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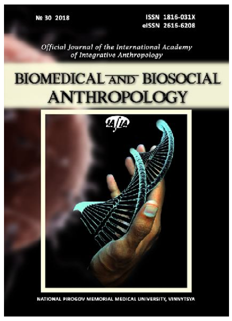

Correlation of anthropo-somatometric parameters of the body of practically healthy women of the ectomorphic somatotype with cerebral blood circulation indicators

Semenchenko V.V.

National Pirogov Memorial Medical University, Vinnytsya, Ukraine

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CORRESPONDING AUTHOR

e-mail: semm88@ukr.net

Semenchenko V. V.

So far, the search for interconnections between the indicators of central or peripheral circulation and the constitutional parameters of the body is considerable attention in many countries of the world. However, most of these works are devoted to studying the problem of various diseases. The study of such relationships in the contingents of a healthy population needs further in-depth study. The purpose of the work is to establish the peculiarities of the connections of anthropo-somatometric parameters of practically healthy women of Podillia with an ectomorphic somatotype with indicators of cerebral circulation. The results of anthropometric, somatotypological and rheoencephalographic studies performed in practically healthy urban women of Podillia ectomorphic somatotype (n = 24) were taken from the data bank of the research center of the National Pirogov Memorial Medical University, Vinnytsya. The rheoencephalographic parameters were determined using a computer diagnostic complex. As a result of processing, the rheograms automatically determined the characteristic points on the curve and determined the main parameters (amplitude, time and derivatives). Anthropometric study according to the scheme of V.V. Bunak included the definition of: total body dimensions, longitudinal, transverse, circumferential size, pelvic size and thickness of skin and fat folds. The craniometry included the definition of: girth of the head, sagittal arc, greatest length and width of the head, smallest head width, face width and mandible. The somatotype is determined by the method of J.Carter and B.Heath, and the component composition of the mass of the body - according to the method of J.Matiegka and the formulas of the American Institute of Nutrition. The correlation analysis was performed using the nonparametric Spirman method in the statistical package "STATISTICA 6.0". In practically healthy women from Podillia with ectomorphic somatotype, among correlations indices of cerebral blood flow with constitutional parameters of the body, the highest percentage, mostly inverse true and false median strength connections is established with the amplitudes indices of the rheoencephalogram. In analyzing the correlations of different groups of anthropo-somatotypological parameters of the body with cerebral blood circulation indices in practically healthy women of the ectomorphic somatotype, it was established that the amplitude values of the rheoencephalogram have the highest relative percentages of connections with the width of distal epiphyses of long limb tubular bones, somatotype components, girth dimensions, components of component composition body mass, longitudinal body size and cephalometric indices; time indices of the rheoencephalogram - with the circumferential dimensions of the body; derivatives indices of the rheoencephalogram - with circumferential body sizes and cephalometric indices.

Keywords: *practically healthy women, ectomorphic somatotype, cerebral hemodynamics, anthropometric indices, correlations.*

Introduction

Both in Ukraine and abroad, medicine is moving towards the individualization of the patient's approach. Studies of recent decades are aimed at taking into account such person's data as gender, age and other indicators in interpreting the results of instrumental research [4, 6, 10, 18, 22, 26]. A special category of such studies is studies aimed at taking into account the somatotype of the subjects [7, 8, 12], which is determined on the basis of anthropometric measurements, genotype-determined constitutional type, characterized by peculiarities of metabolism, that is, the predominant development of muscle, fat or bone tissue.

It is important to note that the number of studies that study the dependence of somatotype on the indicators of cerebral circulation is quite small, while the incidence rate for various cerebral circulation disorders is increasing worldwide [7, 8, 12, 16, 25], which is not surprising - speed and volumetric indices of cerebral blood flow in humans is much larger than in most mammals on the planet [21]. In Ukraine annually there are about 40 thousand cases of transient ischemic attack, 100-110 thousand cases of cerebral stroke, and the number of people with cerebrovascular diseases has reached about 2.5 million people, and 11.2% of them are people of working age [16, 25].

One of the simplest and at the same time valuable methods of non-invasive diagnostics of the state of the vessels of the brain at the moment is considered a rheoencephalography method. Its main advantages are safety and the ability to apply anywhere. The results obtained during this study, namely, the outflow of blood, the tone and the reactivity of vessels of different caliber, vascular elasticity indices and their peripheral resistance, provide a clear idea of the state of blood circulation in the brain [9, 24].

Creating a database that would contain normative indicators of rheoencephalography, depending on the sex of a person, her age and somatotype, would significantly improve the possibilities of this method and accordingly the possibility of diagnosing cerebrovascular diseases and update the limits of the norm of cerebral circulation.

The *purpose* of the work is to establish the peculiarities of the connections of anthropo-somatometric parameters of practically healthy women of Podillia with an ectomorphic somatotype with indicators of cerebral circulation.

Materials and methods

Primary anthropometric and rheoencephalography indices of practically healthy urban women of Podillia (n = 130) are taken from the data bank of the research center of the National Pirogov Memorial Medical University, Vinnytsya.

Using the computer diagnostic complex, an automatic processing of the rheoencephalography was performed [27]. The following parameters were determined: amplitude - base impedance (EZ) (Ohm); amplitude of systolic wave (EH1) (Ohm); incidence amplitude (EH2) (Ohm); amplitude of diastolic wave (EH3) (Ohm); amplitude of the phase of rapid blood filling (EH4) (Ohm); time - duration of the heart cycle (EC) (sec); length of the ascending part (EA) (sec); duration of the downward part (EB) (sec); duration of the fast blood filling phase (EA1) (sec); duration of the phase of slow blood filling (EA2) (sec); derivatives - dicrotic index (EH2H1) (%); diastolic index (EH3H1) (%); average speed of the phase of rapid blood filling (EH4A1) (Ohm/sec); average speed of the phase of slow blood flow (EH4A2) (Ohm/sec); index of total arterial tone (EAC) (%); indicator of tone of arteries of large caliber (arteries of distribution) (EA1C) (%); index of tone of arteries of medium and small caliber (arteries of resistance) (EA2C) (%); the ratio of tone of arteries of different caliber (EA1A2) (%).

Anthropometric study conducted according to the scheme V. V. Bunak [3] includes determination of: body mass (W) (kg), body length (H) (sm), body surface area (S) (m2), above the sternal height (ATND), pubic (ATL), shoulder (ATPL), finger (ATP), and swivel (ATV) anthropometric points (sm), width of the distal epiphysis of the shoulder (EPPL), forearm (EPPR), hip (EPB) and shin (EPG) (sm), shoulder arms in the strained (OBPL1) and calm (OBPL2) condition (sm), forearm grips in the upper (OBPR1) and lower (OBPR2) thirds (sm), hip circumference (OBB), shin at the upper (OBG1) and lower (OBG2) third (sm), neck circumference (OBSH), waist (OBT), thigh (OBBB), brush (OBK), foot (OBS), chest on the inspiration (OBGK1), on exhalation (OBGK2) and in a calm condition (OBGK3) (sm), transverse middle thoracic (PSG) and lower thoracic (PNG) sizes (sm), anterior-posterior chest size (SGK) (sm), shoulder width (ACR) (sm), intraluminal (SPIN), intercostal (CRIS) and inter swivel (TROCH) size of the pelvis (sm), external pelvic conjugate (CONJ) (sm), thickness of the skin and fat folds on the back (GZPL) and the anterior (GPPL) surface of the shoulder, on the forearm (GPR), at the lower angle of the shoulder blade (GL), on the chest (GGR), on the abdomen (GG), on the side (GB), on the thigh (GBD) and on the shin (GGL) (mm).

Craniometry included a definition: head circumference (OB_GL) (sm), maximum head length (B_DL_GL) (sm), smallest head width (N_SH_GL) (sm), lower jaw width (SH_N_CH) (sm), sagittal arc (SAG_DUG) (sm), maximum width of head (B_SH_GL) (sm) and the width of the face (SH_LICA) (sm) [1].

To evaluate the somatotype, the mathematical scheme of J. Carter and B. Heath [5] was used, which is based on the point estimation of three interrelated components: endomorphic (FX) - characterizes the degree of development of fatty deposits; mesomorphic (MX) - determines the relative development of muscles and bone elements of the body; ectomorphic (LX) - characterized the relative elongation of the human body. To determine the absolute amount of fat (DM), bone (OM) and muscle (MM) body mass components (kg), we used formulas J. Matiegka [15]. Besides, the muscular component of the body mass - according to the formulas of the American Institute of Nutrition (MA) (kg) [14].

The evaluation of correlations of cerebral blood flow with anthropo-somatometric parameters of the body of practically healthy women of the ectomorphic somatotype (n = 24) was performed in the statistical statistic package "STATISTICA 6.0" using the Spirman statistics. In the analysis of the sample correlation coefficient (r), the binding strength was estimated as follows: r = 0 - no connection; r = 0,1 -

0,29 or r = -0,1 - -0,29 - weak link; r = 0,3 - 0,69 or r = -0,3 - 0,69 - medium strength bond; r = 0,7 - 1,0 or r = -0,7 - 1,0 - strong bond [2].

Results

In practically healthy women of Podillia, of ectomorphic somatotype, the following correlations of cerebral circulation with constitutional parameters of the body are established. (Table 1, 2).

Discussion

In many studies it was stated that practically all indicators of hemodynamics in one way or another correlate with anthropometric parameters [11, 13, 19]. The quantitative determination of such correlations seems necessary for obtaining detailed normative data for certain age groups of the population. Therefore, it is clear that the quantitative interpretation of the appropriate normative parameters of the rheoencephalogram, depending on the features of the body structure, is extremely relevant and promising and can be widely used for diagnostic purposes [17, 23].

The analysis of the reliable and average strength of false correlations of anthropo-somatotypological parameters of the body with the indices of cerebral circulation of practically healthy women of Podillia of the ectomorphic somatotype revealed the following *multiple relationships*: the reciprocal mean strength significant (r = -0.41 - -0.58) and unreliable (r = -0.31 - -0.39) bonds of all amplitude indices with most indicators of the width of distal epiphyses of long limb tubular bones, third of the circumferential dimensions (predominantly

Table 1. Correlation of the amplitude and temporal indices of the rheoencephalogram of practically healthy women of Podillia ectomorphic somatotype with constitutional parameters of the body.

Indexes	EZ	EC	EA	EB	EA1	EA2	EH1	EH2	EH3	EH4
OB_GL	-0,22	0,19	0,15	0,15	0,08	0,22	-0,12	0,02	-0,01	-0,16
B_DL_GL	0,06	**-0,48**	-0,09	**-0,47**	-0,19	-0,04	-0,20	-0,23	-0,28	-0,15
N_SH_GL	0,16	0,05	0,00	0,09	-0,02	-0,03	0,17	0,17	0,10	0,23
SH_N_CH	0,25	0,13	0,25	0,09	0,14	0,23	0,36	0,17	0,15	0,31
SAG_DUG	0,17	-0,05	0,11	-0,05	0,28	0,00	-0,03	-0,11	-0,14	0,07
B_SH_GL	0,02	-0,29	0,04	-0,31	-0,15	0,12	-0,04	-0,36	-0,36	-0,12
SH_LICA	0,25	0,21	0,15	0,22	0,14	0,09	**0,41**	**0,41**	0,30	**0,41**
W	-0,01	0,01	0,24	0,00	0,24	0,20	0,02	-0,11	-0,21	0,03
H	0,00	0,07	0,01	0,09	0,12	-0,02	-0,14	-0,25	-0,35	-0,11
S	0,04	0,03	0,13	0,03	0,16	0,10	-0,01	-0,14	-0,24	0,02
ATND	0,06	0,05	0,02	0,07	0,11	-0,02	-0,12	-0,24	-0,35	-0,10
ATL	0,06	0,06	0,23	0,05	0,23	0,22	-0,13	-0,29	-0,33	-0,13
ATPL	0,04	0,10	0,11	0,08	0,20	0,08	-0,11	-0,22	-0,31	-0,09
ATP	0,02	0,11	0,23	0,07	0,40	0,10	-0,18	-0,21	-0,32	-0,12
ATV	0,01	-0,07	-0,04	-0,05	-0,08	0,04	-0,27	-0,39	-0,40	-0,29
EPPL	-0,31	0,08	-0,03	0,05	-0,09	0,07	-0,53	-0,35	-0,34	-0,55
EPPR	-0,36	-0,06	0,02	-0,11	-0,01	0,07	-0,36	**-0,44**	**-0,48**	-0,37
EPB	-0,07	0,03	-0,12	0,01	-0,10	-0,11	0,10	-0,28	-0,24	0,05
EPG	-0,20	0,01	**-0,41**	0,05	-0,25	-0,39	**-0,44**	**-0,45**	**-0,48**	-0,39
OBPL1	-0,14	-0,05	**0,42**	-0,11	0,37	0,37	-0,04	-0,04	-0,13	-0,04
OBPL2	-0,16	-0,07	0,40	-0,14	0,33	0,34	0,06	-0,04	-0,13	0,03
OBPR1	-0,39	-0,17	0,14	-0,23	0,21	0,09	-0,23	**-0,43**	**-0,48**	-0,23
OBPR2	-0,34	-0,27	-0,07	-0,29	0,03	-0,05	-0,35	**-0,53**	**-0,58**	-0,29
OBB	-0,03	-0,10	0,19	-0,10	0,28	0,09	0,10	0,02	-0,12	0,18
OBG1	-0,16	-0,02	0,14	-0,04	0,14	0,12	0,06	-0,03	-0,14	0,05
OBG2	-0,15	-0,14	-0,19	-0,16	-0,38	0,00	0,00	-0,33	-0,32	-0,07
OBSH	-0,17	-0,05	0,30	-0,10	0,19	0,36	0,14	-0,08	-0,13	0,10
OBT	-0,13	-0,11	0,39	-0,16	0,33	0,40	0,11	-0,04	-0,12	0,11
OBBB	-0,04	0,11	0,10	0,13	0,10	0,09	0,23	0,09	-0,01	0,24

Continuation of Table 1.

Indexes	EZ	EC	EA	EB	EA1	EA2	EH1	EH2	EH3	EH4
OBK	-0,19	0,06	0,02	0,02	-0,03	0,08	0,02	-0,10	-0,16	-0,02
OBS	-0,24	-0,13	0,03	-0,18	0,03	0,12	**-0,46**	**-0,61**	**-0,61**	**-0,47**
OBGK1	**-0,47**	-0,01	0,00	-0,02	0,10	0,02	**-0,52**	-0,29	-0,33	**-0,49**
OBGK2	**-0,44**	0,12	-0,16	0,15	-0,15	-0,09	**-0,52**	-0,15	-0,17	**-0,53**
OBGK3	**-0,53**	0,04	0,03	0,04	0,06	0,08	**-0,57**	-0,21	-0,24	**-0,55**
PSG	-0,27	0,21	0,19	0,12	0,18	0,17	-0,11	-0,16	-0,20	-0,13
PNG	-0,33	0,27	0,28	0,16	0,30	0,26	-0,25	-0,14	-0,21	-0,27
SGK	0,02	0,09	0,10	0,09	-0,03	0,18	-0,16	0,05	0,05	-0,15
ACR	0,29	0,15	0,44	0,07	0,25	0,45	0,11	-0,02	-0,08	0,07
SPIN	-0,23	0,15	-0,04	0,13	-0,12	0,12	0,10	-0,07	-0,09	0,08
CRIS	0,10	-0,25	-0,19	-0,25	-0,35	-0,08	-0,16	-0,21	-0,25	-0,14
TROCH	0,11	0,13	0,20	0,08	0,10	0,23	0,29	0,09	0,00	0,28
CONJ	-0,25	0,19	0,11	0,15	0,19	0,11	-0,01	-0,22	-0,26	-0,08
GZPL	-0,22	0,05	0,14	-0,01	0,08	0,17	-0,36	-0,17	-0,16	-0,32
GPPL	-0,02	-0,11	-0,06	-0,13	-0,14	0,01	0,15	-0,02	-0,03	0,18
GPR	-0,17	0,13	0,21	0,12	0,27	0,16	-0,08	0,04	-0,02	-0,03
GL	-0,21	-0,18	-0,02	-0,15	-0,08	0,05	-0,33	-0,28	-0,28	-0,31
GGR	-0,19	0,03	0,14	0,01	0,07	0,17	-0,20	-0,11	-0,15	-0,16
GG	0,30	-0,24	-0,01	-0,21	-0,12	0,07	-0,15	-0,23	-0,28	-0,09
GB	-0,04	-0,28	0,01	-0,27	-0,03	0,04	-0,31	-0,24	-0,30	-0,23
GBD	-0,03	-0,17	-0,19	-0,13	-0,17	-0,13	-0,10	-0,09	-0,14	-0,02
GGL	0,05	-0,12	-0,04	-0,07	-0,05	-0,02	-0,25	-0,07	-0,11	-0,19
FX	-0,26	-0,22	-0,01	-0,22	-0,05	0,06	**-0,41**	-0,32	-0,34	-0,36
MX	-0,24	0,04	0,22	-0,05	0,10	0,24	-0,03	-0,03	0,02	-0,09
LX	-0,06	-0,06	-0,31	0,00	-0,19	-0,28	-0,30	-0,26	-0,28	-0,31
MM	-0,16	0,01	0,23	-0,02	0,26	0,17	0,02	-0,09	-0,21	0,02
OM	-0,24	0,05	-0,16	0,04	-0,05	-0,16	-0,38	**-0,47**	**-0,52**	-0,37
DM	0,00	-0,17	0,14	-0,18	0,09	0,17	-0,25	-0,23	-0,31	-0,18
MA	-0,03	-0,12	0,30	-0,16	0,28	0,24	0,00	-0,14	-0,23	-0,02

Notes: here and in the future, bold ties are highlighted, underscoring - medium power false ties.

forearm, foot and thorax), endomorphic component of somatotype and bone component of the body mass (with the exception of the base impedance) and the direct, mostly reliable, average power (r = 0.41 in all cases), the bonds of most amplitudes (with the exception of the base impedance) with the width of the face, as well as the reciprocal average forces are unreliable (r = -0.41 - -0.58) connections of the amplitude of the diastolic wave with all the longitudinal dimensions of the body; direct, mostly unreliable, average strength (r = 0,30-0,40) connections of most time indices (with the exception of the duration of the cardiac cycle and the time of the downstream part of the rheogram) with shoulder, neck and waist; reverse average strength, mostly unreliable (r = -0.30 -0.40) and reliable (r = -0.44 - -0.51) bonds of the dicrotic and diastolic indexes and the average speed of fast and slow blood transfusion with a third (mainly the forearms, stomach and thorax, with the exception of the indexes) and direct, mostly unreliable, average strength (r = 0,31-0,40) of the links of the parameters of the tone of all arteries, the tone of the arteries of the large caliber and the tone of the arteries of the middle and shallow caliber with shoulder girdles, forearms in the upper third, neck and waist, largest length and width of the head and muscle mass of the body by the American Institute of Nutrition (with the exception of the tone of the arteries of medium and small caliber).

Quantitative analysis of the correlations of constitutional parameters of the body with the parameters of the rheoencephalography of practically healthy women of the ectomorphic somatotype revealed the following distribution of links *with different groups of cerebral blood circulation* *indexes*: with amplitudes, 71 out of 290 possible (24.5%), of which 3 - 1.0% of reliable direct average forces; 4 - 1.4% of false direct middle forces; 2 - 0.7% of reliable reverse strong; 25 - 8.6% of the true reciprocal average strength; 37 - 12.8% of unreliable reciprocal average strength; with time indicators - 24 out of 290 possible (8.3%), of which, 3 - 1.0% of reliable direct average forces; 13 - 4.5% of false direct middle forces; 3 - 1,0% of the true reciprocal average strength; 5 - 1.7% of unreliable reciprocal average strength; with derivative indicators - 70 connections out of 464 possible (15.1%), of which 7 - 1.5% of reliable direct average forces; 22 - 4.7% of false direct average forces; 10 - 2.2% of the true reciprocal average strength; 31 - 6.7% of the unreliable reciprocal average strength.

The quantitative analysis of the correlations of anthropo-somatotypological parameters of the body with the parameters of cerebral circulation of practically healthy women of the ectomorphic somatotype revealed the following distribution of connections *with the parameters of structure and body dimensions*: with amplitude indicators - cephalometric indices (8 - 22.9% of the total number of cephalometric indices; 8.6% of the reliable direct average forces, 8.6% of the unreliable direct average forces, 5.7% of the unreliable reciprocal average forces); total body size (1 - 6.7% of the total size, all unreliable reciprocal average forces); longitudinal body dimensions (6 - 24.0% of the total number of longitudinal dimensions, all unreliable reciprocal average forces); the width of distal epiphyses of long limb bones (14 - 70.0% of the total number of these indicators, of which 35.0% of the true reciprocal average strength, 35.0% of the

Table 2. Correlation of derivative indices of rheoencephalograms of practically healthy women of Podillia ectomorphic somatotype with constitutional parameters of the body.

Indexes	EH2H1	EH3H1	EH4A1	EH1H4A2	EAC	EA1C	EA2C	EA1A2
OB_GL	-0,04	0,02	-0,12	-0,18	0,08	0,01	0,12	-0,33
B_DL_GL	-0,14	-0,22	-0,03	-0,17	0,34	0,32	0,33	-0,10
N_SH_GL	0,20	-0,01	0,26	0,24	-0,04	0,07	-0,04	-0,06
SH_N_CH	-0,01	-0,10	0,19	0,26	0,22	0,24	0,14	-0,16
SAG_DUG	-0,22	-0,22	-0,07	-0,02	0,09	0,07	0,03	0,39
B_SH_GL	-0,37	-0,39	-0,04	-0,09	**0,43**	0,38	**0,45**	-0,32
SH_LICA	0,22	0,13	0,34	0,40	0,01	0,09	-0,05	-0,04
W	-0,02	-0,14	-0,03	-0,02	0,23	0,22	0,17	-0,03
H	-0,04	-0,10	-0,11	-0,10	0,03	0,08	-0,04	0,03
S	-0,02	-0,14	-0,01	0,00	0,12	0,14	0,08	0,01
ATND	-0,04	-0,12	-0,08	-0,08	0,04	0,10	-0,03	0,02
ATL	-0,19	-0,24	-0,23	-0,17	0,11	-0,07	0,11	0,01
ATPL	-0,04	-0,09	-0,14	-0,12	0,10	0,13	0,02	0,01
ATP	0,02	-0,15	-0,27	-0,25	0,10	0,23	-0,02	0,23
ATV	-0,22	-0,17	-0,25	-0,25	0,04	-0,17	0,10	-0,12
EPPL	0,05	0,14	**-0,43**	**-0,51**	-0,07	-0,27	0,01	-0,25
EPPR	-0,16	-0,15	-0,34	-0,37	0,11	0,04	0,17	-0,08
EPB	-0,33	-0,28	0,09	0,15	0,05	0,11	0,01	0,00
EPG	-0,04	-0,04	-0,22	-0,27	-0,27	-0,19	-0,26	0,17
OBPL1	0,02	-0,08	-0,16	-0,14	0,39	0,39	0,31	-0,05
OBPL2	-0,11	-0,24	-0,09	-0,05	0,38	**0,41**	0,31	-0,06
OBPR1	-0,34	-0,38	-0,30	-0,26	0,31	0,37	0,23	0,14
OBPR2	-0,31	-0,39	-0,32	-0,35	0,21	0,21	0,24	0,19
OBB	-0,06	-0,22	0,04	0,07	0,15	0,21	0,11	0,27
OBG1	-0,07	-0,13	0,02	0,01	0,24	0,27	0,18	-0,10
OBG2	**-0,48**	**-0,47**	0,04	0,01	0,07	-0,08	0,22	-0,37
OBSH	-0,24	-0,30	0,02	0,02	0,32	0,19	0,38	-0,23
OBT	-0,18	-0,24	-0,02	-0,01	0,40	0,31	**0,42**	-0,13
OBBB	0,01	-0,15	0,19	0,21	-0,06	-0,07	-0,03	0,04

Continuation of Table 2.

Indexes	EH2H1	EH3H1	EH4A1	EH1H4A2	EAC	EA1C	EA2C	EA1A2
OBK	-0,17	-0,20	0,01	-0,04	0,10	0,06	0,12	-0,29
OBS	-0,37	-0,36	**-0,47**	**-0,50**	0,25	0,10	0,26	-0,18
OBGK1	0,06	0,16	-0,40	**-0,46**	0,01	-0,08	0,00	-0,03
OBGK2	0,33	0,42	-0,30	-0,39	-0,21	-0,23	-0,20	-0,24
OBGK3	0,21	0,28	**-0,44**	**-0,51**	-0,07	-0,17	-0,03	-0,11
PSG	-0,07	-0,16	-0,17	-0,17	0,15	0,25	0,10	-0,20
PNG	-0,07	-0,07	-0,36	-0,35	0,04	0,09	0,07	-0,17
SGK	0,13	0,08	-0,05	-0,12	0,00	-0,16	0,03	-0,24
ACR	0,04	-0,05	-0,03	0,00	**0,41**	0,29	0,34	-0,36
SPIN	-0,23	-0,29	0,04	0,06	-0,09	-0,30	0,08	-0,21
CRIS	-0,09	-0,13	-0,01	-0,12	0,10	0,03	0,17	-0,23
TROCH	-0,06	-0,19	0,20	0,20	0,16	0,20	0,17	-0,26
CONJ	-0,31	-0,34	-0,12	-0,12	0,01	0,02	0,01	-0,12
GZPL	0,13	0,16	-0,33	-0,40	0,01	-0,13	0,09	-0,09
GPPL	-0,18	-0,20	0,21	0,14	0,00	-0,05	0,12	-0,08
GPR	0,13	0,10	-0,09	-0,10	-0,07	-0,14	-0,04	0,08
GL	0,00	0,01	-0,25	-0,32	0,10	-0,06	0,19	-0,10
GGR	0,10	0,08	-0,16	-0,21	-0,02	-0,21	0,09	-0,03
GG	-0,07	-0,16	-0,06	-0,12	0,19	-0,01	0,23	-0,05
GB	0,00	-0,11	-0,18	-0,29	0,11	0,00	0,18	0,06
GBD	-0,05	-0,06	0,03	-0,05	-0,08	-0,21	0,01	0,15
GGL	0,14	0,19	-0,12	-0,18	-0,02	-0,23	0,03	0,12
FX	0,01	-0,04	-0,29	**-0,41**	0,09	-0,05	0,19	-0,04
MX	-0,13	0,00	-0,11	-0,08	0,23	0,17	0,22	-0,19
LX	0,03	0,10	-0,23	-0,25	-0,21	-0,18	-0,19	0,09
MM	-0,05	-0,17	-0,06	-0,03	0,25	0,32	0,16	0,00
OM	-0,13	-0,09	-0,29	-0,30	-0,07	-0,03	-0,09	0,05
DM	0,01	-0,06	-0,20	-0,27	0,20	0,02	0,25	0,00
MA	-0,11	-0,19	-0,12	-0,06	0,39	**0,48**	0,27	-0,02

false reciprocal average strength); body diameters (1 - 2.5% of the total number of diameters of the body, all unreliable reciprocal average forces); the circumferential dimensions of the body (23 - 30,7% of the total number of circumferential dimensions, of which 2,7% are reliable reverse strong, 20,0% reliable reciprocal average strength, 8.0% unreliable reciprocal average force); the thickness of skin and fat folds (7 - 15.6% of the total number of these indicators, of which 2.2% of the unreliable direct average strength, 13.3% of the unreliable reciprocal average strength); components of the somatotype according to Hit-Carter (6 - 40.0% of the total number of indicators of components of the somatotype, of which 6.7% of the true reciprocal average strength, 33.3% of the unreliable reciprocal average strength); indicators of the body composition (5 - 25.0% of the total number of components of the body composition, of which 10.0% of the true reciprocal average strength, 15.0% of the false reciprocal average strength); with time indicators - cephalometric indices (3 - 8.6% of the total number of cephalometric indicators, of which 5.7% are reliable reciprocal average forces, 2.9% of false reverse average strength); longitudinal body dimensions (1 - 4.0% of the total number of longitudinal dimensions, all unreliable direct average forces); the width of distal epiphyses of long limb bones (2 - 10.0% of the total number of these indicators, of which 5.0% of the true reciprocal average strength, 5.0% of the unreliable reciprocal average strength); body diameters (4 - 10.0% of the total number of body diameters, of which 5.0% of reliable direct average forces, 2.5% of unreliable direct average forces, 2.5% of unreliable reciprocal average forces); the circumferential dimensions of the body (12 - 16.0% of the total number of circumferential dimensions, of which

1.3% are reliable direct average forces, 13.3% unreliable direct average strength, 1.3% unreliable reciprocal average strength); components of the somatotype according to Hit-Carter (1 - 6.7% of the total number of components of the somatotype, all unreliable reciprocal average forces); indicators of the component composition of the body weight (1 - 10.0% of the total number of components of the body composition, all unreliable direct mean strength); with derived indicators - cephalometric indices (13-27.1% of the total number of cephalometric indices; 4.2% of them are reliable direct mean forces; 14.6% of unreliable direct mean forces; 8.3% of unreliable reciprocal average forces); the width of distal epiphyses of long limb bones (5 - 15,6% of the total number of these indicators, of which, 6,3% of the true reciprocal average strength, 9,4% of the false reciprocal average strength); body diameters (8-12.5% of the total body diameters, of which 1.6% are reliable direct mean forces, 1.6% are false direct average forces, 9.4% are false reciprocal average forces); the circumferential dimensions of the body (36-30.0% of the total number of circumferential dimensions, of which 2.5 reliable direct average forces, 10.0% of false direct middle forces, 5.8% of the true reciprocal average strength, 11.7% of the unreliable reciprocal average force); the thickness of skin and fat folds (3 - 4,2% of the total number of these indicators, all unreliable reciprocal average strength); components of the somatotype according to Hit-Carter (1 - 4.2% of the total number of components of the somatotype, all reliable reciprocal mean forces); indicators of body composition (4 - 12.5% of the total number of components of body composition, of which 3.1% of reliable direct average strength, 6.3% of unreliable direct average strength, 3.1% of unreliable reciprocal average strength)

Comparing the results with correlations of similar indices in practically healthy women of the Podillia mesomorphic somatotype [20] draw attention to the following differences in correlations: in women of the mesomorphic somatotype, the multiple reliable reciprocal mean connections of the amplitude and derivative indices of the rheoencephalography are established with a thickness of one-third of skin and fat folds, the endomorphic component of the somatotype and the fatty component of the body mass, and the multiple, mostly reliable, direct average strength of the connection of the ascending time part and phases of rapid blood flow to the rheoencephalography are established with the width of the distal epiphysis of the forearm, hip and legs.

The established differences in correlations with indicators of cerebral circulation and constitutional parameters of the body in practically healthy women of Podillia of different somatotypes confirm the need to consider the type of body structure when creating the normological parameters of indicators of cerebral circulation.

Prospects for further research are the study of the peculiarities of the relationships of constitutional parameters of practically healthy women of Podillia with other somatotypes with indicators of cerebral circulation.

Conclusions

1. In practically healthy women of Podillia, an ectomorphic somatotype, among correlations of cerebral blood circulation with anthropo-somatotypological parameters of the body, the highest percentage, mostly inverse, reliable and unreliable mean strength connections is established with the amplitude rheoencephalography data (8.6% and 12.8%, respectively), and the smallest - mostly direct, unreliable average correlation power with time (4.5%) indicators of the rheoencephalography. Among the derivatives of cerebral circulation, predominantly unreliable mean reciprocal and direct predominate connections (correspondingly 6.7 and 4.7% respectively).

2. In analyzing the correlations of various groups of anthropo-somatotypological parameters of the body with the parameters of cerebral circulation of practically healthy women of the ectomorphic somatotype, it was established that amplitude parameters of the rheoencephalography have the greatest relative percentage of connections with the width of distal epiphyses of long limb bones (70.0%), components somatotype (40.0%), circumferential dimensions (30.7%), components of body mass (25.0%), body length (24.0%) and cephalometric indices (22.9%); time indices of the rheoencephalography - with girths of the body (16.0%); derivatives of the rheoencephalography - with girth body sizes (30.0%) and cephalometric indices (27.1%).

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Семенченко В.В.

КОРЕЛЯЦІЇ АНТРОПО-СОМАТОМЕТРИЧНИХ ПАРАМЕТРІВ ТІЛА ПРАКТИЧНО ЗДОРОВИХ ЖІНОК ЕКТОМОРФНОГО СОМАТОТИПУ З ПОКАЗНИКАМИ ЦЕРЕБРАЛЬНОГО КРОВООБІГУ

Пошуку взаємозв'язків між показниками центрального або периферичного кровообігу та конституціональними параметрами організму до теперішнього часу приділяється значна увага у багатьох країнах світу. Однак, більшість подібних робіт присвячено вивченню проблеми при різних захворюваннях. Дослідження подібних зв'язків у контингентів здорового населення потребує подальшого поглибленого вивчення. Метою роботи є встановлення особливостей зв'язків антропо-соматометричних параметрів практично здорових жінок Поділля ектоморфного соматотипу з показниками мозкового кровообігу. Результати антропометричних, соматотипологічних і реоенцефалографічних досліджень проведених у практично здорових міських жінок Поділля ектоморфного соматотипу (n = 24) взяті з банку даних матеріалів науково-дослідного центру Вінницького національного медичного університету ім. М. І. Пирогова. Реоенцефалографічні параметри визначали за допомогою комп'ютерного діагностичного комплексу. В результаті обробки реограми автоматично визначали характерні точки на кривій та визначали основні показники (амплітудні, часові і похідні). Антропометричне дослідження згідно схеми В. В. Бунака включало визначення: тотальних розмірів тіла, поздовжніх, поперечних, обхватних розмірів, розмірів тазу і товщини шкірно-жирових складок. Краніометрія включала визначення: обхвату голови, сагітальної дуги, найбільшої довжини і ширини голови, найменшої ширини голови, ширини обличчя та нижньої щелепи. Соматотип визначений за методикою J.Carter і B.Heath, а компонентний склад маси тіла - за методикою J. Matiegka і формулами Американського інституту харчування. Аналіз кореляцій проводили з використанням непараметричного методу Спірмена в статистичному пакеті "STATISTICA 6.0". У практично здорових жінок Поділля ектоморфного соматотипу, серед кореляцій показників церебрального кровообігу з конституціональними параметрами тіла, найбільший відсоток, переважно зворотніх достовірних і недостовірних середньої сили зв'язків встановлений з амплітудними показниками реоенцефалограми. При аналізі кореляцій різних груп антропо-соматотипологічних параметрів

тіла з показниками церебрального кровообігу практично здорових жінок ектоморфного соматотипу встановлено, що амплітудні показники реоенцефалограми мають найбільший відносний відсоток зв'язків із шириною дистальних епіфізів довгих трубчастих кісток кінцівок, компонентами соматотипу, обхватними розмірами, показниками компонентного складу маси тіла, поздовжніми розмірами тіла і кефалометричними показниками; часові показники реоенцефалограми - з обхватними розмірами тіла; похідні показники реоенцефалограми - з обхватними розмірами тіла і кефалометричними показниками.
Ключові слова: *практично здорові жінки, ектоморфний соматотип, церебральна гемодинаміка, антропометричні показники, кореляції.*

Семенченко В.В.
КОРРЕЛЯЦИИ АНТРОПО-СОМАТОМЕТРИЧЕСКИХ ПАРАМЕТРОВ ТЕЛА ПРАКТИЧЕСКИ ЗДОРОВЫХ ЖЕНЩИН ЭКТОМОРФНОГО СОМАТОТИПА С ПОКАЗАТЕЛЯМИ ЦЕРЕБРАЛЬНОГО КРОВООБРАЩЕНИЯ
Поиску взаимосвязей между показателями центрального или периферического кровообращения и конституциональными параметрами организма до настоящего времени уделяется значительное внимание во многих странах мира. Однако, большинство подобных работ посвящено изучению проблемы при различных заболеваниях. Исследование подобных связей в контингентов здорового населения требует дальнейшего углубленного изучения. Целью работы является установление особенностей связей антропо-соматометрических параметров практически здоровых женщин Подолья эктоморфного соматотипа с показателями мозгового кровообращения. Результаты антропометрических, соматотипологических и реоэнцефалографических исследований проведенных у практически здоровых городских женщин Подолья эктоморфный соматотипа (n = 24) взяты из банка данных материалов научно-исследовательского центра Винницкого национального медицинского университета им. Н.И. Пирогова. Реоэнцефалографические параметры определяли с помощью компьютерного диагностического комплекса. В результате обработки реограммы автоматически определяли характерные точки на кривой и определяли основные показатели (амплитудные, временные и производные). Антропометрическое исследования согласно схемы В. В. Бунака включало определение: тотальных размеров тела, продольных, поперечных, обхватних размеров, размеров таза и толщины кожно-жировых складок. Краниометрия включала определение: обхвата головы, сагиттальной дуги, наибольшей длины и ширины головы, наименьшей ширины головы, ширины лица и нижней челюсти. Соматотип определенный по методике J.Carter и B.Heath, а компонентный состав массы тела - по методике J. Matiegka и формулами Американского института питания. Анализ корреляций проводили с использованием непараметрического метода Спирмена в статистическом пакеті "STATISTICA 6.0". У практически здоровых женщин Подолья эктоморфного соматотипа, среди корреляций показателей мозгового кровообращения с конституциональными параметрами тела, наибольший процент, преимущественно обратных достоверных и недостоверных средней силы связей установлен с амплитудными показателями реоэнцефалограммы. При анализе корреляций различных групп антропо-соматотипологических параметров тела с показателями мозгового кровообращения практически здоровых женщин эктоморфного соматотипа установлено, что амплитудные показатели реоэнцефалограммы имеют наибольший относительный процент связей с шириной дистальных эпифизов длинных трубчатых костей конечностей, компонентами соматотипа, обхватными размерами, показателями компонентного состава массы тела, продольными размерами тела и кефалометрическими показателям; временные показатели реоэнцефалограммы - с обхватными размерами тела; производные показатели реоэнцефалограммы - с обхватными размерами тела и кефалометрическими показателями.
Ключевые слова: *практически здоровые женщины, эктоморфный соматотип, церебральная гемодинамика, антропометрические показатели, корреляции.*