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CURRENT ISSUES OF GLOBAL ECOLOGY AND ENVIRONMENTAL MANAGEMENT

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LIMITS OF THE PERCENTILE RANGE OF CEPHALOMETRIC PARAMETERS OF THE UPPER AND LOWER JAWS ACCORDING TO THE COGS METHOD IN UKRAINIAN YOUNG MEN AND YOUNG WOMEN WITH DIFFERENT TYPES OF FACES

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Developmental anomalies of the dentofacial system are an important problem in modern orthodontics, as a significant proportion of patients require specialized treatment to correct morphological and functional disorders. Studies by Aldhorae K. A. et al. [1] showed that among patients of orthodontic clinics, the prevalence of anomalies of the dentition and occlusion is about 34 %, which requires a detailed approach to diagnosis and treatment planning. At the same time, the economic aspects of treating such conditions are a significant factor for the health care system, since orthodontic and surgical interventions require significant resources. As shown in the study by Niemi P. et al. [2], the average cost of orthodontic-surgical treatment with mandibular advancement can reach more than 10,000 euros, and the average duration of therapy is 34 months. Taking into account anthropometric differences is critically important for establishing accurate reference values and forming personalized approaches to the treatment of orthodontic patients. The study by Marchenko A. V. et al. [3] confirm that there is a close relationship between the linear dimensions of the jaws and the morphological type of the face, which must be taken into account when determining the optimal parameters of the dental arch. That is why the study of the percentile range of cephalometric parameters of the upper and lower jaws in young men (YM) and young women (YW) with different types of faces will contribute to the improvement of diagnostic approaches and increase the effectiveness of orthodontic treatment.

Cephalometric analysis of lateral teleradiographs of 46 YM and 72 YW with physiological occlusion was performed according to the COGS method [4] in the OnyxCeph³™ software, version 3DPro, Image Instruments GmbH, Germany.

For the convenience of clinical use of a large number of metric characteristics used in the COGS method, we used the distribution of teleradiographic indicators proposed by Dmitriev M. O. [5, 6, 7], according to which the indicators of the dentofacial system that are in the process of growth, as well as in individuals with a formed bone skeleton, in whom it is possible to change the width, length, angles and position of the upper and lower jaws with the help of orthognathic surgery, belong to the second group (Fig. 1, 2).

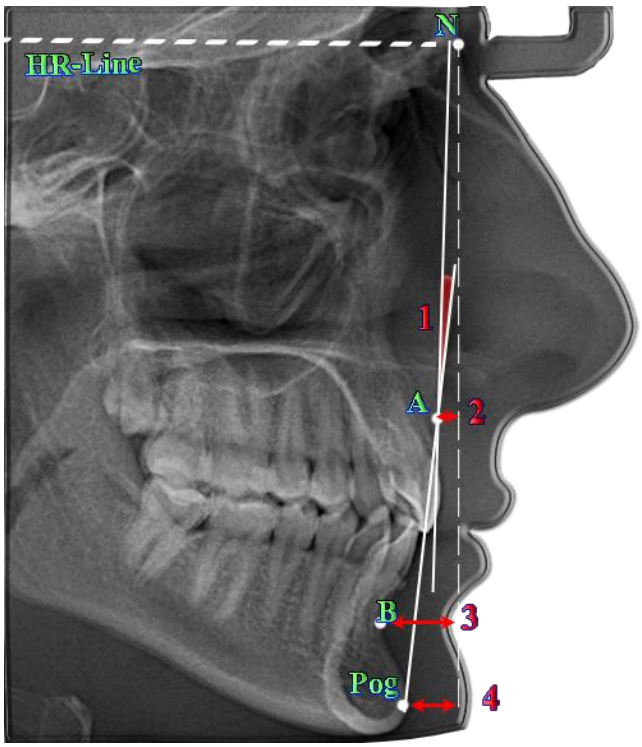

Figure 1. The main cephalometric points and measurements included in the second group of indicators of the COGS method. 1 – N-A-Pog angle; 2 – N-A distance; 3 – N-B distance; 4 – N-Pog distance.

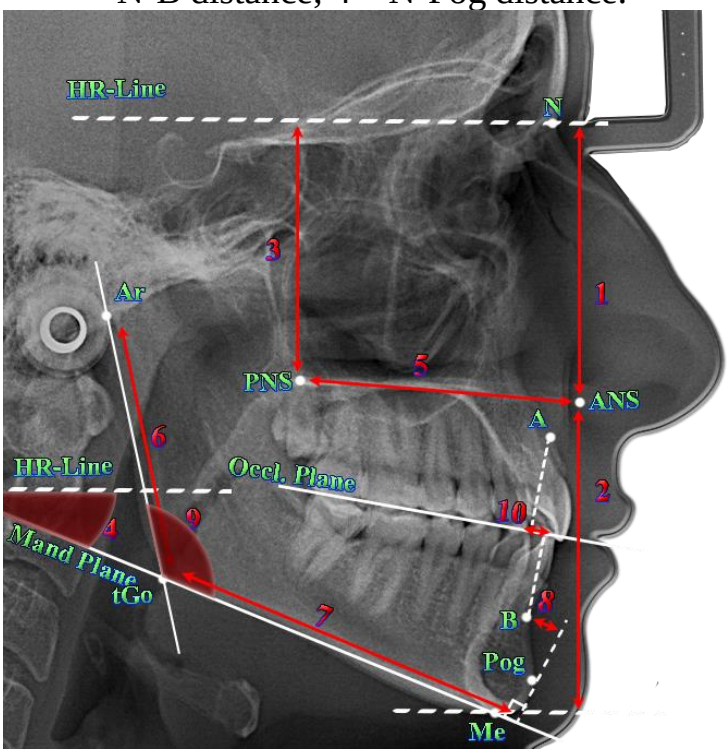

Figure 2. The main cephalometric points and measurements included in the second group of indicators of the COGS method. 1 – N-ANS distance; 2 – ANS-Me distance; 3 – PNS-N distance; 4 – MP-HP angle; 5 – ANS-PNS distance; 6 – Ar-Go distance; 7 – Go-Pog distance; 8 – B-Pog distance; 9 – Ar-Go-Gn angle; 10 – A-B distance.

The determination of the facial type was carried out according to the values of the Garson morphological index [8].

The limits of the percentile range of the obtained indicators were determined in the licensed package "Statistica 6.0".

As a result of the conducted studies in YM and YW with orthognathic bite with different types of faces, the limits of the percentile range of the magnitude of linear and angular measurements included in the second group of indicators according to the COGS method were established:

the magnitude of the N-A-Pog angle – in YM and YW with a very wide face type, respectively 2.9 – 5.8 ° and -4.5 – 1.3 °; in YM and YW with a wide face type, respectively -3.2 – 5.5 ° and 0.2 – 5.7 °; in YM and YW with an average face type, respectively -2.3 – 6.1 ° and -0.1 – 4.7 °; in YM and YW with a narrow face type, respectively -4.6 – 1.6 ° and 1.1 – 6.8 °;

the value of the N-A distance – in YM and YW with a very wide face type, respectively 0.1 – 4.8 mm and -2.3 – 0.7 mm; in YM and YW with a wide face type, respectively -2.5 – 3.2 mm and -3.3 – 1.1 mm; in YM and YW with an average face type, respectively -3.7 – 1.9 mm and -4.2 – -1.9 mm; in YM and YW with a narrow face type, respectively -3.4 – 1.1 mm and -3.2 – 2.1 mm;

the value of the N-B distance – in YM and YW with a very wide face type, respectively -1.2 – 1.9 mm and -5.1 – 0.1 mm; in YM and YW with a wide face type, respectively -9.2 – 2.8 mm and -9.7 – -2.9 mm; in YM and YW with an average face type, respectively -9.0 – -0.1 mm and -10.8 – -5.7 mm; in YM and YW with a narrow face type, respectively -7.0 – -0.1 mm and -8.8 – -3.2 mm;

the value of the N-Pog distance – in YM and YW with a very wide face type, respectively 2.0 – 5.1 mm and -3.3 – 2.5 mm; in YM and YW with a wide face type, respectively -7.2 – 4.1 mm and -9.4 – 0.5 mm; in YM and YW with an average face type, respectively -7.5 – 2.1 mm and -11.8 – -3.5 mm; in YM and YW with a narrow face type, respectively -4.6 – 5.5 mm and -8.4 – -1.7 mm;

the value of the N-ANS distance – in YM and YW with a very wide face type, respectively 41.9 – 52.2 mm and 46.2 – 49.8 mm; in YM and YW with a wide face type, respectively 48.6 – 53.3 mm and 45.7 – 48.9 mm; in YM and YW with an average face type, respectively 50.3 – 53.2 mm and 47.1 – 50.7 mm; in YM and YW with a narrow face type, respectively 52.0 – 54.9 mm and 49.2 – 52.9 mm;

the value of the ANS-Me distance – in YM and YW with a very wide face type, respectively 56.3 – 61.1 mm and 54.9 – 58.6 mm; in YM and YW with a wide face type, respectively 61.0 – 66.0 mm and 56.8 – 61.5 mm; in YM and YW with an average face type, respectively 62.1 – 67.6 mm and 58.9 – 65.6 mm; in YM and YW with a narrow face type, respectively 60.7 – 65.4 mm and 56.9 – 62.5 mm;

the value of the PNS-N distance – in YM and YW with a very wide face type, respectively 46.7 – 51.0 mm and 46.9 – 50.1 mm; in YM and YW with a wide face type, respectively 49.8 – 52.8 mm and 46.3 – 49.0 mm; in YM and YW with an average face type, respectively 48.5 – 52.4 mm and 46.5 – 49.0 mm; in YM and YW with a narrow face type, 52.6 – 55.8 mm and 48.0 – 50.6 mm, respectively;

the value of the MP-HP angle – in YM and YW with a very wide face type, respectively 8.8 – 14.4 ° and 16.7 – 21.0 °; in YM and YW with a wide face type, respectively 14.0 – 24.5 ° and 20.0 – 24.4 °; in YM and YW with an average face type,

respectively 18.5 – 23.4 ° and 23.6 – 29.5 °; in YM and YW with a narrow face type, respectively 12.5 – 21.6 ° and 21.7 – 28.3 °;

the value of the ANS-PNS distance – in YM and YW with a very wide face type, respectively 54.0 – 58.5 mm and 49.1 – 52.1 mm; in YM and YW with a wide face type, respectively 52.3 – 56.7 mm and 50.0 – 52.2 mm; in YM and YW with an average face type, respectively 49.7 – 54.7 mm and 48.1 – 54.6 mm; in YM and YW with a narrow face type, respectively 50.6 – 55.4 mm and 48.8 – 51.3 mm;

the value of the Ar-Go distance – in YM and YW with a very wide face type, respectively 55.1 – 57.9 mm and 44.3 – 49.4 mm; in YM and YW with a wide face type, respectively 50.1 – 55.4 mm and 44.0 – 49.1 mm; in YM and YW with an average face type, respectively 49.6 – 55.4 mm and 43.3 – 50.7 mm; in YM and YW with a narrow face type, respectively 50.9 – 55.3 mm and 45.7 – 49.0 mm;

the value of the Go-Pog distance – in YM and YW with a very wide face type, respectively 76.7 – 86.3 mm and 71.6 – 76.5 mm; in YM and YW with a wide face type, respectively 72.8 – 81.4 mm and 71.2 – 74.4 mm; in YM and YW with an average face type, respectively 74.2 – 83.7 mm and 65.9 – 74.4 mm; in YM and YW with a narrow face type, respectively 76.4 – 82.9 mm and 70.7 – 74.8 mm;

the value of the B-Pog distance – in YM and YW with a very wide face type, respectively 4.5 – 6.4 mm and 5.8 – 6.9 mm; in YM and YW with a wide face type, respectively 6.8 – 8.3 mm and 4.6 – 6.6 mm; in YM and YW with an average face type, respectively 6.3 – 8.5 mm and 5.9 – 7.7 mm; in YM and YW with a narrow face type, respectively 6.5 – 8.9 mm and 6.6 – 7.9 mm;

the value of the Ar-Go-Gn angle – in YM and YW with a very wide face type, respectively 113.7 – 117.9 ° and 112.6 – 121.5 °; in YM and YW with a wide face type, respectively 114.7 – 124.5 ° and 113.8 – 123.3 °; in YM and YW with an average face type, respectively 116.2 – 123.7 ° and 117.1 – 128.5 °; in YM and YW with a narrow face type, respectively 114.2 – 120.4 ° and 119.8 – 128.5 °;

the value of the distance A-B – in YM and YW with a very wide face type, respectively 0.8 – 2.6 mm and -3.0 – -0.5 mm; in YM and YW with a wide face type, respectively -1.8 – 2.2 mm and -.2.5 – 1.0 mm; in YM and YW with an average face type, respectively -2.2 – 0.6 mm and -.2.9 – -1.3 mm; in YM and YW with a narrow face type, respectively -1.6 – 1.4 mm and -3.7 – 1.5 mm.

In Ukrainian YM and YW with physiological occlusion with very wide, wide, medium and narrow facial types, the limits of the percentile range of linear and angular indicators of the upper and lower jaws were established using the COGS method. Most of the established indicators have discrepancies both by facial type and, more pronouncedly, by sex.

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