

Odds of early birth by class of obesity in a propensity score matched sample

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Objective

- Evaluate the odds of preterm birth (< 37 weeks, PTB) or early term birth (ETB, 37 and 38 weeks) by class of obesity in a propensity score matched sample.

Study Design

- The sample was selected from liveborn, non-anomalous singleton deliveries in California between 22 and 42 weeks gestation in 2007-2012.
- Pre-pregnancy body mass index (BMI) was obtained from linked birth certificate records.
- Obesity was categorized by class: class I (BMI 30.0 – <35.0 kg/m²), class II (BMI 35.0 – <40.0 kg/m²), and class III (BMI 40.0 – 55.0 kg/m²).
- Propensity scores were calculated for each class of obesity using maternal age, education, payer for delivery, WIC participation, race/ethnicity, adequacy of prenatal care, parity, maternal birth outside the US, diabetes, hypertension, smoking, drug/alcohol use, mental illness, and previous PTB.
- A referent sample of women with a BMI of 18.5 – <25.0 kg/m² was selected using exact propensity score matching. Logistic regression was used to calculate odds of preterm and ETB.

Results

- The sample included:
 - 332,985 women with class I obesity
 - 135,959 women with class II obesity
 - 76,531 women with class III obesity
- 1,319,846 women with a pre-pregnancy BMI between 18.5 – <25.0 kg/m² (Referent) A propensity score matched control was obtained for 86.8% of women with class I obesity, 96.4% of women with class II obesity, and 95.7% of women with class III obesity.
- Women with obesity were at increased odds of a birth <32 weeks with premature rupture of the membranes (ORs 1.3 for class I, 1.4 for class II, 1.6 for class III).
- Women with obesity were at decreased odds of a spontaneous PTB between 32 and 36 weeks with intact membranes (ORs 0.7 – 0.8) and ETB (OR 0.9, 95% CI 0.9 – 0.9 for all).

Conclusion

- Although population rates of PTB were higher for women with obesity, once matched by propensity score they were at decreased odds of PTB between 32 and 36 weeks.
- Women with obesity were at increased risk of early (<32 weeks) PTB with premature rupture of the membranes compared with propensity score-matched peers.

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Women with class I, II, or III obesity were at increased odds of early preterm birth with PPROM and decreased odds of late preterm and early term birth compared with propensity score-matched peers.



Figure 1. Sample selection

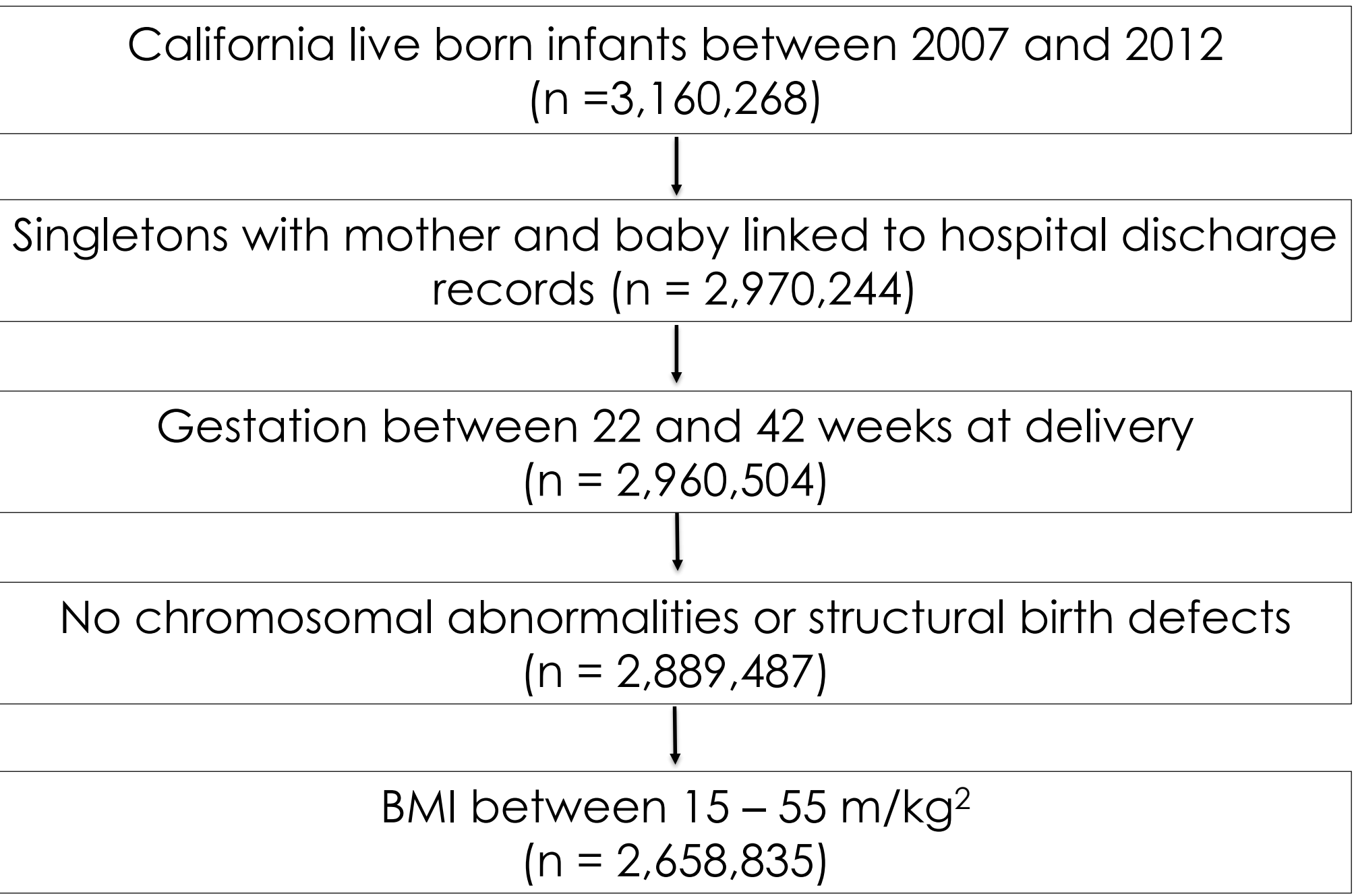


Table 1. Rate of early birth by BMI prior to matching

	Weeks gestation		
	< 32	32 - 36	37 - 38
18.5 - < 25.0 kg/m2	0.7	5.6	26.4
Class I obesity (30.0 - < 35.0 kg/m2)	1.0	6.3	27.1
Class II obesity (35.0 - < 40.0 kg/m2)	1.2	6.7	27.9
Class III obesity (40.0 - 55.0 kg/m2)	1.3	7.4	28.6

Table 2. Rate of early birth among propensity-score matched samples

	Weeks gestation		
	< 32	32 - 36	37 - 38
Class I obesity (30.0 - < 35.0 kg/m2)	1.0	6.1	26.7
Class I matched (18.5 - < 25.0 kg/m2)	1.0	6.9	29.3
Class II obesity (35.0 - < 40.0 kg/m2)	1.1	6.4	27.6
Class II matched (18.5 - < 25.0 kg/m2)	1.0	7.5	29.8
Class III obesity (40.0 - 55.0 kg/m2)	1.2	6.9	28.1
Class III matched (18.5 - < 25.0 kg/m2)	1.2	8.1	29.5

Table 3. Odds of preterm birth by class of obesity

Body mass index (kg/m²)	Class I obesity (30.0-<35.0)	Class II obesity (35.0-<40.0)	Class III obesity (40.0-55.0)
	n (%)	n (%)	n (%)
	OR (95% CI)	OR (95% CI)	OR (95% CI)
<u>Gestation at birth</u>			
< 32 weeks	1.0 (1.0, 1.1)	1.1 (1.0, 1.2)	1.0 (0.9, 1.1)
PPROM	1.3 (1.1, 1.4)	1.4 (1.2, 1.6)	1.6 (1.3, 1.9)
Spontaneous	1.0 (0.9, 1.1)	1.0 (0.9, 1.1)	0.9 (0.8, 1.0)
Indicated	0.8 (0.7, 0.9)	0.9 (0.7, 1.1)	0.7 (0.6, 0.9)
32 - 36 weeks	0.8 (0.8, 0.9)	0.8 (0.8, 0.8)	0.8 (0.8, 0.8)
PPROM	1.0 (1.0, 1.1)	1.0 (0.9, 1.1)	1.0 (0.9, 1.1)
Spontaneous	0.8 (0.8, 0.8)	0.8 (0.7, 0.8)	0.7 (0.7, 0.8)
Indicated	0.9 (0.9, 0.9)	0.9 (0.8, 1.0)	1.0 (0.9, 1.0)
<37 weeks	0.9 (0.9, 0.9)	0.8 (0.8, 0.9)	0.8 (0.8, 0.9)
PPROM	1.1 (1.0, 1.1)	1.0 (1.0, 1.1)	1.1 (1.0, 1.2)
Spontaneous	0.8 (0.8, 0.8)	0.8 (0.8, 0.8)	0.8 (0.7, 0.8)
Indicated	0.9 (0.8, 0.9)	0.8 (0.8, 1.0)	0.9 (0.9, 1.0)
37 and 38 weeks	0.9 (0.9, 0.9)	0.9 (0.9, 0.9)	0.9 (0.9, 0.9)

Bold when p < 0.05