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Editorial

Comparative Anatomy of the Placenta in the Normal Pregnancy and in Miscarriage

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Abstract

Miscarriage is one of the most common complications of pregnancy. Currently, the rate of miscarriage in the post USSR countries is 10 - 25% of all pregnancies. For the study as an experimental group, we selected 100 patients with a gestation period of 16 to 34 weeks with a threat of miscarriage. As a result of our study, it was found that in women with the threat of miscarriage, the placenta is most often attached to the anterior wall of the uterus (15% of cases) or its posterior wall (15% of cases). Ten women had placental attachment in the anterior-upper-left corner of the uterus and another 10 women - in the anterior-upper-right corner. Other variants of attachment were observed in fewer cases. The placenta was thinner in the women with the threat of miscarriages, and it had the smallest thickness at beginning abortion.

In women with pregnancy without complications, the dependence of the thickness of placenta on the diameter of the arteries supplying the uterus was established, as well as its effect on fetal dimensions such as abdominal circumference and thigh diameter.

Keywords: *Miscarriage; Fetus; Placenta; Correlation*

Introduction

The problem of miscarriage, which has not only medical, but also socio-economic importance, remains one of the most urgent in modern obstetrics and gynecology [6]. The concept of miscarriage includes a spontaneous abortion in the time from fertilization till 37 weeks, counting from the first day of the last menstruation. Abortion at the time from fertilization to 22 weeks is called spontaneous abortion (miscarriage), and in the period of 22 - 37 weeks of pregnancy is called premature birth. Clarifying the causes of miscarriage is extremely important from a practical point of view. Knowing the causes and understanding the pathogenesis of pregnancy miscarriage, it is possible to carry out pathogenetic treatment more successfully. Currently, the frequency of miscarriage in post USSR countries is 10 - 25% of all pregnancies, including 5 - 10% of premature births. Preterm infants include more than 50% of stillbirths, 70 - 80% of early neonatal mortality, 60 - 70% of infant mortality [1-3]. All this has a very significant impact on public policy and, in particular, on population growth. Miscarriage is one of the most common complications of pregnancy [4,5]. The fetoplacental system is one of the main systems responsible for the formation of conditions necessary for fetal development. Complications of pregnancy, as well as extragenital diseases of the mother often lead to a variety of changes in the placenta, which significantly violates its function, which in turn negatively affects the fetal condition, causing the development of hypoxia and the delay in its growth. A very important diagnostic criterion is the thickness of the placenta, because compliance with the norm is very important here: both too thin and too thick placenta are indicators of various pathologies. The only way to determine the thickness of the placenta is ultrasound investigation.

Aim of the Study

The aim of the investigation was to study the morphological features of the placenta in women with a normal pregnancy and the threat of miscarriage.

Materials and Methods

For the study as an experimental group, we selected 100 patients with a gestation period of 16 to 34 weeks with a threat of miscarriage. 82% (82 people) of them were diagnosed with premature births, 15% (15 people) with a threatening abortion and 3% (3 people) with

a beginning abortion. The beginning abortion is the second stage of the process of expulsion of the fetus from the uterine cavity. Both in case of threatening, and in case of the beginning abortion it is possible to preserve pregnancy, but in the second case the probability of a successful outcome is slightly lower than in the first stage. As a control, 20 women with a normal pregnancy, who underwent a planned examination in a women's consultation were selected. Studies were carried out using ultrasound, morphometry and statistical method. Some people who pull choose only one area of their hair like Cindy (#1). She is twelve and has had extreme difficulty with relationships at school. Her father, who is a doctor, has tried everything possible to help her to stop pulling. She has been on every psycho-tropic drug imaginable. Nothing worked until she was referred to my office by her orthodontist for tongue thrusting. She stopped pulling on day one.

Results and Discussion

The placenta is located where the fertilized egg is attached to the uterine wall after the movement through the fallopian tube.

The back wall of the uterus and the place that is closest to its fundus are best supplied with blood. It is therefore considered that the data region of the uterus is the most favorable for the attachment of child place. There are a lot of variants for the placenta attaching, and they depend only on the individual characteristics of the organism of the future mother. As a result of our study, it was found that in women with the threat of miscarriage, the placenta is most often attached to the anterior wall of the uterus (15% of cases) or its posterior wall (15% of cases). Ten women had placental attachment in the anterior-upper-left corner of the uterus and another 10 women - in the anterior-upper-right corner. Other variants of attachment were observed in fewer cases. It should be noted that in women with threatening premature births, placental localization was more common on the posterior wall of the uterus (15% of cases), and in pregnant women with a threatening abortion - in the upper part of the anterior wall (40% of cases). In most women in the control group (55% of cases, 11 people), the placenta was located on the posterior wall of the uterus in its upper part. It is also worth noting the fact that placental position in women with the threat of miscarriage is more variable than in pregnant women from the control group.

The dimensions of the placenta are characterized by its thickness, area and volume. However, a standard ultrasound examination can accurately determine only the thickness of the placenta. Obviously, to study the compensatory abilities of placenta, it is very important to determine its area and volume, but the calculation of these indicators using modern ultrasound diagnostic equipment is associated with a laborious procedure of stereo- and planimetry, which can hardly be widely used in clinical practice. In addition, the results of these measurements have very large errors, which affects the interpretation of clinical data. The thickness of the placenta varies in different parts of it. Therefore, for its correct determination and, most importantly, for high reproducibility of the results, we used uniform methodological approaches to the estimation of this parameter. The most optimal site for measuring the thickness of the placenta is the place of the umbilical cord inflow. Exactly there we studied a child's place thickness.

The results of our study showed that the thickness of the placenta was significantly lower ($p < 0.0005$) in the pregnant women of the experimental group and averaged 27.5 ± 5.4 mm, while in women with normal pregnancy it was 34.6 ± 3.2 mm. It should be noted that the thickest placenta was observed in pregnant women with threatening premature births (29.4 ± 3.4 mm), in women with threatening abortion the placenta was almost 1 mm thinner (20.4 ± 4.2 mm), and the thinnest placenta was found in women with a diagnosis of beginning abortion (19.3 ± 4.5 mm).

After the establishment the important morphological features of the placenta, we tried to find out its correlation. Thus, it was found that in women with normal pregnancy, the thickness of the placenta depends on the diameter of the both right uterine artery (correlation coefficient $R = 0.98$, $p < 0.05$) and left one ($R = 0.98$, $p < 0.05$). In turn, the thickness of the placenta has a direct effect on some sizes of the fetus, such as the diameter of the thigh ($R = 0.83$, $p<0.05$). At the same time, there is an inversely proportional relationship between the fetal abdominal circumference and placental thickness ($R = -0.67$, $p < 0.05$). There were no correlations between the thickness of the placenta and the biparietal fetal size in the control group. It should also be noted that in women with normal pregnancy the thickness of the placenta depends on its location in the uterus ($R = 0.98$, p 0.05). The thinnest was the placenta located on the anterior wall of the uterus (32.8 ± 5.4 mm).

As for women with a threat of miscarriage, we did not establish a relationship between the thickness of the placenta and the uterine arteries diameter (if we do not take into account the low reliable correlation coefficient with the diameter of the left artery, $R = 0.24$, $p < 0.05$). However, as in the control group, the influence of placental thickness on fetal size was observed: abdominal circumference ($R = 0.80$, $p < 0.05$), thigh diameter ($R = 0.80$, $p < 0.05$). Also the dependence on biparietal size ($R = 0.79$, $p < 0.05$), which was not observed in the group of women with normal pregnancy was established.

Conclusions

According to the results of the study, it can be concluded that the placenta in women with a normal pregnancy is most often located on the posterior wall of the uterus in its upper part which has the best blood supply, while in pregnant women with miscarriage the placental location is more variable.

The placenta was thinner in the women with the threat of miscarriages, and it had the smallest thickness at beginning abortion.

In women with pregnancy without complications, the dependence of the thickness of placenta on the diameter of the arteries supplying the uterus was established, as well as its effect on fetal dimensions such as abdominal circumference and thigh diameter. In case of the threat of miscarriage, the connection between the uterine arteries and the thickness of the placenta is lost, but this parameter of placenta has a direct relationship to the development of the fetus and its size. Since the placenta is thinner in women with a threat of miscarriage, the fetuses will also be less developed and smaller in women with this pathology, compared to women with normal pregnancy.

It is planned to further study the problem of miscarriage and clarify the anatomical prerequisites for the development of this condition.

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