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THE PATTERN OF MALOCCLUSION IN PATIENTS SEEKING ORTHODONTIC TREATMENT

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Abstract:
Introduction: *Occlusal features of orthodontic patients have been studied. However, there is very little data available on malocclusion in the Pakistan.*
Aim: *To evaluate the pattern of malocclusion in orthodontic patients and to estimate the age of class II malocclusion presentation among patients.*
Materials and Methods: *Data were collected from 150 pre-treatment models and lateral cephalograms from Orthodontic department of Sardar Begum Dental College and Hospital, Peshawar for one-year duration from March 2019 to March 2020. The Angle classification system was used to determine malocclusion, and the ANB angle was used to determine malocclusion. Chi-square test was used to check the relationship between malocclusion and teeth.*
Result: *Class I malocclusion was found in 95 (63.33%), class II division 1 in 41 (27.33%), class II div 2 in 13 (8.66%), and class III in 1 (0. 66%). Among all subjects; 119 (79.33%) had 1st class skeletal, 24 (16%) 2nd class, and 7 (4.66%) 3rd class. A significant relationship was found between malocclusion of teeth and bones. The mean age of reporting malocclusion in class II, class 1 was 16.5 years, and malocclusion in class II, division 2 was 19 years.*
Conclusion: *Class I angle is the most common malocclusion, followed by Class II and III among orthodontic patients. The respondents lack awareness of the age factor in orthodontic treatment.*
Keywords: *angle classification, malocclusion*

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INTRODUCTION:

Orthodontic and maxillofacial orthopedic problems are a major health concern in the community. Growing public awareness and the availability of specialized orthodontic services have led to an increase in the number of orthodontic patients in specialist clinics [1-3]. Edward Angle classified malocclusion based on the antero-posterior relationship of the teeth in 1899 [4-5]. Despite a few limitations; Angle's malocclusion classification is still widely used today. Although much research has been done on the type and distribution of malocclusions in different regions of Pakistan; very little research of this kind has been carried out [6-7]. The aim of the study was to evaluate the patterns of malocclusion occurrence among orthodontic patients and to determine the relationship between dental malocclusion and bone defects, and to estimate the age of presentation of class II malocclusion among patients.

MATERIALS AND METHODS:

Data were collected from 150 pre-treatment models and lateral cephalograms from Orthodontic department of Sardar Begum Dental College and Hospital, Peshawar for one-year duration from March 2019 to March 2020. The samples were categorized on the basis of age group as: children (9-12 years), adolescents (13-17 years) and adults (18-38 years). Ethical approval was obtained from the Institutional Review Committee. A deliberate sampling technique was used in this cross-sectional study. Inclusion criteria were patients with a case history, pre-treatment orthodontic dentures and lateral cephalometric radiographs, presence of the first permanent molars, patients with no history of trauma and prior orthodontic treatment. The malocclusion classification developed by Angle was used to classify the malocclusion of the teeth using research models. The ANB angle was calculated manually according to the parameters of the Steiner skeleton using side cephalograms. The data were analyzed for descriptive statistics and the chi-square test was used to test the relationship between dental and skeletal malocclusion. SPSS version 21 was used for statistical analysis.

RESULTS:

In the presented study, the age of the respondents ranged from 9 to 38 years, with the average being 18.6 years. The samples consisted of 104 (69.33%) women and 46 (30.66%) men. There were 19 children (12.66%) in the age group, 59 adolescents (39.33%), and 72 adults (48%). The main complaint regarding orthodontic treatment among the subjects according to case history were: irregular front teeth 47.33%, protrusion 29.33%, spacing 14.66%, irregular teeth with protrusion 4%, difficulty chewing 2%, spacing with protrusion 2% and irregular teeth with a spacing of 0.66%. The distribution of malocclusion according to the Angle classification system is shown in Table 1.

Table 1: Distribution of malocclusion

Type of Malocclusion	Frequency	Percentage
Class I	95	63.33%
Class II Div 1	41	27.33%
Class II Div 2	13	8.66%
Class III	1	0.66%
Total	150	100%

The total number of samples with increased occlusion was 60 (40%) and 70 (46.66%) with increased excessive bite. The maximum number of patients with increased hyperplasia and upper bite was present at the age of 14. Among the overjet and overbite subjects; 13 (65%) had severe bite and 15 (75%) severe upper bite at 14 years of age (Fig. 1). Patients with class II malocclusion, section 1 were reported for orthodontic treatment at the age of 16.5 in males and 16 years of age).

According to the cephalometric value of the ANB angle; most of the subjects had skeletal malocclusion class I. Of all samples, 119 (79.33%) had skeletal class I, 24 (16%) skeletal class II, and the remaining 7 (4.66%) had the basis of skeletal class III (Fig. 2)

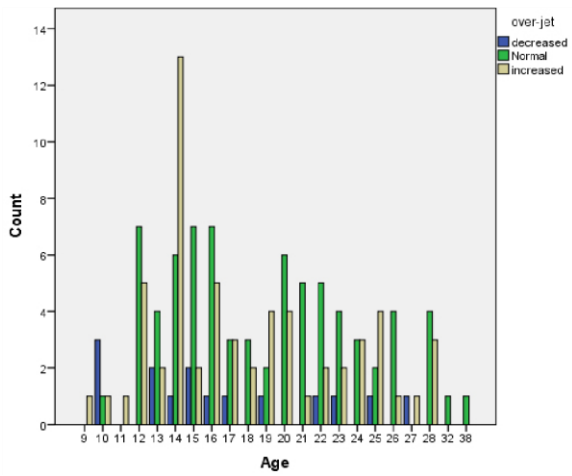

Figure 1: Age versus overjet bar chart

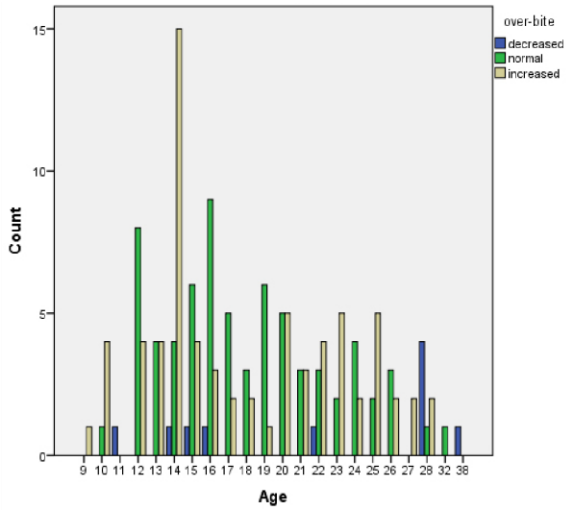

Figure 2: Age versus overbite bar chart

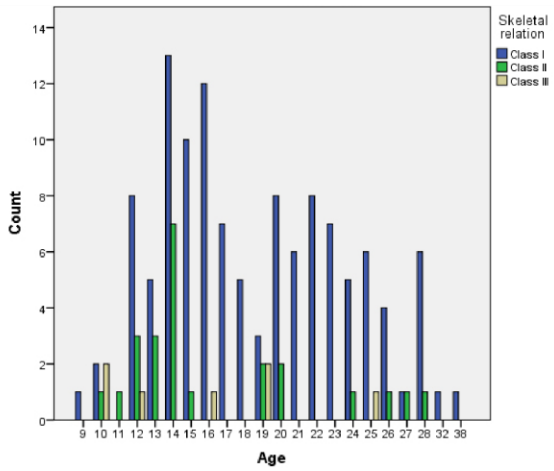

Figure 3: Age versus skeletal relation bar chart

This study revealed an association between Angle's malocclusion classification and the basal base of the skeleton based on the ANB angle (Table 2). There was a significant relationship between the two, as confirmed by the Pearson Chi-square test (p = 0.001). On the contrary, there was no significant gender relationship with the basal base of the skeleton.

Table 2: Association between dental and skeletal malocclusion

Type of Malocclusion	Dental	Skeletal	*p*-Value
Class I	95(63.33%)	119(79.33%)	0.001*
Class II	54(36.0%)	24(16.0%)	
Class III	1(0.66%)	7(4.66%)	

DISCUSSION:

According to this study, the number of female patients (69.33%) is greater than that of men (30.66%). This finding clearly indicates that women are more interested in orthodontic treatment. This fact is consistent with the results of another similar studies[7-9]. Most of our patients complained mainly of irregular front teeth and protrusion, which is also consistent

with other similar studies. Class I malocclusion was found in 63.33%, which is comparable with other reports. Class II malocclusion was found in 36% of patients, which is a slightly higher result than a similar report in the sample from the Sunsari district. Among class II malocclusions; Class II, Zone 1 malocclusion was found in 75.92% and Class II, Division 2 malocclusion was 24.08%, compared with 88.3% and 11.6%, respectively, according to the Sharma study. Similarly, Angle class III malocclusion was observed in only 0.66% of the tested sample, although class III bone malocclusion was observed in 4.66% of patients. This was not in line with the results of a similar study conducted in Dharan. This variability may be due to the reduced incidence of angle class III malocclusion in the south-eastern region. In the presented study, the majority of patients (48%) belonged to the adult age group, followed by adolescents and children[10-12]. This sequence was in line with the findings of Halwai et al. In Midwestern. Piya et al. Found the highest number of orthodontic patients in the adolescent age group. The difference could be due to the greater awareness of aesthetics and the good economic condition of patients in the adult age group in the studied sample. In the present study, 40% of the specimens had an increased undershot bite and 46.66% had an increased upper bite. These numbers are higher than school-age children as reported by Singh et al[13-14]. They reported an increased overjet of 17.51% and a deep bite of 13.23%. However, Shrestha and Shrestha reported an increased overjet in 43.8% of those surveyed and an increased bite in 20.7%. The significant relationship found between Angle's malocclusion classification and the primary skeletal base is consistent with the findings of Patrick et al[15]. The authors reported no significant relationship between gender and the primary skeletal base; which is also consistent with this study.

CONCLUSION:

Angles Class I is the most common malocclusion followed by Class II and III malocclusions in a sample of orthodontic patients. The mean age of malocclusion among patients in is over 16 for class II, Division 1 and over 18 for class II, Division 2; indicating late awareness of the need for orthodontic treatment. The priority should be to raise public awareness of the age factor in orthodontic treatment.

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