STATISTICAL STUDY OF MALOCCLUSION IN A POPULATION OF CENTRAL ROMANIA REGION

Manuela CHIBELEAN (CIREȘ-MĂRGINEAN)¹, Anamaria JURCĂ¹,
Liliana-Gabriela HALIȚCHI², Mariana PĂCURAR¹

¹University of Medicine and Pharmacy of Tg-Mures, Faculty of Dentistry, Dept. Pedodontics and Orthodontics, Romania
²Apollonia University of Iași, Romania
Corresponding author: drmchibelean@yahoo.com

Abstract

Objectives: To evaluate the prevalence of malocclusions and the necessity of orthodontic treatment in a population of Central Romania Region. Method: A retrospective study, analyzing the files and dental cast of 417 patients aged between 12 and 29 years, was performed between 2010 and 2013, on patients from both urban and rural areas. Inclusion criteria: clinically healthy patient, no orthodontic treatment in antecedents. A number of 349 male and female patients were consulted for establishing the presence of malocclusions and their distribution according to sex and origin. Results: Out of the 295 patients with malocclusion, 25.08% evidenced class I Angle; 65.76% - class II; 9.15% - class III. A higher frequency of class I and II malocclusions was recorded in females, comparatively with males: class I - 66.22% females; class II - 68.04%. Class III malocclusion were more frequently observed in males: 55.56%. 78.31% of the cases from urban areas presented one of the three dental classes. Calculations (p=0.00040) evidenced a statistically significant relation between the presence of dental malocclusions and the area the patients came from. All three types of malocclusions had a higher frequency in the females coming from urban areas. Conclusions: A higher frequency of malocclusions (except class III), even if statistically insignificant, is recorded in females. No statistically significant differences were noticed between the origin region and the type of malocclusion, and/or between the type of malocclusion in females or males and their place of origin. The only statistically significant correlation is the one between the presence of malocclusion and the place of origin. Keywords: malocclusion, Angle classification, prevalence, origin

1. INTRODUCTION

Nowadays, the dentofacial aspect has an increasingly important role in social life, malocclusions having a negative impact upon the individual, creating discomfort and affecting life quality. For this reason, the role of orthodontics is more and more important, both to track the presence of dentofacial anomalies and to anticipate and correct their evolution.

Knowledge on the prevalence of various anomalies in a population permits taking of adequate interceptive measures to stop their evolution and to harmonize, by orthodontic treatment, the dentofacial components.

The anomalies affecting facial aesthetics are class I Angle, with crowding and spacing, class II Angle anomalies, division 1, division 2, hereditary maxillary compression or acquired by oral breathing, class III Angle anomalies [2]. In this context, it is important that the orthodontist should have statistical data on the health status of the population in the area where he or she works. Thus, individualized versions of the general scheme of treatment may be developed and subsequently adapted to the population from the respective area. The goal of the treatment is no longer just to correct the malocclusion, but to correct it while also bringing the dentition and facial skeleton into normal relationships with the facial and intra-oral soft tissues [3].

Aim: Evaluation of the prevalence of malocclusions and the necessity of orthodontic treatment to the children, young people and adults in an area of central Romania.
2. MATERIALS AND METHOD

A retrospective study, analyzing the files and dental cast of 417 patients aged between 12 and 29 years, who addressed the Clinic of Orthodontics and Dental-facial Orthopedics in Targu-Mures, was developed between 2010 and 2013. The patients come from both urban and rural areas. Malocclusion was diagnosed on the basis of cast analysis and panoramic X-ray.

Inclusion criteria:
- healthy patient, with no chronic illnesses;
- absence of any orthodontic treatment in antecedents;
- possibility of correctly determining dental class diagnosis.

To establish a diagnosis of malocclusion, the Angle classification was used, based on the theory that the first permanent upper molar has a fixed position in the sagittal plane in comparison with the first permanent lower molar.

Thus, there is class I Angle with neutral ratio to the molar, normal molar relationship, the malocclusion being present at frontal or group level, crowded, rotated teeth; class II Angle presents lower molar distal to upper molar, class II Angle, division 1, with frontal protrusion, and class II Angle, division 2 with retrusion. Class III Angle has lower molar mesial to upper molar relationship of other teeth to line of occlusion not specified [3].

349 male and female patients were included in the study, as 68 of them did not fulfill the inclusion criteria. The presence of dental anomalies and the distribution of malocclusions according to sex and origin were analysed.

The initial data are presented in table 1.

Out of the 349 patients included in the study, 295 (193 females and 102 males) belonged to one of the 3 above-described classes, and 54 of them showed no dental anomalies.

In the female group, 155 patients came from urban areas and 38 from rural zones. In the male group, 76 come from urban areas and 26 from rural ones.

The situation of the females with malocclusion is the following:
- 34 - class I with crowding: 27 urban, 7 rural;
- 15 - class I with spacing: 12 urban, 3 rural;
- 76 - class II Angle division 1: 60 urban and 16 rural;
- 56 - class II Angle division 2: 48 urban and 8 rural;
- 12 - class III Angle, 8 urban and 4 rural.

The clinical evaluation for males is the following:
- 17 - class I with crowding: 11 urban, 6 rural;
- 8 - class I with spacing: 7 urban, 1 rural;
- 38 were diagnosed with class II Angle division 1: 29 urban and 9 rural;
- 24 - class II Angle division 2: 19 urban and 5 rural;
- 15 - class III Angle, 10 urban and 5 rural.

For statistical data analyses, the Chi square test was used.

3. RESULTS

The data obtained gave the following percentage values (fig 1): out of the total number of 295 patients with dental anomalies, 25.08% have class I Angle (74); 65.76% - class II Angle (194); 9.15% - class III Angle (27).

![Fig. 1 - Frequency of Angle anomalies](image-url)

A higher frequency was recorded for class I and II malocclusion in females than in males: class I: 66.22% females and 33.78% males; class II: 68.04% females and 31.96% males. Class III malocclusion was more frequent in males: 55.56%. (Fig 2)
Out of the total number of analyzed cases, 17.29% presented class I with crowding, 11.53% being females; 7.80% had class I with spacing; in this case, the prevalence of females being higher: 5.08%. Class II division 1 was present in 38.64% of cases, 25.76% of them being females. Class II subdivision 2 was found in 27.12% of cases, 18.98% for females. For class III, the prevalence was 9.15%, here 5.08% being males, and only 4.07% females. (figs. 3,4)

In spite of these percentual differences, calculations evidenced no statistically significant connection between the type of anomaly and patient sex.

Analysis on the presence or absence of dental anomalies in patients from urban or rural areas led to the following results (fig. 5):
- 78.31% of the cases from urban areas presented one of the three dental classes;
- 21.69% of the patients from rural area presented dental malocclusion.

Statistical calculations (p=0.00040) showed a statistically significant relation between the presence of dental malocclusions and the area the patients were coming from.

Analyzing the connection between the area of origin and the type of malocclusion, the following data were obtained: dental class I was present in 77.03% of the cases in urban areas and in 22.97% in rural areas, respectively; class II was present in 80.41% of the cases in urban areas and in 19.59%, in rural areas; class III was present in 66.67% of the cases in urban areas and in 33.33%, in rural areas. Statistical analysis (p=0.255) evidenced no connection between the area of origin and type of dental anomaly. (fig. 6)

For class I with crowding, a frequency of 74.51% was recorded in urban areas compared to 25.49% in rural areas;
- class II with spacing has a prevalence of 82.61% in urban areas;
- class II division 1: 78.07 in urban areas;
- class II division 2: 83.75% in urban areas;
- class III: 67.67% in urban areas.
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Fig. 6 - Prevalence of dental anomalies in patients from urban and rural areas

Analysis of the relation between the sex of the patients and the area of their origin showed that: all three types of malocclusions (classes and subclasses) had a higher frequency in the females from urban areas: class I: 20.21% urban, compared to 5.18% rural; class II: 55.96% urban compared to 12.44% rural; class III: 4.15% urban compared to 2.07% rural; class I with crowding: 13.99% urban, 3.63% rural; class I with spacing: 6.22% urban, 1.55% rural; class II division 1: 31.09% urban, 8.09% rural; class II division 2: 24.87% urban, 4.15% rural; class III 4.15% urban, 2.07% rural. No statistically significant correlation was observed between the type of anomaly in females and the area of their origin. (fig. 7)

Fig. 7 - Prevalence of dental anomalies in patients (males and females) from urban or rural areas

In the same manner, the different types of malocclusion were compared in the males coming from the two areas: urban and rural. (figs. 8,9)

Class I was present in a percentage of 17.65% in the males coming from urban areas, and of 6.86%, respectively, in those coming from rural areas.

Class I had a prevalence of 47.06% in the males coming from urban areas, and of 13.73% in those coming from rural areas.

For class III, the recorded percentages are: 9.80% in the males coming from urban areas, 4.90% in those coming from rural areas.

The following distribution was recorded for subclasses: class I with crowding: 10.78% in the males coming from urban areas, 5.88% in those coming from rural areas, class I with spacing: 6.86% urban, 0.98% rural; class II division 1: 28.43% urban, 8.82% rural, class II division 2: 18.63% urban, 4.90% rural, class III: 9.80% urban, 4.90% rural. In this case, no statistically significant correlation could be established between the type of anomaly in boys and the area of their origin.

Fig. 8 - Prevalence of dental anomalies in girls from urban or rural areas

Fig. 9 - Prevalence of dental anomalies in boys from urban or rural areas

4. DISCUSSION

A higher frequencies of class II anomalies (65.76%) was recorded in the investigated patients, comparatively with those of class I (25.08%) and class III (9.15%) for the here analyzed population. This percentage allotment is different from the one reported by Zegan et al.
[4] for other population groups in our country, namely the following percentage values: 63.2% for class I, 28.3% for class II and 5.8% for class III. In Lithuania, Sidlauskas and Lopatiene [5] reported values of 68.4% for class I, of 27.7% class II and of 2.8% class III, respectively. For the Brazilian population, Uchoa Lins et al. [6] showed that 56.66% presents class I, 36.66% class II and 6.66% class III. In Germany, Christopher et al. [7] reported a percentage of 27.8% for class II malocclusion and of 3%, respectively, for class III, in a study done on a sample of 9 year-old boys.

In our country, the study performed by Temelcea et al. [8] put into evidence a higher frequency of class I malocclusions in the studied population. An explanation could be that considered for investigation was a population that came to the orthodontist in view of dental status evaluation, and solving of aesthetic problems.

Even if no statistically significant difference was established between the sex of the patient and the type of dental malocclusions, a higher frequency of class I and II malocclusions in females and of class III in males, respectively, was recorded. Among the anomalies, the highest frequency is registered by class II Angle division 1 in females, followed by class II subdivision 2 in females, and then by class II subdivision 1 in males, class I with crowding in girls, class II division II in boys, class II with crowding in boys, class I with spacing in females and class III in males, class III in females, respectively.

The relation between the type of dental malocclusion and the area of origin has been also studied, no statistically significant differences being recorded. The frequency of malocclusions in the two studied environments is the following: the highest frequency occurred in class II division 1 in urban areas (30.17%), followed by class II division 2, also in urban areas (22.71%), then by class I with crowding (12.88%) in urban areas, class II division 1 in rural areas (8.47%), class I with spacing in urban areas (6.44%), class III in urban areas (4.41%), class III rural (3.05%), class I with spacing in rural areas registering the lowest frequency (1.36%).

No statistically significant correlation was observed between the area of origin and sex of the patients included in the study. 52.54% of them were females coming from the urban area, 25.76% males from the urban area, the percentages recorded for the rural area being lower: 12.88% males, 8.81% females.

Instead, a statistically significant difference was established between the presence of dental anomalies and patients’ area of origin. Out of the total studied population, 66.19% represent the urban population, in which one of the 5 types of dental malocclusions were evidenced, while only 18.34% represent the percentage of the rural population affected with dental malocclusions. 8.60% are urban population without malocclusions and 6.88% represent orthodontically healthy rural population.

No statistically significant correlation could be also established between the type of malocclusion in females and the area of their origin, and the type of malocclusion in males and the area of their origin.

5. CONCLUSIONS

1. A higher frequency of dental anomalies (class III excepted), even if statistically insignificant, was evidenced in females, comparatively with males, because females are more interested in dental treatments and more concerned with their aesthetic aspect than males.

2. No statistically significant differences were observed between the area of origin and type of dental anomaly, nor between the type of malocclusion in females or males and their area of origin.

3. The only statistically significant relation established is between the presence of the dental malocclusion and the area of origin, possibly because of the higher interest of the urban population to address an orthodontist.

4. The increased frequency of dental malocclusions is due both to racial cross-breeding (civilization and individual emancipation) and to the manner of eating, on considering the manifestation of the acceleration phenomenon.

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