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Management of Late-Term and Postterm Pregnancies

Postterm pregnancy refers to a pregnancy that has reached or extended beyond 42 0/7 weeks of gestation from the last menstrual period (LMP), whereas a late-term pregnancy is defined as one that has reached between 41 0/7 weeks and 41 6/7 weeks of gestation (1). In 2011, the overall incidence of postterm pregnancy in the United States was 5.5% (2). The incidence of postterm pregnancies may vary by population, in part as a result of differences in regional management practices for pregnancies that go beyond the estimated date of delivery. Accurate determination of gestational age is essential to accurate diagnosis and appropriate management of late-term and postterm pregnancies. Antepartum fetal surveillance and induction of labor have been evaluated as strategies to decrease the risks of perinatal morbidity and mortality associated with late-term and postterm pregnancies. The purpose of this document is to review the current understanding of late-term and postterm pregnancies and provide guidelines for management that have been validated by appropriately conducted outcome-based research when available. Additional guidelines on the basis of consensus and expert opinion also are presented.

Background

Etiologic Factors

The etiology of most pregnancies that are late-term or postterm is unknown. There are, however, several risk factors for postterm pregnancy that have been identified by observational studies, including nulliparity, prior postterm pregnancy, carrying a male fetus, and maternal obesity (3–7). Studies of twins also have suggested that a genetic predisposition may confer 23–30% of the risk of late-term and postterm pregnancies (8). Certain fetal disorders also have been associated with postterm pregnancies, such as anencephaly and placental sulfatase deficiency, although the precise physiologic reasons for these associations are unknown (9, 10).

Fetal and Neonatal Risks

Several studies have demonstrated that late-term and postterm pregnancies are associated with an increased risk of perinatal morbidity and mortality. A large Swedish study of term (37–41 6/7 weeks of gestation) and postterm (42 0/7 weeks of gestation or greater) singleton neonates demonstrated that postterm pregnancies were associated with an increased risk of neonatal convulsions,

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meconium aspiration syndrome, and 5-minute Apgar scores of less than 4 (11). Delivery after 42 weeks of gestation also was associated with a significant increase in the rate of neonatal intensive care unit admissions (odds ratio, 2.05; 95% confidence interval [CI], 1.35–3.12) (12).

Although most fetuses in late-term and postterm pregnancies are appropriately grown for their gestational ages, pregnancies in this gestational age range are associated with an approximate twofold increased risk of macrosomia (13, 14). This increase in macrosomia is believed to contribute to the increased risks of operative vaginal delivery, cesarean delivery, and shoulder dystocia observed in postterm pregnancies (3, 15, 16).

Postmaturity syndrome complicates 10–20% of postterm pregnancies (17–19). Postmature fetuses have decreased subcutaneous fat and lack vernix and lanugo. Meconium staining of the amniotic fluid, skin, membranes, and umbilical cord often is seen in association with a postmature newborn.

Oligohydramnios occurs more frequently in postterm pregnancies than in pregnancies at less than 42 0/7 weeks of gestation. Pregnancies complicated by oligohydramnios have an increased risk of fetal heart rate abnormalities, umbilical cord compression, meconium-stained fluid, umbilical cord artery blood pH of less than 7, and lower Apgar scores (20–23).

Although the absolute risk of stillbirth and neonatal mortality in postterm pregnancies is low, observational studies that have evaluated the risk of stillbirth and neonatal mortality at each gestational week show an increased risk as gestational age advances beyond the estimated date of delivery (24–26). A large retrospective study that evaluated fetal and neonatal mortality rates in 181,524 late-term and postterm pregnancies found a significant increase in fetal mortality after 41 weeks of gestation compared with 40 weeks of gestation (odds ratio, 1.5, 1.8, and 2.9 at 41 weeks, 42 weeks, and 43 weeks of gestation, respectively) (27).

In a retrospective study that included 171,527 births, higher rates of stillbirth were observed among postterm pregnancies compared with term pregnancies (28). There was a nadir at 41 weeks of gestation but an eightfold higher rate of stillbirth at 43 weeks than at 37 weeks of gestation. An analysis of data from the Scottish birth registry showed a similar significant increase in the risk of stillbirth from 37 weeks (0.4/1,000) to 43 weeks of gestation (11.5/1,000) (29).

Maternal Risks

There are risks to the mother as pregnancies extend into the postterm period. One large observational study of maternal and obstetric complications with increasing gestational age found that the risks of severe perineal laceration, infection, postpartum hemorrhage, and cesarean delivery were all increased in women with late-term and postterm pregnancies (30). In addition, some studies suggest that maternal anxiety is increased as pregnancies approach the postterm period (31). However, expectant management until the postterm period is appropriate in otherwise uncomplicated pregnancies.

Clinical Considerations and Recommendations

▶ ***Are there interventions that decrease the incidence of late-term and postterm pregnancies?***

Accurate gestational age determination decreases the incidence of the diagnosis of late-term and postterm pregnancies. Early assignment of gestational age by firm clinical criteria or early ultrasonography is important for the accurate diagnosis and appropriate management of late-term and postterm pregnancies. Using the date of the LMP alone to assign gestational age and the estimated date of delivery has been proved to be unreliable by several studies and often leads to the incorrect classification of a pregnancy as late term or postterm (32, 33). Inaccurate maternal recall and variation in the timing of ovulation may contribute to the inaccuracy of LMP-based pregnancy dating (34, 35). Several studies also have demonstrated that when ultrasonography is used to confirm menstrual dating, the incidence of late-term and postterm pregnancies is reduced, as is the need for obstetric intervention (36–39). For example, the rates of postterm pregnancies decreased from 9.5% to 1.5% when ultrasonography was used to confirm LMP dating (39, 40).

Membrane sweeping, which involves the digital separation of the membranes from the lower uterine segment during pelvic examination with a dilated cervix, is associated with a decreased risk of late-term and postterm pregnancies. Although some studies of membrane sweeping have yielded conflicting results, the most recent Cochrane review demonstrated that membrane sweeping was associated with a significant reduction in the number of pregnancies that progressed beyond 41 weeks of gestation (41). Women with late-term or postterm pregnancies who are considering membrane sweeping should be counseled that the procedure can be associated with vaginal bleeding and maternal discomfort. Contraindications to membrane sweeping include placenta previa and other contraindications to labor and

vaginal delivery. There are insufficient data on the risks of membrane sweeping in women who are colonized with group B streptococci. Therefore, the decision to perform membrane sweeping in these women should be based on clinical judgment (42).

▶ *Should antepartum fetal testing be performed in late-term and postterm pregnancies?*

There are no randomized controlled trials (RCTs) that demonstrate that antepartum fetal surveillance decreases perinatal morbidity or perinatal mortality in late-term and postterm pregnancies. Most retrospective studies of antepartum fetal surveillance in pregnancies that extended beyond the estimated date of delivery initiated testing between 41 weeks and 42 weeks of gestation (43, 44). Given the observational data indicating an increased risk of stillbirth at or beyond 41 0/7 weeks of gestation, initiation of antepartum fetal surveillance at or beyond 41 0/7 weeks of gestation may be indicated.

▶ *What type of antepartum fetal surveillance should be used, and how frequently should testing be performed in late-term and postterm pregnancies?*

There are several options for fetal surveillance, including the nonstress test (NST), contraction stress test, biophysical profile (BPP), and modified BPP (NST and amniotic fluid assessment). Although antepartum fetal surveillance may be indicated for pregnancies at or beyond 41 0/7 weeks of gestation, there are insufficient data to define the optimal type or frequency of testing.

No large RCTs have compared different modalities of fetal surveillance in late-term and postterm pregnancies. A small RCT of 145 pregnancies beyond 42 weeks of gestation, compared BPP with modified BPP and no differences in umbilical cord blood pH at delivery or neonatal outcome were found between the two groups (45).

A Cochrane review of five randomized and quasi-randomized trials of fetal surveillance in 2,974 high-risk pregnancies that included postterm pregnancies found no difference in perinatal death between the BPP and NST groups (relative risk [RR], 1.35; 95% CI, 0.6–2.98). When the two higher-quality trials were examined, there was an increased risk of cesarean delivery in the BPP group but conclusions based on this finding are limited by the low number of study participants (280) that were included in the analysis (46). A number of small studies suggest that twice-weekly antepartum fetal surveillance may be superior to once-weekly testing in postterm pregnancies, but the data are insufficient to make a firm recommendation about frequency of testing (47, 48). Women with late-term and postterm pregnancies are at risk of oligohydramnios. Several studies have evaluated the importance of detecting oligohydramnios in pregnancies that progress beyond their estimated date of delivery. Although limited by retrospective design, current evidence suggests that an ultrasonographic assessment of amniotic fluid volume to detect oligohydramnios is warranted. *Oligohydramnios* has been commonly defined as a single deepest vertical pocket of amniotic fluid of 2 cm or less (not containing umbilical cord or fetal extremities) or an amniotic fluid index of 5 cm or less (49–51). The available data from RCTs support the use of the deepest vertical pocket of amniotic fluid volume of 2 cm or less to diagnose oligohydramnios (52, 53). A meta-analysis of these trials found that the use of the deepest vertical pocket measurement, in place of amniotic fluid index, to diagnose oligohydramnios was associated with a reduction in unnecessary interventions without an increase in adverse perinatal outcomes (52).

A large retrospective study of 7,582 high-risk pregnancies found that decreased amniotic fluid volume was associated with an increased risk of fetal demise (49). When oligohydramnios, defined in the study as a single vertical pool of amniotic fluid measuring less than 3 cm, was observed in postterm pregnancies, there were statistically significant increased rates of meconium-stained amniotic fluid and growth restriction and higher rates of fetal heart rate abnormalities and cesarean delivery (54). In another study, an increased incidence of fetal heart rate abnormalities, including decelerations and bradycardia, was observed with oligohydramnios in postterm pregnancies (55). If oligohydramnios is detected at 41 0/7 weeks of gestation or beyond, delivery usually is indicated. Cesarean delivery should be reserved for the usual obstetric indications.

▶ *When should labor be induced in the late-term or postterm pregnancy?*

Several RCTs have compared induction of labor to expectant management in pregnancies that have progressed beyond their estimated date of delivery. One of the largest clinical trials evaluated the perinatal outcomes of 3,407 women with singleton pregnancies at 41 weeks of gestation or greater who were assigned to receive induction of labor or expectant management with fetal surveillance two to three times per week (56). The primary outcomes for the trial were perinatal mortality and neonatal morbidity. The secondary outcomes included the rate of cesarean delivery. The authors found an increased rate of cesarean deliveries in the expectantly

managed group, although there were no differences in the rates of perinatal mortality and neonatal morbidity (56). Likewise, no differences were demonstrated in either the perinatal mortality or in similar secondary maternal and infant outcomes in two other RCTs of women with postterm pregnancies who were assigned to induction or expectant management (57, 58).

In a Cochrane review of 22 RCTs of 9,383 women that compared expectant management with induction of labor in term and postterm pregnancies, induction of labor was associated with a decreased risk of perinatal death (RR, 0.31; 95% CI, 0.12–0.88; 17 trials of 7,407 women), cesarean delivery (RR, 0.89; 95% CI, 0.81–0.97; 21 trials of 8,749 women), and meconium aspiration syndrome (RR, 0.50; 95% CI, 0.34–0.73; eight trials of 2,371 infants) (59). The number needed to treat with induction of labor to prevent one perinatal death was 410 (95% CI, 322–1,492). There were no differences in the rates of neonatal intensive care unit admission (RR, 0.90; 95% CI, 0.78–1.04; 10 trials of 6,161 infants) (59).

In summary, based on available epidemiologic evidence, induction of labor between 41 0/7 weeks and 42 0/7 weeks of gestation can be considered. Induction of labor after 42 0/7 weeks and by 42 6/7 weeks of gestation is recommended given evidence of an increase in perinatal morbidity and mortality.

▶ *Is there a role for vaginal birth after cesarean delivery in the management of postterm pregnancy?*

A successful vaginal birth after cesarean delivery is associated with decreased maternal and neonatal morbidity. A trial of labor after cesarean delivery (TOLAC) is a reasonable option in the management of uncomplicated postterm pregnancies. A large observational study showed no increase in the risk of uterine rupture associated with TOLAC attempted at or beyond the estimated date of delivery. However, as with pregnancies without prior cesarean deliveries, the TOLAC failure rate increased with advancing gestational age, from 22.2% before 40 weeks of gestation to 35.4% after 41 weeks of gestation (60). For women who desire TOLAC and who have not had a prior vaginal delivery, awaiting spontaneous labor, as opposed to undergoing labor induction, most likely avoids further additional increased risk of uterine rupture. Thus, TOLAC remains an option for women with postterm pregnancies who have not had a prior vaginal delivery, but these women should be counseled regarding their individual risks such as failure of TOLAC and of uterine rupture.

Summary of Recommendations and Conclusions

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

- Late-term and postterm pregnancies are associated with an increased risk of perinatal morbidity and mortality.
- Induction of labor after 42 0/7 weeks and by 42 6/7 weeks of gestation is recommended, given evidence of an increase in perinatal morbidity and mortality.

The following conclusions are based on limited or inconsistent scientific evidence (Level B):

- Membrane sweeping is associated with a decreased risk of late-term and postterm pregnancies.
- Induction of labor between 41 0/7 weeks and 42 0/7 weeks of gestation can be considered.

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

- Initiation of antepartum fetal surveillance at or beyond 41 0/7 weeks of gestation may be indicated.
- A trial of labor after cesarean delivery is a reasonable option in the management of uncomplicated postterm pregnancies.

Proposed Performance Measure

The percentage of pregnant women undergoing antepartum fetal surveillance at or beyond 41 0/7 weeks of gestation

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The MEDLINE database, the Cochrane Library, and the American College of Obstetricians and Gynecologists' own internal resources and documents were used to conduct a literature search to locate relevant articles published between January 1990–May 2014. The search was restricted to articles published in the English language. Priority was given to articles reporting results of original research, although review articles and commentaries also were consulted. Abstracts of research presented at symposia and scientific conferences were not considered adequate for inclusion in this document. Guidelines published by organizations or institutions such as the National Institutes of Health and the American College of Obstetricians and Gynecologists were reviewed, and additional studies were located by reviewing bibliographies of identified articles. When reliable research was not available, expert opinions from obstetrician–gynecologists were used.

Studies were reviewed and evaluated for quality according to the method outlined by the U.S. Preventive Services Task Force:

I	Evidence obtained from at least one properly designed randomized controlled trial.
II-1	Evidence obtained from well-designed controlled trials without randomization.
II-2	Evidence obtained from well-designed cohort or case–control analytic studies, preferably from more than one center or research group.
II-3	Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments also could be regarded as this type of evidence.
III	Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

Based on the highest level of evidence found in the data, recommendations are provided and graded according to the following categories:

Level A—Recommendations are based on good and consistent scientific evidence.

Level B—Recommendations are based on limited or inconsistent scientific evidence.

Level C—Recommendations are based primarily on consensus and expert opinion.

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