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Bariatric Surgery and Preterm Birth

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TO THE EDITOR: Bariatric surgery, the most effective method of achieving sustained weight loss, is increasingly performed in women of reproductive age.¹ Some studies have shown that women who have undergone bariatric surgery have a higher risk of preterm birth than women who have the same body-mass index (BMI) and have not undergone bariatric surgery.^{1–3}

We previously reported outcomes of pregnancy in 590 women with a history of bariatric surgery who gave birth between 2006 and 2011, as compared with women matched for presurgery BMI, and we found no significant association with preterm birth.⁴ We now report the risk of preterm birth among an expanded cohort of women who gave birth between 2006 and 2013 (Table 1).

Our Swedish population-based cohort study included 1941 births to women who had undergone bariatric surgery and 6574 control births matched for maternal presurgery BMI (with the use of early-pregnancy BMI in the controls), age, parity, smoking status, and delivery year. Information on bariatric surgery and presurgery BMI was obtained from the Scandinavian Obesity Surgery Registry, and information on pregnancy characteristics was obtained from the Swedish Medical Birth Register.

A total of 163 of 1941 women who had undergone bariatric surgery delivered preterm (<37 completed weeks of gestation), as compared with 447 of 6574 women who had not undergone bariatric surgery (8.4% vs. 6.8%; odds ratio, 1.24; 95% confidence interval [CI], 1.02 to 1.51). The risk of moderately preterm birth (between 32 completed weeks and 36 weeks 6 days of gestation) was higher among women who had undergone bariatric surgery (139 of 1917 women) than among women who had not (369 of 6496 women) (7.3% vs. 5.7%; odds ratio, 1.30; 95% CI, 1.05 to 1.60). However, no significant association was observed between a history of bariatric surgery and very preterm birth (<32 completed

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weeks of gestation); these births occurred in 24 of 1941 women in the surgery group and 78 of 6574 women in the control group (1.2% vs. 1.2%; odds ratio, 0.99; 95% CI, 0.61 to 1.62).

We detected a significantly higher risk of spontaneous preterm birth ($P = 0.01$) but not medically indicated preterm birth ($P = 0.56$) among women who had bariatric surgery than among controls. The results of our overall analyses of preterm birth were similar when the analyses were restricted to women who were either nulliparous or had no history of preterm birth (see Section 4.2 of the Supplementary Appendix, available with the full text of this letter at NEJM.org). The mean (\pm SD) time from bariatric surgery to conception was 1.6 ± 1.1 years. Preterm births occurred in 7.7% of women with a time from surgery to conception of less than 1 year, 9.5% of women with a time from surgery to conception of 1 to 2 years, and 8.0% of women with a time from surgery to conception of more than 2 years ($P = 0.96$).

Although obesity is an established risk factor for preterm birth,⁵ we found a significant inverse association between obesity after bariatric surgery and the risk of preterm birth ($P = 0.03$). Additional details of the methods and results are provided in the Supplementary Appendix.

In contrast to the findings reported in our earlier article,⁴ we now report a significant association between a history of bariatric surgery and an increased risk of preterm birth and spontaneous preterm birth in particular. Despite careful matching, differences between the surgery group and the control group may have influenced the results.

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Supplementary Material

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Table 1

Preterm Births among Women with and Women without a History of Bariatric Surgery in Sweden, 2006–2013.*

Variable	Births		Odds Ratio (95% CI) [†]	P Value
	Bariatric-Surgery Group	Matched Control Group		
	<i>no./total no. (%)</i>			
Preterm birth	163/1941 (8.4)	447/6574 (6.8)	1.24 (1.02–1.51)	0.03
Moderately preterm birth [‡]	139/1917 (7.3)	369/6496 (5.7)	1.30 (1.05–1.60)	0.01
Very preterm birth	24/1941 (1.2)	78/6574 (1.2)	0.99 (0.61–1.62)	0.97
Spontaneous preterm birth [§]	101/1937 (5.2)	245/6553 (3.7)	1.38 (1.08–1.77)	0.01
Medically indicated preterm birth [§]	62/1937 (3.2)	198/6553 (3.0)	1.09 (0.81–1.47)	0.56

* Data on preterm births to women who had undergone bariatric surgery and matched control deliveries from the general population are shown. Preterm birth was defined as less than 37 completed weeks of gestation, moderately preterm birth as birth between 32 completed weeks and 36 weeks 6 days of gestation, and very preterm birth as birth before 32 completed weeks of gestation. CI denotes confidence interval.

[†]Odds ratios were conditioned on the matching set, including one pregnancy after bariatric surgery and up to five controls, with matching for maternal presurgery body-mass index (BMI) (with the use of early-pregnancy BMI in the controls), age, parity, smoking status, and delivery year.

[‡]Analyses of moderately preterm birth excluded very preterm births.

[§]Data on spontaneous or medically indicated preterm births in 4 postsurgery births and 21 control births were not available.