ECRONICON OPEN ACCESS

EC GYNAECOLOGY
Research Article

Should a Small Gestational for Age Infant Outcome be of Concern with Gestational Weight Loss in Pregnancy Afflicted with Obesity?

Anne M Davis*

Assistant Professor of Nutrition Science, University of New Haven, West Haven, CT, USA

***Corresponding Author**: Anne M Davis, Assistant Professor of Nutrition Science, University of New Haven, West Haven, CT, USA.

Received: August 13, 2019; **Published:** September 30, 2019

Abstract

Obesity in pregnancy is the leading cause of maternal and fetal morbidity and excess or insufficient GWG can exacerbate these outcomes. There have been inconsistent reports of the risk for small for gestational age occurring when gestational weight loss occurs in obese pregnant women. This short communication aims to consider the newer studies available on the small for gestational age outcome incidence in obese pregnant women who experience gestational weight loss.

Keywords: *Maternal Obesity; Infant Outcomes; Gestational Weight Loss; Small for Gestational Age; Preterm Delivery*

Abbreviations

GWL: Gestational Weight Loss; GWG: Gestational Weight Gain; SGA: Small for Gestational Age; IOM: Institute of Medicine; RCT: Randomized Controlled Trial; GDM: Gestational Diabetes; Kg: Kilograms; OR: Odds Ratio; BMI: Body Mass Index (kg/m^2)

Introduction

The rate of obesity (body mass index (BMI) ≥ 30) in women of reproductive age continues to grow. Although gestational weight loss (GWL) during pregnancy is not recommended by the Institute of Medicine (IOM), approximately 8% of pregnant women have reported trying to lose weight and an even higher prevalence (13%) is found in women suffering from obesity [1-3]. Preconception and gestational weight gain interventions in obese pregnancy have been fraught with inconsistent results, few randomized controlled studies (RCTs), reliance on observational study designs and variation in collected outcome data. There is an evolving body of research investigating the prevalence and safety in GWL in overweight and obese pregnant women [4-9].

Few studies have directly examined the consequences of gestation weight loss during an obese pregnancy. Some studies have observed a higher risk of small for gestational age (SGA) infants resulting from GWL in obese pregnant women while other researchers have not [4-9]. There are also observational studies and RCTs of weight change during overweight and obese pregnancy that may have not reported GWL and SGA. The aim of this short communication is to review new studies published in 2019 on this topic.

Materials and Methods

PubMed, EMBASE and CINHAL databases were searched for any English-only articles published during 2017-2019 with the following search terms, obese pregnant women, GWL, SGA and maternal obesity. Articles on gestational diabetes were excluded due to likelihood of a prescription of an oral hypoglycemic agent or insulin. These medications could separately affect fetal growth. Descriptive data extraction was conducted by a single researcher.

Results

Total retrieval resulted in nineteen articles. Of the nineteen articles, two articles included data on GWL, infant outcomes to include PTD or SGA and published in 2017, 2018 or 2019. Both studies were retrospective cohorts, one from France and the other from Japan [10,11] and represented a total of 2,836 obese pregnant women (and 4,941 overweight pregnant women (Japan)). The Institute of Medicine (IOM) 2009 Pregnancy Weight Guidelines served as the reference standard for gestational weight gain (GWG) in each study [12].

GWL ranged from 13.6% (250 of 1,840 obese pregnant women) [11] to 20.3% (202 of 996 obese pregnant women) [10]. The study by Hirooka-Nakama., *et al*. included all classes of obesity calculating the odds ratio (OR) risk for SGA as 1.44 (0.74 - 2.82) in obese pregnant women with GWL compared to IOM recommended GWG [12] p = 0.29 [11]. The OR for SGA in overweight (BMI 25.0 - 29.9) pregnant women (20 of 182 with GWL, 11.0%) was 2.45 (1.45 - 4.15). The prevalence of SGA in overweight pregnant women with GWL was higher than SGA in obese pregnant women with GWL, 11.0% vs. 6.8%, respectively [11]. Therefore, the OR of SGA in overweight pregnant women with GWL was 2.45 (1.45 - 4.15) p = 0.001 compared to the OR of 1.44 (0.74 - 2.82) p = 0.29 for SGA in obese pregnant women with GWL. This study calculated predicted probabilities for the sum of SGA and LGA births in the obese group. GWL did not increase the prevalence of SGA births. When the sum of predicted probabilities of was ≤ 20%, the optimal weight gain was -7 kg. Higher weight gain was associated with higher predicted probabilities of the sum of LBW, LGA, and macrosomia, which showed significant differences compared to the IOM recommended weight gain; therefore, weight loss was determined to be optimal for Japanese obese pregnant women.

In the second study, Roussel and colleagues evaluated pregnant women with class II obesity only (BMI 30.0 to 34.9) and found the adjusted OR risk for SGA with GWL was 1.62 (1.02 - 2.58). The OR was adjusted for maternal age, parity, ethnicity, chronic hypertension, pre-existing diabetes mellitus, and tobacco use [10]. The risk of SGA newborns was only increased when maternal weight loss exceeded ≥ - 5 kg.

Discussion

No consensus has been reached on whether weight loss during pregnancy increases the risk of SGA birth in obese pregnant women. Bianco., *et al.* [13] reported that the prevalence of SGA birth was only 4% in pregnant women with a BMI of > 35 kg/m^2 who lost weight or kept it unchanged during pregnancy. Kiel., *et al.* [8], reported that the risk of SGA birth was lower in Class II/III obese women with weight gain of < 15 lb (Class I: BMI 30 - 35 kg/m^2, Class II: BMI 35 - 40 kg/m^2 and Class III: BMI ≥ 40 kg/m^2). Bogaerts., *et al.* [14] reported that maternal and neonatal outcomes were favorable without increased risk of SGA births in Class I women with a weight gain of 0 to 5 kg, Class II women with a weight loss of 0 to 5 kg, and Class III women with a weight loss of up to 15 kg. in obese pregnant women based upon optimal neonatal birth weight in accordance to obesity classes in Belgium. Beyerlein., *et al.* [15] reported that the risk of SGA births significantly increased in Class I/II pregnant women with a weight loss of 0 to 5 kg, whereas weight loss during pregnancy was not associated with poor maternal or neonatal outcomes in Class III women. The obese group was not subdivided by the obesity classification in the Japanese study [11], the lowest predicted probability of poor maternal and neonatal outcomes without increased risk of SGA birth was observed in the loss subgroup of the obese group suggesting that weight loss is optimal for obese pregnant Japanese women.

There are several study limitations identified in this body of work. First, retrospective data may be limited to birth certificates. It is difficult to compare studies when the classes of obesity for studied pregnant women are different. Other unknowns include the timing of when the GWL occurred (trimester), degree of GWL, and dietary intake to name a few. Outcomes were not reported in uniform units of measure (OR versus adjusted OR). Using birth weight standards without considering neonatal gender could overestimate the incidence of SGA in female newborns [16].

Conclusion

There is a scarcity of comparative data on GWL with or without GWL from numerous studies evaluating gestational weight gain in obese pregnant women [1-9]. This short communiqué only examines two of the latest studies evaluating the outcome of SGA in obese

pregnant women who experience GWL. More detailed observational research is needed to define the highest risk for SGA in obese pregnant women with GWL. Dose-response, exposure and duration need classification. For example, knowing the thresholds for amount of weight loss by class of obesity, the caloric and macronutrient cut points are as important as learning most critical trimesters for GWL and duration of weight loss. Until these parameters are better understood, it is difficult to conduct RCTs safely let alone recommend safe weight loss to obese pregnant women. This safety work is central given the data on overweight/obese pregnant women intentionally who lose weight during pregnancy.

Conflict of Interest

There are no financial interests or any conflict of interests.

Bibliography

1. Bish CL., *et al*. "Trying to lose or maintain weight during pregnancy-United States, 2003". *Maternal and Child Health Journal* 13.2 (2009): 286-292.

2. Blomberg M. "Maternal and neonatal outcomes among obese women with weight gain below the new Institute of Medicine recommendations". *Obstetrics and Gynecology* 117.5 (2011): 1065-1070.

3. Cohen JH and Kim H. "Sociodemographic and health characteristics associated with attempting weight loss during pregnancy". *Preventing Chronic Disease* 6.1 (2009): A07.

4. Kapadia MZ., *et al*. "Can we safely recommend gestational weight gain below the 2009 guidelines in obese women? A systematic review and meta-analysis". *Obesity Reviews* 16.3 (2015): 189-206.

5. Schumann NL., *et al*. "A review of national health policies and professional guidelines on maternal obesity and weight gain in pregnancy". *Clinical Obesity* 4.4 (2014): 197-208.

6. Kapadia MZ., *et al*. "Weight loss instead of weight gain within the guidelines in obese women during pregnancy: a systematic review and meta-analyses of maternal and infant outcomes". *PLoS One* 10.7 (2015): e0132650.

7. Goldstein RF., *et al*. "Association of gestational weight gain with maternal and infant outcomes: a systematic review and meta-analysis". *Journal of the American Medical Association* 317.21 (2017): 2207e2225.

8. Kiel DW., *et al*. "Gestational weight gain and pregnancy outcomes in obese women: how much is enough?" *Journal of the American Medical Association* 110.4 (2007): 752-758.

9. Beyerlein A., *et al*. "Optimal gestational weight gain ranges for the avoidance of adverse birth weight outcomes: a novel approach". *American Journal of Clinical Nutrition* 90.6 (2009): 1552-1558.

10. Roussel E., *et al*. "Birthweight and pregnancy outcomes in obese class II women with low weight gain: A retrospective study". *PLOS ONE* 14.5 (2019): e0215833.

11. Hirooka-Nakama J., *et al*. "Optimal weight gain in obese and overweight pregnant Japanese women". *Endocrine Journal* 65.5 (2018): 557-567.

12. Institute of Medicine (US) and National Research Council (US) Committee to Reexamine IOM Pregnancy Weight Guidelines. "Weight gain during pregnancy reexamining the guidelines". In: Rasmussen KM, Yaktine AL (eds.) The National Academies Collection: Reports Funded by National Institutes of Health. National Academies Press (US), Washington (DC) (2009).

13. Bianco AT., *et al*. "Pregnancy outcome and weight gain recommendations for the morbidly obese woman". *Obstetrics and Gynecology* 91.1 (1998): 97-102.

14. Bogaerts A., *et al*. "Weight loss in obese pregnant women and risk for adverse perinatal outcomes". *Obstetrics and Gynecology* 125.3 (2015): 566-575.

15. Beyerlein A., *et al*. "Associations of gestational weight loss with birth related outcome: a retrospective cohort study". *BJOG: An International Journal of Obstetrics and Gynaecology* 118.1 (2011): 55-61.

16. Goldstein RF., *et al*. "Gestational weight gain across continents and ethnicity: systematic review and meta-analysis of maternal and infant outcomes in more than one million women". *BMC Medicine* 16.1 (2018): 153.

Volume 8 Issue 10 October 2019