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Maternal risk factors and obstetric complications in late preterm prematurity

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ABSTRACT

Objective: Late preterm prematurity has been related to poorer neonatal outcomes. However, research has focused on the neonatal outcomes of late preterm infants, maternal characteristics of these births have been less evaluated. The aim of the study was to compare maternal risk factors and obstetric complications in late preterm births (LPTB) and term births. These factors were also assessed comparing spontaneous LPTB with medically-indicated LPTB.

Study design: We conducted a retrospective cohort study with two groups. All singleton LPTB occurred at our University Hospital between January 1, 2009 and December 31, 2010 were included in the first cohort ($n=171$). A comparison cohort of term births was configured in a ratio 2:1 ($n=342$). Well-dated pregnancies without congenital malformations, congenital infections or chromosome abnormalities were eligible. LPTB were classified into two groups, spontaneous LPTB and medically-indicated LPTB following delivery indications. Statistical analysis of categorical variables was performed using either χ^2 or Fisher's exact. Continuous variables were compared using the Student's t -test.

Results: Women with LPTB had more medical conditions than women with term births (29% vs 15.7%; $P=0.002$). Prior preterm births (9.7% vs 2%; $P<0.001$), prior adverse obstetric outcomes (6.9% vs 2.3%; $P<0.001$), and obstetric complications were also more frequent in LPTB than in term births. However, no differences were found in maternal medical conditions when spontaneous LPTB and medically-indicated LPTB were compared. Women with medically-indicated LPTB were older (33.69 vs 31.07; $P=0.003$) and mainly nulliparous (75.8% vs 49.4%; $P=0.002$). Obstetric complications were more frequent in medically-indicated LPTB than in spontaneous LPTB.

Conclusions: Maternal risk factors and obstetric complications are significantly higher in LPTB than in term births. These factors should be considered to identify women at risk for either spontaneous or medically-indicated LPTB.

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Introduction

Prematurity rates have increased in recent years mainly due to an increase in late preterm births (LPTB) [1–3], defined as births occurring between 34 0/7 and 36 6/7 weeks. This group currently represents nearly 75% of preterm births (PTB). Several factors have been suggested to contribute to the increase in prematurity rates. One proposed explanation is that changes in maternal factors, such as the rise of maternal age at pregnancy and assisted reproduction

techniques, may have increased the number of high-risk pregnancies, which are at higher risk of prematurity [2]. Another possible explanation is that pregnancies at risk for an adverse perinatal outcome are often delivered before term. This could be due to a more comprehensive understanding of fetal adaptation mechanisms to threatening situations [4,5]. The enhancements in obstetric surveillance and neonatal care have also been cited as partially responsible for the increase in prematurity rates [2].

Late preterm prematurity has been related to poorer neonatal outcome [6–9]. Teune et al. [9] performed a systematic review, comparing neonatal morbidity in LPTB to term births. The authors reported higher rates of respiratory distress syndrome, intraventricular hemorrhage, necrotizing enterocolitis and neonatal death in late preterm infants. Long-term outcomes, such as mortality in the first year of life, neurological development and

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school performance, were also worse in LPTB. These results have increased concern among obstetric and pediatric communities [10], and indications for delivery in LPTB have been investigated [11,12].

Previous studies suggest that only a few LPTB are avoidable, since these preterm births often occur following a maternal or obstetric complication [13]. However, although extensive research has been conducted on LPTB, few studies have evaluated the maternal and obstetric factors specifically associated with this situation. Differences in maternal and obstetric characteristics between spontaneous and indicated LPTB also remain unknown. Better knowledge of the maternal risk factors involved in LPTB may allow to identify patients at risk for LPTB. Better knowledge of the obstetric complications associated with LPTB may help to determine which situations would benefit from conservative management, without increasing maternal and perinatal risks by continuing the pregnancy. We therefore conducted a retrospective cohort study to evaluate maternal risk factors and obstetric complications in singleton pregnancies delivered between 34 0/7 and 36 6/7 weeks at our institution. We assessed these factors by comparing LPTB with term births, and spontaneous LPTB with medically-indicated LPTB.

Material and methods

We performed a retrospective cohort study of all singleton LPTB delivered at Hospital de la Santa Creu i Sant Pau in Barcelona, a tertiary university hospital, between January 1, 2009 and December 31, 2010. A control cohort of term births (37 0/7–41 6/7 weeks) was randomly configured in a 2:1 ratio. Approval for the study was obtained from the ethics committee of the Institutional Review Board at Hospital de la Santa Creu i Sant Pau, Barcelona.

Eligible cases were identified from the delivery room logbook, and maternal and pregnancy data were reviewed. Well-dated and well-controlled singleton pregnancies with a live fetus at hospital admission were accepted for statistical analysis. Only pregnancies with first-trimester ultrasound assessment of gestational age were considered well-dated. Exclusion criteria for both the study and control groups were major anatomic malformations, chromosome abnormalities and congenital infections.

Data were collected through retrospective chart review. We recorded information on maternal age, parity, prior uterine

surgery, artificial reproductive technique (ART), history of PTB, and history of adverse obstetric outcome (defined as 3 or more miscarriages, second trimester fetal loss, prior fetal major malformation or prior chromosome abnormality). Presence of maternal medical disorders was reviewed. We considered for analysis hypertensive, endocrinological (thyroid disorders and diabetes), autoimmune and prothrombotic disorders. Congenital heart diseases and infectious conditions were also noted. Other maternal medical disorders (e.g. neurological, psychiatric, rheumatic or respiratory conditions) were considered as “others” for the analysis. This category included medical conditions that are less likely to be linked to pregnancy-related complications. We created a composite variable to measure maternal medical disorders. This variable, composite maternal morbidity, was defined as the presence of one or more medical disorders.

Pregnancy-related complications analyzed were hypertensive disorders of pregnancy (gestational hypertension and preeclampsia), intrauterine growth restriction (IUGR), intrahepatic cholestasis of pregnancy, gestational diabetes, and bleeding in the second half of pregnancy (abruptio placentae, placenta previa). Other pregnancy-related complications (e.g. urinary tract infections, ovarian hyperstimulation syndrome, alterations in the quantity of amniotic fluid, maternal anemia) were considered as “others” for the analysis. We also recorded maternal antenatal care requirements (admission to the High Risk Obstetric Unit, antenatal corticosteroid and tocolytic treatment). Finally, indication for delivery and mode of delivery were noted. The study investigators jointly resolved all uncertainties and discrepancies in the medical charts.

For comparative purposes, LPTB were classified into two groups, spontaneous LPTB and medically-indicated LPTB. We considered LPTB was spontaneous when preterm premature rupture of membranes (PPROM) or spontaneous preterm labor (SPTL) occurred between 34 0/7 and 36 6/7 weeks, as in these cases our current protocols recommend immediate delivery. Women admitted to hospital for SPTL or PPRM in the late preterm period were included in the spontaneous group even if they presented other obstetric complications. We considered LPTB as medically-indicated when delivery occurred following an obstetric or maternal complication. As established in our institutional protocols, when PPRM occurred before 34 0/7 weeks, conservative management was adopted after excluding chorioamnionitis

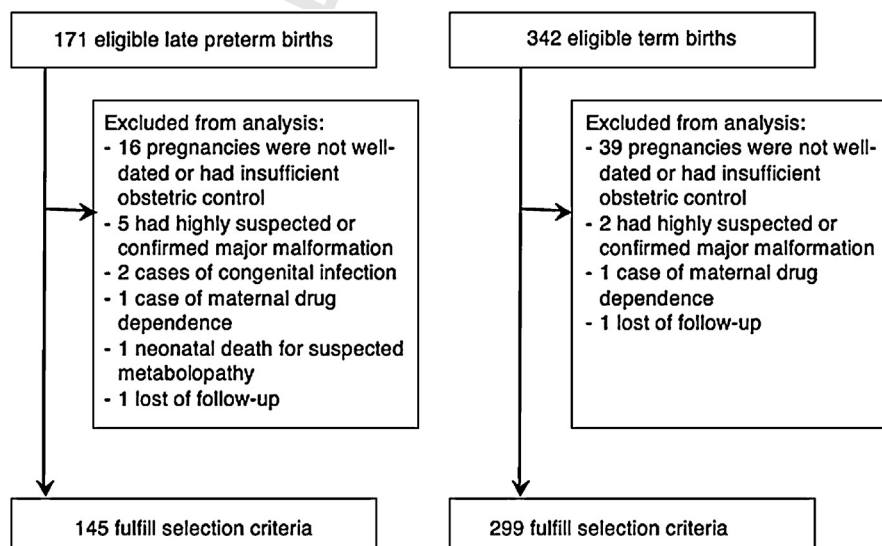


Fig. 1. Diagram of included and excluded patients. This figure shows the study profile. Causes for patient exclusion are also detailed.

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