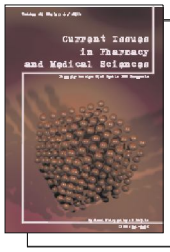

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Adult patients treated at the Department of Jaw Orthopaedics, Medical University of Lublin

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ABSTRACT

The aim of the present study was to make an overview of the age, sex and malocclusion of adult patients admitted to the Department of Jaw Orthopaedics, Medical University of Lublin in the years 1995–2009. In the 15 years under study, the orthodontic treatment was started by 8892 patients, including 642 patients above 18 years of age, which constituted 7.2% of the total number of patients treated during that period. The most numerous group was the group of 20–24 year-old subjects, whereas the least numerous was that including 35 year-olds. Women undertook orthodontic treatment decidedly more often – 69.8% of patients. In the years 1995–2009 adults from the Lublin region made up a small percentage of orthodontic patients treated in the Department of Jaw Orthopaedics (only 7.22%). Young adults (average age 22.9 years) prevail in the group of adult patients who decided on treatment. Women decide to start orthodontic treatment more frequently than men (69.8%). The main reason why both men and women decided on orthodontic treatment was dental abnormalities (52.5%).

Keywords: orthodontic treatment, adult patients, malocclusion

INTRODUCTION

Adults constitute a specific group of orthodontic patients. In 1990, Grubb reported an increase in the number of adult orthodontic patients by 800% in comparison with 1970 [11]. American and European reports suggest that malocclusion affects 2/3 to 3/4 of adults [3]. Studies conducted in Sweden and the Netherlands showed the incidence of malocclusion ranging from 40 to 76% of adults [21]. According to Burgermodijk et al., 14% of Danish population seeks orthodontic treatment [3]. In Poland, the majority of studies on prevalence of malocclusion have involved children and adolescents. In the group of eighteen-year-old individuals, the percentage of malocclusion cases oscillated between 60.6% and 71.2%, depending on the region [2, 13, 19].

Women are more aware of their malocclusion compared to men and constitute about 70% of orthodontic patients in the USA and England [9, 11, 14]. The percentage of adult female patients in Spain reaches 92.5% [23]. In Norway the average age for adults to begin the orthodontic treatment is 28.3 years [1] whereas in Spain – 25.8 years (ranging from 18 to 28 years of age) [21]. Literature reports have revealed that in most cases adult patients are treated due to dental abnormalities [1,3,8,16,17,18,21].

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AIM

The aim of the present study was to make an overview of age, sex and malocclusion of adult patients admitted to the Department of Jaw Orthopaedics, Medical University of Lublin in the years 1995–2009.

MATERIAL AND METHODS

The study was based on medical records (dental records, diagnostic models, panoramic radiographs, lateral cephalometric radiographs) of patients treated at the Department of Jaw Orthopaedics in the years 1995–2009. From among 8892 of all patients treated during this period, the individuals above 18 years of age were included in the study. Data concerning age, sex and malocclusion were collected from their dental records. Patients were divided into five groups according to the chronological age, at which they were admitted for treatment: Group A. 18–19 years, Group B. 20–24 years, Group C. 25–29 years, Group D. 30–34 years, Group E. ≥35 years. For the reasons of statistics there were three groups covering the

span of 5 years each, the youngest group including only 18-year-olds (full of age) and 19-year-olds.The oldest group included all the patients who started their treatment at the age of over 35. There were very few such patients so other age groups were not distinguished for them. The diagnostic models of all patients were analysed to determine anterior-posterior, transverse and vertical abnormalities. The Angle's classification was used.

The results were statistically analysed. Due to the nominal scale of measurements, values of parameters were characterized by size and percentage. Differences or correlations between non-measurable parameters were evaluated using contingency tables and χ^2 tests homogeneity/independence. The 5% deduction error was adopted and the significance level was set at $p<0.05$. Statistical analysis was carried out using STATISTICA v. 8.0 software (StatSoft, Poland).

RESULTS

During 15 years, the orthodontic treatment was started by 8892 patients, including 642 above 18 years of age, which constituted 7.2% of the total number of patients treated during that period (Fig. 1). The percentage of adult patients oscillated between 3.1% and 11.5% annually (Tab. 1) and did not show an upward tendency in the consecutive years.

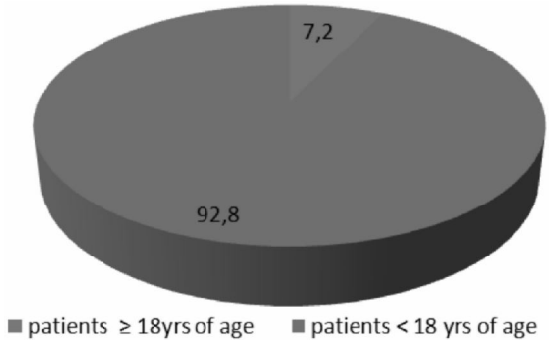

Fig. 1. The percentage of adult patients treated in the Department of Jaw Orthopaedics in the years 1995–2009

Table 1. The number and percentage of adult patients undertaking treatment in consecutive years

Year	Number of patients	%
1995	74	10.5
1996	65	10.0
1997	64	9.6
1998	56	7.1
1999	30	6.5
2000	25	4.2
2001	36	6.0
2002	22	3.1
2003	36	6.3
2004	32	5.0
2005	36	6.3
2006	18	4.0
2007	38	10.2
2008	65	11.5
2009	45	7.9
Total	642	100.0

The average age of patients beginning the orthodontic treatment was 22.9 years. The most numerous group was group B (20–24 years) whereas the least numerous was group E (≥35 years of age). Sizes of age groups are presented in Table 2.

Table 2. The number of patients in a given age group

	Number	%
18–19	187	29.1
20–24	307	47.8
25–29	89	13.9
30–34	27	4.2
Over 35	32	5.0
Total	642	100.0

Women undertook orthodontic treatment decidedly more often – 69.8% of patients (Tab. 3).

Table 3. The number of male and female individuals undertaking orthodontic treatment

Sex	Number	%
Female	448	69.8
Male	194	30.2
Total	642	100.0

The overall distribution of various types of malocclusion is presented in Table 4. The findings show that adult patients started treatment mainly due to class I malocclusion (337 – 52.5%), followed by class II and class III maloccclusion according to the Angle's classification.

Table 4. The number and percentage of malocclusion cases

	Dental abnormalities class I	Class II	Class III	Cross bite	Open bite	Mandibular asymmetry	Impacted canine
Number / %	337/52.5	106/16.5	65/10.1	51/8.0	27/4.2	8/1.3	48/7.5

Class I malocclusion was the most frequent cause of treatment in groups A, B and C. Class II abnormalities were predominant in group B (50 patients). Similarly, the highest number of patients with class III malocclusion started treatment between 20 and 24 years of age (29 patients) (Tab. 5).

The division of malocclusions depending on sex is presented in Table 6. The percentages of men and women with diagnosed Angle's class I malocclusion were comparable (52.6% and 52.5%, respectively). The data were statistically significant (p=0.0008). Treatment due to class II malocclusion was undertaken by 20.1% of men and 15.0% of women; class III malocclusion affected mainly men (15.5%). Forty-two women (9.4%) underwent impacted maxillary canine testing. Cross-bite occlusion was observed in 9.2% of women and 5.2% of men. Open bite was more common in women (5.2%).

Table 5. Incidence of malocclusion in given age groups.

Abnormality	Age									
	18–19		20–24		25–29		30–34		35	
	No.	%	No.	%	No.	%	No.	%	No.	%
Dental abnormalities class I	98	52.4	164	53.4	45	50.6	11	40.7	19	59.4
Class II	27	14.4	50	16.3	16	18.0	6	22.2	7	21.9
Class III	20	10.7	29	9.5	11	12.4	4	14.8	1	3.1
Cross bite	14	7.5	28	9.1	6	6.7	2	7.4	1	3.1
Open bite	8	4.3	13	4.2	5	5.6	1	3.7	0	0.0
Mandibular asymmetry	4	2.1	3	1.0	0	0.0	1	3.7	0	0.0
Impacted canine	16	8.6	20	6.5	6	6.7	2	7.4	4	12.5
Total	187	100.0	307	100.0	89	100.0	27	100.0	32	100.0

Table 6. Incidence of malocclusion depending on sex

Abnormality	Sex			
	Female		Male	
	No.	%	No.	%
Dental abnormalities class I	235	52.5	102	52.6
Class II	67	15.0	39	20.1
Class III	35	7.8	30	15.5
Cross bite	41	9.2	10	5.2
Open bite	23	5.1	4	2.1
Mandibular asymmetry	5	1.1	3	1.6
Impacted canine	42	9.4	6	3.1
Total	448	100.0	194	100.0

p=0.0008

DISCUSSION

The number of adult patients treated at the Department of Jaw Orthopedics of the Medical University of Lublin in the years 1995-2009 constituted 7.2% of the total number of patients. The percentage of adult patients over the studied period ranged between 3.1% and 11.5% annually showing no upward tendency in consecutive years. Low percentages were likely to be associated with the number of patients undertaking orthodontic therapy within the National Health Fund contract, which was pre-set.

Our results are different from those reported in the USA, where the percentage of adult orthodontic patients increased on average from 5% in 1970 to 25% in 1990 [8]. According to some studies, the number of adult orthodontic patients increased by 800% between 1970 and 1990 [11]. In some states, mainly the ones with high concentration of pensioners, adults constituted more than half of patients. The number of patients treated at the Department of Orthopaedics in Lublin was significantly lower.

Our findings demonstrated that in the years 1995–2009 orthodontic treatment was undertaken by 124 patients aged 18 (19.3%), 63 aged 19 (9.9%), 78 aged 20 (12.2%) and 67 patients aged 21 years (10.4%). Young patients constituted over half of the total number (51.7%). The average age of patients beginning the treatment was 22 years and 8 months. Group B, the most numerous, included 20 to 24-year-old patients, constituting 47.8% of all subjects. The study by Birkeland carried out in the Norwegian population revealed similar results; young adults mostly undertook orthodontic treatment and the average age was 28.3 years [1]. Spanish and Egyptian studies confirm the above results - young adults predominate and the average age is 25.8 [21] (22.3 years for women and 24.1 years for men, respectively) [12].

In the studied period, women (69.8% of patients) undertook the orthodontic treatment at the Department of Jaw Orthopaedics more often. Khan and Horocks reached similar conclusions; according to their findings, in Great Britain women were more dissatisfied than men with the state of their dentition and constituted over 70% of all orthodontic patients [14]. The same percentage of female patients was observed in the USA [11]. The highest percentage of adult female patients (92.5%) was found in Spain [21] and the lowest one in Egypt (58.2%) [12].

In our study, the percentage of men and women with class I malocclusion was comparable. Similar results were reported for the Turkish population; no statistically significant differences in the incidence of class I abnormalities between men and women were demonstrated [5]. Burgermodijk found the largest degree of crowding of lower incisors among the Danes between 20 and 34 years of age, especially in men [3].

Our study showed class I malocclusion in 52.5% of patients. The percentages of dental abnormalities in men and women were similar – 52.6% and 52.5%, respectively. Malocclusion-related treatment was undertaken by 59.4% of patients from the oldest age group (above 35 years), followed by Group B (20–24 years) – 53.42%, Group A (18–19 years) – 52.4% and Group C (25–29 years) – 50.56% of patients. Golusik et al. who studied the population of Lower Silesia observed malocclusion in 56% of adult patients [8]. Suszczewicz et al. reported dental abnormalities in 29.2% of 18-year-olds in the Polish population [18]. Burgermodijk et al. diagnosed class I malocclusion in 38% of adult Danes [3]. In Spain, this abnormality was found in 27.5% of patients [21] whereas in Norway class I malocclusion affected 44.2% of patients [1]. In the USA, 80-85% of patients suffered from class I dental abnormalities [16]. The highest percentage was reported amongst Brazilian sportsmen where 89% of patients had class I malocclusion [17].

The incidence of class II malocclusion in the study population was found to be lower – 16.5% of all adult patients undertaking the orthodontic treatment, including 20.1% of men and 15.0% of women. Similar results were

found among American patients (15%) [17]. In the Lower Silesia population, this abnormality was observed in 11% of the patients [8]. According to Suszczewicz et al. class II malocclusion was present in 10.6% of the 18-year-olds [18]. Burgermodijk et al. diagnosed this abnormality in 28% of patients. The percentage reported in the Spanish study was 37.5% [21] whereas in Norway – 48.7% [1]. The study conducted in the Turkish population showed class II malocclusion in 38.3% of patients [6]. Moreover, according to the study by Onyeaso, in Nigeria, the highest incidence rates of class II and III malocclusion were observed, in both men and women [15].

In our study, class III malocclusion was diagnosed in 10.12% of patients, mainly in men (15.5%). The percentage of female patients was much lower (7.9%) and regarded patients from the oldest age groups, i.e. Group D (30-34 years) – 14.81% and Group C (25-29 years) – 12.4%. The treatment of class III malocclusion was more frequently undertaken in adults, since this condition requires team treatment conducted once the growth has been completed [14]. The literature data show varied percentages of adults with class III malocclusion; in Spain, 35% of patients ? 18 years were affected [24], whereas in Norway 7.1% of adult patients [1]. The abnormality was frequently observed in the Turkish adult population (16.7%) [6]; in contrast, only 1% of American patients (the least numerous group) were affected [16]. In Colombia, class III malocclusion was detected in 5.8% of the population [20].

In our study, cross-bite occlusion was diagnosed in 7.9% of patients, in 9.2 of women and 5.2% of men. The highest percentage of this abnormality was observed in Group B (20–24 years). Similar results were found in the youngest group (18–19 years) – 7.5% and patients aged 30–34 – 7.4%. The results reported for the Lower Silesia population revealed a 15% incidence of cross-bite occlusion [8]. Suszczewicz et al. detected cross-bite occlusion in 14.4% of the 18-year-old population [18]. The American studies found this occlusion in 6% of patients [4] whereas the Spanish ones reported it in 37.5% of adults [21].

Open occlusion was observed in 4.2% of patients, including 5.1% of women and 2.1% of men. According to Polish findings, the incidence of open occlusion ranges from 6% [9] to 9% in patients above 18 years of age [14]. Similar results were reported in Turkey (10%) [6] and Colombia (10.7%) [20].

Mandibular asymmetry was detected in the lowest percentage of patients (1.3%). The only study regarding this abnormality available in literature was that of Brazilian sportsmen, where mandibular asymmetry was diagnosed in 3% of cases [17].

Furthermore, the presence of impacted canines was found in 48 cases, constituting 7.5% of all patients. Impacted maxillary canines were observed in 9.4% of women. The same problem appeared in 12.5% of the oldest patients from Group E (above 35 years). A lower percentage (8.6%) was observed in the youngest patients (18–19 years). According to Syryńska et al., the incidence of mandibular canine impaction among patients aged 10–60 years was 3.2% of all patients admitted for treatment in the years 1994–2006. The majority of them (73.7%) were women [19]. Ericson and Kurol reported impacted upper canines in 2% of young individuals, mainly women [7].

CONCLUSIONS

1. In the years 1995–2009, adults from the Lublin region made up a small percentage of orthodontic patients treated in the Department of Jaw Orthopaedics (only 7.22%).
2. Young adults (average age 22.9 years) prevail in the group of adult patients who decided on treatment.
3. Women decide to start orthodontic treatment more frequently than men do (69.8%).
4. The main reason why both men and women decided on orthodontic treatment was dental abnormalities (52.5%).

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