

Review

Prolonged Pregnancies: Approaches in Clinical Management

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ÖZET

Uzamış gebeliklere klinik yaklaşımlar

Postterm gebelik son adet tarihinden itibaren 42. gebelik haftasını tamamlamış ya da geçmiş (294 gün) ya da tahmini doğum tarihinden 14 gün geçmiş olan gebelikler olarak tanımlanır.

Postterm gebelik modern obstetrikte giderek artan tartışmalı bir problem olmaya devam etmektedir ve hem fetus hem de anne için birçok komplikasyonları vardır. Geleneksel olarak postterm antenatal fetal yakın gözetim 42. gebelik haftasında başlar. Ancak yakın zamanda yapılan bazı çalışmalarda perinatal asfiksinin 40. ve 42. gebelik haftaları arasında da belirgin artışı gösterilmiştir. Bazı çalışmalar da perinatal risklerin 41. gebelik haftasından itibaren arttığı söylenmektedir. En fazla intrapartum ve neonatal dönemlerde risk artmaktadır. Bunun üçte dördünü oluşturan en çok ölüm nedenleri intrapartum asfiksi, ve mekonyum aspirasyonudur. Postterm gebeliklere yaklaşımlar tartışmalıdır.

Bunun düşünce ile bu yazımızda, postterm gebeliklerin tanısını, prenatal belirleyici faktörlerini, maternal-fetal sonuçlarını ve antenatal fetal testlere başlangıç zamanlarını tartıştık.

Anahtar Kelimeler : Postterm gebelik, etyoloji, maternal fetal riskler

ABSTRACT

Prolonged (postterm) pregnancy is defined as a pregnancy that continues to or beyond 42 weeks (294 d) from the first day of the last normal menstrual period or 14 days beyond the best obstetric estimate of the date of delivery (EDD).

Postterm pregnancy remains constantly a difficult and controversial problem in modern obstetrics and have many complications for both fetus and mother. Postterm antenatal fetal surveillance has traditionally begun at 42 completed weeks of gestation. However recent data have shown that a significant percentage of cases of perinatal asphyxia occurs between 40 and 42 weeks of gestation. Some studies reported that the pregnancy risks increase already from gestational week 41. The most significant increase seems to occur in the intrapartum and neonatal periods. The major causes of death are intrapartum asphyxia and meconium aspiration, which are present in almost three quarters of these deaths. Opinions on the management of post-term pregnancy are controversial.

With this idea, in this article we have discussed the diagnosis of post-term pregnancy, prenatal indicators and maternal-fetal outcomes of prolonged pregnancy and timing to start the antepartum fetal tests.

Key Words : Prolonged pregnancy, etiology, maternal fetal risks

INTRODUCTION

The classic pregnancy term is between 37 and 42 weeks of gestation and the perinatal mortality and morbidity rates increases progressively during this period¹. In clinical practice, it is important and also very difficult to decide of an "ideal" time above which a medical intervention (induction of labour) brings more benefits than risks linked to the natural evolution of pregnancy. Both preterm (defined as delivery 37 week of gestation) and postterm (delivery at or beyond 42 week of gestation) births are associated with increased neonatal morbidity and mortality. Postterm pregnancy remains constantly a difficult and controversial problem in modern obstetrics¹. Postterm pregnancy by definition refers to a pregnancy that has extended to or beyond 42 weeks of gestation (294 days, or estimated date of delivery (EDD)+14 days). Accurate pregnancy dating is critical to the diagnosis². Prolonged (postterm) pregnancy defined as delivery at or beyond 42 weeks' gestation complicates 10% of

all gestations^{2,3}. The most frequent cause of an apparently prolonged gestation is an error in dating. When postterm pregnancy truly exists, the cause usually is unknown².

Postterm antenatal fetal surveillance has traditionally begun at 42 completed weeks of gestation. However recent data have shown that a significant percentage of cases of perinatal asphyxia occurs between 40 and 42 weeks of gestation⁴. Some studies⁴⁻⁶ mentioned that the pregnancy risks increase already from gestational week 41.

In this paper we have reviewed the literature data about the diagnosis of post-term pregnancy, prenatal indicators and maternal-fetal outcomes of prolonged pregnancy and timing to start the antepartum fetal tests.

DEFINITION

Postterm (prolonged) pregnancy is defined as a pregnancy that continues to or beyond 42 weeks (294 d) from the first day of the last normal

menstrual period or 14 days beyond the best obstetric estimate of the date of delivery (EDD)³. Postterm antenatal fetal surveillance has traditionally begun at 42 completed weeks of gestation. However recent data have shown that a significant percentage of cases of perinatal asphyxia occurs between 40 and 42 weeks of gestation⁴. Some studies⁴⁻⁶ mentioned that the pregnancy risks increase already from gestational week 41. The term 'postdates' is not well defined and as such is best avoided³.

PREVALENCE

Approximately 18% of all singleton pregnancies continue beyond 41 weeks, 10% continue beyond 42 weeks and are therefore postterm and 4% continue beyond 43 completed weeks³. The prevalence depends on the patient population, including such factors as the percentage of primigravid women, history of pregnancy complications, accurate dating of pregnancy with ultrasound assessment, the rates of scheduled cesarean delivery and routine labor induction.

ETIOLOGIC FACTORS

The most common cause of postterm pregnancy is an error of the last menstrual period³. Bennett et al.⁷ showed that routine first trimester ultrasound for pregnancy dating reduced the incidence of postterm pregnancy from 13% to 15% when compared with second trimester ultrasound dating. In most cases of 'true' postterm pregnancy, the cause is unknown. Primiparity and prior postterm pregnancy are the most common identifiable risk factors for prolongation of pregnancy². Rarer causes include placental sulfatase deficiency (an X-linked recessive disorder characterized by low circulating estriol levels), fetal adrenal insufficiency or hypoplasia, and fetal anencephaly (in the absence of polyhydramnios)³. Kitstka et al.⁸ examined the hypothesis that the risk for subsequent postterm birth was increased in women with an initial postterm birth and found that there was a significant risk for subsequent postterm births among mothers who deliver postterm.

Prolonged pregnancy in mother may be a risk factor for prolonged pregnancy in daughter. A previous prolonged pregnancy increases the risk of prolonged pregnancy in a subsequent birth. However, the familial factor of prolonged pregnancy explains just a minor part of its occurrence in the population⁹. Laursen et al.¹⁰ studied about a possible genetic component to prolonged gestation and found that maternal genes influenced prolonged gestation. However a

substantial paternal genetic influence through the fetus was not found in this study.

Divon et al.¹¹ evaluated the association between fetal gender and prolonged pregnancy and found that male gender significantly predisposed to the prolongation of pregnancy to the extent that by 43 weeks of gestation, there are 3 male deliveries for every 2 female deliveries. The mean gestational age at delivery was significantly higher in male fetuses (280.6 ± 8.9 days vs 279.8 ± 8.6 days, respectively; $P < 0.0001$) in this study¹¹.

In a study, pre-pregnancy body mass index of 25 kg/m^2 or more, and nulliparous were showed as prenatal risk indicators for prolonged pregnancy¹². And also in a recent study the pre-pregnancy body mass index and nulliparity were found significantly higher in the pregnant above 41 weeks of gestation¹³.

Hilder et al.¹⁴ designed a study to evaluate the influence of parity on fetal mortality in prolonged pregnancy and concluded that being parous appears to have a protective effect on fetal mortality in prolonged pregnancy. These findings questioned the need for routine induction of labour at 41 weeks in parous women.

Accuracy of the pregnancy dating

Useful measurements include the crown-rump length of the fetus during the first trimester and the biparietal diameter or head circumference and femur length during the second trimester. If the estimated gestational age by a patient's last menstrual period differs from the ultrasound estimate by more than these accepted variations, the ultrasound estimate of gestational age should be used instead of the patient's menstrual cycle estimate^{2,3}.

MATERNAL-FETAL RISKS

The perinatal mortality rate (stillbirths plus early neonatal deaths) at 42 weeks of gestation is twice that at 40 weeks and increases 4 fold at 43 weeks and 5 fold to 7 fold at 44 weeks^{3,15,16}. Complications include non-progressive labor, cervical tear, retained placenta, postpartum hemorrhage, vacuum delivery, macrosomia, meconium-stained amniotic fluid, oligohydramnios, rates of cesarean delivery, birth injury, non-reassuring fetal heart rate monitoring and antepartum, intrapartum and postpartum deaths. Postterm pregnancy also is an independent risk factor for low umbilical artery Ph levels at delivery and low 5-minute APGAR scores. Uteroplacental insufficiency, meconium aspiration, and intrauterine infection contribute to the increased rate of perinatal deaths^{2,17}.

Hovi et al.¹⁸ showed that the overall frequency of post-term pregnancies was 6.9% and the incidence

of post-term pregnancies was found to be increased in obese, primiparous, and smoking women, whereas in women with chronic diseases and obstetric risks deliveries were induced earlier. The risks of macrosomia, maternal complications, and operative deliveries were increased in post-term pregnancies.

However some studies have suggested that perinatal morbidity, including fetal asphyxia, intrapartum distress, meconium aspiration increases significantly each week from 40 weeks on^{4,19,20}. Nakling et al.⁵ evaluated the mortality and morbidity of conservatively managed postterm pregnancies and concluded that the risks increases from gestational week 41 and said expectant management of post-term pregnancies allowing pregnancies to continue up to week 43 carries more risks for perinatal mortality and morbidity. In an other study Caughey et al.²¹ found that maternal complications such as postpartum hemorrhage, chorioamnionitis, endomyometritis, third or fourth degree lacerations were increased beyond 40 weeks of gestation. Bochner et al.⁴ said that maternal-fetal risks increased from 41 weeks of gestation and suggested that starting antenatal testing at 41 weeks of gestation may result in decreased postterm perinatal mortality and morbidity as well as decreased incidence of intrapartum fetal distress.

Fetus born postterm also are at risks of deaths within the first year of life^{2,16,22}. In a large prospective follow-up study of children at ages 1 and 2 years the general intelligence quotient, physical milestones, and frequency of intercurrent illnesses were not significantly different between normal infants born at term and those born postterm²³.

Doppler sonography and postterm pregnancy

The capability of Doppler flow velocimetry to predict intrauterine growth retardation is well known. The increased morbidity and mortality rate of postterm newborns is also well known. Jörn et al.²⁴ examined if doppler flow velocimetry is able to indicate fetal jeopardy in the postterm period. They obtained flow velocimetry of the foetal descending aorta, the umbilical artery, the uterine arteries and also the foetal middle cerebral artery, after 40 completed weeks of gestation. They found significant changes of normal values in prolonged pregnancy compared to third trimester normal values, examining the mean velocity of the foetal descending aorta and the S/D-ratio of the umbilical artery. No clinically significant changes were found examining the S/D-ratio of the uterine arteries and the pulsatility index of the foetal

middle cerebral artery and they concluded that measurement of sensitivity and positive predictive value of the four arteries examined showed, that Doppler ultrasound could not predict small for date infants or cesarean section because of fetal distress²⁴. In a study Weiner et al.²⁵ evaluated the association between fetal cardiac function and amniotic fluid index in postterm fetuses, and to determine if changes in fetal cardiac function precede the occurrence of nonreassuring intrapartum fetal heart rate patterns. Each subjects performed doppler studies of the aortic and pulmonic outflow tracts and also non-stress test, a biophysical profile and they concluded that in prolonged pregnancies, cardiac function deteriorates in fetuses that develop a nonreassuring intrapartum FHR, and the changes in the left cardiac function correlate with changes in amniotic fluid index²⁵.

In an other study Hitschold et al.²⁶ examined postterm pregnancies with pulsed Doppler ultrasound of an umbilical artery and concluded that the sensitivity of pulsed doppler ultrasound in predicting cesarean section for fetal distress was 71%, the specificity 91%. The oxytocin challenge test indicated this with a sensitivity of 58% and a specificity of 82%, whereas the nonstress test is not useful in predicting fetal risk in postterm pregnancy²⁶.

But an other study Farmakides et al.²⁷ said that the postdate syndrome was not associated with significant alterations in the maternal or umbilical blood flow prior to the onset of labor.

When should antepartum fetal testing begin ?

Management of low-risk postterm pregnancy is controversial. Postterm antenatal fetal surveillance has traditionally begun at 42 completed weeks of gestation. However, recent data have shown that a significant percentage of cases of perinatal asphyxia occurs between 40 and 42 weeks of gestation⁴.

Treatment includes active methods (induction of labour, elective caesarean section) or conservative way (strict fetal antenatal surveillance). In a cross-sectional study Annette et al. analyzed the risk of perinatal and maternal complications stratified on fetal weight groups (<2500, 2500-4499, and 4500+g). There were more maternal complications and also fetal complications in fetuses with birth weight less than 2500 g and birth weight of 2500-4499 g²⁸. In a randomized controlled trial Heimstad et al.²⁹ showed that policies of immediate induction of labor or serial antenatal monitoring while awaiting spontaneous labor produce no significant difference in the neonatal outcome or mode of delivery of postterm

pregnancies. Women who were induced were more likely to have a precipitate labor with a shorter active second stage, although these factors did not alter neonatal outcome. And they concluded that if pregnancy is uncomplicated and continued surveillance is possible, women's own wishes may guide the decision to induce or monitor a pregnancy beyond 41 weeks.

Caughey et al.²¹ found that the risk of maternal complications for otherwise low risk nulliparous and multiparous women increased as pregnancy progressed beyond 40 weeks of gestation. In a retrospective analysis of 145,695 singleton births, before 41 weeks the stillbirth risk rose gradually¹⁴. By 41 weeks there was a substantial increase in the stillbirth risk in nulliparous women¹⁴.

Some studies suggested that starting antenatal testing at 41 weeks of gestation may result in decreased postterm perinatal mortality and morbidity as well as decreased incidence of intrapartum fetal distress and the guidelines for management of post-term pregnancies should be revised^{4,5}.

Ramos et al.³⁰ compared routine labor induction with expectant management for patients who reach or exceed 41 weeks' gestation in a systematic review with meta-analysis and concluded that labor induction at 41 weeks' gestation for otherwise uncomplicated singleton pregnancies reduces cesarean delivery rates without compromising perinatal outcomes.

Both expectant management and labor induction are associated with low complication rates and good perinatal outcomes in low-risk postterm women with unfavorable cervixes^{2,31,32}. However, there appears to be a small advantage to labor induction using cervical ripening agents, when indicated regardless of parity or method of induction².

Doganay et al.³³ studied relationship between maternal endogenous dehydroepiandrosterone sulfate (DHEAS) levels, success of labor induction and Bishop scores in postterm pregnancies and concluded that DHEAS might be an important biochemical marker of cervical maturation and might be an important factor influencing the efficiency of labor in postterm pregnancies.

Can we decrease the rate of postterm pregnancy?

Accuracy dating of the estimated gestational age with first trimester and second trimester ultrasonographic examinations reduced the incidence of postterm pregnancy from 13% to 15%⁷. Magan et al.³⁴ determined the optimal management of pregnancies beyond 41 weeks' gestation with a cervix unfavorable for induction and they

concluded that daily membrane stripping or daily placement of prostaglandin gel is successful in reducing the number of inductions at 42 weeks for postdatism. In an other Magan's study, daily membrane sweeping was more effective than dinoprostone administration with fewer postdate inductions at one-fourth the cost³⁵. Contrary to these studies Wong et al.³⁶ assessed the efficacy of sweeping of membranes beyond 40 weeks of gestation in reducing the incidence of induction of labour, when induction was planned at 42 weeks and concluded that sweeping of membranes beyond 40 weeks does not reduce the need for formal induction of labour at 42 weeks and said although it is safe, the majority of women felt uncomfortable during the procedure³⁵. Breast and nipple stimulation at term have not been shown to affect the incidence of postterm pregnancy³⁷.

American Collage of Obstetrician and Gynecologists (ACOG) Recommendations²

The following recommendations are based on good and consistent scientific evidence (Level A):

Women with postterm gestations who have unfavorable cervixes can either undergo labor induction or be managed expectantly.

Prostaglandin can be used in postterm pregnancies to promote cervical ripening and induce labor.

Delivery should be effected if there is evidence of fetal compromise or oligohydramnios².

The following recommendations are based primarily on consensus and expert opinion (Level C):

Despite a lack of evidence that monitoring improves perinatal outcome, it is reasonable to initiate antenatal surveillance of postterm pregnancies between 41 weeks (287 days; EDD +7 days) and 42 weeks (294 days; EDD +14 days) of gestation because of evidence that perinatal morbidity and mortality increase as gestational age advances.

Many practitioners use twice-weekly testing with some evaluation of amniotic fluid volume beginning at 41 weeks of gestation. A nonstress test and amniotic fluid volume assessment (a modified BPP) should be adequate.

Many authorities recommend prompt delivery in a postterm patient with a favorable cervix and no other complications².

Postterm antenatal fetal surveillance has traditionally begun at 42 completed weeks of gestation. However recent data have shown that a significant percentage of cases of perinatal

asphyxia occurs between 40 and 42 weeks of gestation⁴.

Some studies suggested that starting antenatal testing at 41 weeks of gestation may result in decreased postterm perinatal mortality and morbidity as well as decreased incidence of intrapartum fetal distress and the guidelines for management of post-term pregnancies should be revised^{4,5}.

According to ACOG², women with postterm gestations who have unfavorable cervixes can either undergo labor induction or be managed expectantly. Prostaglandin can be used in postterm

pregnancies to promote cervical ripening and induce labor. Delivery should be effected if there is evidence of fetal compromise or oligohydramnios². In conclusion, findings suggest that maternal-fetal risks increase from 41 weeks and starting antenatal testing at 41 weeks of gestation may decrease the complications. Closer monitoring should commence and induction of labor should be considered in gestational week 41. Further studies are needed for management of post-term pregnancies and what is designated as post-term pregnancy needs to be readdressed.

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