пацієнтами та нормальними суб'єктами істотно не відрізнялися. Як у хлопчиків, так і у дівчаток, не було виявлено істотних відмінностей або тенденцій у варіантах розподілу соматотипу між групами пацієнтів з акне різного ступеня тяжкості.

Ключові слова: розподіл соматотипів, акне, хлопчики, дівчата.

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между пациентами и нормальными субъектами существенно не отличались. Как у мальчиков, так и у девочек, не было выявлено существенных различий или тенденций в вариантах распределения соматотипа между группами пациентов с акне различной степени тяжести.

Ключевые слова: распределение соматотипов, акне, мальчики, девочки.

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DEFINITION REGULATORY CEPHALOMETRIC OPTIONS BY THE METHOD OF TWEED INTERNATIONAL FOUNDATION FOR UKRAINIAN BOYS AND GIRLS

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In the article the cephalometric parameters which are used in the analysis of Charles H. Tweed International Foundation and their importance for young people Podilskiy region of Ukraine with orthognathic bite, assessment of sexual differences of these parameters and the comparison of obtained results with normative data which are used by Charles H. Tweed International Foundation and normative data of H. Stockfisch for the European population. Established gender and ethnic differences point to the need to create a normative base of cephalometric indicators used in the analysis of Charles H. Tweed International Foundation for the population of Ukraine.

Key words: lateral teleroentgenogram of the head, cephalometry, Ukrainian boys and girls, Charles H. Tweed International Foundation.

Throughout the time of anthropologists and artists try to explore and express the regularities of the human body. Quite a lot of attention is paid to the face as an element of craniofacial structures. Often-subjective concept beauty objectively trying to express in the form of proportions, relationships and dependencies. Particular importance acquire this knowledge, when there is a need for an objective distinction between "normal" and "pathology" when needed reconstructive surgery with a clear plan to change the size of the bone and soft structures. Also, this information is necessary in the treatment of pathologies of dentoalveolar structures, because the orthodontist can change the growth and development of the jaws, the position of the teeth and the ratio of all of the teeth-jaw complex, which directly affects the shape and structure of the soft tissues of the face. The need to understand the principles of building a harmonious and well-formed face of dentoalveolar structures has led to a huge variety of methods and techniques for determining the norms of certain facial parameters and head as a whole [5]. The most common and practical use is the method of studying the lateral X-rays of the head - teleradiography that today almost 90% of cases be a regular diagnostic records during orthodontic treatment [10].

According to a study conducted in 2008 in the US [10] from 17.2% to 27.3% depending on the year of the study, orthodontists in the USA used the cephalogram analysis by the method proposed by Charles Tweed. Despite the remoteness of the research approach and the philosophy of Charles Tweed, the first licensed orthodontist USA still relevant and in demand in today's science. His views and teachings, based on the analytical evolutionary approach, the analysis of a huge number of successfully and not successfully treated patients, have served as formation of an entire school and a large number of followers who have perfected and practiced this direction. Therefore, in consequence to the proposed in 1954 by Ch. Tweed corners FMA, FMIA and IMPA [20] his disciple and follower L. L. Merrifield [11] in 1966 proved and added an element of evaluation of the facial profile of the patient - a line «Z». In 1989, L. L. Merrifield and T. R. Gebeck [12] added to the analysis of the measurement front «anterior facial height, AFH» and posterior «posterior facial height, PFH» facial heights. In 1992, A. J. Horn [9] proposed to use the height of the index face «facial height index, FHI», and in 1995 J. F. Gramling [6] used the angles SNA, SNB and ANB. Today the method presented in the form of a comprehensive standardized research – «Craniofacial analysis of the Tweed Foundation» [3].

Research purpose - establish cephalometric parameters by Charles H. Tweed International Foundation for boys and girls Podilskiy region of Ukraine with orthognathic bite and compare results with data proposed as regulations.

Material and methods. Using the device Veraviewepocs 3D, Morita (Japan) in 38 boys (age from 17 to 21 years) and 55 girls (aged from 16 to 20 years) with physiological occlusion closest to orthognathic were obtained lateral teleroentgenogram. To conduct teleroentgenogram analysis used software OnyxCeph³ ™, version 3DPro, of Image Instruments GmbH, (Germany).

Measurements were carried out accordance with recommendations of L. L. Merrifield, H. A. Klontz, J. L. Vaden [13] and Charles H. Tweed International Foundation [3], and cephalometric points determined by Basavaraj Subhashchandra Phulari [1] and S.I. Doroshenko and Ye.A. Kulhynskyi [4].

We determined the following parameters (Fig. 1, Fig. 2 - numbered and marked in red): - angle FMIA (Frankfort Mandibular Incisor Angle) – formed by lines Is1L-Ap1L (the central axis of the lower medial incisor) and Po-Or (frankfurt plane FP); - angle FMA (Frankfort Mandibular Angle) – formed by lines tGo-Me (mandibular plane MP) and Po-Or (frankfurt plane FP); - angle IMPA (Incisor Mandibular Plane Angle) – formed by lines Is1L-Ap1L (the central axis of the lower medial incisor) and tGo-Me (mandibular plane MP); - angle SNA – formed by lines S-N and N-A (points to anteroposterior location of the upper jaw to the skull base);- angle SNB – formed by lines S-N and N-B (points to anteroposterior location of the lower jaw to the skull base); - angle ANB – formed by lines A-N and N-B (points to angle between–jaw value in the anteroposterior direction; ANB angle considered positive if point A is in front of line NB; if the lines NA and NB overlap, the ANB angle is 0˚; if the point A is behind the line NB, then the angle is considered negative);- index Wits – the distance between the design points AOclP and BOclP - projections corresponding points A and B on the line apOcP-ppOcP (locking plane OclP) points to linear correlation between-jaw in anteroposterior direction; if the projection of point A is ahead of projections point B the index takes a positive value; if the projection of point A is behind projections point B then the index takes a negative value); - angle POr_OcP – formed by lines apOcP-ppOcP (locking plane OclP) and Po-Or (frankfurt plane FP);- angle Z – formed by lines Pog'-Li and Po-Or (frankfurt plane FP) (the angle between a soft tissue, determined chin-lower-lip line and frankfurt plane FP);- distance Ls1u_Ls – the thickness of the upper lip (the distance from point Ls1u to point Ls);- distance Pog_Pog' – the thickness of soft tissue chin (distance from point Pog to point Pog'); - distance PFH – rear height of face (distance from point Ar to point tGo); -distance AFH – front height of face (distance from point Me to line ANS-PNS – distance from the lowest point on the mandibular symphysis and the plane of the upper jaw bases SpP); - ratio AFH_PFH – the ratio of the distance from the point Me to line ANS-PNS and from point Ar to point tGo (relationship between values AFH and PFH).

A   B
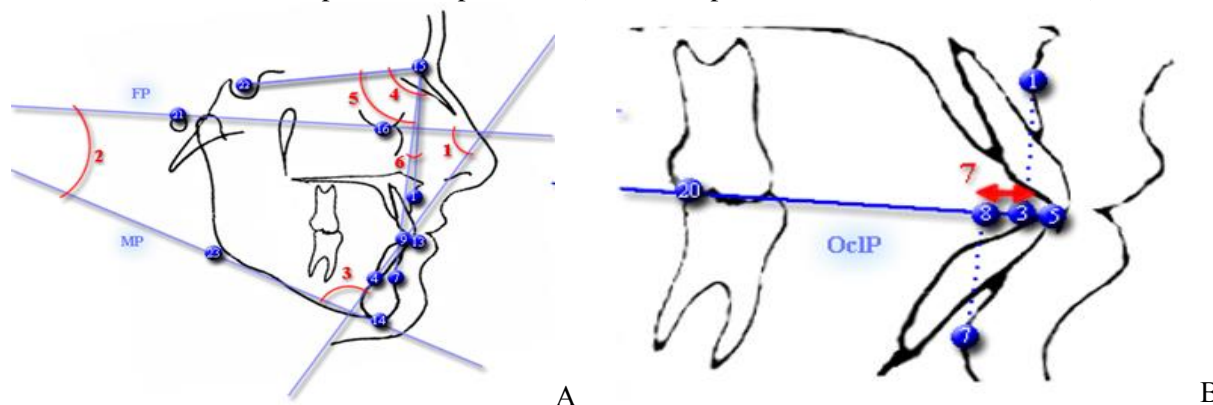
Pic. 1. Key points, lines and dimensions that are used in cephalometric analysis byTweed.

Key points, lines and dimensions that are used in the cephalometric analysis by Tweed numbered and marked in figures 1 and 2 blue: - A – subspinale – point A by Downs, most posterior point placed forward contour of the upper jaw; - ANS – spina nazalis anterior – top of the front nasal spine (form the front point of the palatal plane SpP); - AOclP – projection of point A on the line apOcP - ppOcP (locking plane OclP);- Ap1L – apex first inferior incisor – root apex point of lower medial incisor;- apOcP – anterior point of occlusal plane –front point of locking plane (OclP) – the middle line connecting the cutting edge of medial incisors upper and lower jaws; - Ar – articulare – the intersection of the front surface of the main part of the occipital bone with back of the neck of the mandible; - B – submentale – point B by Downs, the deepest point in the front contour of the mandible; - BOclP – projection point B on the line apOcP-ppOcP (locking plane OclP); - Is1L – incision inferior - the point located on the cutting edge of the lower medial incisor; - Li – labium inferius – most protruding point the outer contour of the lower lip red border; - Ls – labium superius – most protruding point the outer contour red border of the upper lip; - Ls1u – most projecting point vestibular contour crowns medial upper incisor; - Is1u – incision superior – the point located on the cutting edge of the upper medial incisor; - Me – menton – the lowest

point on the mandibular symphysis; - N – nasion – most forward point of the fronto-nasal suture connections frontal and nasal bones in the mid- boom plane; - Or – orbitale – the lowest part of infraorbital edge is on the edge of the orbital zygomatic bone; - PNS – spina nazalis posterior – posterior nasal beard; rear bases limit of the upper jaw, forming the foundations of the plane of the upper jaw (SpP); - Pog – pogonion – most forward point of the chin bone speech; - Pog' – skin pogonion – most protruding point on the profile of the chin;
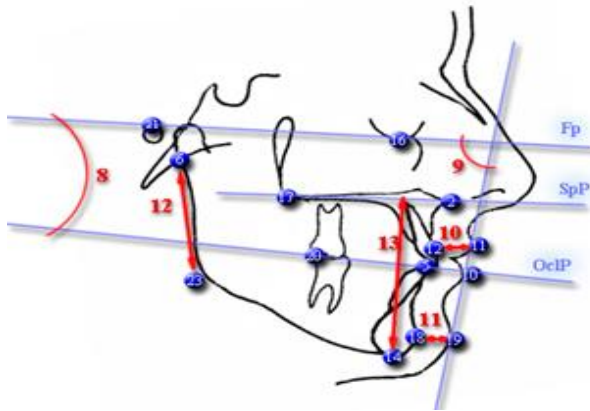
Pic. 2. Key points, lines and dimensions that are used in cephalometric analysis byTweed.

- ppOcP – posterior point of occlusal plane - rear point of locking plane (OclP), located in the place most rear contact of first major corner teeth; - Po – porion – placed on the top edge of external acoustic hole; - S – sella – constructive point at the center of Turkish saddle; -tGo – projection point on the mandibular angle formed at the intersection of lines, one of which is tangent line to the rear edge of the branches of the mandible from the point Ar, the second line is tangent to the lower edge of the body of the mandible from the point Me. Usually a few millimeters below and distal to a point Go.

Statistical analysis of obtained results carried out in the license package "Statistica 6,0" using nonparametric methods for assessing the results. Reliability of difference values between independent quantitative values were determined using the U-Mann-Whitney criterion.

Results and its discussion. Cephalometric parameters by Charles H. Tweed International Foundation for boys and girls Podilskiy region of Ukraine with orthognathic bite and standards used by Charles H. Tweed International Foundation and the resulting study of the American population [13] and the norms recommended by N. Stockfisch [18] for the European population presented in the table 1.

Table 1

Cephalometric parameters by Charles H. Tweed International Foundation (1*), recommended by H. Stockfisch (2*) and for boys and girls Podilskiy region of Ukraine with orthognathic bite.

Indicator	Norms		Boys		Girls		p
	1*	2*	M±δ	25 – 75 p-l	M±δ	25 – 75 p-l	
FMIA (°)	67	65 – 71	62.98±5.85	58.46 –67.36	63.04±7.01	57.50 –68.37	>0.05
FMA (°)	25	16 – 35	19.95±6.23	16.12 –24.09	21.89±4.44	18.41 –24.11	>0.05
IMPA (°)	88	84 – 92	97.06±8.08	90.49 –103.2	95.07±6.49	88.91 –99.59	>0.05
SNA (°)	82	80 – 89	82.32±3.98	79.45 –84.22	81.48±3.36	79.17 –83.35	>0.05
SNB (°)	80	75 – 82	80.16±3.89	76.89 –83.12	79.66±3.05	77.10 –81.89	>0.05
ANB (°)	2	1 – 5	2.167±1.965	0.658 –3.913	1.816±1.991	0.684 –3.185	>0.05
Wits (мм)	2	0 – 4	0.051±2.842	-1.441 –2.912	-1.388±2.275	-3.020 --0.064	<0.05
POr_OcP (°)	10	8 – 12	5.461±4.246	2.884 –7.694	7.800±3.208	5.653 –10.37	<0.01
Z (°)	75	75 – 78	77.66±7.97	71.90 –82.53	78.77±7.79	72.91 –84.83	>0.05
Ls1u_Ls (мм)			14.74±1.49	13.53 –15.64	12.25±1.63	11.38 –13.47	<0.001
Pog_Pog' (мм)			12.60±1.74	11.30 –13.43	11.31±1.87	10.27 –12.06	<0.001
PFH (мм)	45		51.98±5.26	48.37 –55.30	46.18±4.35	43.60 –48.81	<0.001
AFH (мм)	65		63.84±4.22	60.92 –66.94	59.75±4.01	57.05 –62.13	<0.001
AFH_PFH (%)	70	69	81.77±10.12	74.89 –86.83	77.46±7.32	71.38 –82.69	<0.05

Notes: M±δ – mean ± standard deviation; 25p-l, 75p-l - percentile swing.

When comparing cephalometric parameters which are used in the analysis of Charles H. Tweed International Foundation between boys and girls Podilskiy region of Ukraine with orthognathic bite for boys set higher value of indicators Wits (p <0,05), Ls1u_Ls (p <0,001), Pog_Pog '(p <0,001), PFH (p <0,001), AFH (p <0.001) and AFH_PFH (p <0.05); and in girls - significantly greater angle value POr_OcP (p <0.01) (Table 1). Comparing cephalometric parameters by Charles H. Tweed International Foundation with percentile scale data indicators that received from boys and girls Podilskiy region of Ukraine with orthognathic bite, set expressed following differences: the smaller angle value FMA and larger angle value IMRA in boys and girls of Podillya; POr_OcP smaller angle value and distance PFH in boys of Podillya and distance AFH in girls of Podillya and AFH_PFH ratio of boys and girls of Podillya (see Table 1). When comparing cephalometric parameters with norms recommended by H. Stockfisch for the European population with percentile scale data indicators that received in boys and girls Podilskiy

region of Ukraine with orthognathic bite, set expressed following differences: smaller values of Wits in girls of Podillya and corner POr_OcP in boys of Podillya; as well as in comparison with Charles H. Tweed International Foundation, smaller values AFH_PFH ratio in boys and girls of Podillya (Table 1).

Analysis cephalometric parameters between boys and girls Podilsky region of Ukraine with orthognathic bite showed that in boys from on one side, set higher values of inter-jaw linear relationship (Wits), and from other - indicators of the position of the upper (SNA) and lower (SNB) jaw relative to the point N and angular rate between-jaw relationship (ANB) have no significant differences. This phenomenon can be explained only by geometric influence of different position locking plane on which carried the projection of points A and B. Installed in girls larger value of the angle POr_OcP, formed by locking and frankfurt plane corresponds to more vertical position of locking plane, and consequently decreases the rate of WITS (takes more negative value). This fact once again indicating on sensitivity of indicator WITS to the position of locking plane and it necessary to consider only in combination with other indicators. Established in boys more than in girls, linear indicators thickness of the upper lip (Ls1u_Ls), the thickness of soft tissue of chin (Pog_Pog '), and also back (PFH) and front (AFH) face height and according to their value (AFH_PFH) match to common anatomical features of the body structure men.

Established in boys and girls Podilsky region of Ukraine, compared with the standards by the Charles H. Tweed International Foundation, the smaller value of the angle FMA and larger value of the angle IMRA indicates that the angle position of lower incisors to the base of the mandible (IMRA angle) compensates more horizontal position the foundations of the mandible in relation to the frankfurt plane (angle FMA). Smaller value of the angle rPOr_OcP indicating on more horizontal position of locking plane to frankfurt plane. Given the fact that the indicators position of anterior contour of the mandible (SNB and ANB) are not significantly different, then such a slope bases of mandible (corner FMA) and locking plane (angle rPOr_OcP) to the frankfurt plane can occur by changing the ratio of the back and the front face height. This result confirmed the increase a greater extent for boys, back facial height (PFH) and decreasing to a greater extent in girls, the anterior face height (AFH) and corresponding increase the coefficient of correlation anterior and posterior face heights (AFH_PFH) in boys and girls.

When comparing cephalometric parameters in boys and girls Podilskiy region of Ukraine with the standards, recommended by H. Stockfisch for the European population established only smaller (more negative) values of Wits, caused by a more horizontal tilt locking plane (angle POr_OcP) in boys and higher values AFH_PFH ratio in boys and girls. Therefore most of cephalometric differences in parameters obtained from boys and girls Podilskiy region with Ukraine orthognathic bite set with norms and standards by Charles H. Tweed International Foundation, which were derived from a study of the American population without regard to ethnicity and gender. In his works, I. Solmaz and M. Raberin [19] point to a need to review the regulations, taking into account the fact that most cephalometric norms were prepared for the North American population, and completely inappropriate for African and Asian populations. In contrast to the aesthetic norms and accordingly the need for a different regulatory framework indicates a study conducted in two Brazilian states [15].

Studies of adult Iranians profile of (mean age 24.5 years) with normal occlusion indicate a more convex profile in both sexes, the rear position of the chin and lips in comparison with European standards [8]. Similar results were obtained by the researchers of the Turkish population [2], and pointed to the existence of sexual differences. Cephalometric analysis of the Tweed held at the Bangladesh study population showed differences in the angular characteristics of the cranial complex in relation to the proposed standards [16]. As a result, the study of the Mexican population in 2013 (mean age 19 years) with an acceptable occlusion revealed significant differences between the results obtained and the existing regulations. Specific population norms for cephalometric analysis of the Tweed were established too [7]. Similar studies standards cephalometric analysis of Tweed and its components have been carried out for Maratha Ethnic population [14], Nepal [17], Saudi Arabia [21]. Our results, as in presented research results of other authors, point to the need for the creation of Charles H. Tweed International Foundation regulatory framework cephalometric standards based on ethnicity, age and sex.

Conclusions

1. In most cases, sex differences cephalometric parameters which are used in the analysis of Charles H. Tweed International Foundation between boys and girls Podilskiy region with Ukraine with orthognathic bite set for linear dimensions (higher values in boys distances Wits, Ls1u_Ls, Pog_Pog ', PFH and AFH, and as result ratio AFH_PFH) and only in girls greater angle value POr_OcP.

2. Differences in cephalometric parameters which are used in the analysis of Charles H. Tweed International Foundation (derived from study of the American population) with those obtained in young people Podilskiy region of Ukraine with orthognathic bite installed for both corners (lower values of angles FMA and POr_OcP

and greater value IMRA corner in boys and girls), and for linear sizes higher distance value PFH in boys and less distance value AFH in girls and as a result, the ratio AFH_PFH in boys and girls).

3. With the standards recommended by N. Stockfisch for the European population is set less pronounced differences of cephalometric parameters which are used in the analysis of Charles H. Tweed International Foundation (lower values of Wits in girls and in boys in the corner POr_OcP and relationship AFH_PFH in boys and girls Podilskiy region Ukraine).

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Реферати

ВИЗНАЧЕННЯ НОРМАТИВНИХ ЦЕФАЛОМЕТРИЧНИХ ПАРАМЕТРІВ ЗА МЕТОДИКОЮ МІЖНАРОДНОГО ТОВАРИСТВА ТВІД ДЛЯ УКРАЇНСЬКИХ ЮНАКІВ І ДІВЧАТ
Гунас І. В., Дмітрієв М. О., Прокопенко С. В.,. Шінкарук-Диковицька М. М., Єрошенко Г. А.

У статті наведені цефалометричні параметри, що використовуються при аналізі Міжнародним товариством Чарльза Х. Твіда, та їх важливість для молоді Подільської регіону України з ортогнатичним прикусом, оцінкою статевих відмінностей цих параметрів та порівнянням отриманих результатів з нормативними даними, які використовуються Міжнародним товариством Чарльза Х. Твіда та нормативними даними Г. Штокфіша для європейського населення. Виявлені гендерні та етнічні відмінності вказують на необхідність створення нормативної бази ціфалометричних показників, що використовуються при аналізі Міжнародним товариством Чарльза Х. Твіда для населення України.

Ключові слова: бокова телерегенгеографія голови, цефалометрія, українські хлопчики та дівчата, Міжнародне товариство Чарльза Х. Твіда.

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ОПРЕДЕЛЕНИЕ НОРМАТИВНЫХ ЦЕФАЛОМЕТРИЧНИХ ПАРАМЕТРОВ ПО МЕТОДИКЕ МЕЖДУНАРОДНОЙ ОБЩЕСТВА ТВИД ДЛЯ УКРАИНСКИХ ЮНОШЕЙ И ДЕВУШЕК
Гунас И. В., Дмитриев М. А., Прокопенко С. В.,. Шинкарук-Диковицкого М. М., Ерошенко Г. А.

В статье приведены цефалометрические параметры, используемые при анализе Международным обществом Чарльза Х. Твида, и их важность для молодежи Подольского региона Украины с ортогнатическим прикусом, оценке половых различий этих параметров и сравнением полученных результатов с нормативными данными, которые используются Международным обществом Чарльза Х. Твида и нормативными данным Г. Штокфиш для европейского населения. Выявленные гендерные и этнические различия указывают на необходимость создания нормативной базы цифалометрических показателей, используемых при анализе Международным обществом Чарльза Х. Твида для населения Украины.

Ключевые слова: боковая телерегенгеография головы, цефаметрия, украинские мальчики и девочки, Международное общество Чарльза Х. Твида.

Рецензент Волков К.С.