

- hormones in children with major beta-thalassemia. Iran J Ped Hematol Oncol. 2013;3(4):149–53.
14. Wailace AM, Mc Mahon AD, Packard CJ, Kelly A, Shepherd J, Gaw A, et al. Plasma leptin and the risk of cardiovascular disease in the west of Scotland coronary prevention study (WOSCOPS). Circulation. 2011;104:3052–60.
15. Yu D, Yu Z, Sun Q. Effects of body fat on the associations of high-molecular-weight adiponectin, leptin and soluble leptin receptor with metabolic syndrome in Chinese. PLoS One. 2011;6(2):e16818.

#### Реферати

#### ВПЛИВ КОМПЛЕКСНОГО ЛІКУВАННЯ ГІПОТИРЕОЗУ НА РІВЕНЬ ЛЕПТИНУ У ХВОРИХ ІЗ ПЕРВИННИМ ГІПОТИРЕОЗОМ

Дідушко О.М., Герич П.Р., Чернявська І.В., Яцишин Р.І., Паньків В.І.

Обстежено 188 хворих на первинний гіпотиреоз та 30 людей без порушення функції щитоподібної залози, порівнянних за статтю і віком. При оцінці рівня лептину в сироватці крові хворих на гіпотиреоз відзначено, що збільшення маси тіла у даних пацієнтів супроводжується наростанням його концентрації. Виявлено більш виражену гіперлептинемію у хворих на післяопераційний гіпотиреоз. Базове лікування левотироксином і особливо його поєднання з аторвастатином сприяло покращенню клінічного стану хворих, зменшенню проявів гіпотиреозу, зниженню ваги тіла. Включення до комплексного лікування аторвастатину мало достовірний вплив на рівень лептину у хворих на гіпотиреоз із ожирінням незалежно від етіології гіпотиреозу.

**Ключові слова.** Гіпотиреоз, гіперлептинемія, ожиріння, лікування.

Стаття надійшла: 5.06.18р.

#### ВЛИЯНИЕ КОМПЛЕКСНОГО ЛЕЧЕНИЯ ГИПОТИРЕОЗА НА УРОВЕНЬ ЛЕПТИНА У БОЛЬНЫХ С ПЕРВИЧНЫМ ГИПОТИРЕОЗОМ

Дидушко О.Н., Герич П.Р., Чернявская И.В., Яцишин Р.И., Панков В.И.

Обследовано 188 больных первичным гипотиреозом и 30 человек без нарушения функции щитовидной железы, сопоставимых по полу и возрасту. При оценке уровня лептина в сыворотке крови больных гипотиреозом отмечено, что увеличение массы тела у данных пациентов сопровождается нарастанием его концентрации. Выявлено более выраженную гиперлептинемию у больных послеоперационным гипотиреозом. Базовое лечение левотироксином и особенно его сочетание с аторвастатином способствовало улучшению клинического состояния больных, уменьшению проявлений гипотиреоза, снижению веса тела. Включение в комплексное лечение аторвастатина имело достоверное влияние на уровень лептина у больных гипотиреозом с ожирением независимо от этиологии гипотиреоза.

**Ключевые слова.** Гипотиреоз, гиперлептинемия, ожирение, лечение.

Рецензент Катеринчук І.П.

DOI 10.26724/2079-8334-2018-3-65-63-68

UDC 616.314-084

M.O. Dmitriev, A.I. Kondratyuk, O.N. Semenenko, A.I. Kondratiuk  
National Pirogov Memorial Medical University, Vinnytsya

#### HOLDAWAY'S SOFT-TISSUE CEPHALOMETRIC ANALYSIS NORMS FOR THE UKRAINIAN POPULATION

E-mail: dmitriyevnik@gmail.com

Numerous studies prove the opposite viewpoint and conclusions about the influence of cephalometric parameters of hard and soft tissues on the aesthetic result that the physician gets at the end of orthodontic treatment. Therefore, there is a need to continue research on the accumulation, analysis and modeling of the patterns of the structure of the craniofacial complex, taking into account ethnic, age and sexual characteristics. The purpose of the work is to study the features of cephalometric parameters in Ukrainian boys and girls with orthognathic bite using the Holdaway method compared to the results established for other races and ethnic groups. With the Veraviewepocs 3D device, Morita (Japan) in 38 boys (in age from 17 to 21 years) and 55 girls (aged from 16 to 20 years) with physiological bite maximally close to the orthognathic side teleroentgenograms were obtained. Measurements were carried out in accordance with the recommendations of R. A. Holdaway (1983, 1984), and cephalometric points were determined according to A. E. Athanasiou (1997) and S. I. Doroshenko, Ye. A. Kulgynskiy (2007). The article presents the cephalometric parameters of soft facial tissues by the Holdaway method for the Ukrainian population of juvenile age with orthognathic bite and evaluates the discrepancies of these parameters with the results obtained by researchers in the study of other populations according to this technique. Among the Ukrainian boys or girls with orthognathic bite and gender-specific indicators of the Saudi, Turkish, North American, Palestinian and Persia populations, as well as with the Japanese (regardless of sex), there are numerous differences in teleroentgenogram indices by the Holdaway method. The largest number of discrepancies in these indicators is set with the Japanese, and the smallest - with the Palestinians.

**Keywords:** Holdaway's analysis, cephalometry, Ukrainian boys and girls, orthognathic bite.

*The paper is a fragment of the research project "Clinical and experimental justification of the application of new methods for prevention, diagnosis, treatment of children and adolescents with anomalies in the dento-jaw system and caries complications" (state registration No. 0115U007010).*

When studying the possibilities of correction of tooth-jaw deformations and the profile of soft facial tissues for the further conduct of orthodontic or surgical treatment or contouring facial plastic surgery, in addition to his subjective vision and wishes of the patient, it is very important for doctor to have more precise meanings of metric indices and their individual variations. After all, the nature of the correlation of the anatomical structures of the head itself creates a sense of harmony and aesthetic perception of its own face [10].

The most common and accessible diagnostic method that provides information on the location of bone and soft head structures is lateral cephalometry. In attempts to objectify the understanding of the harmony and the aesthetics of the soft face profile, researchers who studied subjects with normal occlusion and balanced faces proposed different methods for the analysis of cephalograms with the corresponding normative bases [4, 12]. These methods form the foundation of modern anthropometric studies aimed at studying the ethnic diversity of human traits and a deeper understanding of the interaction and relationships of various anatomical facial structures. But some studies point out that values that were proposed as "universal" or "normal" are often incorrect in diagnostic and therapeutic planning in patients of different ethnic and racial groups [8]. The obtained results indicate the need to revise the standards, taking into account that the majority of cephalometric norms were obtained for the North American population and are completely unsuitable for African and Asian populations. The presence of distinct differences in profile characteristics of the face with generally accepted European norms indicates the study of Iranians, Mexicans [11], Turks [9], Northern Indians, Saudis [5], Palestinians, Mongols and Koreans, Brazilians.

**The purpose** of the work was to study the features of cephalometric parameters in Ukrainian boys and girls with orthognathic bite using the Holdaway`s method compared to the results established for other races and ethnic groups.

**Materials and methods.** With the Veraviewepocs 3D device, Morita (Japan), 38 boys (aged from 17 to 21) and 55 girls (aged from 16 to 20 years) with normal occlusion close to orthognathic bite, received side telerontgenograms and analyzed.

Cephalometric points and measurements were carried out in accordance with the recommendations of R. A. Holdaway [12], and taking into account the recommendations of A. E. Athanasiou [3] and S. I. Doroshenko and Y. A. Kulginsky [1].

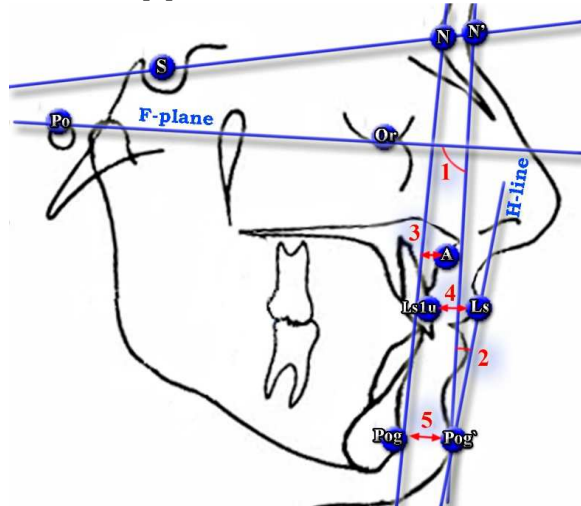


Fig. 1. 1 – Soft-Tissue Facial Angle, angle  $P\_Or\_N'Hold\_Pog'$ ; 2 – H Angle, angle  $N'Hold\_Pog'\_Hline$ ; 3 – Skeletal profile Convexity, distance  $A\_N\_Pog$ ; 4 – Upper Lip Strain, distance  $Ls1u\_Ls$ ; 5 – Soft Tissue Chin Thickness, distance  $Pog\_Pog'$ .

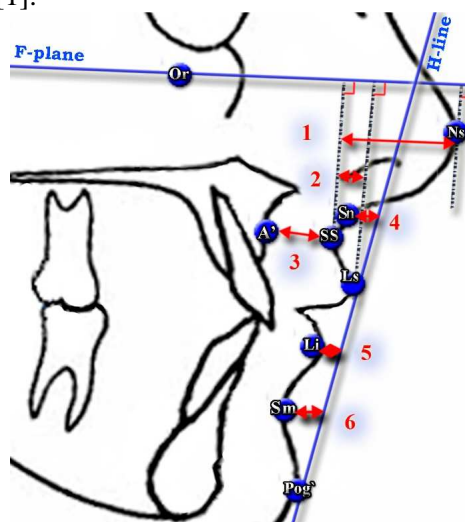


Fig. 2. 1 – Nose prominence, distance  $SS\_Ns$ ; 2 – Superior Sulcus Depth, distance  $SS\_Ls$ ; 3 – Basic Upper Lip Thickness, distance  $A'\_SS$ ; 4 – Soft tissue Subnasale to H line, distance  $Sn\_H\ line$ ; 5 – distance from the  $Li$  to the  $H\ line$ ; 6 – Inferior Sulcus to H Line, distance  $Sm\_H\ line$ .

According to the Holdaway method, the following indicators (fig. 1, fig. 2) were studied: Angle  $P\_Or\_N'Hold\_Pog'$  – **Soft-Tissue Facial Angle**, angle between the Frankfurt Horizontal  $Po-Or$  and the line between soft-tissue Nasion acc. to Holdaway and soft-tissue Pogonion  $N'Hold-Pog'$  (degree); angle  $N'Hold\_Pog'\_Hline$  – **H Angle**, angle between the  $H-line\ Ls-Pog'$  and the reference line  $N'Hold-Pog'$  (degree); distance  $A\_N\_Pog$ , – **Skeletal profile Convexity**, distance from  $A$  to the Facial plane  $N-Pog$  (mm); distance  $Ls1u\_Ls$  – **Upper Lip Strain**, thickness of vermillion of upper lip, distance from the labial outline of the crown of the most prominent upper incisor  $Ls1u$  to the upper lip's edge  $Ls$  (mm); distance  $Pog\_Pog'$  – **Soft Tissue Chin Thickness**, distance of the points  $Pog'$  and  $Pog$ , representing the thickness of soft tissue at the chin (mm); distance  $SS\_Ns$  – **Nose prominence**, distance from the tip of the nose  $Ns$  to the sulcus of the upper lip  $Ss$ , measured parallel to the Frankfurt Horizontal (mm); distance  $SS\_Ls$  – **Superior Sulcus Depth**, distance from the upper lip sulcus  $Ss$  to a perpendicular to the Frankfurt Horizontal through the point  $Ls$  (mm); distance  $A'\_SS$  – **Basic Upper Lip Thickness**, distance between  $A'$  point and the naso-labial sulcus  $Ss$  (mm); distance  $Sn\_H\ line$  – **Soft tissue Subnasale to H Line**, distance from  $Sn$  to the  $H-line\ (Ls-Pog')$  (mm); distance  $Li\_H\ line$  – **distance from the lower lip's**

edge **Li to the H-line (Ls-Pog')** (mm); distance **Sm\_H line – Inferior Sulcus to H Line**, distance from the Sm to the H-line (Ls-Pog') (mm).

The statistical processing of the obtained results was carried out in the licensed package "Statistica 6.0" using nonparametric methods for evaluating the obtained results.

**Results of the study and their discussion.** The attempt to discover the ethnic laws of natural beauty is due to the need to create a normative framework for the population of Ukraine, which the orthodontist doctor can rely on in determining the treatment plan and creating a visualized ultimate goal.

We have established the boundaries of the percentile scale (25p-1 –75p-1) of teleroentgenographic indicators by the Holdaway method in Ukrainian boys and girls with orthognathic bite (table 1).

Table 1

**Limits of percentile scope (25p-1 –75p-1) teleroentgenographic indicators by the Holdaway method in Ukrainian boys and girls with orthognathic bite**

Indicators	Boys	Girls
	25p-1 –75p-1	25p-1 – 75p-1
(P_Or_N'Hold_Pog') Soft tissue facial angel (°)	89.48 – 94.15	89.00 – 92.88
(SS_Ns) Nose prominence (mm)	16.42 – 19.44	15.52 – 18.90
(SS_Ls) Superior Sulcus Depth (mm)	2.363 – 3.285	2.026 – 3.298
(Sn_H line) Soft tissue Subnasale to H Line (mm)	3.192 – 6.400	2.395 – 5.376
(A_N_Pog) Skeletal profile convexity (mm)	-1.095 – 2.555	-1.053 – 1.920
(A'_SS) Basic Upper lip thickness (mm)	15.35 – 17.17	12.13 – 14.69
(Ls1u_Ls) Upper Lip strain (mm)	13.53 – 15.64	11.38 – 13.47
(N'Hold_Pog'_Hline) H-Angle (°)	11.04 – 16.89	7.801 – 13.98
(Li_H line) Distance from the Li to the H-line (mm)	-0.913– 1.066	-0.484 – 1.387
(Sm_H line) Inferior Sulcus to H Line (mm)	4.905– 7.516	3.842 – 5.854
(Pog_Pog') Soft Tissue Chin Thickness (mm)	11.30 – 13.43	10.27 – 12.06

There is a need to determine the cephalometric parameters of hard and soft tissues for different ethnic groups, as well as the importance of taking into account certain differences in the interpretation by orthodontists or jaw-facial surgeons results of metric research [14], as well as taking into account the aesthetic preference in creating an individual treatment plan [7]. After all, attempts to achieve artificial aesthetic ideal, without taking into account individual morphological variations of facial characteristics, can lead to unnecessary unwarranted surgical intervention. On the other hand, the physician's desire to create functional and stable occlusion may not always coincide with the maximum aesthetic result, which may change over time. Therefore, in addition to the importance of the effects of the facial features of soft tissues on the aesthetic outcome that the physician gets at the end of the orthodontic treatment, it is important to understand the future changes that occur with the patient's age. Many studies are devoted to this issue and the changes that occur when tooth extraction is described and continues to be studied by many authors [7, 13, 15]. Since these studies prove the opposite points of view and conclusions, there is a need to continue research on the accumulation, analysis and modeling of the laws of the structure of the craniofacial complex, taking into account the age group, ethnicity and sex.

We have established numerous differences in cephalometric indicators by the Holdaway method in Ukrainian boys and girls with orthognathic bite in comparison with the results established for other races and ethnic groups.

As a rule, the position and shape of the mandible causes the dominant position in the formation of the profile of the face. And since the aesthetic perception of the profile is determined by the soft tissue point (Pog'), whose position is due both to the shape and position of the bone fundament and thickness of the chin itself, which can compensate or decompensate the anomaly of the bone skeleton [12]. And that is why the digital expression of the value of the Soft tissue facial angel is very important in the objectification of the notion of aesthetics. Compared to North Americans of both sexes ( $p < 0.001$  in both cases) and Persians ( $p < 0.05$ ) women, in Ukrainian boys or girls this angle is smaller, that is, the profile is more retrograde. But on the contrary, in Ukrainian boys and girls, this angle is greater, that is, the profile is more prognostic than that of the representatives of both sexes of the Turkish population ( $p < 0.05-0.01$ ) and of the Saudis ( $p < 0.01$ ). Nose prominence indicator or its severity also has a very significant effect on the shape of the face, but as a rule, in its formation, the more involved are soft tissue and cartilage than nasal bones. This indicator allows you to conditionally define a nose as small, medium and large, and take these values into account in an individual context [12]. Average values of this indicator are lower in Saudi ( $p < 0.001$  in both cases), North Americans ( $p < 0.05-0.001$ ) and Japanese ( $p < 0.001$  in both cases) both sexes, as well as in Persian ( $p < 0.001$ ) women and larger in Palestinians of both sexes ( $p < 0.05-0.001$ ) and Turks ( $p < 0.01$ ) than in the corresponding groups of Ukrainian boys or girls.

Superior Sulcus Depth allows you to determine the shape and severity of the upper lip. As the most aesthetic value Holdaway determines 3 mm with tolerances from 1 to 4 mm. The average values of this indicator are higher in the Persian ( $p<0.05-0.001$ ) and Japanese ( $p<0.001$  in both cases) of both sexes, as well as in the Saudis ( $p=0.064$ ) and North American population ( $p<0.05$ ) than in the corresponding groups of Ukrainian boys or girls. Diagnostically, this indicator is very important especially in patients with a significantly convex or concave facial profile, when the definition of the H-line (harmony line) is complicated. Taking into account the values of this parameter will allow to reduce the number of patients dissatisfied with changes in the profile after extraction and excessive distalization of the frontal group of teeth. When planning a treatment, one should clearly understand where there should be a tooth row for optimal support for the upper lip. Holdaway believes this indicator is more convenient to use than the often used nasolabial angle, since the latter does not determine the abnormality of the position of the lip and nose. Also, in the author's opinion, it is better to characterize this site precisely with respect to the Frankfurt plane than to the H-line, E-line, Z-line, or S-line by Steiner [12].

The Soft tissue Subnasale to H Line indicator is very useful for everyday use in the modeling of the Visualized Treatment Objective (VTO). If the patient has short and thin lips - the value is close to 3 mm, if thick and long - 7 mm. However, the indicators of 8 and 9 mm are not considered as indicating the need for extraction of premolars. In the case of strong convexity or concavity of the face profile, all measurements regarding the H-line lose their meaning due to the incorrect location of the upper lip, which determines the H-line [12]. The average values of this indicator are higher in Persians ( $p<0.05-0.001$ ) and in Japanese ( $p<0.001$  in both cases) in both sexes, as well as in Turks ( $p=0.068$ ) than in the corresponding groups of Ukrainian boys or girls.

Skeletal profile convexity indicator determines the position of the convexity of the skeletal profile due to the characteristic of the position of the upper jaw, namely, point A, to the line N-Pog. Since the proprietary bone profile is tightly integrated with the understanding of the harmonic position of the lips, its definition is important in understanding the individual features of the face [17]. The mean values of this indicator were higher among the Japanese in both sexes ( $p<0.05-0.01$ ), in Saudis ( $p<0.01$ ), North American population ( $p<0.05$ ), Palestine ( $p<0.05$ ), and Persia women ( $p<0.01$ ) than in the corresponding groups of Ukrainian boys or girls; as well as smaller ones - in Turks ( $p<0.05$ ) than in Ukrainian boys.

The Basic Upper lip thickness indicator is very useful when compared to Upper Lip strain, which allows you to estimate the level of tension or existing incongruity of the lips that cover abnormal incisors [12]. The mean values of this indicator are higher in Turks ( $p<0.001$  in both cases), North Americans ( $p<0.001$  in both cases) and Persians ( $p<0.001$  in both cases) in both sexes, Saudis ( $p<0.01$ ), Palestinians ( $p<0.01$ ) and Japanese ( $p<0.001$ ) women, as well as smaller in Japanese ( $p<0.05$ ) men than in the corresponding groups of Ukrainian boys or girls.

The Upper Lip strain measurement indicator allows you to assess the state of the upper lip tension and also an indicator of vertical bite violations. So the decrease of this indicator shows that the lips are tightening overlying vestibularly located incisors. If this index is much larger than the thickness of the base of the upper lip, then this indicates a lack of growth in the vertical plane, and as a rule, when excessive overlapping of the front teeth there is an excessive increase in the lips [12]. The mean values of the upper lip voltage index are lower in the Saudis of both sexes ( $p<0.01$  in both cases) and larger in Persian ( $p=0.064$ ) women than in the corresponding groups of Ukrainian boys or girls.

The Holdaway angle (H-Angle), or the location of the H-line relative to the soft-tissue faceplate, allows us to determine the maximum aesthetic location of the upper lip contour, taking into account the individual characteristics of the convexity of the human skeletal profile. Holdaway recommends to determine the individual value of H-Angle, by adding 10 degrees to the value of the degree of convexity of the skeletal profile. The ideal value of H-Angle is 10 degrees, with a convexity of 0 mm. The value of the H-Angle when considering the values of the skeletal convexity and the depth of the nasolabial fold can be a good benchmark for determining the position of the central incisors in the anterior-posterior direction, which will provide full support for the upper lip and its natural, non-stressed position and condition [12]. The mean values of this indicator were higher in Saudis ( $p<0.001$ ), Turkish ( $p<0.05$ ), Palestinians ( $p<0.01$ ), Persians ( $p<0.001$ ) and Japanese ( $p<0.001$ ) women than in Ukrainian girls; as well as lower in North Americans ( $p<0.05$ ) than in Ukrainian boys. Distance from the Li to the H-line indicator is considered to be optimal when the lower lip is positioned on the H-line or 0.5 mm in front. But acceptable values are in the range of 1 mm behind and 2 mm ahead of the H-line. The position of the lower lip is much larger behind the H-line, with an adequate meaning of other indicators, indicates the extremely tongue position of the lower incisors. Sometimes this may be the result of orthodontic treatment with serial removal of the teeth in the event that this approach was not shown, or the early

dropout of temporary canine, or even the early loss of the first permanent molars. Such cases require orthodontic or surgical correction of the lower dental arc to restore the anatomical support of the lower lip [12]. The mean values of the distance from the lower lip to the H-line are greater in the Palestinians ( $p<0.01-0.001$ ) and in the Japanese ( $p<0.01-0.001$ ) in both sexes, Saudis ( $p<0.05$ ) and Persian ( $p<0.05$ ) women than in the corresponding groups Ukrainian boys or girls.

The Inferior Sulcus to H Line distance indicator is a convenient indicator of the vestibular-lingual inclination of the lower incisors, the movement of which during orthodontic treatment can improve or worsen the exposure of the chin and Inferior Sulcus [12]. The average values of this indicator are lower in the Saudis ( $p<0.05-0.001$ ) and in the Japanese ( $p<0.01-0.001$ ) in both sexes than in the corresponding groups of Ukrainian boys or girls and larger in Turks ( $p=0.055$ ) than in Ukrainian boys.

The Soft Tissue Chin Thickness indicator may vary greatly and needs to be taken into account when moving the frontal upper and lower jaw teeth group in the anterior-posterior direction to create optimum support for lips [12]. Average values of this indicator are higher in Turks ( $p<0.05$  in both cases), North Americans ( $p<0.001$  in both cases), Persian ( $p<0.01-0.001$ ) and Japanese ( $p<0.001$  and  $p=0.050$ ) in both sexes, than in the corresponding groups of Ukrainian boys or girls.

### Conclusions

1. In Ukrainian boys and girls with orthognathic bite, boundaries of the percentile scope of teleroentgenographic indicators by the Holdaway method are set.
2. There are numerous differences in the teleroentgenographic characteristics of the Holdaway method between the Ukrainian boys or girls with orthognathic bite and relevant by gender indexes of the Saudi, Turkish, North American, Palestinian and Persia populations, as well as with the Japanese (regardless of gender).
3. The largest number of teleroentgenographic discrepancies by the Holdaway method is established with the Japanese, and the smallest – with the Palestinians.

### References

1. Doroshenko SI, Kulginskiy EA. Osnovy telerentgenografii. Kyiv: Zdorovya; 2007. 72 p. [in Russian]
2. Alcalde RE, Jinno T, Orsini MG, Sasaki A, Sugiyama RM, Matsumura T. Soft tissue cephalometric norms in Japanese adults. Am. J. Orthod. Dentofacial Orthop. 2000; 118(1):84-9.
3. Athanasiou AE. Orthodontic cephalometry. London. Osby Wolfe; 1997. 241-292 p.
4. Arnett GW, Bergman RT. Facial keys to orthodontic diagnosis and treatment planning. Part I. Am. J. Orthod. Dentofacial. Orthop. 1993; 103: 299-312.
5. Barakatia NA, Bindayelb K. Holdaway soft tissue cephalometric standards for Saudi adults. Saud University Journal of Dental Sciences. 2012; 3(1): 27-32.
6. Basciftci FA, Uysal T, Buyukerkmen A. Determination of Holdaway soft tissue norms in Anatolian Turkish adults. Am J Orthod Dentofacial Orthop. 2003; 123(4): 395-400.
7. Bowman SJ, Johnston LE Jr. The esthetic impact of extraction and nonextraction treatments on Caucasian patients. Angle Orthod. 2000; 70: 3-10.
8. Bronfman CN, Janson G, Pinzan A, Rocha TL. Cephalometric norms and esthetic profile preference for the Japanese: a systematic review. Dental Press J. Orthod. 2015; 20(6): 43-51.
9. Celebi A.A, Tan E, Gelgor IE, Colak T, Ayyildiz E. Comparison of Soft Tissue Cephalometric Norms between Turkish and European-American Adults. The Scientific World Journal. 2013; Article ID 806203: 6. <http://dx.doi.org/10.1155/2013/806203>.
10. Coleman G, Lindauer S, Tufekci E, Shroff B, Best A. Influence of chin prominence on esthetic lip profile preferences. Am. J. Orthod. Dentofacial Orthop. 2007; 132(1): 36-42.
11. Gonzalez MB, Caruso JM, Sugiyama RM, Schlenker WL. Establishing cephalometric norms for a Mexican population using Ricketts, Steiner, Tweed and Arnett analyses. APOS Trends Orthod. 2013; 3: 171-177.
12. Holdaway RA. A soft-tissue cephalometric analysis and its use in orthodontic treatment planning. Part I. Am. J. Orthod. 1983; 84(1): 1-28.
13. Kocadereli I. Changes in soft tissue profile after orthodontic treatment with and without extractions. Am. J. Orthod. Dentofacial Orthod. 2002; 122: 67-72.
14. Shindoi JM, Matsumoto Y, Sato Y, Ono T, Harada K. Soft tissue cephalometric norms for orthognathic and cosmetic surgery. J. Oral Maxillofac. Surg. 2013; 71(1): 24-30.
15. Wholley CJ, Woods MG. The effects of commonly prescribed premolar extraction sequences on the curvature of the upper and lower lips. Angle Orthod. 2003; 73: 386-395.

### Реферати

#### НОРМЫ ДЛЯ ЦЕФАЛОМЕТРИЧНОГО АНАЛИЗА М'ЯКИХ ТКАНИН ЗА ХОЛДАВЕСМ ДЛЯ УКРАЇНСЬКОЇ ПОПУЛЯЦІЇ

Дмітрів М.О., Кондратюк А.І., Семененко О.М.,  
Кондратюк А.І.

Багаточисельні дослідження доводять протилежні точки зору та висновки стосовно впливу цефалометричних

#### НОРМЫ ДЛЯ ЦЕФАЛОМЕТРИЧЕСКОГО АНАЛИЗА МЯГКИХ ТКАНЕЙ ПО ХОЛДАВЕЮ ДЛЯ УКРАИНСКОЙ ПОПУЛЯЦИИ

Дмитриев Н.А., Кондратюк А.И., Семененко О.Н.,  
Кондратюк А.И.

Многочисленные исследования доказывают противоположные точки зрения и выводы относительно

параметрів твердих та м'яких тканин на естетичний результат, який лікар отримує наприкінці ортодонтчного лікування. Тому існує необхідність в продовженні досліджень що присвячені накопиченню, аналізу та моделюванню закономірностей будови краніофациального комплексу із врахуванням етнічних, вікових і статевих особливостей. Мета дослідження – вивчення особливостей цефалометричних параметрів у українських юнаків і дівчат з ортогнатичним прикусом, використовуючи метод Холдавея, в порівнянні з результатами, що встановлені для інших рас та етнічних груп. За допомогою пристрою Veraviewerocs 3D, Моріта (Японія) у 38 юнаків (віком від 17 до 21 року) та 55 дівчат (віком від 16 до 20 років) з фізіологічним прикусом максимально наближеним до ортогнатичного, були отримані бокові телерентгенограми. Вимірювання проводили згідно рекомендацій R.A. Holdaway (1983, 1984), а цефалометричні точки визначали згідно А.Е. Athanasiou (1997) та С.І. Дорошенко і С.А. Кульгинського (2007). В статті наведені цефалометричні параметри м'яких тканин обличчя за методом Холдавей для української популяції юнацького віку з ортогнатичним прикусом та проведена оцінка розбіжностей даних параметрів з результатами, що отримали дослідники при вивченні інших популяцій за даною методикою. Між українськими юнаками або дівчатами з ортогнатичним прикусом та відповідними за статтю показниками саудівської, турецької, північно-американської, палестинської та персіанської популяцій, а також із японцями (незалежно від статі) встановлені багаточисельні розбіжності телерентгенографічних показників за методом Холдавея. Найбільша кількість розбіжностей даних показників встановлена з Японцями, а найменша – з Палестинцями.

**Ключові слова:** аналіз Холдавея, цефалометрія, українські юнаки та дівчата, ортогнатичний прикус.

Стаття надійшла 13.03.2018 р.

влияния цефалометрических параметров твердых и мягких тканей на эстетический результат, которые врач получает в конце ортодонтического лечения. Поэтому существует необходимость в продолжении исследований посвященных накоплению, анализу и моделированию закономерностей строения краниофациального комплекса с учетом этнических, возрастных и половых особенностей. Цель исследования - изучение особенностей цефалометрических параметров украинских юношей и девушек с ортогнатическим прикусом, используя метод Холдавея, по сравнению с результатами, которые установлены для других рас и этнических групп. С помощью устройства Veraviewerocs 3D, Морита (Япония) в 38 юношей (в возрасте от 17 до 21 года) и 55 девочек (в возрасте от 16 до 20 лет) с физиологическим прикусом максимально приближенным к ортогнатическому, были получены боковые телерентгенограммы. Измерения проводили согласно рекомендациям R.A. Holdaway (1983, 1984), а цефалометрические точки определяли согласно А.Е. Athanasiou (1997) и С.И. Дорошенко и Е.А. Кульгинского (2007). В статье приведены цефалометрические параметры мягких тканей лица по методу Холдавей для украинской популяции юношеского возраста с ортогнатическим прикусом и проведена оценка расхождений данных параметров с результатами, которые получили исследователи при изучении других популяций по данной методике. Между украинскими юношами или девушками с ортогнатическим прикусом и соответствующими по полу показателями саудовской, турецкой, североамериканской, палестинской и персидской популяций, а также с японцами (независимо от пола) установлены многочисленные разногласия телерентгенографических показателей по методу Холдавея. Наибольшее количество расхождений данных показателей установлено с японцами, а наименьшее – с палестинцами.

**Ключевые слова:** анализ Холдавея, цефалометрия, украинские юноши и девушки, ортогнатический прикус.

Рецензент Гунас І.В.

DOI 10.26724/2079-8334-2018-3-65-68-71

UDK 614.08:16.24.012

<sup>1</sup>V.V. Ivanchyshyn, <sup>2</sup>P.A. Hasiuk, <sup>3</sup>U.O. Stadnyk, <sup>4</sup>A.B. Vorobets, <sup>5</sup>N.V. Malko, <sup>6</sup>Ye.S. Leshchuk  
<sup>1</sup>Danylo Halytsky Lviv National Medical University, Lviv;  
<sup>2</sup>I. Horbachevsky Ternopil State Medical University, Ternopil.

## ANALYSIS OF THE ORAL FLUID'S pH DEPENDING ON THE STATE OF FISSURES OF THE FIRST PERMANENT MOLARS IN CHILDREN

E-mail: p.gasyuk@gmail.com

The oral fluid is one of the factors that cause damage to the tooth, because its characteristics provide the homeostasis of the oral cavity and the resistance of the enamel to the caries. Results: Results of the study demonstrate that pH of oral fluid, on average, is lower in children with fissure caries ( $6,35 \pm 0,13$ ) compared to children with intact first permanent molars ( $6,77 \pm 0,11$ ,  $p < 0,02$ ). It was found that in children with intensity of caries of the primary teeth  $df < 5$  the pH value was close to neutral and was, on average,  $6,48 \pm 0,14$ . While in the group of children with the affected fissures of the first permanent molars and  $df \geq 5$  teeth its pH value was reduced and made  $6,22 \pm 0,12$  ( $p > 0,01$ ). Conclusion: Therefore, the results showed that pH of oral fluid in children with fissures caries of the first permanent molars was much lower compared with children with intact fissures. With age, the pH changed toward acidic environment that also could promote demineralization of the dental hard tissues. The pH of oral fluid in children with low intensity of primary teeth was close to neutral, but in children with  $df \geq 5$  teeth, this indicator decreased toward the acidic environment. These results indicate that the acidic environment of the oral fluid is an important factor in the development of dental caries in children.

**Key words:** children, oral liquid, fissures, first permanent molars.

The work is a fragment of the research project "Pathogenetic approaches to the treatment of major dental diseases on the basis of the study of mechanisms of damage to the tissues of the oral cavity on the background of concomitant somatic pathology", state registration number 0116U005076.

It is well known that local factors, that cause damage to the tooth, play a significant importance in the occurrence of dental caries. The oral fluid is one of these factors, because its characteristics provide