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**INDIVIDUAL VARIABILITY OF CORPUS CALLOSUM HEIGHT AND
SHAPE OF MATURE AGE PEOPLE ON THE BASIS OF MRI-IMAGES**

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Introductions. For centuries corpus callosum has been extensively studied and as a result it is now known that its function includes hemispheric exchange of information, the integration of the input information reaching one or both hemispheres as well as the facilitating of some types of cortical activity and its inhibition [1]. At the same time, attempts were made to find the reflection of the psychophysiological difference between male and female as well as age differences in the corpus callosum size that resulted in ambiguous data [2-5].

Aim. Determination of individual variability in height and shape of the corpus callosum of mature adults and its dependence on the height and shape of the skull.

Materials and methods. The material used were two samples from a series of MR-tomograms of male and female heads of mature age without pathology of the central nervous system, which were made on the basis of the European Radiological Center LLC "Hemo Medica Kharkiv".

Morphometric analysis was performed using RadiAnt Dicom Viewer software on a series of MR tomograms performed in the sagittal plane in T1 and T2 modes of weighted image, with a slice thickness of 5 mm.

Results and discussion. According to the data obtained morphometric analysis of the corpus callosum of men and women of mature age (Table 1), the height of the trunk convexity of the corpus callosum of men varies from 20.4 to 31.3 mm (on average – $26.1 \pm 2, 8$ mm), and the height of the neurocranium varies from 134.8 to 166.1 mm (an average of 150.4 ± 6.9 mm). The ratio of the height of the neurocranium to the height of the trunk convexity of the corpus callosum is in the range from 4.7 to 7.4 (average – 5.8 ± 0.7).

Table 1

The results of morphometric analysis of the corpus callosum and neurocranium of men and women of mature age

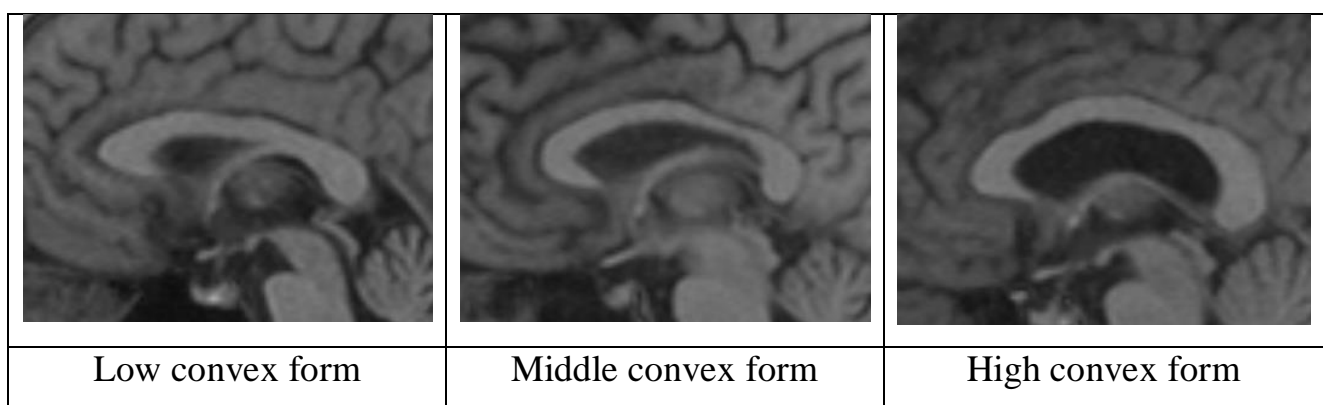
№	Sex	Longitudinal dimension of the contracting chord (mm)	Height of the trunk convexity (mm)	The ratio of the longitudinal dimension of the contracting chord to the height of the trunk convexity	Height of the neurocranium (mm)	The ratio of the height of the neurocranium to the height of the trunk convexity	Length of the neurocranium (mm)
1	M	65,7	24,7	2,7	156,8	6,3	184,5
	W	66,4	24,6	2,7	144,7	5,9	177,3
2	M	79,2	25,1	3,2	159,7	6,4	194,4
	W	66,4	24,7	2,7	137,6	5,6	180,2
3	M	70,3	24,0	2,9	156,1	6,5	190,9
	W	72,3	28,6	2,5	144,8	5,1	184,2
4	M	77,0	25,7	3,0	145,4	5,7	194,1
	W	68,9	32,8	2,1	151,0	4,6	190,4
5	M	71,5	25,5	2,8	143,1	5,6	186,7

	W	68,7	24,7	2,8	136,2	5,5	176,5
6	M	76,0	31,3	2,4	147,0	4,7	183,8
	W	67,8	22,7	3,0	142,7	6,3	186,0
7	M	70,6	27,2	2,6	146,4	5,4	190,3
	W	66,0	25,8	2,6	142,7	5,5	165,6
8	M	76,2	27,1	2,8	166,1	6,1	197,5
	W	65,5	22,8	2,9	137,6	6,0	174,5
9	M	71,8	28,3	2,5	151,0	5,3	187,7
	W	63,4	25,0	2,5	133,7	5,3	167,2
10	M	74,5	25,3	2,9	134,8	5,3	185,6
	W	70,8	28,2	2,5	140,9	5,0	186,1
11	M	68,3	25,0	2,7	148,6	5,9	181,8
	W	64,5	21,0	3,1	137,7	6,6	175,3
12	M	66,0	28,4	2,3	151,6	5,3	181,8
	W	71,4	25,0	2,9	142,9	5,7	182,1
13	M	70,5	25,6	2,8	148,1	5,8	186,4
	W	67,9	25,9	2,6	138,6	5,4	183,3
14	M	68,7	25,0	2,7	153,5	6,1	183,0
	W	67,4	23,1	2,9	135,1	5,8	173,6
15	M	71,9	23,0	3,1	146,6	6,4	197,0
	W	67,3	23,3	2,9	143,5	6,2	164,4
16	M	78,3	30,5	2,6	149,2	4,9	191,5
	W	75,9	23,5	3,2	136,9	5,8	180,3
17	M	70,1	20,4	3,4	151,4	7,4	181,0
	W	67,6	25,1	2,7	139,2	5,5	182,6
18	M	79,8	30,0	2,7	156,4	5,2	191,3
	W	67,7	26,8	2,5	138,3	5,2	171,2
19	M	79,1	22,9	3,5	146,0	6,4	199,4
	W	72,1	24,4	3,0	139,5	5,7	177,0
M± m	M	72,9±4,5	26,1±2,8	2,8±0,3	150,4±6,9	5,8±0,7	188,9±5,7
	W	68,3±3,0	25,2±2,6	2,7±0,3	140,2±4,2	5,6±0,5	177,8±7,2

In women, the height of the convexity of the corpus callosum is almost indistinguishable from that of men and ranges from 21.0 to 32.8 mm (on average 25.2 ± 2.6 mm). The height of the neurocranium in women is somewhat smaller, it ranges from 133.7 to 151.0 mm (on average – 140.2 ± 4.2 mm). The ratio of the height of the neurocranium to the height of the trunk convexity of the corpus callosum is in the range of 4.6 to 6.4 (on average – 5.6 ± 0.5), that is not significantly different from the same indicator in men.

In previous works, the relationship between the length of the cerebral skull and the longitudinal dimension of the contracting chord of the corpus callosum in men and women of mature age was found, and the ratio between these parameters that equals to 2.6 was determined. It is noteworthy that this ratio is the same for men and women. According to the results given in the table, it can be seen that such relationship is absent between the height of the skull and the height of the corpus callosum.

At the same time, the ratio of the longitudinal size of the corpus callosum along the contracting chord to the height of its trunk convexity was calculated. According to the data obtained (Table 1) in men, this coefficient varies from 2.3 to 3.5 (on average – 2.8 ± 0.3). In women, this figure is in the range of 2.1 to 3.2 (on average – 2.7 ± 0.3). Depending on the coefficient found and the shape of the trunk convexity of the corpus callosum, it was proposed to divide the latter into low convex, middle convex and high convex of its form (Fig. 1). The low convex shapes correspond to the coefficient $x > 2.8$, the middle convex ones correspond to the coefficient $2.8 \geq x \geq 2.7$, and the high convex ones correspond to the coefficient $x < 2.7$. It is noteworthy that the quantitative distribution of the aforementioned corpus callosum forms is approximately the same in both men and women.



**Fig. 1. MR-images of different corpus callosum forms
in terms of their convexity**

Conclusions. 1. The metrics obtained indicate a direct correlation between the length of the corpus callosum along the contracting chord and the length of the neurocranium.

2. There is no dependence between the height of the skull and the height of the trunk convexity of the corpus callosum.

3. According to the calculated coefficient of the ratio of the longitudinal size of the corpus callosum along the contracting chord to the height of its trunk convexity, it is proposed to distribute the corpus callosum to low convex, middle convex and high convex forms.

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