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Papers

Rise in "no indicated risk" primary caesareans in the United States, 1991-2001: cross sectional analysis

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This paper analyses US national birth certificate data on approximately 4 million births annually to create a new category—mothers at "no indicated risk"—and then examines the growth of primary caesareans in these women from 1991 to 2001. No indicated risk denotes mothers with singleton, full term (≥37 weeks), vertex presentation births who were not reported to have any medical risk factors and for whom no complications of labour or delivery were listed on the birth certificate. (See bmj.com for definitions.)

Methods and results

The proportion of mothers at no indicated risk decreased from 46% of all births in 1991 to 42% in 1998 but has since levelled off (table). However, the primary caesarean rate for this exceptionally low risk group rose 67% between 1991 (3.3%) and 2001 (5.5%), with a gradual increase from 1991 to 1996 and a rapid one thereafter.

Older, primiparous mothers were much more likely to have a no indicated risk primary caesarean; almost one fifth (19.5%) of primiparous mothers aged over 34 had such a delivery in 2001. More than 5% of multiparous mothers over 34 who had had previous vaginal births also had a no indicated risk primary caesarean in 2001. Among mothers under 30 with no indicated risk, the primary caesarean rate grew by more than half (58%) between 1991 and 2001 to 4.9%.

The raw numbers of births also illustrates this trend. In 2001, 80 028 no indicated risk primary caesareans took place in the United States, an increase of 25 162 since 1996. This represented 25.8% of the total increase (97 659) in primary caesareans between 1996 and 2001.

We used multivariate logistic regression analysis (SAS version 8) to examine changes in primary caesarean rates after controlling for parity; maternal ethnicity, age, and education; birth weight; and data year (1991, 1996, or 2001) (see table on bmj.com). We ran models for all mothers, including parity as a variable, and for first time mothers only. Age was a major factor, particularly among first time mothers. For primiparous mothers aged over 40, the odds of having a caesarean were 5.4 times that for mothers aged 20-24. In the multivariate analysis, the overall increase between 1991 and 1996 disappeared, but the odds of having a no indicated risk primary caesarean in 2001 were almost 50% higher than the odds for comparable mothers in 1996.

Comment

The proportion of no indicated risk primary caesareans is growing rapidly in the United States, adding to the overall rise in primary caesareans. The major limitation of this study is the quality of reporting of items on the US birth certificate.[1] However, we would expect that "defensive medicine" would encourage the reporting of a risk factor associated with the resulting caesarean. Also, in the trend analysis there is no inherent reason to expect a bias that would cause a shift in the measurement of these variables at different time periods. It would also be inappropriate to equate no indicated risk caesareans with "patient choice" caesareans, as birth certificate data provide no record of the mother's intent.

Although some recent editorials have suggested that vaginal births carry risks comparable to caesarean births,[2] health problems associated with caesareans have been amply documented.[3] All of these risks may be easily outweighed by the potential benefits to a mother or infant with a condition that could have been avoided by a timely caesarean, but what if the caesarean was done without a medical indication? In the case of no indicated risk primary caesareans, particularly for younger mothers who plan to have more children and may be denied a vaginal birth after a caesarean,[4] additional research is needed to elucidate whether the risks of a no indicated risk primary caesarean will be offset by associated benefits.

What is already known on this topic

The overall and primary caesarean rate is growing rapidly in the United States and worldwide, and the likelihood of a caesarean is strongly related to age of the mother and parity

What this study adds

A new category for analysis has been created—the "no indicated risk" caesarean

The proportion of no indicated risk primary caesareans is growing rapidly in the United States, adding to the overall rise in the primary caesarean rate

Contributors: ED conceived of the new measure, planned the study, and wrote the first draft. All authors were involved in analysing the data and contributed to subsequent drafts and approved the final version of the paper. All are guarantors.

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P+ *Definitions and an extra table are on bmj.com*

Percentage of all live births to women with no indicated risk factors* and associated rate of primary caesarean delivery†, United States, 1991-2001, and percentage change 1991-2001

Age (years) and parity	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Percentage change between 1991 and 2001
All ages and parities	46.3	45.5	45.2	44.6	44.4	43.5	42.6	42.1	42.1	41.9	41.8	–10
Primary caesarean rates: all parities												
All ages	3.3	3.3	3.4	3.4	3.6	3.7	3.9	4.1	4.4	4.9	5.5	67
<20	3.0	3.1	3.1	3.2	3.3	3.3	3.5	3.7	4.0	4.5	5.1	70
20-24	3.0	3.0	3.0	3.1	3.1	3.2	3.4	3.4	3.8	4.2	4.7	57
25-29	3.3	3.3	3.3	3.3	3.4	3.5	3.7	3.9	4.2	4.8	5.1	55
30-34	3.5	3.4	3.5	3.6	3.8	3.9	4.2	4.4	4.8	5.3	5.9	69
35-39	4.3	4.5	4.6	4.6	4.8	4.9	5.3	5.6	5.9	6.6	7.4	72
≥40‡	6.1	6.2	6.5	6.8	7.0	6.8	7.4	7.9	8.2	9.7	10.2	67
Primiparous women												
All ages	5.6	5.7	5.6	5.7	5.8	6.1	6.3	6.7	7.1	8.0	8.9	59
<20	3.6	3.7	3.6	3.7	3.8	3.9	4.0	4.3	4.6	5.2	5.9	64
20-24	4.9	5.0	4.9	4.9	5.0	5.3	5.5	5.6	6.1	6.8	7.7	57
25-29	6.3	6.4	6.3	6.3	6.3	6.7	6.8	7.4	7.7	8.9	9.6	52
30-34	8.6	8.2	8.2	8.4	8.7	8.9	9.3	9.6	10.4	11.2	12.3	43
35-39	12.4	13.4	13.2	13.1	13.4	13.4	13.5	14.6	15.6	16.8	18.5	49
≥40‡	18.2	17.6	19.5	18.3	19.7	18.2	19.7	21.1	21.9	25.1	25.7	41
Multiparous women												
All ages	2.1	2.1	2.1	2.1	2.2	2.3	2.5	2.6	2.8	3.2	3.5	67
<20	1.7	1.7	1.8	1.8	1.9	1.9	1.9	2.1	2.3	2.5	2.8	65
20-24	1.7	1.7	1.8	1.8	1.7	1.8	1.9	2.0	2.2	2.4	2.7	59
25-29	1.9	2.0	1.9	2.0	2.0	2.1	2.2	2.3	2.6	2.9	3.0	58
30-34	2.3	2.2	2.3	2.2	2.4	2.5	2.6	2.8	3.1	3.4	3.8	65
35-39	3.0	3.0	3.1	3.0	3.2	3.3	3.6	3.8	3.9	4.5	5.1	70
≥40‡	4.5	4.7	4.6	5.1	4.9	5.0	5.4	5.7	5.9	7.0	7.5	67

Source: Natality Data Sets, 1991-2001. National Center for Health Statistics.
*Proportion of women with full term, vertex, singletons with birth weight <4000 g with no reported medical risk factors or complications of labour and delivery.
†Number of primary caesareans per 100 live births to women who have not had a previous caesarean.
‡Beginning in 1997, data are for women aged 40-54 years.

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