimed incisors while skeletal open bite is characterized by one or more clinical features such as an increase in the anterior facial height, chronic gum infections and periodontal enlargement, posterior cross bite, short ramus, steep mandibular plane angle, palatal plane tipped upward anteriorly, increase in the angles between the mandibular plane and the cranial base (backward rotation of the mandible), angle between Y axis and the cranial base [11-13].

The aesthetic appearance of open bite individuals are unpleasant psychological impact in the social life and communication [14]. Patients with severe facial deformity show a significantly higher prevalence of emotional instability, introversion, anxiety, psychological distress, depression, adverse psychological reactions, and unsociability [15]. In addition, the stomatognathic function may be affected such as speech impediments and difficulty incising food [16,17]. Enhancement in esthetic 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 [18].

Numbers of epidemiological studies regarding the prevalence of anterior open bite have given a vast amount of information on it is occurrences at a different dental stages, its prevalence and distribution in various part of the world. Different results have been achieved by several authors showing the wide range of variety in the prevalence of anterior open bite among different population, ages and ethnic groups [19-25].

Camilleri and Mulligan reported only 1% of open bite among Malta Population [19]. In contrast Tschill reported a prevalence of 37.6% among Caucasian [20].

In recent decades, the demand for orthodontic treatment has...
increased in many countries. About 10 years ago a similar situation started to develop in Yemen i.e., the number of patients seeking orthodontic treatment in has increased markedly from one year to another. 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 had been designed to determine the prevalence of anterior open bite among adults population.

Materials and Methods

The present study had been carried out for all dental students (no students refused to participate in the study) at the faculties of dentistry in; Sana’a, Al-Salam and the Science and Technology Universities, in Sana’a, for practical reason in assessing the dental clinics, and to ensure consistency of the study sample since the enrolled students were from the majority of the cities in Yemen. All the students enrolled in the study were of Yemeni nationality, aged 18-25 years old, and no previous orthodontic treatment or in active orthodontic treatment and students who had no syndromes or any craniofacial anomalies. The students were informed about the aims of the research and the steps required for collecting the information at the lecture room. Clinical examination was carried out for 1585 dental students (1009 female and 576 male) in the dental clinic at each university. The overbite was recorded for each student according to the degree of vertical overlap of the lower incisors by the upper incisors in centric occlusion by metallic rulers directly in the oral cavity. The overbite was considered normal if the maxillary central incisors overlapped the incisal one-third of the mandibular central incisors. Excessive relation if the overlap exceeded the middle third of the lower central incisors crown and reduced when it was less than incisal one third of the crown. An edge-to-edge incisor relationship was recorded if the maxillary and mandibular incisors occluded on their incisal edges. Anterior open bite was diagnosed when there was a vertical gap between the maxillary and mandibular incisors. Excessive relation if the overlap exceeded the incisal one-third of the mandibular central incisors. Excessive relation if the overlap exceeded the middle third of the lower incisors crown and reduced when it was less than the incisal one-third of the crown. An edge-to-edge incisor relationship was recorded if the maxillary and mandibular incisors occluded on their incisal edges. Anterior open bite was diagnosed when there was a vertical gap between the maxillary and mandibular incisor edges with the teeth in centric occlusion. All the examination performed by the main researcher. The study protocol was ethically approved by the university research committees.

Data processing and analysis

Data was collected, summarized, coded and entered to the Statistical Package for Social Sciences (SPSS) program (version 17) into the computer. A descriptive statistical analysis was used (demographic statistic). The results presented in tables.

Results

A total of 1585 students 18-25 years old were involved in this study. The majority were female 1009, while 576 were male. Table 1, shows the distribution of the vertical relationship among the whole sample, male and female. It is clear that normal vertical relationship was the most frequent occurrence followed by increase over bite and the least one are anterior open bite among both gender. However, it observed 4 times in male 7.99% than female 1.88% (Table 2).

Discussion

A descriptive cross-section study was conducted to determine the prevalence of anterior open bite among a sample of Yamani university student’s 18-25 years old at Sana’a city age. The results showed that the overall prevalence of anterior open bite was 4.1% and it 4 times more common among males than females a ratio of 4:1.

Camilleri and Mulligan reported less percentage 1% of open bite among Malta school children [19] than the present finding. However, current percentage of the anterior open bite was in agreement with the finding among Pakistani, Lithuania and Lebanon, population when [21-23]. Whereas, slightly less percentage were recorded among; Kuwaiti, Iranian and in Indian studied sample [24-26].

In contrast extremely high percentage 37.6% of open bite had been recorded by Tschill among Caucasian in the deciduous dentition [20]. Moreover, previous results in Colombia, Nigeria, and Nepal revealed a little more percentage than the current study 9%, 7% and 5% respectively [27-29].

Worldwide open bite prevalence in deciduous and early mixed dentition showed increase percentage when evaluated with permanent dentition [22,27,29-32]. This is wide variation in the prevalence of anterior open bite, can be partially attributed to the study sample size, age of the individual; younger age had a high percentage mainly due to habits which diminish by age, environmental factors as well as ethnic back ground.

Concerning gender, open bite were reported four time more in male than female in the present study ratio 4:1 which in contrast with previous studies in Lebanon, India and Pakistan in which open bite reported more among females [21,23,26].

However, it very hard to compare between the current results and other finding worldwide in part due to varying methods and indices used for performing these studies and other variables such as differences between the age group and sample sizes of each population. There is a reality that the Yamani parents are more worried about the facade of their daughters, and all effort can be spend to prevent and intercept the foretell abnormalities in the developing dentition at early age so as to comprise attractive smile in the prospect life.

Conclusion

The prevalence of anterior open bite in Yemeni adults is 4.1%. It is 4 times more in male than female (7.99 in male and 1.88 in female). The normal overbite account 41.2%, 26.75% increased overbite, reduced 22.15%, and edge to edge in 5.8%.

Limitations

The study excluded the risk factors of open bite due to the fact that, the majority of the students with open bite had difficulties to memorize the exact causes or may be ashamed to tell truth. However, only two students stated “genetic factors”.

Recommendations

A larger sample size is recommended to be studied in the future.
with different age groups and in different areas in Yemen to determine the overall prevalence of anterior open bite and its etiological factors so as to raise the awareness upon bad habits and their side effects on the permanent dentition in order to avoid further complication at adults hood.

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