

## MORPHOFUNCTIONAL STRUCTURE OF THE PLACENTA IN PREMATURE LABOR

Shavazi Nargiz Nuraliyevna

Associate Professor, Head of the Department of Obstetrics and Gynecology No. 3

Clinical Resident of the Department of Obstetrics and Gynecology No. 3

Jabborova Maftuna Dilshodovna

Samarkand State Medical University, Uzbekistan

### ABSTRACT

The study revealed pathomorphological changes in the placenta in late preterm birth from 30 weeks to 36 weeks and 6 days. Late preterm birth is accompanied by morphostructural changes in the placental tissue, manifested by involutive dystrophic changes, impaired maturation of chorionic villi as well as the presence of compensatory-adaptive reactions.

**Keywords:** late preterm birth, morphology of placenta.

**Аннотация.** Исследование выявило патоморфологические изменения в плаценте при преждевременных родах в сроке от 30 недель до 36 недель. Преждевременные роды сопровождаются морфоструктурными изменениями в плацентарной ткани, проявляющимися инволютивно-дистрофическими изменениями, нарушением созревания ворсин хориона, а также наличием компенсаторно-приспособительных реакций.

**Ключевые слова:** преждевременные роды, морфология плаценты.

### ACTUALITY

Late preterm birth is an actual problem of modern obstetrics, whose frequency is still significant in developed countries, totally from 5 to 9 %, in different regions of our country varies from 4 to 12 %, by defining steadily high rates of sickness and death of newborns. For a share of late preterm birth in terms between 30 and 36 weeks there are more than 70 % of all late births, which is connected with high frequency of extragenital pathologies among pregnant women, preterm rupture of amniotic fluid, wide usage of helping reproductive technologies and the increase of multiple pregnancy. The upgrading of methods of early diagnosis's, the creation of personified forecast of unpleasant results of fetus provides an ability to discrete a high risk of prenatal pathology in time (fetus's growth retardation, development's vices and anomalies, intrauterine hypoxia), which is, actually, can be a reason of preterm birth destruction.

According to trends, which were established recent time, about increasing of amount preterm births, a lot of researches were dedicated for searching forecasting factors. The analysis of functioning disturbance of fetoplacental complex is a perspective direction, as a key reason of preterm birth, but the revealing of morph functional changes in placenta will let to discrete factors of realization late preterm births.

### AIM OF THE WORK

Studying of morph functional placenta's features in late preterm births.

## METHODS OF RESEARCHES

There were carried out complex research of 260 pregnant at reproductive age with preterm birth in term 30-36 weeks (main group). The comparison group contains 50 patients with timely births. Anamnestic dates of women were analyzed, the features of pregnancy, births, postnatal and early neonatal period's duration. Comparative analysis of placentas' morph functional condition at late preterm and urgent births. After placenta's separation and isolation was made macroscopic research. Placenta was observed, the place umbilical cord attachment was assessed. Placenta's mass was defined. The thickness was measured, maximal and minimal diameter of it. Material for histological research was taken from central, paracentral and edgy parts. Obtained material was fixed in 10% buffered formalin and poured into paraffin. Slices were made on sled microtome from fetus's, medium and maternal parts with thickness 5-7 mkm. Gotten microclines were dyed by hematoxylin-eosin. Microscopic research of placenta carried out on «Zeiss Axio Lab.A1» microscope. The state of basal and chorionic plates was assessed in microclines, intervillous space, vessels, chorionic epithelium, syncytial kidneys, as well. The assessment of each microscopic rate of placenta was based on a three-point system (from 1 to 3 scores). Materials' static processing has been done using parametric and non-parametric criterias (T-criteria of Student, Manna-Witney's U-criteria), for assessing the interconnections was used Spearman's correlation coefficient ( $r_{\text{main}}$ ,  $r_{\text{control}}$ ). If differences had  $p \leq 0,05$ , they could be counted as reliable.

## THE RESULTS OF THE STUDY AND DISCUSSIONS

Average age of patients in both groups contains  $26,9 \pm 0,49$  years. In main group 62% of pregnant were at a late reproductive age (30 and up). During the studying of obstetric-gynecological anamnesis there were 65,7% of abortions, unprompted miscarriage were met at about 14,5% between patients, which, actually, were repeated. In the concrete, each fifth pregnant had preterm birth in her anamnesis. Patients of the main group among gynecological diseases mostly had chronic inflammation of the uterine appendages around 74%, and dysfunction of biogenesis had 19% of pregnancy ( $p < 0,05$ ).

Amongst extra genital pathologies infectious diseases had prevailed, among which diseases of the urinary organs (pyelonephritis, cystitis) and upper respiratory tract prevailed. Anemia of pregnancy, which was revealed at 38% pregnancy in the main group, leads to decreasing of general resistance, and in this way the risk of exacerbation of existing chronic foci of infection and an increase in infectious morbidity during pregnancy, which in the next is a risk factor for late preterm birth. 17(34%) pregnancy, had endocrine pathology, who, also, had late preterm birth, amid them each third woman had obesity. Except this, 26(52%) pregnancy, had mixed (two or more diseases) extra genital pathology ( $p < 0,05$ ).

The study revealed that all women with late preterm birth had a low health index. When studying the complications of this pregnancy, in a significantly greater percentage ( $p < 0,01$ ) the threat of termination of pregnancy was observed in 54% of patients, which is a risk factor for preterm birth. Isthmic-cervical insufficiency was diagnosed in 12% of pregnant women, about which correction was carried out with an obstetric peccary. Polyhydramnios, as a manifestation of intra-amniotic infection, was observed in 18% of cases. In every third patient with late preterm labor, pregnancy proceeded against the background of preeclampsia symptoms of

varying severity. The course of pregnancy in 26% of women was complicated by an acute respiratory viral infection. Thus, the presence of foci of chronic infection, inflammatory gynecological diseases, a history of reproductive losses, the threat of termination of pregnancy, polyhydramnios, ARVI are risk factors for premature birth of a late gestational period. Analysis of the course of labor in patients with late preterm labor showed that in 54% of cases, labor ended through the vaginal birth canal, in 46% - by cesarean section. The main indications for operative delivery were progressive fetal hypoxia in 26.1% of cases, severe preeclampsia - 13%, concomitant extra genital pathology - 26.1%, fetal malposition - 13%, premature detachment of the normally located placenta - 21.8%. The choice of adequate obstetric tactics of labor management is determined by the interests of the fetus. The duration of labor in the main group in primiparous women was  $(7.3 \pm 0.6)$  h ( $p < 0.05$ ) and in multiparous women -  $(5.3 \pm 0.8)$  h ( $p < 0.05$ ). The total blood loss during labor was  $(268 \pm 19)$  ml ( $p < 0.05$ ). Eight newborns received resuscitation care: the Apgar score in 5 newborns was  $(5 \pm 0.3)$  points ( $p < 0.05$ ), in three -  $(3 \pm 0.2)$  points ( $p < 0.05$ ). In a macroscopic examination of the placentas of the main group, the central attachment of the umbilical cord is noted in 14% of cases, paracentral in 58%, and marginal in 28%. In the main group, the maximum and minimum diameters of the placenta significantly decreased in comparison with the control group by 3 and 13%, respectively. There is a decrease in the thickness of the placenta in the main group by 37%, the area of the placenta - by 16%. The average weight of the placenta in the main group is 23.5% less than in the control group. There is also a decrease in fetal weight in the main group by 25.1%. The placental-fetal ratio in late preterm labor is 6.1% lower than in the control group. This may indicate a decrease in the specific volume of placental tissue per unit of body weight of a newborn and depletion of its adaptive potential against the background of an unfavorable premorbid background [5]. Microscopic examination of the placenta in the main group shows dissociated maturation of chorionic villi in 50% of cases, and premature maturation in 50%, which is manifested by a significant predominance of the number of terminal villi and the appearance of multiple syncytio-capillary kidneys in 73% of cases. The uneven thickness of the syncytiotrophoblast was revealed with the formation of syncytia capillary membranes in 73% of cases.

Involutive-dystrophic changes in the placenta are statistically significantly more common (92% of cases) in the main group: calcifications - in 72% of cases, thrombosis of the intervillous space - in 59%, single pseudo infarctions - in 82%, which are manifestations of placenta aging.

In the main group, circulatory disorders are statistically significant in 72% of cases, fibrinoid deposition in 94%: Langhans striae are located in the intervillous space in the form of thin stripes, surrounding villi, and in the area of the basal decidual membrane of the placenta, deposition of Nitabuch fibrinoid is expressed.

## CONCLUSIONS

The morphological structure of the placentas of women with late preterm labor is characterized by involutive-dystrophic changes, as well as the presence of compensatory-adaptive reactions. These morphological changes in the placenta in late preterm labor will make it possible to further provide personalized assistance to women in subsequent pregnancies to prevent preterm labor.

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