

Evaluation of Malocclusion Pattern among Orthodontic Patients in Basrah City, Iraq

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Abstract

Background: Malocclusion is defined as an irregularity or malalignment of the teeth or a malrelationship of the dental arches beyond the range of what is considered normal. Although the malocclusion is not considered a life-threatening condition, most of the focus in recent year was laid upon the development of orofacial disorders and treatment of resulting malocclusions and the seeking for orthodontic treatment is increasing in most countries to enhance the facial beauty and improve the facial appearance. The aim of current study was to evaluate the pattern of malocclusion among orthodontic patients attending the orthodontic clinic at College of Dentistry in Basra city, Iraq. **Method:** This study was based on clinical examination of 100 patients (46 males and 54 females) attending the orthodontic clinic with age range (4-30) years. Dental examination was done by an orthodontist. The measured parameters were recorded and analyzed using computer-based program (SPSS software, version 23). **Results:** According to the statistical analysis, class I malocclusion was the most prevalent type (55%) followed by class II (39%) and class III malocclusion (6%). Other occlusal traits included increased overjet (46%), normal overbite (55%), crossbite (23%) and scissor bite (1%), crowding and spacing (12% for each one). Chi-squared test showed a significant association between malocclusion and age, and a non-significant association between malocclusion and gender and decayed teeth. **Conclusion:** Class I malocclusion was the most prevalent type of malocclusion, while class III was the least prevalent type. There is significant association between the malocclusion and age.

Keywords: Malocclusion, overjet, overbite, crossbite, scissor bite.

Introduction

Malocclusion is defined as an irregularity or malalignment of the teeth or a malrelationship of the dental arches beyond the range of what is considered as normal⁽¹⁾. Although the malocclusion is not considered a life-threatening condition⁽²⁾, most of the focus in recent years was laid upon the development of orofacial disorders and the treatment of resulting malocclusions and the seeking for orthodontic treatment is increasing in most countries to enhance the facial beauty and improve the facial appearance⁽³⁻⁷⁾.

Epidemiological data on the prevalence of malocclusion are important determinant in planning

the appropriate levels of orthodontic treatment⁽⁸⁾. Therefore, many studies involved investigating the prevalence of malocclusion in various populations. A review of previous studies showed that the prevalence of malocclusions ranged from 11 to 93% and varied for different ethnic groups, different age groups and also different methods of investigation⁽⁹⁻¹²⁾. Additionally, variations in the genetic and environmental influences may also result in variations in different malocclusion patterns in different populations.

Malocclusion usually affects the health of oral tissues and also may lead to psychological and social problems^(13, 14). Measuring the severity of malocclusion is important as it can be considered an epidemiological tool for preventive procedures and also evaluating the occlusal condition of subjects in the community and establishing the treatment priority in a given region^(3, 15).

As there is a lack of studies on malocclusions in Basrah city, Iraq, this study considered to be the first

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one that provides statistical data regarding malocclusion pattern in this geographical region. This study was aimed to evaluate the most prevalent pattern of malocclusion among orthodontic patients in Basrah city, Iraq and to find if there are associations between the measured parameters. since the Angel's classification is the most commonly examined topic in many studies⁽¹⁶⁾.

Material and Method

The sample of this study was collected from 100 orthodontic patients (46 males and 54 females) who came to the orthodontic clinic at College of Dentistry/ University of Basrah, seeking for orthodontic treatment. Their age ranged from 4-30 years. Patients were examined by one examiner (orthodontist) and those who were undergoing or had undergone orthodontic treatment or have uncompleted records been excluded from the study. Additionally, patients with skeletal or soft tissue deformity were also excluded from the study. Each patient was seated on a dental chair and subjected to clinical examination which included the following parameters:

- Class of malocclusion: based on Angle's classification that based on the inter-maxillary relationship of the first permanent molars⁽¹⁷⁾. In the absence of the first permanent molar, the inter-maxillary canine relationship was used. Asymmetric malocclusions were classified based on the predominant Class or on the canine relationship⁽¹⁸⁾.

- Overjet: the horizontal distance between the incisal edge of the upper central incisor and the labial surface of the lower central incisor, it is measured in millimeters⁽⁵⁾. Normal overjet was recorded when the horizontal distance is between 2-4mm, less than 0mm was considered as a reversed overjet and more than 4mm was considered as increase in overjet.

- Overbite: the vertical distance from the edge of the upper central incisor to the lower central incisor edge, it was measured in millimeters⁽¹⁹⁾. Overbite of 1-3mm was recorded as normal overbite, more than 3mm was considered as deep bite and less than 0mm was considered as open bite.

- Crossbite and scissor bite: crossbite and scissor bite were evaluated in transversal relationship of the upper and lower anterior teeth, premolars and molar teeth and registered as anterior crossbite, posterior

crossbite and scissor bite (present, absent)^(11,5).

- Number of decayed teeth: the decayed primary and/ or permanent teeth were recorded according to the total number of the involved teeth.

- Spacing and crowding: both of spacing and crowding were measured in millimeters, excess space in the upper and lower dental arches that exceeding 2mm was recorded as spacing, crowding of upper and lower arches of more than 2mm was considered as crowding⁽⁸⁾.

Statistical Analysis

Data of this study were entered into Microsoft Excel sheet (2010) and then analyzed using computer program (Statistical Package for Social Sciences; SPSS version 23). Descriptive statistics were done to calculate the frequency and percentage of distribution of study variables among study participants. The Chi-squared test was used to test the association between study variables.

Results and Discussion

“One of the basic rules of the universe is that nothing is perfect. Perfection simply doesn't exist.... Without imperfection.”

-Stephen Hawking-

The present study was carried out to determine the prevalence of different classes of malocclusion that will help provide valuable information in planning the orthodontic treatment and the type of orthodontic services that could be provided for orthodontic patients who come to the orthodontic clinic at College of Dentistry, Basrah City, Iraq. However, many studies had been published regarding the subject of malocclusion and described the prevalence and types of malocclusion. Some variability between their findings were existed due to the different racial and ethnic population origin, variations in methods and indices that were used to assess and record the occlusal relationships, specific objectives, examiner subjectivity, age differences of the study populations and variable sample sizes^(5, 16, 20).

Out of 100 orthodontic patients included in current study, 53(53.5%) of them were females and 46(46.5%) were males, since the females were more concerned about their aesthetic appearance than males. Additionally, most of the examined patients (68%) were

10-19 years old, whereas 25% of them were less than 10 years old since this age usually requires parents observation and only 7% of the examined patients were between (20-30) years of age (Figure 1). This could be due to that adults are more influenced by the functional rather than the aesthetic aspect of their dentition more younger people who are highly concerned about their appearance⁽²¹⁾.

Although the Angel's classification was considered to be limited in that it does not assess the vertical and transverse abnormalities, it is a globally accepted system as the most reliable and repeatable classification and also minimizes examiner's subjectivity⁽¹⁶⁾. According to Angle's classification of malocclusion, this study reported that class I malocclusion was the most prevalent type of malocclusion with a percentage of 55% followed by 39% for class II malocclusion, whereas the least prevalent one was Class III malocclusion at 6% (Figure (2) below). These findings were consistent with findings reported by^(22, 23) and differed from those reported by⁽¹⁸⁾ where class II malocclusion was the least prevalent type. The variation in these results could be due to differences in sample size and/ or methods of registration.

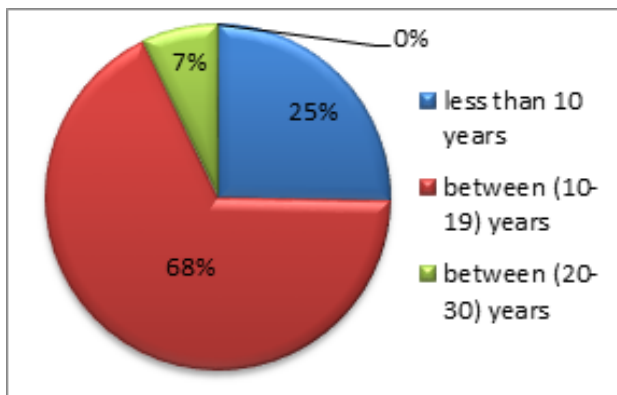


Figure 1 Distribution of study participants **Figure 2** Prevalence of malocclusion classes, according to their age.

The major occlusal finding in the present study was normal overjet (52%) of all patients examined. This percentage was lower than the 53.2%, 67.7% and 87.1% reported^(24, 25, 26) and higher than the (20.11%) reported by⁽⁸⁾. The prevalence of increased overjet (46%) was found to be higher than negative overjet (3%) in the examined patients; this was a reflection of the higher prevalence of class II malocclusion among the study subjects.

Normal overbite was found to be the most common pattern (55%) of the overbite. Increased overbite (deep bite) was recorded in 36% of patients, while the

prevalence of the open bite was only 9%. These findings were consistent with^(27, 28). In addition, in the present study, the scissor bite was rare (observed in only 1% of the examined patients) and less frequently observed than the crossbite. The low rate of scissor bite in this study was close to the finding reported by^(27, 29).

Crossbite was present in 23% of total patients; 17% of them had anterior crossbite and 6% had posterior crossbite which were lower than the (14.1%) documented by⁽¹⁴⁾. This increase in the rate of the crossbite (anterior and posterior) could be explained by that the examined patients were already come to the orthodontic clinic seeking for orthodontic treatment⁽¹¹⁾.

Moreover, 12% of the patients showed crowding and spacing in their dentition. This result considerably differed from that reported by^(5, 27) who found that crowding was the most frequent finding of all anomalies. Regarding the spacing, data from current study were consistent with those of⁽³⁰⁾, but disagreed with those of⁽⁵⁾. These variations could be due to the differences in sampling.

In terms of association between the different classes of malocclusion and gender, age as well as number of decayed teeth (Figure 3 and Table 1), Chi-squared test results showed a non-significant association between the different classes of malocclusion and gender ($P > 0.05$). On the other hand, Table 2 showed a significant association between the different classes of malocclusion and age of the examined patients.

These findings were in agreement with^(20, 27). The latter could be explained by that most of malocclusion problems arise with the exfoliation of primary teeth and eruption of permanent teeth (mixed dentition period) as the establishment of malocclusion is a process that progresses with age⁽³¹⁾.

Table (3) showed a non- significant association between the different classes of malocclusion and the number of decayed teeth. This result was in agreement with⁽³²⁾. Although some epidemiological studies have implicated malocclusion as a risk factor predisposing to dental caries, some authors concluded that there is no relation between malocclusion and dental caries under the control of fluoride mouth rinsing programs⁽³³⁾.

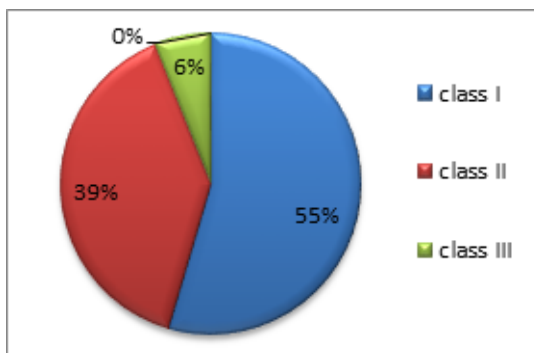


Figure 3: Distribution of Angle's classification according to gender.

Table 1: Association of malocclusion with gender

Angle's classification	Males No.(%)	Females No.(%)	Pearson Chi-Squared	P-value
Class I	27(27.3)	27(27.3)	2.260	0.323 (NS)
Class II	15(15.2)	24(24.2)		
Class III	4(4.0)	2(2.0)		
Total	46(46.5)	53(53.5)		

NS: Non-significant. df= 2.

Table 2: Association of malocclusion with age

Age group/yr	Class I No.(%)	Class II No.(%)	Class III No.(%)	Pearson Chi-Squared	P-value
<10	15(15.2)	7(7.1)	3(3.0)	10.282	0.036*
10-19	32(32.3)	32(32.3)	3(3.0)		
20-30	7(7.1)	0(0.0)	0(0.0)		
Total	54(54.5)	39(39.4)	6(6.1)		

*: Statistically significant at $P < 0.05$. df= 4.

Table 3: Association of malocclusion with number of decayed teeth

Angle's classification	Decayed teeth	Pearson Chi-Squared	P-value
Class I	54.5%	6.878	0.142 (NS)
Class II	39.4%		
Class III	6.1%		
Total	100.0%		

NS: Non-significant. df= 4.

Conclusion

Class I malocclusion is the most prevalent type, while class III malocclusion is the least prevalent one. In addition, most of patients who seek for orthodontic treatment were females of the age group (10-19) years. Also, scissor bite is a rare condition as compared to crossbite (anterior and posterior) and the prevalence of increased overjet and deep bite was found to be higher than negative overjet and open bite, respectively. Malocclusion significantly associated with age, however, it did not show significant association with gender or decayed teeth.

Ethical Clearance: The research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq.

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