

Chances of Stillbirth and Infant Mortality Increasing with Full Pregnancy

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I. INTRODUCTION

Long-term pregnancies are known to increase the risk of stillbirth. Women are commonly given the option of induction of labor after 41 weeks of pregnancy to prevent this unfavorable outcome. This advice is supported by data showing that the risk of stillbirth increases after 41 weeks. However, 1 in 3 stillbirths happen before 41 weeks of pregnancy. The magnitude and consistency of findings by gestational week in various research on the risk of stillbirth in what is considered to be a normal term gestation differ. Matching newborn mortality estimates are imprecise. We did a systematic analysis to determine the incremental weekly risks of stillbirth in term pregnancies that continue versus deliver at various gestational ages. We also examined the week-specific risks of newborn death by gestational age at birth.

❖ Why was this research conducted?

- In the UK, a third of stillborn infants are delivered at term (>37 weeks) and were previously regarded as healthy.
- Extending a term pregnancy is a recognized risk factor for stillbirth. In order to prevent stillbirths, women are currently frequently offered induction of labor after 41 weeks of pregnancy. But before this point in pregnancy, 1 in 3 women give birth to a stillborn child.

❖ What did the scientists do and discover?

- We discovered that as term gestation progressed, the probability of stillbirth rose steadily. Compared to moms who delivered at 40 weeks, mothers who carried their pregnancies to 41 weeks had a 64% higher chance of stillbirth, with 1 more mother experiencing a stillbirth for every 1,449 women.
- Between 38 and 41 weeks, the odds of neonatal death remained stable, and they only started to rise after that point.

❖ What do these results imply?

Each mother who is thinking about continuing her pregnancy past 37 weeks should be made aware of the slight but definite increase in stillbirth risk.

❖ Literature review and topic selection

We looked for studies reporting rates of stillbirth and/or neonatal death at different gestational ages in what appeared to be low-risk term pregnancies in Medline, Embase, and Google Scholar from January 1990 to March 2017, and we updated the search to October 2018. For the population, we used the terms "term pregnancy," "prolonged pregnancy," "post-term," and "postdates," along with terms that were pertinent to the results, such as "stillbirth," "intrauterine death," "fetal death," "perinatal death," and "perinatal mortality." Neonatal mortality, newborn death, and neonatal death were paired with the terms "term pregnancy," "singleton," and "low-risk pregnancy" in a separate search to find studies that solely reported neonatal deaths. There were no limits on languages. We personally searched the references of pertinent studies to find more pertinent material, and when necessary, we contacted the authors and researchers in the field to request additional studies or pertinent information.

❖ Study choice

If cohort studies offered weekly estimates of stillbirths, we included them (including those nested inside randomized trials) on pregnant women at term gestation without a predetermined indication for early delivery. Studies that only included women with pre-existing medical conditions, congenital fetal malformations, complications like preeclampsia, gestational diabetes, or small-for-gestational-age fetuses, or women who required planned delivery before 37 weeks for maternal or fetal reasons were all excluded, as were abstracts,

letters, case reports, case series, and animal studies. Pregnancies with a gestational age of 37 completed weeks or more were considered term pregnancies under our definition. A baby dying before birth, including prenatal and intrapartum deaths, was referred to as stillbirth. A neonatal death is any infant loss before the age of 28 days. We defined a low-risk pregnancy as one in which the chance of intrapartum problems is low when a healthy woman with an apparently straightforward pregnancy goes into labor.

II. ANALYSIS

In the first stage, we determined the prospective risk of stillbirth for each gestational week in each study by dividing the number of at-risk pregnancies by the number of stillbirths that occurred during that week. The number of women who were still expecting at the start of the week, minus the proportion of those who gave birth that week, was used to identify the "at risk" pregnancies. The number of deliveries throughout that week was divided by the quantity of infant fatalities that took place during that time. The following stage was computing the risk ratio to assess changes in the overall week-specific risk of the event (stillbirth or neonatal death) between 2 consecutive weeks (RR). We divided the week-specific risks that were discovered after the respective logistic models were fitted to determine the RR. We also calculated the number of pregnancies at risk for each gestational week, or the number of pregnancies that, if carried to the following week, would result in an additional stillbirth compared to delivery at that gestational week.

III. RESULTS

Only singleton pregnancies were included in 10 of the 13 research, pregnancies complicated by congenital fetal deformities were eliminated from 6 studies, and women without any medical difficulties were included in 4 studies. Just rates of neonatal death were reported in one study, rates of stillbirth were reported in twelve research, and rates of both stillbirth and neonatal death were reported in four studies. Data from four studies were used to examine the weekly chances of stillbirth for Black and White women, as well as for White and Asian women. The definitions of stillbirth and neonatal death used in the research did not significantly differ from one another. Clear definitions of stillbirth and infant death were provided by ten studies. Three studies employed registry entry data on stillbirth and infant death for analysis. Details of each study included in the systematic review and meta-analysis of stillbirths and neonatal mortality in full-term pregnancies

Characteristics of individual studies included in systematic review and meta-analysis of stillbirths and neonatal deaths in pregnancies continued to term.

Study [reference] (country)	Study type/quality	Inclusion	Exclusion	Number in study	Definition of GA	Outcomes
Balchin 2007 [30] (UK)	Prospective cohort, in 15 maternity units from 1988–2000	Nulliparous White, Asian, or Black women delivering singleton weighing at least 500 g at 24–43 weeks	Preterm birth, multiple birth, previous poor obstetric history; we excluded data below 37 weeks gestation	476,371	LMP/USS (weeks) (BPD)	Perinatal mortality, stillbirths, neonatal deaths
Ferguson 1990 [12] (US)	Retrospective cohort in Illinois from 1980–1984	Singleton birth at 25–42 weeks	We excluded data below 37 weeks gestation	711,195	NS	Stillbirths (fetal deaths)
Feldman 1992 [37] (US)	Retrospective cohort from birth records of New York City Department of Health from 1987–1989	Singleton and multiple births at 26–42 weeks	We excluded data below 37 weeks gestation	328,864	LMP (weeks)	Stillbirths
Ferguson 1994 [31] (US)	Retrospective cohort in Illinois from 1984–1988	Singleton births at 25–42 weeks; data reporting birth weight, GA, and White or Black race	We excluded data below 37 weeks gestation	669,491	LMP (weeks)	Stillbirths (fetal deaths)
Hilder 1998 [13] (UK)	Retrospective cohort from notified births in 18 hospitals in London from 1989–1991	Singleton and multiple births at 37–43 weeks	We excluded data below 37 weeks gestation	158,171	LMP/USS (weeks)	Still births, neonatal deaths
Hedegaard 2014 [35] (Denmark)	Retrospective cohort from Danish birth register from 2000–2012	Singleton and multiple births (twin counted as 2 pregnancies and 2 births) at 37–42+ weeks	—	772,483	USS (LMP) (weeks)	Stillbirths
Khalil 2015 (unpublished) (UK)	Retrospective cohort from St George's Hospital from 2000–2015	Singleton pregnancies at 37–43 weeks; raw data provided by author	Multiple pregnancies, pregnancies with medical problems, congenital malformations	91,693	USS (weeks)	Stillbirths neonatal deaths
Nakling 2006 [32] (Norway)	Prospective study in 1 Norwegian county from 1989–1999	Singleton births at 37–42+ weeks	Multiple births, lack of USS information, delivery before 37 weeks, congenital abnormalities	17,493	USS (weeks)	Stillbirths
Rasmussen 2003 [14] (Norway)	Retrospective cohort from records of births in Norway from 1967–1998	Singleton births at 28–43+ weeks; raw data provided by the author	Multiple births, congenital anomalies, lack of information about LMP, GA < 28 weeks; we excluded data below 37 weeks gestation	1,595,535	LMP (weeks)	Stillbirths
Rosenstein 2012 [33] (US)	Retrospective cohort study including term births in California from 1997–2006	Singleton pregnancies at 37–42 weeks; raw data provided by the author	Multiple births, DM, HTN, congenital abnormality, lack of information on LMP	3,759,300	LMP (weeks)	Stillbirths, infant deaths
Smith 2001 [34] (UK)	Retrospective cohort study including term births in Scotland from 1985–1996	Singleton pregnancies at term (37–43 weeks)	Multiple births, congenital abnormalities, >43 weeks gestation	700,878	LMP/USS (weeks)	Stillbirths, neonatal deaths
Zhang 2009 [36] (US)	Retrospective cohort in US from 1995–2001	Singleton live births at 37–41 weeks from National Center for Health Statistics; low-risk data provided by author; spontaneous (non-induced) vaginal births with no medical problems	Births with known congenital abnormalities	5,768,536	LMP (weeks)	Neonatal deaths, post-neonatal deaths
Bhattacharya 2015 (unpublished) (UK)	Retrospective cohort in Scotland from 2002–2012	Singleton pregnancies at 37–43 weeks; raw data provided by author	Multiple pregnancies, PET, GDM, APH	9,627	NS	Stillbirths

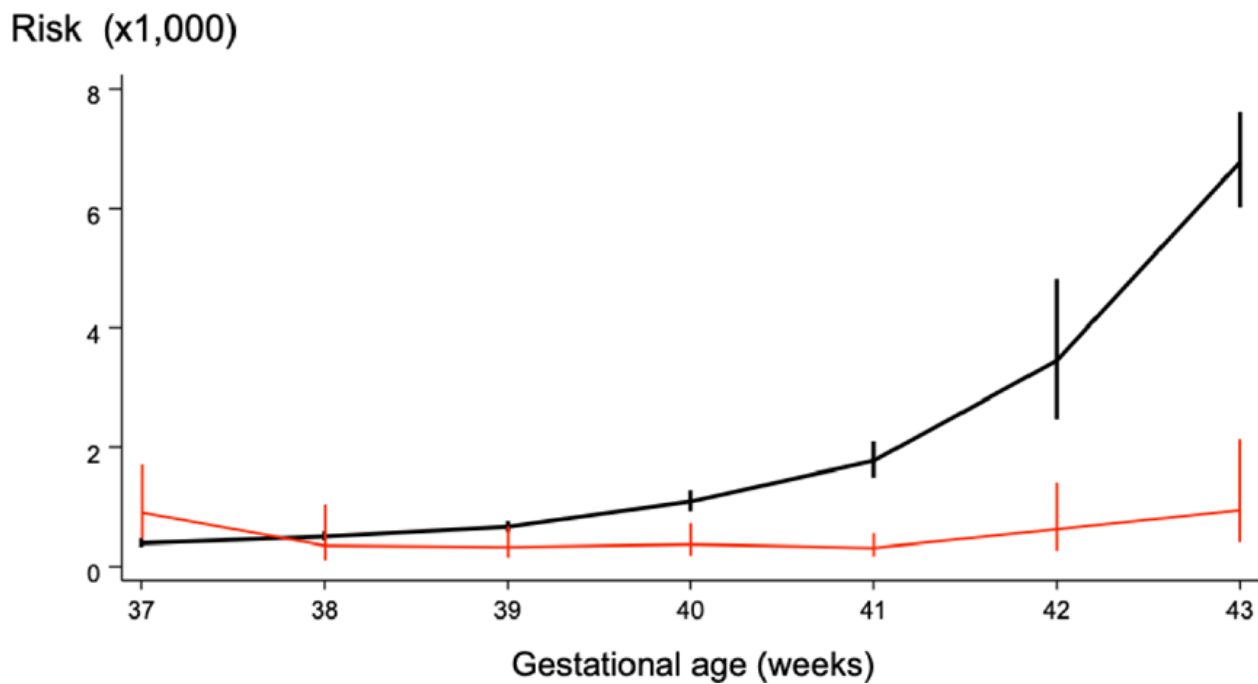
APH, antepartum haemorrhage; BP, biparietal diameter; DM, diabetes mellitus; GA, gestational age; GDM, gestational diabetes; HTN, hypertension; LMP, last menstrual period; NS, not specified; PET, preeclampsia.

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Risk of at term stillbirth

In the studies, the risk of stillbirth at term ranged from 1.1 to 3.2 per 1,000 pregnancies. From 0.11 per 1,000 pregnancies at 37 weeks (95% CI 0.07 to 0.15) to 3.18 per 1,000 at 42 weeks (95% CI 1.84 to 4.35), the total prospective risk of stillbirth rose with gestational age.

When pregnancies are carried to 41 weeks, as is now advised, the chance of stillbirth increases by 64% (RR 1.64, 95% CI 1.51 to 1.77, p 0.001) as compared to delivery at 40 weeks.



Neonatal mortality risk at term

For deliveries between 38 and 41 weeks of gestation, the risk of infant death remained unchanged; the risk rose after 41 weeks.

IV. DISCUSSION

In term pregnancies, we discovered that the prospective risk of stillbirth increased with gestational age, while the risk of newborn mortality increased after 41 weeks of gestation. When compared to pregnancies that ended at 40 weeks, which are still regarded as normal term gestations, there was no difference in newborn death, but there was a little but substantial increase in the probability of stillbirth.

Our findings offer the necessary context for interpretation by presenting both absolute and relative increases in the risks.

Each study used a different set of inclusion standards. However, because early delivery was not necessary, all trials included women whose pregnancies extended to term or beyond, a sign of their low-risk status.

Our findings were consistent with earlier research in that we did not notice any appreciable differences in newborn mortality for infants between 38- and 41-weeks' gestation. It is unknown whether children born at term but before 40 weeks of gestation experience significantly different developmental outcomes from those of children born at that gestational age.

Any conversation with women considering carrying their pregnancy over 41 weeks of gestation should cover the absolute risk increase as well as the impact of inducing labor on the delivery method and perinatal outcomes. To reduce the minor risk of stillbirth, it is necessary to determine whether parents and medical professionals will accept an early delivery at term.

In conclusion, mothers at term who carry their pregnancies to the current recommended gestational age of 41 weeks are at a significantly increased risk of stillbirth, without a corresponding decrease in the risk of newborn death. In term pregnancies, we discovered that the prospective risk of stillbirth increased with gestational age, while the risk of newborn mortality increased after 41 weeks of gestation. When compared to pregnancies that ended at 40 weeks, which are still regarded as normal term gestations, there was no difference in newborn death, but there was a little but substantial increase in the probability of stillbirth. Our findings offer the necessary context for interpretation by presenting both absolute and relative increases in the risks.

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V. CONCLUSION

Our results imply that term pregnancies that last to 41 weeks, as opposed to 40 weeks of pregnancy, are much more likely to result in stillbirth, with no comparable decrease in newborn mortality.

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