

# Impact of a lifestyle intervention on stillbirth and other adverse perinatal outcomes in a cohort of obese women (Winner of the SIMP EUBRAIN Award, in memory of Claudio Bastia)

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**Objective.** Obesity is a well-known risk factor for several adverse perinatal outcomes. This study evaluates if a lifestyle intervention (LI) started early in pregnancy, has a benefit, namely in preventing stillbirth (SB).

**Materials and Methods.** This is a prospective cohort study including singleton obese women (BMI ≥ 30) delivered at a tertiary hospital between 2016 and 2020. A group of them was randomly referred to an *ad-hoc* clinic for LI (LI group). The program started at the 9-12<sup>th</sup> week implementing a low-glycemic index, low-saturated fat diet (total intake 1500 kcal/d), and physical activity. Follow-up was granted until delivery. The remaining received standard care (SC group) in public and private settings. Perinatal outcomes were collected. Student t-test, chi-squared test, and multivariate logistic regression were performed.

**Results.** A total of 14,849 deliveries occurred in the study period, and 1963 (13.2%) were considered obese. Among them, 654 (33.2%) entered the LI program. Gestational diabetes and preterm birth did not differ between groups, while severe obesity and hypertensive disorders were higher in the LI group (Table 1). Antepartum SB (5.1/1000) was more frequent in the SC group, in particular the SB risk increased with each class of obesity (OR 2.58, 95%CI 1.13-5.86), while it was reduced in those who received LI (OR 0.10, 95%CI 0.01-0.79). On the other hand, a low Apgar score was more frequent in the LI with respect to the SC group (p = 0.001).

Table 1. Maternal characteristics and perinatal outcomes.

	Standard Care (N=1309)	Lifestyle intervention (N=654)	P value
<b>Maternal characteristics</b>			
Mean age	36.5 ± 5.6	34.8 ± 5.7	0.000
Nulliparity	435 (33.2)	245 (37.5)	0.06
Country of origin			0.005
Italy	686 (52.4)	387 (59.2)	
Others	623 (47.6)	267 (40.8)	
Ethnicity			0.000
Caucasian	709 (54.1)	473 (72.3)	
African	251 (19.1)	95 (14.5)	
Maghrebian	290 (22.1)	60 (9.2)	
Others	59 (4.5)	26 (4.0)	
Low Education level (≤8 years)	673 (51.4)	353 (54.1)	0.32
Obesity classes			0.000
Class I	971 (74.2)	381 (58.3)	
Class II	257 (19.6)	164 (25.1)	
Class III	81 (6.2)	109 (16.7)	
Care providers			0.000
Public (family centers)	960 (73.4)	521 (79.6)	
Private (Gynecologist)	349 (26.6)	133 (20.3)	
Gestational Diabetes Mellitus	401 (30.6)	219 (33.5)	0.41
Gestational Hypertension	89 (6.8)	70 (10.7)	0.000
Preterm Birth (<37 weeks)	96 (7.3)	53 (8.1)	0.51
<b>Perinatal Outcomes</b>			
Birthweight	3334.8 ± 578.8	3322.4 ± 596.2	0.65
Macrosomia (>4000g)	130 (9.9)	62 (9.5)	0.37
Need for resuscitation	11 (0.8)	7 (1.1)	0.26
Apgar 5* ≤ 7	53 (4.0)	35 (5.3)	0.001
Stillbirth	9 (0.7)*	1 (0.1)†	0.05

\* Five cases were related to placental insufficiency, three to infections, and one to a congenital anomaly.  
 † Placental abruption

**Conclusions.** An early intervention through LI program can prevent antepartum SB among obese women. Further randomized controlled trials are required to prove this effect.