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Prolonged Newborns and Prolong Pregnancy: A Modern View on the Problem

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Abstract---*The article is devoted to the current problems of obstetrics, perinatology, and neonatology. The article presents a literary review and covers scientific views on the factors of births and hazardous factors that lead to transfer and prolonged pregnancy. The most common perinatal complications of a delayed pregnancy are stillbirth, asphyxia, and birth trauma. Neonatal morbidity in premature infants is 29% and perinatal mortality is 19%, which is higher than in preterm infants. If the pregnancy is 43 weeks or more, these rates will increase. All of these diseases are associated with a decrease in fetal resistance to hypoxia due to the large size of the brain and morphological changes in the placenta. Therefore, the incidence of meconium aspiration syndrome and fetal distress syndrome at birth increases, leading to high perinatal morbidity and mortality.*
Keywords---*complications, long-term pregnancy, mortality, post-term delivery, risk factors.*

Introduction

Relevance of the problem: At present, the problems of premature birth and long-term pregnancy remain very relevant, as they can lead to complex biological processes (Aviles et al., 2006). Often this problem leads to various complications in childbirth, which can end with perinatal disease and, in some cases, death. Most often, this problem leads to various complications in childbirth, which ends with an increase in the risk factor for perinatal disease and both for the woman who gave birth and for the baby (Medvedev et al., 1999; Milovanov: 1999; Chernukha, 2007). Premature pregnancies and overdue pregnancies are associated with factors such as the delay in pregnancy, onset of labor, intrauterine condition of the fetus, and condition of the fetoplacental system. The significance of this problem biological system is that there are significant changes in the physiology of the "mother-placenta-fetus", leading to a variety of sorates in the course of late births, as well as leading to high neonatal diseases and perinatal death in an overdue child (Ailamazyan, 2009; Glukhovets, 2002; International Statistical Classification, 1995).

The Main Findings and Results

According to the data from the literature, many authors have included premature pregnancy in the high-risk group due to numerous birth traumas in babies born, close and distant complications in children, for mothers, and especially for the fetus (Alexander, 2001; Klok et al., 2020). Analysis of the data in the literature shows that in many authors, overdue pregnancies are included in the high-risk group for mothers and especially for the fetus, due to multiple birth trauma in newborns, close and long-term complications in children (Alexander, 2001; Büchler et al., 1992).

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Prevalence

Overdue pregnancies occur in an average of 3.5–13.5% of the total number of births, accounting for 8–10%. Among Perinatal pathologies, central nervous system injuries occupy a leading place among premature babies (Bolshakova, 1998). According to the generally accepted date, such a pregnancy lasts more than 287-290 days, the fetus is accompanied by intrauterine suffering and with symptoms of biological maturation, with a greater risk, and the baby is born with Ante - and intranatal distress syndrome and neonatal obstruction (Strizhakov, 2006).

According to the literature, the frequency of developmental abnormalities in children born prematurely is 9,2%, with prolonged pregnancy - 4,8%, with full - term-3,3%. Developmental defects of the brain (encephalopathy, hydrocephalus), Down syndrome, polycystic kidney disease occur only in overdue fetuses. In the structure of perinatal pathologies, injury of the CNS (central nervous system) occupies a leading position, damage to the central nervous system occurs in 80% of children with diseases of the nervous system (Glukhovets, 2002).

Diagnosis

To date, there are no clear antenatal criteria for the diagnosis of long-term and overdue pregnancies, which leads to a combination of these concepts (International Statistical Classification, 1995). Pregnancy is considered to be overdue, lasting more than 42 weeks (294 days) from the first day of the last normal menstrual cycle. Premature and long-term pregnancy is not allocated (Hemminki & Meriläinenb, 1996; Simeoni & Barker, 2009). Delays that start after 42 full weeks are considered late births. According to the literature, the perinatal mortality rate in overdue pregnancies is 19% and neonatal morbidity is 29%, which is 6 times higher than in overdue pregnancies. The risk of neonatal death in infants born at 38 weeks is the lowest, and from 42 gestational weeks, this figure increases sharply (Jeleznov, 1975; Fox, 1978).

In terms of data from the English literature, the terms “postdates pregnancy” refer to complications that begin after the expected period, “rostterm pregnancy” means a long-lasting pregnancy, and “postmature” refers to specific changes in the fetus. In terms applied to the baby, “foetus hypermaturus” in overdue pregnancy, “foetus postmaturus” in chronic prolonged pregnancy. If the pregnancy lasts more than 294 days and the baby is born with signs of biological delay, the life is in danger - "fetal distress", which leads to ante- and instranatal distress syndrome and impaired neonatal adaptation (Reznichenko, 1999; Clifford, 1954). 20-30% of babies born in late births are born with signs of biological maturity. In long-term pregnancy (chronic) - pregnancy lasts more than 294 days and is born without signs of overdue (Benirschke, 1990).

J. Bellentyen was the first, then Runge (1948), describes the signs of overdue in infants, and this syndrome was called Bellentyen-Runge syndrome. Classical Bellentein-Runge syndrome: increased density of the skull, narrow ligaments, and sutures, lack of head configuration, long nails and hair, lack of caseous coating, dry skin, macerated heels, and palms, “old look” - wrinkled skin, decreased turgor, stained skin (in meconium amniotic fluid), however, the baby may be of normal mass, overweight, or malnourished. In late births, the fetus is considered overdue in the presence of 2-3 of the above symptoms (Timokhina & Baev, 2003).

Etiology and pathogenesis

To date, overdue pregnancies have not been adequately studied, but delayed pregnancy is not considered a random change in a normal pregnancy, so it should be interpreted as a pathological condition, taking into account the condition of both mother and child. The risk of overdue pregnancy should be considered in the presence of delayed pregnancy and a history of chronic inflammatory diseases, endocrine diseases, menstrual cycle disorders, cervical “miscarriage” or “insufficient” at 41 weeks of gestation, placental hypoplasia, and low water content (Santi et al., 2021; Layuk et al., 2021). For early diagnosis and prevention of perinatal complications, it is important to separate a group of pregnant women at high risk of recurrence (Schuit et al., 2002; Krahn et al., 1995). Overdue pregnancy should be considered as a pathological condition associated with the influence of various factors (International Statistical Classification, 1995; Fox, 1978).

Recently, in overdue pregnancies, a great deal of attention has been paid to the dysfunction of the placenta, which leads to fetal dyscrasia. Changes observed in the placenta in overdue pregnancy are secondary, but in the future, they may play an important role in steroidogenesis, fetal status, and fetal activity. With a delayed pregnancy, the balance in a woman’s hormonal and humoral systems is disturbed, which affects the formation of fertility dominants and the timely onset of labor (Santi et al., 2021; Fatimah et al., 2021).

Recent studies show that micronutrient metabolism is impaired in overdue pregnancies. It was found that a significant decrease in the amount of copper, zinc, manganese in the blood serum harms uterine contractions

(Glukhovets, 2002; Chernukha, 2007). The amount of progesterone, estradiol, and their ratios in the peripheral blood of pregnant women, as well as the amount of phospholipid fractions, deserves special attention to differentiate the type of overdue pregnancy (Bolshakova, 1998).

According to the literature, the content of corticosteroids in the blood and urine during pregnancy increases significantly and reaches a maximum before birth, which is associated with increased synthesis by the adrenal glands by the mother, fetus, and placenta. Therefore, overdue pregnancy occurs in women with a decrease in the amount of 17- oxycorticosteroids in pregnancy and a decrease in blood serotonin levels, as well as a decrease in the ability to adapt to 17-KS in the urine after 37 weeks. Some authors believe that a 1.5-fold decrease in serum estradiol and cortisol levels, a 1.7-fold increase in progesterone, as well as low production of cytokine, which is responsible for immunological material in the reproductive field, are prognostic for overdue pregnancy (Reznichenko, 1999).

To date, a comprehensive examination is being conducted for the correct and timely diagnosis of overdue and long-term pregnancies, including: anamnesis and formulas Negel, Jordania, determination of gestational age according to the pregnancy calendar; external and internal obstetric examination; cardiotocography; dopplerometry, ultrasound examination, determination of estrogen and progesterone levels in the blood; instructions-amniocentesis, followed by the study of amniotic fluid. Overdue pregnancy is characterized by objective examination: decreased abdominal circumference, impotence, the large size of the fetus and its restriction of movement, increased density of the skull, decreased skin firmness, separation of colostrum, unfettered cervix.

Recent studies of science and modern technology for antenatal diagnosis of overdue pregnancy recommend paraclinical objective examination methods, which in some cases help to make the prognostic diagnosis more reliable. Data obtained using ultrasound are of particular importance for the differential diagnosis of long-term and overdue pregnancies. When diagnosing fetal and amniotic fluid status in an overdue pregnancy, it is important to determine the time and type of induction of the complication that will lead to improved perinatal outcomes. At present, the certain experience of ultrasound diagnosis of overdue pregnancy has been accumulated, which allows diagnosing this pathology at a high level (Jeleznov, 1975; Milovanov, 1999; Strizhakov, 2006).

One of the specific signs of overdue pregnancy in ultrasound diagnosis is a progressive decrease in placental thickness, which indicates placental dysfunction. Therefore, the placenta can be used to assess the structure and maturity of the placenta, to determine the amount and quality of amniotic fluid. Thus, in the opinion of many authors, the characteristic signs for overdue pregnancy were considered to be signs such as the presence of petrification of the placenta at grade 3, impotence, and increased exogenousness of amniotic fluid (Glukhovets, 2002).

Given that biochemical, hormonal, functional, morphological, cytological, and other studies did not differ statistically significantly during long-term and long-term pregnancy, there is reason to believe that pregnancy prolongation is a physiological condition. It should be noted that the premature fetus has no pathognomatic symptoms, but there is a syndrome that is the basis for the diagnosis of overdue pregnancy (Rossi & Prefumo, 2013; Clausson et al., 1999; Vayssiere et al., 2013). Therefore, the different levels of reliability of research methods in assessing the degree of maturity of the fetus allow assessing its functional status, the function of the mother-placenta, based on which it is possible to make a diagnosis of overdue pregnancy or long-term pregnancy.

Adverse effects of overdue fetuses

High fetal weight, stiff skull, lack of head configuration at birth, distress syndrome after 41 weeks, etc., as well as anomalies of labor activity, are observed at high frequency. Cesarean section results in a higher frequency - 33.3%, which increases the risk of obstetric complications (Reznichenko, 1999).

The most common perinatal complications of a delayed pregnancy are stillbirth, asphyxia, and birth trauma. Neonatal morbidity in premature infants is 29% and perinatal mortality is 19%, which is higher than in preterm infants. If the pregnancy is 43 weeks or more, these rates will increase. All of these diseases are associated with a decrease in fetal resistance to hypoxia due to the large size of the brain and morphological changes in the placenta. Therefore, the incidence of meconium aspiration syndrome and fetal distress syndrome at birth increases, leading to high perinatal morbidity and mortality. Often the mortality rate during meconial aspiration reaches 60% when conducted hypoxia leads to perinatal damage of the central nervous system, which accounts for 60-80% of all pediatric pathologies. It is important to distinguish high-risk groups of pregnant women in the diagnosis of prevention of perinatal complications. Thus, the etiology of overdue pregnancy requires identification and subsequent study (Clifford, 1954).

Conclusion

1) At present, antenatal differential diagnosis of overdue pregnancy and long-term pregnancy is of particular importance, with different tactics: in the first case - preparation for active delivery and delivery, and in the second case waiting (conservative treatment of such women).
2) Induction of labor after 41 weeks of gestation revealed a low rate of daperinatal mortality compared with the tactic of waiting for the onset of spontaneous labor. The urgency of this problem is because it leads to significant changes in the physiology of the complex biological system of "mother-satellite-fetus". To date, there are no clear recommendations for effective treatment and prevention measures in women with delayed pregnancies resulting from multifactorial causes.
3) Thus, there is no single perspective for long-term and pregnancy today. Discussions continue on the nature of ante and intranatal risk factors for perinatal pathology. There are certain difficulties in making a differential diagnosis of long-term pregnancy and overdue pregnancy.
4) Despite many scientific studies devoted to the study of pathogenetic, diagnostic, and prognostic mechanisms of premature birth development, the available data are contradictory and do not allow pregnant women to choose treatment tactics; therefore, modern etiopathogenetic complex research in determining the cause of fetal miscarriage and long-term pregnancy is relevant and promising.
5) It should be noted that recently in our country there is a small-scale study of the problem of overdue pregnancy, which provides us with a detailed study of this topic and the study of the etiological factors leading to overdue pregnancy.

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