



Review

The respiratory consequences of early-term birth and delivery by caesarean sections



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EDUCATIONAL AIMS

The reader will be able:

- To define early-term birth.
- To discuss the epidemiology of early-term birth.
- To discuss the short and long term respiratory outcomes of early-term birth.
- To discuss the short and long term respiratory outcomes of delivery by caesarean section.

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SUMMARY

In England and Wales, 19% of live births in 2012 were at 37–38 weeks' gestation, equating to nearly 140 000 early-term births each year. Since caesarean sections (CS) are often performed at early-term gestations, this accounts for some of the increased proportion of the early-term births. Infants born early-term are at an increased risk of neonatal respiratory morbidity particularly if they are delivered by caesarean section. The long term lung function data are limited but available data suggest that early-term delivery is associated with respiratory morbidity in childhood. CS also appears to be associated with increased neonatal morbidity and future development of respiratory symptoms. However, future studies need to confirm the independent effects of caesarean sections and early-term deliveries particularly for long term outcomes as both are likely to affect the respiratory system differently.

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INTRODUCTION

This review will discuss the short and long term respiratory outcomes of early-term births, which occur between 37 and 38 weeks' gestation. It will also review the evidence for respiratory outcomes resulting from delivery by caesarean section (CS) which result in greater proportions of early-term births. The review will discuss:

1. The epidemiology of early-term births;
2. The short term and long term respiratory outcomes of early-term births and delivery by CS.

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DEFINITIONS

In 2013, The American College of Obstetricians and Gynecologists (ACOG) suggested that early-term should be defined as delivery occurring between 37^{+0/7} and 38^{+6/7} weeks' gestation [1]. They noted that neonatal outcomes, in particular respiratory morbidity, were different depending on the time of delivery hence the need to redefine the traditional definition of term deliveries occurring between 37 and 42 weeks' gestation.

EPIDEMIOLOGY

The Office for National Statistics reported that 19% of live births in 2012 in England and Wales were at 37–38 weeks' gestation, equating to nearly 140 000 early-term births [2]. In one study of nearly 200 000 singleton term births in the United States of America (USA) between 2002 and 2008, 34.1% were early-term

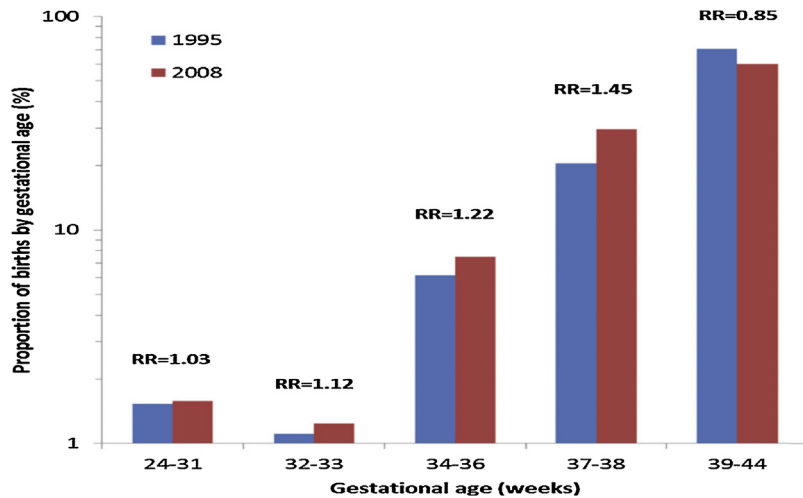


Figure 1. Changes in the proportion of deliveries at 24–31, 32–33, 34–36, 37–38, and 39–44 weeks in the United States among singleton live births between 1995 and 2008. Relative risk (RR) is shown for births in 1995 and 2008, showing increased RR for early-term and moderately preterm. Reprinted from [4] with permission from Elsevier.

births [3]. In 2008, 29.7% of all births in the USA were at 37–38 week's gestation increasing from a rate of 20.6% in 1995 [4]. There appears to have been a concurrent decrease in the deliveries at ≥ 39 weeks' gestation. (Figure 1).

Parikh et al. reported that just over half of early-term births were due to spontaneous labour, just over a quarter had a documented indication for early term delivery (including women with intact membranes without spontaneous labour who underwent an induction of labour or pre-labour CS for maternal, foetal or obstetric complications of pregnancy), 15.5% had no recorded indication and 3.3% had pre-labour rupture of the membranes [3].

One reason for increased early-term births is delivery by CS at 37–38 weeks' gestation. The overall rate of deliveries by CS has increased. In the USA between 1996 and 2006 births by CS increased from 20.7% to 31.1%, the rates of CS increased for all gestational ages [5]. In 2013–14, 26.2% of deliveries at all gestations in England were by CS, but at 37–38 weeks' gestation 32.5% of deliveries were by CS. For all gestations, 13.2% of deliveries were planned caesarean sections; however, for early-term gestations 20.3% were planned caesarean sections [6]. Delnord et al. studied gestational age patterns in CS using data from 17 European countries and the USA. They reported that in the majority of countries at 38 weeks' gestation there was an increase in CS [7]. However, encouragingly, in England it has been reported that,

in response to the evidence on the benefits of performing CS at after 39 weeks' gestation, NHS trusts delaying elective CS to after 39 weeks' gestation has increased between 2000 and 2009. The proportion of elective CS performed after 39 weeks' gestation in 2000/01 was 39% and 63% in 2008/09. Nevertheless, there is much room for improvement [8]. Clearly the risks of early delivery compared to the risks of continuing the pregnancy must be assessed and, in some cases, early-term delivery is medically indicated [9,10]. The risks to both the mother and the infant of an early-term birth need to be balanced and clearly the risks change with increasing gestational age as shown in Figure 2 [11].

Studying the short- and long-term respiratory outcomes after delivery at 37–38 weeks' gestation is confounded by higher rates of delivery by CS at this gestational range. Some studies report outcomes after delivery at 37–38 weeks' gestation and may or may not include mode of delivery in their analysis. Other studies have reported respiratory consequences of CS often without taking into consideration delivery at early-term gestations.

SHORT TERM RESPIRATORY OUTCOMES AFTER DELIVERY AT 37–38 WEEKS' GESTATION

Traditionally term birth was defined as delivery at ≥ 37 weeks' gestation and it was thought that births at 37–38 weeks' gestation

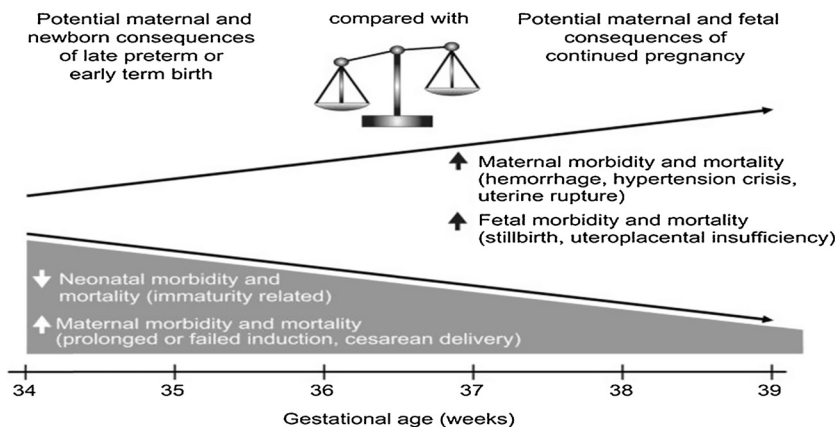


Figure 2. Conceptual diagram representing the competing risks and benefits of indicated late preterm or early-term birth vs. pregnancy continuation. The figure does not represent specific magnitudes or rates of changes in risks as these will vary according to the specific pregnancy complication and individual circumstances. Reprinted from [11] with permission from Wolters Kluwer Health.

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