2. Grischenko VI, Yurchenko TN. Platsenta: kriokonservirovanie, struktura, svoystva i perspektivyi klinicheskogo primeneniya. H: SPD FL Brovin AV., - 2011. – 292 s. [in Ukrainian]
3. Karupu VYa. Elektronnaya mikroskopiya. Kiyev: Vishcha shkola; 1984. 207 s. [in Russian]
4. Merkulov GA. Kurs patogistologicheskoy tekhniki. – Leningrad: Meditsina. 1969, 422 s. [in Russian]
5. Shepitko V.I. Kharakterystyka strukturnykh elementiv selezinky pry transplantatsii kriokonservovanoi platsenty. Svit medytsyny ta biolohii. 2011; 2: 76-78. [in Ukrainian]

Реферати

МОРФОФУНКЦИОНАЛЬНОЕ СОСТОЯНИЕ СЕТЧАТКИ ПРИ ОДНОРАЗОВОМ ПОДКОЖНОМ ВВЕДЕНИИ КРИОКОНСЕРВИРОВАННОЙ ПЛАЦЕНТЫ НА ФОНЕ ОСТРОГО ЭКСПЕРИМЕНТАЛЬНОГО АСЕПТИЧЕСКОГО РЕТИНИТА У КРЫС

Стецук О. А., Шепитько К.В.

Исследование было проведено на 65 половозрелых крысах-самцах линии «Вистар», 55 из которых был смоделирован асептический ретинит с помощью 5 мг λ-каррагинана в 1 мл раствора NaCl и проведена однократная трансплантация криоконсервированной плаценты. Контрольная группа включала 10 крыс. Изучали морфологические изменения сетчатки глаз на ранних строках эксперимента. Было установлено, что моделированный асептический ретинит имеет четкие стадии воспаления (альтерация, эксудация и пролиферация). Изменения позникали постепенно, начиная с ганглионарного слоя.

Ключевые слова: криоконсервированная плацента, λ-каррагинан, сетчатка, асептический ретинит.

Стаття надійшла 20.01.19 р.

MORFOLOGICAL STATE OF RETINA IN RATS DURING SUBCUTANEOUS TRANSPLANTATION OF CRYOPRESERVED PLACENTA IN EXPERIMENTALLY INDUCED ACUTE ASEPTIC RETINITIS

Stetsuk O.A., Shepitko K.V.

The study was carried out on 65 male rats of Wistar line, 55 of them being modeled aseptic retinitis by administering 5 mg of λ-carrageenan in 1 ml of NaCl solution. A single subcutaneous transplantation of cryopreserved placenta was performed. The control group included 10 rats. Morphological changes of the eye retina were studied at the early terms of the experiment. It was established that modeled aseptic retinitis has clear stages of inflamation (altiration, exudation and prolifiration). Changes were arising gradually starting from ganglion cell layer.

Keywords: cryopreserved placenta, λ-carrageenan, retina, aseptic retinitis.

Рецензент Шепітько В.І.

DOI 10.26724/2079-8334-2019-1-67-196
UDC: 611.818 – 053.13:616.811.013:616.811.018

V. O. Tikholaz, O. V. Oniskova, L. O. Yushchenko, R. V. Skoruk, O. O. Hordiichuk
National Pyrogov Memorial Medical University, Vinnytsya

MACROMETRIC PARAMETERS OF THE STRUCTERES OF MEDULLA OBLONGATA IN THE PRENATAL PERIOD OF HUMAN ONTOGENESIS IN NORMAL AND MALFORMATION

E-mail: tikholaz.vo@gmail.com

The article presents results of investigations of macrometric parameters of medulla oblongata in 230 human fetuses from 8-9 till 39-40 weeks in prenatal period of ontogenesis. The dimensions of the medulla oblongata and the sizes of the olives in different age groups in human fetuses without anomalies and in human fetuses with malformation were determined. Accelerated growth rate of all sizes of medulla oblongata and the sizes of the olives were found in different age groups in human fetuses.

Keywords: macrometric parameters, medulla oblongata, olives, prenatal ontogenesis.

The study is a fragment of the research project "Determination of the regularities in organo- and histogenesis and topography of the chest and abdominal cavity internal organs, as well as structures of the central nervous system in human fetuses (macroscopic, histological, immunohistochemical and ultrasound studies). Comparison of the obtained data with the analogues ones in fetuses with congenital development malformations", state registration No. 0113U05070.

The central nervous system has an ectodermal origin and appears neural plate in the middle of the third week of development [3]. Neural tube formation starts during the fourth week after fertilization and fuses approximately between the days 25^{th} -27^{th} [4, 6]. Most defects of the spinal cord result from abnormal closure of the neural folds. Verity of genetic factors and environmental factors are poorly understood [2, 5]. The resulting abnormalities, neural tube defects, may involve the meninges, vertebrae, muscles, and skin [4]. It is important to investigate parameters of medulla oblongata during prenatal ontogenesis.

The purpose of the study was to determine the macrometric parameters of medulla oblongata in different age groups in human fetuses without anomalies and in human fetuses with malformation.

Material and methods. The investigations were performed in 230 human fetuses from 8-9 till 39-40 weeks in prenatal period of ontogenesis. Age was determined using tables by Patten B.M. (1959), Knore A.G. (1967), Beard R. (1984) and Sadler T. (2001) on the basis of measurement of parietal-coccygeal length. Embryos and fetuses were divided into 14 age groups (table 1).

Table 1

Distribution of human embryos and fetuses for ages

Age, weeks	Number	Parietal-coccygeal length, mm
6-7	10	18.2±2.4
8-9	15	45.2±3.1
10-11	21	72.1±3.2
12-13	24	81.2±3.5
14-15	28	119.0±4.7
17-18	14	154.3±4.9
20-21	17	202.8±5.4
22-23	13	234.4±7.8
25-26	18	257.3±10.2
28-29	17	298.1±12.7
30-31	10	307.1±12.2
33-34	15	337.3±13.3
37-38	16	352.3±16.1
39-40	12	374.5±19.2
Всього:	230	-

We obtained the material for the study as a result of late abortions and stillborn. There are no malformations of the central nervous system. Moreover, we measured the main parameters of 10 fetuses with the malformations (table 2). We obtained the material after termination of pregnancy based on medical indications. The study was carried out in the Vinnytsya Regional Pathoanatomical Office and Vinnytsya Maternity Hospitals. Macrometric study of medulla oblongata was done according Avtandilov G.G. [1].

Table 2

The structure objects of study with the malformations

No.	Malformations	Age, weeks	Number	Parietal-coccygeal length, mm	Weight, g
1	Torakoomfalopah	17-18	1	Right – 115, Left – 119	Right – 175, Left – 119
2	Fetal human skull tower	20-21	1	183	440
3	Anencephaly	14-15	1	59.0	123.0
4	Spinabifida	17-18	5	142.7±10.1	174.0±12.2
5	Sacrococcygeal teratoma	17-18	2	165.0±2.2	370.5±14.5

The length of the medulla oblongata was measured from pyramids intersection along anterior median fissure till bulb-bridge grooves. The cranial transverse dimension was measured between the most distant points at bulb-bridge grooves. The caudal transverse dimension was measured at pyramids intersection. The olive length was measured at the most distant vertical points of olives, the olive width was measured at the most distant horizontal points of olives.

The results were calculated using Software “Statistica 6.0”. We evaluated correctness of distribution of the characteristics for each of the received variational series, average value for each indication and standard deviation. Statistical significances of differences between the values of independent quantitative values were determined using the Student t-criterion (normal distribution characteristics) or Mann-Whitney U-criterion (abnormal distribution characteristics).

Materials of the study do not contravene the fundamental bioethical norms of WMA Declaration of Helsinki adopted by the 59th World Medical Association in 2008.

Results of the study and their discussion. Macrometric parameters tend to increase from 8-9 till 39-40 weeks in prenatal period of ontogenesis (table 3). During performing statistic analyses we have determined that medulla oblongata indicators increase 3.2 times in human fetuses at 39-40 weeks of prenatal development (PD) under 8-9 weeks human fetuses at 39-40 weeks of PD ($p<0.01$). The medulla oblongata length is 15,6±0,6 mm in human fetuses at 39-40 weeks of PD and 4,8±0,2 mm in human fetuses at 8-9 weeks of PD.

Statistically significant indicators of differences in the length of the medulla oblongata have been determined in human fetuses among the following age groups: 10-11, 12-13, 14-15, 17-18 weeks PD.

During the fetal period of prenatal ontogenesis length of the medulla oblongata has a different growth rate. So, the most high, and nearly equal, growth rate of this indicator set in human fetuses is 12-

13, 14-15 and 17-18 weeks of PD. In human fetuses at 12-13 weeks PD length of the medulla oblongata is 6.5±0.2 mm, which is 25 % higher than the value of this indicator in human fetuses of 10-11 weeks of PD, in which the value of this indicator is 5.2±0.2 mm ($p<0.01$). In human fetuses at 14-15 weeks of PD length of the medulla oblongata is 8,3±0,3 mm, which is 27.7 % higher than the value of this indicator in human fetuses at 12-13 weeks of PD ($p<0.01$). It was found that the length of the medulla oblongata in human fetuses at 17-18 weeks of PD is 103±0.3 mm, and 24.1% greater than the length of the medulla oblongata of fetuses 14-15 weeks in PD ($p<0.01$). The cranial transverse dimension of the oblong brain during fetal period of prenatal ontogenesis, from 8-9 till 39-40 weeks increased 2.4 times ($p<0.01$). So, its value of human fetuses at 39-40 weeks of PD is 12.8±0.5 mm, whereas its value of human fetuses at 8-9 weeks of PD is 5.3±0.2 mm.

Table 3

Macrometric parameters of medulla oblongata in human fetuses of different age groups

Age, weeks	The dimensions of the medulla oblongata, mm			
	Length	Cranial transverse dimension	Caudal transverse dimension	Anterior-posterior size
8-9	4.8±0.2	5.3±0.2	3.2±0.1	3.9±0.1
10-11	5.2±0.2	5.7±0.2	3.4±0.1	4.1±0.1
12-13	6.5±0.2	6.1±0.2	3.5±0.1	4.6±0.1
14-15	8.3±0.3	7.7±0.2	4.3±0.2	5.7±0.2
17-18	10.3±0.3	8.8±0.3	5.5±0.2	6.6±0.2
20-21	11.2±0.4	9.3±0.3	5.7±0.2	7.4±0.3
22-23	11.4±0.4	9.7±0.3	6.3±0.3	7.6±0.3
25-26	11.5±0.4	9.8±0.3	6.3±0.3	7.7±0.3
28-29	13.1±0.5	9.8±0.3	6.5±0.2	7.9±0.3
31-32	14.2±0.5	9.9±0.4	7.1±0.3	7.9±0.3
34-35	14.6±0.6	10.4±0.4	7.5±0.3	8.2±0.3
37-38	15.2±0.5	11.7±0.4	7.9±0.3	8.4±0.3
39-40	15.6±0.6	12.8±0.5	8.1±0.3	9.8±0.4

It was revealed that statistically significant cranial transverse size of the medulla oblongata has the differences between age groups of human fetuses at 12-13, 14-15, 17-18 weeks of PD. The transverse cranial size of the medulla in human fetuses at 14-15 weeks of PD is 7.7±0.2 mm, which is 26.2 % more than the value of this index in the human fetus at 12-13 weeks of PD, where the value of this indicator amounted to 6.1±0.2 mm ($p<0.01$). The cranial transverse dimension of the oblong brain in human fetuses at 17-18 weeks of PD is 8.8±0.3 mm, which is 14.3 % higher than the index in the human fetus at 14-15 weeks in PD ($p<0.05$). The caudal transverse dimension of the oblong brain during the fetal period of prenatal ontogenesis, from 8-9 weeks till 39-40 week increases by 2.5 times ($p<0.01$). So, its value is 8.1±0.3 mm in human fetuses at 39-40 weeks of PD, whereas it is 3.2±0.1 mm in human fetuses of 8-9 weeks of PD.

The caudal transverse dimension of the medulla oblongata in human fetuses at 14-15 weeks of PD is 4.3±0.2 mm, which is 22,8% more than the value of this indicator in human fetuses at 12-13 weeks of BP. The value of this index is 3.5±0.1 mm ($p<0.01$).

The cranial transverse dimension of the oblong brain from human fetuses at 17-18 weeks of PD is 5.5±0.2 mm, 27.9 % more than this indicator in fetuses at 14-15 weeks of PD ($p<0.01$).

The anterior-posterior size of the oblong brain during the fetal period of prenatal ontogenesis, from 8-9 till 39-40 week increases by 2.5 times ($p<0.01$). So, its value in human fetuses at 39-40 weeks of PD is 9.8±0.4 mm, whereas its value in human fetuses at 8-9 weeks of PD is 3,9±0,1 mm.

In human fetuses at 14-15 weeks of PD the anterior-posterior size of the medulla is 5.7±0.2 mm, which is 23.9% greater than the value of this indicator in human fetuses at 12-13 weeks of PD, in which the value of this index is 4.6±0.1 mm ($p<0.01$). The anterior-posterior size of the medulla oblongata in human fetuses at 17-18 weeks of PD is 6.6±0.2 mm, which is 15.8 % more than this indicator in fetuses at 14-15 weeks of PD ($p<0.05$).

So, human fetuses at 14-15 and 17-18 weeks of PD have high growth rates of all sizes of the medulla oblongata. The following differences were revealed during comparison of rates of increasing of the longitudinal and transverse dimensions according to age groups of human fetuses. The cranial transverse size becomes greater than the length of the medulla oblongata at 10-11 weeks of PD. The length

of the medulla oblongata becomes 6.5% more than cranial transverse dimension ($p<0.05$) at 12-13 weeks of PD. The difference of these indicators is 17% at 17-18 weeks of PD and this difference is stored in human fetuses till 25-26 weeks of PD ($p<0.05$). In human fetuses at 28 and 29 weeks of PD difference is 33.7%, at the human fetuses at 31-32 weeks PD – 43,4 % and the difference is stored in human fetuses prior to 34-35 weeks of PD ($p<0.01$). This difference decreases in human fetuses at 37-38 weeks of PD and the length of the medulla oblongata is 29.9% less than cranial transverse dimension, and the same index in the human fetus at 39-40 weeks of PD is 21.8% less ($p<0.01$).

It is established that in human fetuses from 8-9 weeks till 39-40 weeks of PD the length of the medulla oblongata is more than its front-rear size: at 8-9 weeks the difference is 23% and gradually increased to 17-18 weeks of PD, where it is 56.1%. It remains almost the same level in 25-26 weeks of PD. It significantly increases up to 65.8 % in human fetuses at 28 and 29 weeks of PD. The difference between the length and anterio-posterior size of the medulla from 28-29 weeks to 37-38 weeks of PD increases gradually and it equals to 80.9 per cent ($p<0.01$) in human fetuses at 37-38 weeks of PD. This index decreases in human fetuses at 39-40 weeks of PD and it is 59.2 % ($p<0.01$).

The cranial transverse size of the medulla oblongata is more than anterior-posterior from 8-9 weeks till 39-40 weeks of PD. The difference between these indicators during the fetal period increases from 27.2% to 39.2 %, the patterns of changes during prenatal ontogenesis are not found.

The olive sizes were determined higher in each age group in comparison with the previous age group in the fetal period of human ontogenesis from 8-9 weeks to 39-40 weeks of PD (table 4). It is established that the right olive length is 6.3 times bigger and the left olive length is 6.5 times bigger in human fetuses at 39-40 weeks of PD than these values in fetuses at 8-9 weeks of PD ($p<0.001$). So, the right olive length is 10.1±0,42 mm and the left olive length is 9.8±0,35 in human fetuses at 39-40 weeks of PD, while the right olive length is 1.6±0.05 mm and the left olive length is 1,5±0,05 mm in human fetuses at 8-9 weeks of PD.

The right olive width is 8.4 times greater and the left olive width is 7.8 times greater in human fetuses at 39-40 weeks of PD than these values in fetuses at 8-9 weeks of PD ($p<0.001$). So, the right olive width is 4.2±0.15 mm and the left olive width is 3,9±0,14 mm in human fetuses at 39-40 weeks of PD, while width of the right and the left olives are the same and equaled 0.5±0.01 mm in human fetuses at 8-9 weeks of PD.

Table 4

Macrometric parameters of olives of the medulla in human fetuses of different age groups

Age, weeks	The size of olives, mm			
	The right olive		The left olive	
	length	width	length	width
8-9	1.6±0.05	0.5±0.01	1.5±0.05	0.5±0.05
10-11	2.1±0.07	0.9±0.03	2.1±0.07	0.8±0.04
12-13	2.8±0.09	1.3±0.04	2.7±0.09	1.4±0.04
14-15	3.3±0.11	1.5±0.05	3.1±0.09	1.6±0.07
17-18	4.2±0.14	2.3±0.07	4.4±0.14	2.4±0.09
20-21	4.9±0.16	2.7±0.09	5.1±0.15	2.8±0.09
22-23	5.3±0.17	2.8±0.09	5.4±0.17	3.1±0.12
25-26	5.6±0.18	3.1±0.11	5.6±0.19	3.1±0.11
28-29	6.7±0.22	3.3±0.12	6.9±0.24	3.4±0.12
31-32	7.4±0.24	3.4±0.12	7.5±0.25	3.4±0.13
34-35	8.4±0.27	3.5±0.13	8.5±0.29	3.5±0.13
37-38	9.6±0.37	3.8±0.14	9.7±0.32	3.7±0.15
39-40	10.1±0.42	4.2±0.15	9.8±0.35	3.9±0.14

The statistically significant differences of the length and width of the right and the left olives from human fetuses at 8-9, 10-11, 12-13, 14-15, 17-18, 20-21 weeks of PD were identified. In addition, the length of the right and left olive statistically differ significantly in human fetuses at 25-26, 28-29 weeks of PD.

It is established that the right olive length is 2.1±0.07 mm in human fetuses at 10-11 weeks of PD, which is 31.2 % more than this indicator in human fetuses at 8-9 weeks of PD ($p<0.01$). The right olive

length is 2.8±0.09 in human fetuses at 12-13 weeks of PD, which is 33,3 % more than this indicator in human fetuses at 10-11 weeks of PD ($p<0.01$). The right olive length is 3.3±0.11 mm in human fetuses at 14-15 weeks of PD, which is 17.9% more than this indicator in human fetuses at 12-13 weeks of PD ($p<0.05$). The right olive length is 4.2±0.14 mm in human fetuses at 17-18 weeks of PD, which is 27.3% more than this indicator in human fetuses at 14-15 weeks of PD ($p<0.01$). The right olive length is 4.9±0,16 mm in human fetuses at 20-21 weeks of PD, which is 16.7% more than this indicator in human fetuses at 17-18 weeks of PD ($p<0.05$). The right olive length is 6.7±0.22 mm in human fetuses at 28-29 weeks of PD, which is 19.6% more than this indicator in human fetuses at 25-26 weeks of PD, in which its value is 5.6±0.18 mm ($p<0.05$).

The left olive length is 2.1±0.07 mm in human fetuses at 10-11 weeks of PD, which is 40% more than this indicator in human fetuses at 8-9 weeks of PD ($p<0.01$). The left olive length is 2.7±0.09 in human fetuses at 12-13 weeks of PD, which is 28.7% more than this indicator in human fetuses at 10-11 weeks of PD ($p<0.01$). The left olive length is 3.1±0.09 mm in human fetuses at 14-15 weeks of PD, which is 14.8% more than this indicator in human fetuses at 12-13 weeks of PD ($p<0.05$). The left olive length is 4.4±0.14 mm in human fetuses at 17-18 weeks of PD, which is 41.9% more than this indicator in human fetuses at 14-15 weeks of PD ($p<0.01$). The left olive length is 5.1±0.15 mm in human fetuses at 20-21 weeks of PD, which is 15.9% more than this indicator in human fetuses at 17-18 weeks of PD ($p<0.05$). The left olive length is 6.9±0.24 mm in human fetuses at 28-29 weeks of PD, which is 23.2% more than this indicator in human fetuses at 25-26 weeks of PD, in which its value is 5.6±0.19 mm ($p<0.05$).

The right olive width is 0.9±0.03 mm in human fetuses at 10-11 weeks of PD, which is 80% more than this indicator in human fetuses at 8-9 weeks of PD ($p<0.001$). The right olive width is 1.3±0.04 mm in human fetuses at 12-13 weeks of PD, which is 44.4% more than this indicator in human fetuses at 10-11 weeks of PD ($p<0.01$). The right olive width is 1.5±0.05 mm in human fetuses at 14-15 weeks of PD, which is 15.4% more than this indicator in human fetuses at 12-13 weeks of PD ($p<0.05$). The right olive width is 2.3±0.07 mm in human fetuses at 17-18 weeks of PD, which is 53.3% more than this indicator in human fetuses at 14-15 weeks of PD ($p<0.01$). The right olive width is 2.7±0.09 mm in human fetuses at 20-21 weeks of PD, which is 17.4% more than this indicator in human fetuses at 17-18 weeks of PD ($p<0.05$).

The left olive width is 0.8±0.04 mm in human fetuses at 10-11 weeks of PD, which is 60% more than this indicator in human fetuses at 8-9 weeks of PD ($p<0.001$). The left olive width is 1.4±0.04 in human fetuses at 12-13 weeks of PD, which is 75% more than this indicator in human fetuses at 10-11 weeks of PD ($p<0.01$). The left olive width is 2.4±0.09 mm in human fetuses at 17-18 weeks of PD, which is 50% more than this indicator in human fetuses at 14-15 weeks of PD ($p<0.01$). The left olive width is 2.8±0.09 mm in human fetuses at 20-21 weeks of PD, which is 16.7% more than this indicator in human fetuses at 17-18 weeks of PD ($p<0.05$).

The right and left thoracodidymus at 17-18 weeks of PD the medulla oblongata length is 8.0 mm; the transverse cranial size of right thoracodidymus is 8.0 mm, the transverse cranial size of left thoracodidymus is 8.5 mm; caudal transverse size of the right thoracodidymusis is 4.5 mm, caudal transverse size of the left thoracodidymusis is 5.0 mm. Anterior-posterior size of the right and left thoracodidymusis is 6.0 mm. The size of the olive, both left and right side are the same: right and left thoracodidymusis length is 4.0 mm, the width of the olives of right thoracodidymus is 1.5 mm, the width of the olives of left thoracodidymus is 1.0 mm.

The length of the medulla in human fetus at 20-21 weeks of PD with oxycephalia is 10.0 mm. The transverse dimension at cranial part is 11.0 mm, in caudal part is 5.7 mm. The anterior-posterior size is 7.0 mm. The sizes of the left oliva and right oliva are identical, the length is 4.9 mm, the width is 3.0 mm.

The lengths of the medulla oblongata are 9.9 mm and 10.2 mm in two human fetuses at 17-18 weeks of PD with sacrococcygeal teratoma. Transverse dimensions at cranial part are 8.7 mm and 8.9 mm, dimensions at caudal part are 4.5 mm and 4.7 mm. The anterior-posterior sizes are 6.6 mm and 6.8 mm. The sizes of the left olive and right olive are identical, lengths are 4.5 mm and 4.3 mm, widths are 1.8 mm and 2.0 mm.

The length of the medulla oblongata is 10.1±0,2 mm in human fetuses at 17-18 weeks of PD with spina bifida. The transverse size at cranial part is 8,7±0,2 mm, dimension at caudal part is 5,3±0,2 mm. The anterior-posterior size is 6.5±0.3 mm. The dimensions of the right olive: the length is 4.0±0.13 mm, the width is 2.1±0.13 mm. The dimensions of the left olive: the length is 4.2±0.15 mm, the width is 2.3±0.14 mm.

The medulla oblongata length is 5.5 mm in human fetus at 14-15 weeks of PD with anencephaly. The transverse dimension in cranial part is 5.8 mm, dimension in caudal part is 3.5 mm. The anterior-posterior size is 4.2 mm. The sizes of the left olive and right olive are identical, the length is 2.2 mm, the width is 0.8 mm.

Conclusions

1. The length of the medulla oblongata becomes larger 3.2 times during prenatal ontogenesis. The cranial transverse dimension becomes larger 2.4 times and the caudal transverse size and the anterior-posterior size become larger 2.5 times ($p<0.001$). Accelerated growth rate of all sizes of medulla oblongata was found in human fetuses at 14-15 and 17-18 weeks of PD.

2. The cranial transverse size prevails the length of the medulla oblongata in human fetuses till 10-11 weeks of PD. The length of the medulla oblongata becomes bigger than the cranial transverse size from 12-13 weeks of PD and it increases with each different age group in human fetuses.

3. The right olive length increases 6.3 times, the left olive length increases 6.5 times. The right olive width increases 8.4 times, the left olive width increases 7.8 times ($p<0,001$). More intensive growth rate in human fetuses at 10-11 weeks of PD and less intensive growth rate in human fetuses at 12-13 and 17-18 weeks of PD were determined.

4. We have identified, that the cranial transverse dimension of the medulla oblongata of thoracodidymus matches to their gestational age, but other dimensions match to the sizes of human fetuses without anomalies at 14-15 weeks of PD. All dimensions of the medulla oblongata in human fetus with oxycephalia match to the gestational age except the cranial transverse dimension, which is 2,2 mm more than the cranial transverse dimension in human fetus at 20-21 weeks of PD. All dimensions of the medulla oblongata in human fetus with sacrococcygeal teratoma match to the gestational age except the caudal transverse dimension, which is 0,8-1,0 mm less than the caudal transverse dimension in human fetus at 17-18 weeks of PD. All dimensions of the medulla oblongata in human fetus with anencephaly match to the gestational age.

References

1. Avtandilov GG. Meditsinskaya morfometriya. 1990; Moskow. Meditsina. [in Russian]
2. De Keersmaecker B., Claus F., De Catte L. Imaging the fetal central nervous system. Facts Views Vis Obgyn. 2011; 3(3): 135–149.
3. Mohammed H. Karrar Alsharif, Abubaker Y. Elamin, Deya Eldin A. Mohamed, Khalid M. Taha. Sonagrahpic Evaluation of Normal Anatomy of Fetal Central Nervouse System in Mid-trimester, Forensic Medicine and Anatomy Research. 2015; 3, 32-38.
4. Salder T.W. Lagman's Medical embryology (13th ed.). 2015; Wolters Kluwer.
5. Savelev S. V. Patologiya embrionalnogo morfogeneza golovnogo mozga cheloveka. Vestnik RAMN. 2012; 8, 40-46.
6. Stiles, J., Terry, L. J. The basics of Brain Development. Neuropsychol Rev. 2010; 20, 327-348.

Реферати

МАКРОМЕТРИЧНІ ПАРАМЕТРИ ДОВГАСТОГО МОЗКУ У ПРЕНАТАЛЬНОМУ ПЕРІОДІ ОНТОГЕНЕЗУ ЛЮДИНИ В НОРМІ ТА ПРИ МАЛЬФОРМАЦІЯХ

Тихолаз В.О., Оніськова О.В., Ющенко Л.О., Скорук Р.В., Гордійчук О.О.

У статті представлені результати дослідження макрометричних параметрів довгастого мозку у 230 ембріонів та плодів людини віком від 6-7 до 39-40 тижнів внутрішньоутро бного розвитку. Були визначені макрометричні параметри довгастого мозку та макрометричні параметри олив довгастого мозку у плодів людини різних вікових групп в нормі та при мальформаціях. Встановлено, що протягом плодового періоду пренатального онтогенезу людини відмічається збільшення розмірів усіх показників та розмірів олив довгастого мозку.

Ключові слова: макрометричні параметри, довгастий мозок, оливи, пренатальний онтогенез.

Стаття надійшла 15.02.18 р.

МАКРОМЕТРИЧЕСКИЕ ПАРАМЕТРЫ ПРОДОЛГОВАТОГО МОЗГА В ПРЕНАТАЛЬНОМ ПЕРИОДЕ ОНТОГЕНЕЗА ЧЕЛОВЕКА В НОРМЕ И ПРИ МАЛЬФОРМАЦИЯХ

Тихолаз В.А., Ониськова Е.В., Ющенко Л.А., Скорук Р.В., Гордийчук А.А.

В статье представлены результаты исследования макрометрических параметров продолговатого мозга у 230 эмбрионов и плодов человека от 6-7 до 39-40 недель внутриутробного развития. Были определены макрометрические параметры продолговатого мозга и макрометрические параметры олив продолговатого мозга у плодов человека разных возрастных групп в норме и при мальформациях. Определено, что на протяжении плодового периода пренатального онтогенеза человека отмечается увеличение размеров всех показателей и размеров олив продолговатого мозга.

Ключевые слова: макрометрические параметры, продолговатый мозг, оливы, пренатальный онтогенез.

Рецензент Старченко І.І.