Lifestyle intervention can guarantee an adequate gestational weight gain and improve perinatal outcomes in a cohort of obese women

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Objective. Although there is no agreement, the Institute of Medicine (IOM) recommends 5-9 kg of gestational weight gain (GWG) for all obesity classes. This study evaluates if a lifestyle intervention (LI) can guarantee an adequate GWG affecting perinatal outcomes.

Materials and Methods. Prospective cohort study including singleton obese women (BMI ≥ 30) delivered at a tertiary hospital between 2016 and 2020. A group was randomly referred to an *ad-hoc* clinic for LI. The LI started at the 9-12th week implementing a low-glycemic index, low-saturated fat diet, and physical activity. Patients were followed until delivery and perinatal outcomes were collected. According to the IOM range, patients were classified into three different groups based on total GWG: Insufficient, Adequate or Excessive. Data of women included in the LI group were compared with the remaining patients who received standard care (SC group).

Results. A total of 1874 obese women delivered in the study period. Among them, 565 (30.1%) were included in the LI group while 1309 received SC. A higher rate of women with a GWG out of the IOM was found in the SC group, while women in the LI group showed higher adequate GWG (**Table 1**). The SGA rate was frequent in the SC group and after multivariate analysis the risk for SGA was increased by insufficient GWG (OR 1.31, 95%CI 1.02–1.68) and reduced by LI (OR 0.66, 95%CI 0.43-0.98) (**Table 2**).

Conclusions. SGA risk is associated with an insufficient GWG and may be modifiable by applying early LI in pregnancies complicated by obesity.

Table 1. *Maternal and pregnancy characteristics and perinatal outcomes.*

	Control (N=1309)	Lifestyle intervention (N=565)	P value
Maternal age ≥ 40	401 (30.6)	151 (26.7)	0.09
Nulliparity	**434 (33.1)**	**213 (37.7)**	**0.05**
Ethnicity			**0.000**
Caucasian	**709 (54.1)**	**402 (71.1)**	
African	**251 (19.1)**	**83 (14.7)**	
Maghrebian	**290 (22.1)**	**60 (10.6)**	
Others	**59 (4.5)**	**20 (3.5)**	
Low Education level (≤8 years)	673 (51.4)	279 (49.4)	0.37
Obesity classes			**0.001**
Class I	**971 (74.2)**	**373 (66.0)**	
Class II	**257 (19.6)**	**144 (25.5)**	
Class III	**81 (6.2)**	**48 (8.5)**	
Mean BMI	**33.4 ± 3.3**	**34.2 ± 4.3**	**0.000**
ART	30 (2.3)	9 (1.8)	0.34
Pregnancy assistance			**0.02**
Public (family centers)	**960 (73.4)**	**449 (79.5)**	
Private (Gynecologist)	**349 (26.6)**	**116 (20.5)**	
Gestational Diabetes Mellitus	**401 (30.6)**	**202 (35.7)**	**0.03**
Gestational hypertension	**89 (6.8)**	**58 (10.3)**	**0.000**
Excessive GWG (≥ 9kg)	**361 (27.6)**	**133 (23.5)**	**0.04**
Adequate GWG (5-9kg)	**512 (39.1)**	**272 (48.1)**	**0.0001**
Insufficient GWG (<5kg)	**436 (33.3)**	**160 (28.3)**	**0.01**
Labor induction	481 (36.7)	208 (36.8)	0.47
Cesarean Section	377 (28.8)	162 (28.7)	0.49
Operative delivery	67 (5.1)	21 (3.7)	0.09
Preterm Delivery (<37 weeks)	96 (7.3)	47 (8.3)	0.41
Birthweight	3333.5 ± 579.4	3323.2 ± 602.3	0.72
LGA	265 (20.2)	105 (18.6)	0.18
SGA	**98 (7.5)**	**29 (5.1)**	**0.03**

Table 2. *Multivariate logistic regression for the likelihood of having a SGA newborn.*

	OR	95% CI	P value
Obesity classes	1.22	0.90 – 1.66	0.18
Italian place of origin	1.19	0.82 – 1.73	0.34
Lifestyle intervention	**0.66**	**0.43 – 0.98**	**0.05**
Maternal age ≥ 40 years	0.78	0.43 – 1.21	0.22
Public assistance	0.94	0.61 – 1.45	0.80
Inadequate GWG	**1.31**	**1.02 – 1.68**	**0.03**
Gestational hypertension	1.08	0.55 – 2.14	0.81