INCREASES IN THE RATES OF TERM STILLBIRTH IN THE USA FOLLOWING THE ADOPTION OF THE 39-WEEK RULE: WHEN ARE THE ADDITIONAL STILLBIRTHS OCCURRING?

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ABSTRACT:

Objective: Observational studies have identified associations between early-term delivery, as compared to full-term delivery, and various neonatal morbidities. As a result, an obstetric guideline called "the 39-week rule" was implemented throughout the USA in 2010. The rule restricts "non-indicated" planned delivery prior to 39 weeks of gestation and thereby increases the likelihood that deliveries occur during or after the 39th week of gestation. However, there is a known link between increasing gestational age and increasing cumulative risk of term stillbirth, and the USA rate of term stillbirth has increased since the implementation of the 39-week rule. This study sought to determine the gestational age pattern behind the increase in term stillbirth rate.

Study Design: Sequential ecological study over a 7-year period, using state data. Patterns of the timing of term birth, overall yearly stillbirth rate, and changes in the rate-proportion for each week of the term period over the 7-year period were the metrics of interest.

Results: Usable datasets were obtained from 46 states. Between 2007 and 2013 in the USA, the proportion of term births occurring before the 39th week of gestation decreased (Figure 1) and the overall rate of term stillbirth increased (Figure 2). The increase in the incidence of term stillbirth appeared to occur primarily in the 37th, 38th and 39th weeks of gestation (Figure 3).

Conclusion: Despite a reduction in the proportion of term births that occurred in the 37th and 38th weeks of gestation, the burden of term stillbirth grew among early-term deliveries. The burden of term stillbirth also increased within the 39th week of gestation. Hence, the increase in the burden of term stillbirth appears to have increased primarily within the gestational ages that were most directly impacted by the 39-week rule. This study raises the possibility that the 39-week rule may be causing serious unintended harm. Additional studies measuring the possible impact of the implementation of the 39-week rule on major childbirth outcomes are urgently needed.

DEFINITIONS:

- ***TERM BIRTH* – 37 WKS 0 DAYS – 41 WKS 6 DAYS**
- ***EARLY-TERM PERIOD* – 37 WKS 0 DAYS – 38 WKS 6 DAYS OF GESTATION**
- ***39 WEEK RULE* – "ELECTIVE" DELIVERY, BY EITHER LABOR INDUCTION OR PRE-LABOR CESAREAN SETION, SHOULD NOT OCCUR BEFORE 39 WKS 0 DAYS OF GESTATION**
- ***ELECTIVE DELIVERY* – A PLANNED DELIVERY WITHOUT AN ACCEPTED INDICATION**

BACKGROUND:

- ***39 WEEK RULE WAS A RECOMMENDATION BETWEEN 1995-2010***
- ***39 WEEK RULE BECAME AN ENFORCED GUIDELINE THOROUGHOUT THE USA IN 2010***
- ***DATA FROM STATES (2007 – 2013) INDICATE THAT THE PROPORTION OF TERM BIRTHS DELIVERING IN THE EARLY-TERM PERIOD (37 AND 38 WKS) DECREASED SIGNIFICANTLY BETWEEN 2007 AND 2013 (Figure 1)***
- ***DATA FROM STATES (2007 – 2013) INDICATE THAT THE RATE OF TERM STILLBIRTH INCREASED SIGNIFICANTLY BETWEEN 2007 AND 2013 (Figure 2)***

STUDY QUESTION:

- ***IF OVERALL TERM STILLBIRTH RATES INCREASED BETWEEN 2007 AND 2013, AT WHAT GESTATIONAL AGE(S) DID THE GREATEST INCREASES OCCUR?***

Fig 1: Patterns of Term Birth (2007-2013)

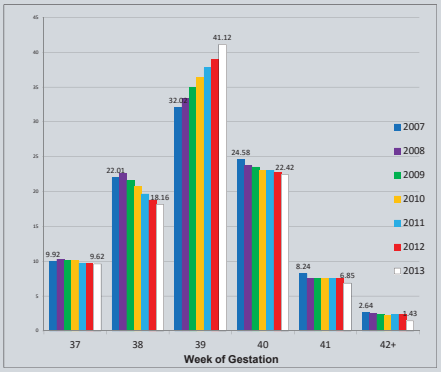

Fig 2: Change in USA Rate (per 1000) of Term Stillbirth (2007 – 2013)

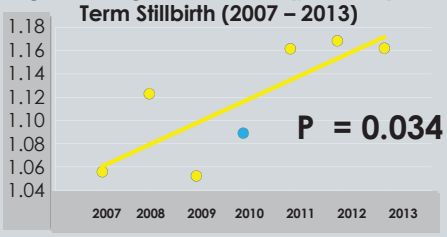

Fig 3: Stillbirth Rate-Proportions

STILLBIRTH RATE-PROPORTIONS*

37TH WEEK – 0.003 ←
38TH WEEK – 0.004 ←
39TH WEEK – 0.004 ←
40TH WEEK – 0.002
41ST WEEK – 0.001
42ND WEEK – 0.001

FINDINGS:

- ***THE GREATEST INCREASES IN WEEKLY RATE OF TERM STILLBIRTH OVER THE 7-YEAR PERIOD OCCURRED IN THE 38TH AND 39TH WEEKS OF GESTATION***
- ***THE NEXT GREATEST INCREASE IN WEEKLY RATE OF TERM STILLBIRTH OCCURRED IN THE 37TH WEEK OF GESTATION***
- ***MINIMAL INCREASES IN THE WEEKLY RATE OF TERM STILLBIRTH OCCURRED IN THE 41ST AND 42ND WEEKS OF GESTATION***

LIMITATIONS:

- ***STATE BASED DATA – UNCERTAIN QUALITY***
- ***FEW CO-VARIATES***
- ***POSSIBLE UNKNOWN CONFOUNDING***
- ***RETROSPECTIVE ECOLOGICAL COHORT STUDY – cannot identify causation***

STRENGTHS:

- ***LARGE NUMBER OF DELIVERIES***
- ***BALANCED PERIOD OF TIME (3 YEARS BEFORE 2010 AND 3 YEARS AFTER 2010)***
- ***NOVEL MEASURE OF WEEKLY STILLBIRTH BURDEN (Weekly Rate-Proportion)***

CONCLUSIONS:

- ***THE 39 WEEK RULE WAS IMPOSED IN 2010***
- ***BETWEEN 2007 AND 2013 THE PROPORTION OF USA TERM BIRTHS THAT DELIVERED IN THE 37TH AND 38TH WEEKS OF GESTATION DECREASED***
- ***BETWEEN 2007 AND 2013 THE PROPORTION OF USA TERM BIRTHS THAT DELIVERED IN THE 39TH WEEK OF GESTATION INCREASED***
- ***THE 39 WEEK RULE HAD THE GREATEST IMPACT ON THE MANAGEMENT OF PREGNANCY IN THE 38TH AND 39TH WEEKS OF GESTATION (FIGURE 1)***
- ***BETWEEN 2007 AND 2013 THE USA RATE OF TERM STILLBIRTH INCREASED (FIGURE 2)***
- ***BETWEEN 2007 AND 2013 THE GREATEST INCREASES IN TERM STILLBIRTH OCCURRED IN THE 38TH AND 39TH WEEKS OR GESTATION (FIGURE 3)***
- ***THESE FINDINGS SUGGEST THAT THE GREATEST INCREASES IN THE RATES OF USA TERM STILLBIRTH OCCURRED WITHIN THE GESTATIONAL AGE RANGE THAT WAS MOST IMPACTED BY THE 39 WEEK RULE***
- ***THE 39 WEEK RULE MAY BE CAUSING UNINTENDED HARM***

FUTURE RESEARCH:

- ***STUDY OF TRENDS IN OTHER ADVERSE MATERNAL AND NEONATAL OUTCOMES OVER THIS 7-YEAR PERIOD***
- ***STUDY OF ADDITIONAL YEARS (2005-2006 and/or 2014-2015)***
- ***REPLICATION OF THIS STUDY USING FEDERAL BIRTH CERTIFICATE DATABASES***
- ***REPLICATION OF THIS STUDY USING CONDITIONAL RISK OF STILLBIRTH (WHEREIN RATE CALCULATIONS INVOLVE THE USE OF "ONGOING PREGNANCIES" IN THE DENOMINATOR RATHER THAN NUMBER OF DELIVERIES THAT OCCUR IN ANY GIVEN WEEK OF GESTATION)***

*****Main Study Definition*****

Term Stillbirth Weekly Rate-Proportion = annual term stillbirth rate * proportion of term deliveries that occurred during any given week of term gestation