ASSESSMENT OF THE ORTHODONTIC TREATMENT NEEDS IN THE LUBLIN VOIVODESHIP RESIDENTS

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Abstract

Introduction. When a patient reports to an orthodontist, it does not always mean a necessity of beginning the treatment. Therefore, the demand for treatment – patient's willingness to be treated is not equal to a need for treatment. Conducting professional evaluation of occlusion made by a specialist/specialists on the basis of thorough objective examination allows to either confirm or exclude the need for orthodontic treatment.

Aim. Assessment of the orthodontic treatment needs among the population residing in the Lublin Voivodeship.

Material and methods. Retrospective analysis of medical documentation from the years 2015-2016 was made in two dental offices from the Lublin Voivodeship, in which professional orthodontic treatment was offered; one dental office is located in a big urban centre – Lublin, and one in a small city – Łuków. Orthodontic treatment was required in 1609 patients, who were divided into three age groups for the analysis purpose: 6-12 years old (Group I), 13-19 years old (Group II) and 20 years old or above (Group III). Collected data were statistically analysed.

Results. An analysis of the medical documentation (a year after year comparison) showed an increase in the orthodontic treatment needs by 14.96% in the big city and by 83% in the small city. The increase in orthodontic treatment needs especially concerned the population of children up to 12 years old, followed by persons over 20 years old and the youth in the age 13-19 years old. The biggest orthodontic treatment needs were found in the mean age of 13.2 years.

Conclusions.

1. Significant increase in orthodontic treatment needs in the Lublin Voivodeship residents is observed.
2. It is reasonable to verify the age criteria concerning reimbursement of orthodontic treatment by the National Health Fund, taking into consideration 13-year-olds.

Keywords: malocclusions, treatment needs, children, youth, adults.

Introduction

National epidemiological studies concerning state of oral health conducted in Poland during the last 17 years have shown approximately 54% rate of occlusal disorders in children and youth who are eligible for orthodontic treatment, what gives evidence of great orthodontic treatment needs in the population of the young Poles.

At the same time, continuous increase of patients willing to be treated is observed, therefore the demand for orthodontic treatment is raising, what is undoubtedly influenced by improvement of an economical situation in the society and availability of the orthodontic treatment. Another significant factor constitutes the popularity of treatment resulting from increasing care about appearance of children, youth and adults, as well as raising patients' pro-health awareness [1-4]. In the Polish reality an issue of reimbursement of orthodontic treatment by the National Health Fund (NFZ) and distribution of contracts in the voivodeships it is not without influence [5].

Aim

Assessment of the orthodontic treatment needs among the population residing in the Lublin Voivodeship.

Material and methods

The research was conducted in two dental offices: in the big city – Lublin and in the small city – Łuków. Both dental offices have offered general treatment and specialistic orthodontic treatment since 2005. Each patient reporting for the first time to a dental office, regardless of the reason, had his/her condition of occlusion evaluated – confirming or excluding the need for specialistic orthodontic treatment. In the case of children, the parents or guardians were informed, and in the case of adults – the patient himself.

On the basis of the collected medical documentation from the years 2015-2016 (from the beginning of 2015 to the end of 2016), a retrospective analysis of orthodontic treatment needs was conducted. The patients taking part in the research were divided into three age groups. The first group (Group I) included patients aged 6-12 years inclusively, the second group (Group II) – patients aged 13-19 years inclusively, and the third group (Group III) – patients who were 20 or above. The collected data were statistically analysed.

The research project obtained a positive opinion of the Bioethics Committee of Medical University of Lublin (resolution no. KE-0254/306/2018).

Results and discussion

In 2015 in the dental office in Lublin 655 patients required the orthodontic treatment, including 268 from the first age group, what constituted 40.92% of respondents in the given calendar year; 128 from the second age group what constituted 19.54% of respondents; 259 from the third age group (39.54%). In the same dental office in 2016 the total number of 753 patients required orthodontic treatment, including 326 from the first age group, what constituted 43.29% of respondents in the given calendar year; 159 from the second age group (21.12%); 268 from the third age group (35.59%). In the years 2015-2016 in the dental office in Lublin 1408 patients required orthodontic treatment. The first age group included 594 patients, what constituted 42.19% of all respondents; the second age group involved 287 patients (20.38%); the third age group included 527 persons (37.43%). Taking into account

numerical data obtained in 2015 and 2016, there observed an increase in the general number of patients in 2016 in comparison to 2015 by 14.96%. In the first age group there was an increase by 21.64%, in the second age group – by 24.21%, while in the third one – by 3.47% (Figures 1 and 2).

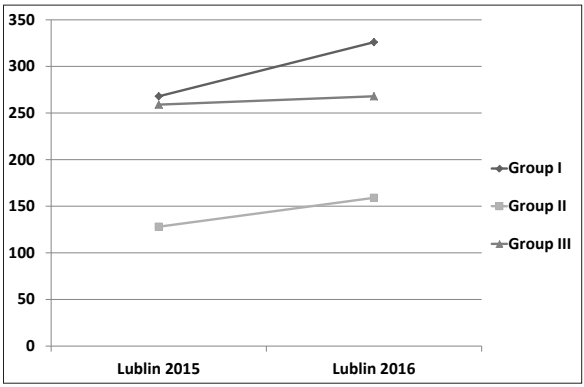

Figure 1. The number of first time patients of the Lublin dental office within 2 years in whom the need for orthodontic treatment was found (divided into groups according to age)

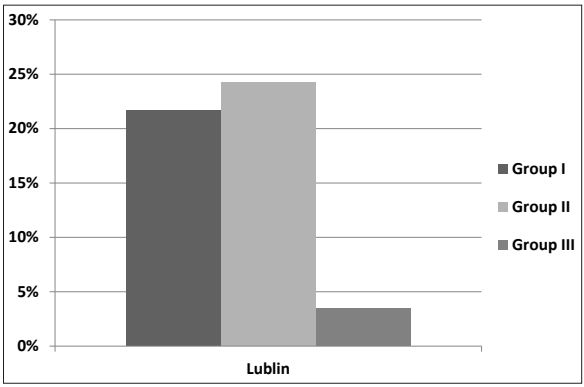

Figure 2. A percentage increase in the number of first time patients of the Lublin dental office within 2 years in whom the need for orthodontic treatment was found (divided into groups according to age)

In 2015 in the dental office in Łuków 71 patients required the orthodontic treatment, including 30 from the first age group, what constituted 42.26% of respondents in the given calendar year; 21 from the second age group what constituted 29.58% of respondents; 20 from the third age group (28.16%). In the same dental office in 2016 the total number of 130 patients required orthodontic treatment, including 60 from

the first age group, what constituted 46.16% of respondents in the given calendar year; 33 from the second age group (25.38%); 37 from the third age group (28.46%). In the years 2015-2016 in the dental office in Łuków 201 patients required orthodontic treatment. The first age group included 90 patients, what constituted 44.78% of all respondents; the second age group involved 54 patients (26.87%); the third age group included 57 persons (28.35%). Taking into account numerical data obtained in 2015 and 2016, there observed an increase in the general number of patients requiring orthodontic treatment in Łuków in 2016 in comparison to 2015 by 83.00%. In the first age group there was an increase by 100%, in the second age group – by 57%, while in the third one – by 85.00% (Figures 3 and 4).

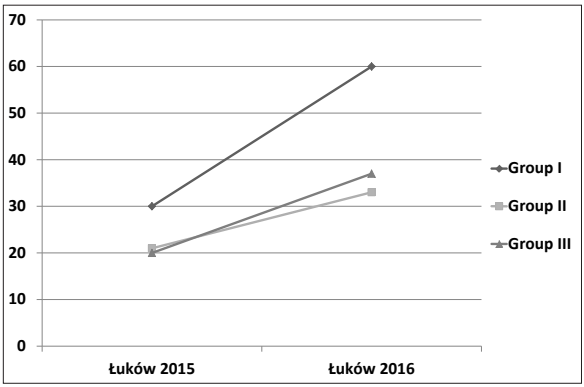

Figure 3. The number of first time patients of the Łuków dental office within 2 years in whom the need for orthodontic treatment was found (divided into groups according to age)

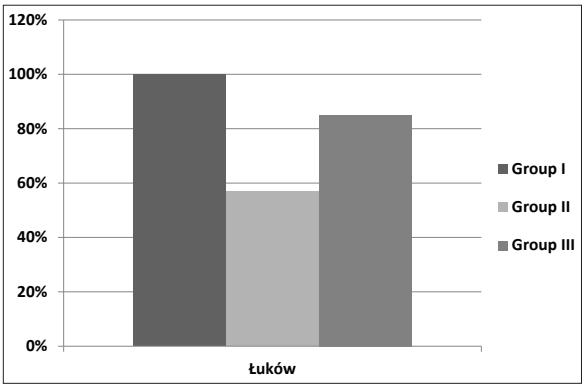

Figure 4. A percentage increase in the number of first time patients of the Łuków dental office within 2 years in whom the need for orthodontic treatment was found (divided into groups according to age)

On the basis of the conducted research and analysis of statistical data coming from dental offices in Lublin and Łuków, results showing significant increase in the number of patients requiring orthodontic treatment in both localizations in 2015 and 2016 were obtained. The data indicate the scale of rise in the number of patients requiring orthodontic treatment in 2015 and 2016 both, in the big voivodeship city – Lublin, where an increase by nearly 15% was noted, as well as in the small county town – Łuków, where an increase was as much as 83%. The results prove an increase in the orthodontic treatment needs, wherein the issue less concerns the big voivodeship city, while it much more concerns the small city (Figure 5).

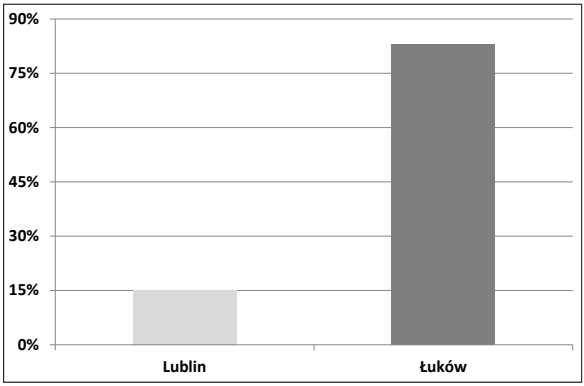

Figure 5. A percentage increase in the number of first time patients of the Lublin and the Łuków dental offices within 2 years in whom the need for orthodontic treatment was found (divided into groups according to age)

An interesting observation is that in the Lublin dental office the biggest increase was noted among the youth (aged from 13 to 19 years inclusively) – by over 24%, while in the youngest group (aged from 6 to 12 years inclusively) – by over 21%. The smallest increase was indicated among people over 19 years old – little more than 3%. In Łuków the situation shaped quite differently: in the case of the youngest group there was an increase by as much as 100%, while in the youth group by 51%. Among persons over 19 years old, there was a clear difference in comparison to patients in the Lublin dental office, as the number of patients requiring orthodontic treatment raised by 85%. Discrepancy of the increase of patients in this age group between the dental office in Lublin and Łuków was over 80 percentage points, while between the groups of the youngest patients – nearly 80 percentage points.

Comparing the general percentages of patients in particular age groups during the whole period of research with an increase in the number of patients in the groups, it is visible that in Lublin the most numerous group was the one with the youngest patients (aged from 6 to 12 years inclusively), in which for two years (2015-2016) medium increase was observed compared to other groups (by over 21%), however close to the highest increase. In the group of the youth (aged from 13 to 19 years inclusively),

which was the least numerous one, having about half the number of the patients in comparison with the remaining groups, the highest increase in orthodontic treatment needs by over 24% in the period of two years (2015-2016) was observed. In the third age group (20 years and above), which was medium in terms of size (over 37%), but close to the youngest group, there observed the smallest increase – only nearly 3.5%.

In Łuków in turn, the group of kids (aged from 6 to 12 years inclusively) was the most numerous and constituted almost 45% of all the patients requiring orthodontic treatment, and additionally, there was the biggest increase (100%) among all the groups in both localizations in two years. The group of the youth (aged from 13 to 19 years inclusively) in Łuków, also the least numerous one, despite it was close to percentage of the same group from Lublin, it constituted over 26% of all the patients requiring orthodontic treatment in this dental office. An increase during the two studied years was by 51% and despite such a high number, it was the lowest rise of patients requiring orthodontic treatment among all three groups in Łuków. In the oldest age group (20 years and above), constituting 28% of all patients an increase by 85% was observed, which is close to an average increase in general number of respondents, and at the same time different from results obtained in Lublin, where the increase was small (approximately 3.5%).

The mean age of young patients (from the I and II age groups in both localizations), calculated on the basis of raw data available in the authors of the study, was equal to 13.2 years and indicated the highest orthodontic treatment needs in 13-year-old patients. It casts some doubt on legitimacy of the NFZ (National Health Fund) reimbursement, which only guarantees free treatment for patients up to 12 years old (up to 13 years old if the treatment began earlier and was continued) without taking into account differences in developmental age, depending on sex and individual parameters of young patients [6-8].

It needs to be mentioned that the age division used in this study, allows to draw the boundaries considering general period of the greatest developmental changes connected with the pubertal peak, which is attributable to the age in the second age group (from 13 to 19 years inclusively). The puberty period now tends to initiate early – even one or two years earlier than in the parents' generation. The final growth period falls on 16-18 years of age, and even 19 years according to contemporary studies, also from the field of developmental neuropsychology [9,10].

Minch *et al.* [3] in the study of 67 children and teenagers from Wrocław (46 girls and 21 boys), aged from 10 to 19 years old (patients of the Department of Maxillofacial Orthopaedics and Orthodontics of the Wroclaw Medical University) found the mean age 14.2 years; 31% of the studied were the primary school students, another 31% junior high school students, and 37% high school students.

In the study of 100 patients of the Academic Centre for Dentistry Amsterdam, conducted by Bos *et al.* [11], the mean age was 15.81 years (there were patients up to 30 years old). The female respondents constituted 56%, and their mean age was quite lower – 15.59 years, in comparison to male respondents, who constituted 44% of all the studied, and their mean age was quite higher – 16.09 years.

Analyzing the results of epidemiological studies conducted in Poland during the last 17 years, a tendency to increase in frequency of malocclusions occurrence together with respondents' age can be observed. It should be however mentioned, that broad differences in the obtained results, recurring problem of lack of research randomization, lack of uniformity of assessment criteria, as well as diversified research groups and methods impede interpretation of those results. Kawala *et al.* [12] in their research from 2009 prove increasing trend in percentages of occlusal disorders together with increase of mean age of both groups' population.

Epidemiological studies conducted in Poland from 2011 to 2017 showed, however, that among children and youth aged from 6 to 12 years inclusively, that is in the first age group in the own studies, the results referring only to this age range indicate the percentage of malocclusions between 52.7% (according to Łyszczarz *et al.* [13]) and 82% (according to Osmólska-Bogucka *et al.* [14]). Whereas in the age range from 13 to 19 years inclusively, corresponding to the second age group in the own studies, the percentage of malocclusions varied from 30%, according to Kozanecka *et al.* [7], to 72.8%, according to Dubowik *et al.* [6]. The average values from the abovementioned studies were approximately 59% for the group corresponding to the first age group in the own studies and approximately 54% for the group corresponding to the second age group in the own studies. Due to the abovementioned differentiation of the particular research criteria, it is impossible to clearly state an increasing or decreasing trend concerning percentage of malocclusions in the population of children and youth in Poland.

Conclusions

1. Significant increase in orthodontic treatment needs in the Lublin Voivodeship residents is observed.
2. It is reasonable to verify the age criteria concerning reimbursement of orthodontic treatment by the National Health Fund, taking into consideration 13-year-olds.

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