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Yu.O. Slynko, I.I. Sokolova, K.I. Karpenko, N.M. Udovychenko, S.I. Herman, T.V. Tomilina, K.V. Skydan
Kharkiv National Medical University, Kharkiv

GENDER ASPECTS OF THE DENTAL STATUS IN THE ADULT POPULATION OF THE KHARKIV REGION

e-mail: sdent_irina@ukr.net

This study is devoted to analysis of the prevalence of small dental defects in the adult population of the Kharkiv region by gender. Orthopantomograms of 1269 patients of both genders, aged 18 to 84 years, were analyzed. The condition of the dentition in women is better than that of men, namely: small dentition defects (DDs) in women were less than by 1.10 times, large ones – less than by 1.16 times, and the DDs absence, conversely, occurred by 1.3 times more frequently than in men, but the established differences were not statistically significant (χ^2=8.859, p=0.012). The study performed also showed that women had smaller DDs in the lower and upper jaws, frontal and lateral areas more frequently than men, but there was no statistical difference between the prevalence of small DDs with regard to topographic and quantitative characteristics and the gender (p>0.05).

Key words: dentition defects, prevalence, gender differences, gender gap.

Ю.О. Слинко, І.І. Соколова, К.І. Карпенко, Н.М. Удовиченко, С.І. Герман, Т.В. Томіліна, К.В. Скидан

ГЕНДЕРНІ АСПЕКТИ СТАНУ ЗУБНИХ РЯДІВ У ДОРОСЛОГО НАСЕЛЕННЯ ХАРКІВСЬКОГО РЕГІОНУ

Дослідження присвячене аналізу поширеності дефектів зубних рядів у дорослого населення Харківського регіону в залежності від статі. Проаналізовано ортопантомограми 1269 пацієнтів обох статей у віці від 18 до 84 років. Загалом стан зубного ряду у жінок кращий, ніж у чоловіків, а саме: поширеність малих дефектів зубних рядів (ДЗР) у жінок була меншою у 1.10 раза, великих ДЗР – у 1.16 раза, ніж у чоловіків, а відсутність будь-яких ДЗР, навпаки, була виявлена у 1.3 раза частіше, ніж у чоловіків. Проте, встановлені відмінності не були статистично значущими (χ^2=8.859, p=0.012). Проведене дослідження також показало, що жінки мали меншу кількість ДЗР на нижній та верхній щелепах, а у фронтальній та бічній областях – більшу, ніж у чоловіків. Але статистичної різниці між поширеністю малих ДЗР щодо топографічних та кількісних характеристик та статі не було (p>0.05).

Ключові слова: дефекти зубних рядів, поширеність, гендерні відмінності, гендерний розрив.

The study is a fragment of the research project "Formation and implementation of modern scientific approaches to the diagnosis, treatment and prevention of dental pathology in children and adults", state registration No. 0118U000939.

Almost 40 years ago, the World Health Organization drew attention to the need for in-depth analysis of gender differences in all areas of medicine. But even today, these issues need in-depth study due to lack of information for both preventive and curative aspects of medicine.

It is in recent decades, concepts such as gender medicine, gender analysis have become widespread and have attracted the attention of not only sociologists, cultural scientists, social scientists, but also medical researchers (Thiede M. et al., 2014; Nestler K. et al., 2017; Phillips KA., 2017). This is due to the fact that men and women have different biological characteristics, different physiological functions, different features of the organs and systems functioning, different dietary preferences, different behavioral stereotypes, etc.

These differences cause a different tendency to develop certain diseases in the representatives of different genders [2]. This is the case of dental diseases, too, but gender differences in dentistry have not yet been studied properly and most publications are only devoted to the features of the oral cavity anatomical structure, oral hygiene, dental caries or periodontritis [1, 4, 5, 10, 11]. Also today despite considerable achievements of modern dentistry, the problem of dentition defects (DD) occurrence, the frequency of which remains high [3, 8], doesn't lose relevance. DD are the cause of masticatory disorders, constant discomfort and even psychological trauma. DD gradually lead to the development of dental deformities and a number of irreversible dysfunctional changes.

Modern literature sources contain information on the condition of the dentition of residents in different regions of Ukraine, but there is no systematic data on the condition of the dentition in the population of the Kharkiv region in recent years.

The purpose of the study was to analyze the prevalence of small dentition defects in the adult population of the Kharkiv region by gender.

Materials and methods. Orthopantomograms (OPTG) of 1269 patients were referred to the WDE Diagnostic Center (Kharkiv) for the purpose of initial studying the condition of the dento-alveolar apparatus within the period from May 2017 to May 2020. Digital panoramic 2D diagnostics was performed with Vereviewepocs 3D R100 fifth-generation dental computed tomography scanner (Morita, Japan). Distribution of factual material was carried out according to the age of the patients undergoing examination, from young (from 18 years) to senile (up to 84 years) according to the WHO classification (2019) every 5 years. The exceptions were the first (18–19 years) and the last groups (80–84 years), where, due to the small number of persons, their grouping was performed according to the following and previous groups in order to obtain reliable data in compliance with the World Health Organisation recommendations (1988). The total number of observation groups in our study was 12. Age groups are homogeneous by sex (χ^2=19.68, p=0.37). All ethical requirements for meeting the confidentiality of information obtained during the study were met. The work was reviewed and approved by the Bioethics Commission of the KhNMU, MOH of Ukraine. The analysis of the primary material was performed on a gender basis in the following areas: absence of any dentition defects (DD), presence of small DD (defect length – from 1 to 3 teeth) and large DD (defect length – more than 3 teeth).

SPSS Statistics 19.0 and Statistica 64 version 10 application packages were used to process the obtained results statistically. The results obtained were considered statistically significant at $p<0.05$.

Results of the study and their discussion. The performed OPTG analysis of 1269 persons showed that among the total number of the radiographic material, 62.61 % belonged to women (767 persons) and 37.39 % (by 1.67 times less, $p<0.05$) – to men (502 persons). The number of female persons' OPTG exceeded that of male in all age groups: from gr.1 to gr.9 respectively by 1.67, 1.48, 1.65, 1.23, 1.59, 1.48, 1.23, 1.45, 1.35 times and even by 2.25 and by 3.44 times respectively in gr.10 and gr.11 (χ^2=8.859, p=0.012). Only in the last group 12 the material distribution was proportional – 50.00 % for both genders (Table 1).

Table 1.

Quantitative distribution of patients' OPTG by age and gender, abs/ %.

Groups	Age gradation, years	Total number, n=1269 abs. / %	Women, n=767 abs. / %	Men, n=502 abs. / %
gr. 1	18–24	115/100	72/62.61	43/37.39
gr. 2	25–29	164/100	98/59.76	66/40.24
gr. 3	30–34	210/100	131/62.38	79/37.62
gr. 4	35–39	141/100	78/55.32	63/44.68
gr. 5	40–44	127/100	78/61.42	49/38.58
gr. 6	45–49	107/100	64/59.81	43/40.19
gr. 7	50–54	85/100	47/55.29	38/44.71
gr. 8	55–59	91/100	54/59.34	37/40.66
gr. 9	60–64	92/100	53/57.61	39/42.39
gr. 10	65–69	65/100	45/69.23	20/30.77
gr. 11	70–74	40/100	31/77.50	9/22.50
gr. 12	75–84	32/100	16/50.00	16/50.00

The analysis of the dentition status by gender permitted to establish the following: among the total number of women (767) whose OPTG was analyzed, any defects were absent in 262 persons (34.2 %), in 392 women (51.1 %) small DDs were found, and large DDs were revealed in 113 (14.7 %) (fig. 1).

Among men, the total of 502 persons, there were no defects in 132 persons (26.3 %), the presence of small DDs was established in 284 persons (56.6 %), and large ones in 86 (17.1 %). That is, the condition of the dentitions is better in women than that in men, namely: small DDs in women were less than by 1.10 times, large ones – less than by 1.16 times, and the absence of DDs, on the contrary, was by 1.3 times more frequent in women than that in men. However, no statistically significant differences were found (χ^2=8.859, p=0.012).

It should also be noted that the number of persons who were found to have small DDs was the highest among all items that were subject to analysis (along with the absence of any defects and large DDs) in both genders. Therefore, further analysis will be focused on the characteristics of small defects in the dentition (topographic and quantitative).

Gender dental status analysis of the Kharkiv region residents was also applied to their topographic characteristics. Thus, the quantitative characteristics of the small DDs in the lower jaw are shown in fig. 2, which clearly demonstrates that for all categories subjected to analysis, with the exception of the simultaneous presence of four small DDs, the leading positions were occupied by female persons.

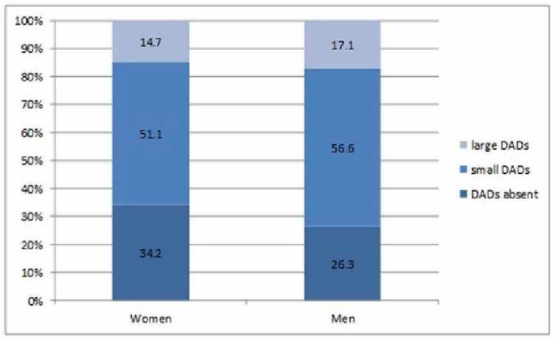

Fig. 1. Analysis of the dental arches status by gender, %.

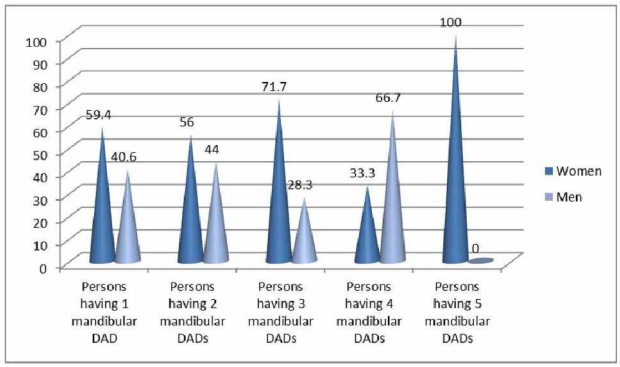

Fig. 2. Prevalence of small DDs in the lower jaw depending on gender, %.

At the same time, gender differences were statistically significant in the cases of simultaneous presence of three small DDs (women more than men by 2.53 times, p<0.001), four (women less than men by 2.0 times, p<0.05) and five small DDs, which in 100 % of cases were only detected in female persons (p<0.001). In general, women with small DDs in the mandible were by 1.41 times more than men, but there was no statistically significant association between the gender and the number of small DDs in the mandible (χ^2=3.086, p=0.379).

Gender aspects of the quantitative characteristics of small DDs in the upper jaw are shown in fig. 3, which proves that in all categories which the analysis was performed for, the leading positions were occupied by female persons.

At the same time, gender differences were statistically significant in the cases of having a single small DD in the upper jaw (women more than men by 1.51 times, p<0.05), while having four and five small DDs (women less than men by 2.0 times in both cases, p<0.05). In general, women who had small upper jaw DDs were by 1.35 times more than men, but there was no statistically significant association between gender and the number of small upper DDs (χ^2=3.344, p=0.647).

The performed analysis of topographic features of small DDs in the frontal areas shows the absence of any gender features. Thus, there were by 1.1 times more men who had a single DD in the frontal areas than women (p>0.05). In the case of simultaneous presence of two small DDs in the frontal areas, on the contrary, the number of women exceeded the number of men by 1.8 times (p<0.05). Finally, the simultaneous presence of three defects of the specified localization was recorded in men only (p<0.001). However, there was no statistically significant correlation between the gender and the number of small frontally localized DDs (χ^2=7.526, p=0.057).

The gender aspects of the small DDs prevalence in buccal areas are presented in fig. 4, which demonstrates that women in all positions of the analysis occupied leading positions.

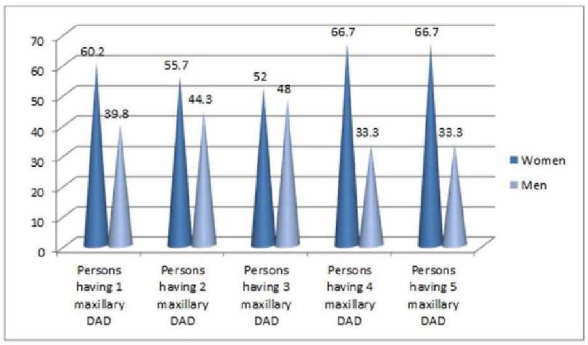

Fig. 3. Prevalence of small DDs in the upper jaw, depending on gender, %.

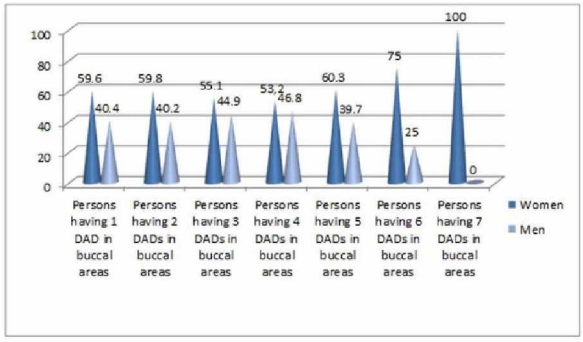

Fig. 4. Gender aspects of small DDs prevalence in lateral areas, %.

Thus, in the case of having a single small DD in the buccal areas, the number of women exceeded that of men by 1.47 times ($p>0.05$), in the case of two DDs – by 1.48 times ($p>0.05$), three DDs – by 1.22 times ($p>0.05$), four DDs – by 1.13 times ($p>0.05$), five DDs – by 1.51 times ($p>0.05$), six DDs – by 3 times ($p<0.05$). Simultaneously, the presence of seven small DDs in the buccal areas was recorded in female subjects only ($p<0.001$). In general, women who had small DDs in the buccal areas were by 1.39 times more than men, but there was no statistically significant correlation between the gender and the number of small DDs in the buccal areas ($\chi^2=7.193$, $p=0.409$).

The study showed that women have maxillary and mandibular small DDs in frontal and buccal areas more frequently than men, but no statistical difference between the prevalence of small DDs with regard to topographic characteristics and the gender was found ($p>0.05$). Regarding the quantitative characteristics of small DDs, a statistically significant correlation between the gender and the number of defects in the mandible was only found in the cases of simultaneous presence of three, four and five small defects (women more than men, $p<0.05–0.001$), in the upper jaw – in the presence of a single small DD (women more than men, $p<0.05$) and simultaneous presence of four and five small DDs (women less than men, $p<0.05$), in the frontal areas – with the presence of two small DDs (women more than men, $p<0.05$) and the simultaneous presence of three defects (women less than men, $p<0.05$) and finally in the buccal areas with only six and seven small DDs simultaneously (women more than men, $p<0.05$). The above data show that there are no gender regularities for the quantitative characteristics of small DDs in Kharkiv residents.

Thus, gender differences in medicine have a deep systemic biological basis. It is known that the physiology of a woman's body during life adapts to different and long periods of hormonal activity and is aimed at performing a unique reproductive function. This, of course, affects the level of metabolic processes of various organs and systems of a woman's body. Biological differences between men and women are also exacerbated by existing socio-behavioral (dietary preferences, bad habits, motivation to maintain one's own health) and socio-economic aspects (material security, employment, education and culture).

Gender aspects of medicine continue to attract the attention of researchers, including dentists. Over the last decade, the idea that gender plays an important role in the difference in dental morbidity and the prevalence of tooth loss among men and women has been confirmed [15].

But researchers from different countries do not have a single opinion on this issue. Thus, Chinese researchers [7] found a statistically higher proportion of complete dentition in men than in women ($p=0.01$). A literature review of Indian scientists [6] suggests a lack of gender correlation of partial edentulism. Systematic review and meta-analysis conducted by Brazilian researchers [14] showed a lower risk of edentulism in men. Male sex, according to authors, were identified as protective factors against edentulism among older individuals. Polish scholars [12] note that the female sex is an independent correlates of complete edentulism and is ahead of such indicators as advanced age, rural dwelling, lower education level, physical work in the past, smoking and diabetes. The study by Pakistan researchers [13] also found a significant, but divergent, relationship between gender and partial edentulism ($p=0.047$). At the same time the preliminary study of another pakistan population [9] no significant association between gender and pattern of partial edentulism was found.

The performed studies are generally consistent with the information of other domestic researchers. Thus, data of Labunets V.A. et al. (2013) confirm the prevalence of DD in women compared to men in general. The authors note, however, that the figure was slightly lower for women than for men in the age groups of 15–19 years and 20–24 years. But already at the age of 25–29 years, there was an increase in the

DDs prevalence in women compared to men, which, according to the authors, is due to the special physiological functions of women.

Thus, women have higher rates of tooth loss and edentulism in many populations of the world.

Our study also shows that in women the indices analyzed prevail. This can be associated not only with their unique reproductive function, but also with greater tension in the woman's social life, which in its turn may limit her ability to actively monitor her own health, including dental health. On the other hand, according to the results of our study, the condition of dentitions in women is better than that in men, which may be due to the greater motivation for women to maintain their own dental health.

Conclusion

1. According to the analysis of orthopantomograms, the status of dentitions has a gender dependence in the adult population of Kharkiv: women have no DDs more frequently than men, and small and large DDs in women are, on the contrary, diagnosed in less cases.

2. Although the prevalence of small DDs in terms of different topographic and structural characteristics was higher in women than in men, these gender differences did not have statistical reliability.

Our further research may be related to the assessing of quality of life in patients with dentition defects depending on the gender difference.

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