OBSTETRICS

Gestational weight gain and obesity: is 20 pounds too much?

Michelle A. Kominiarek, MD; Neil S. Seligman, MS, MD; Cara Dolin, MD; Weihua Gao, MS; Vincenzo Berghella, MD; Matthew Hoffman, MD; Judith U. Hibbard, MD

OBJECTIVE: To compare maternal and neonatal outcomes in obese women according to weight change and obesity class.

STUDY DESIGN: Cohort study from the Consortium on Safe Labor of 20,950 obese women with a singleton, term live birth from 2002-2008. Risk for adverse outcomes was calculated by multiple logistic regression analysis for weight change categories (weight loss [<0 kg], low [0-4.9 kg], normal [5.0-9.0 kg], high weight gain [>9.0 kg]) in each obesity class (I 30.0-34.9 kg/m^2, II 35.0-39.9 kg/m^2, and III ≥40 kg/m^2) and by predicted probabilities with weight change as a continuous variable.

RESULTS: Weight loss was associated with decreased cesareans for class I women (nulliparas odds ratio [OR], 0.21; 95% confidence interval [CI], 0.11—0.42; multiparas OR, 0.61; 95% CI, 0.45—0.83) and increased small for gestational age infants (class I OR, 1.8; 95% CI, 1.3—2.5; class II OR, 2.2; 95% CI, 1.5—3.2; class III OR, 1.7; 95% CI, 1.1—2.6). High weight gain was associated with increased large for gestational age infants (class I OR, 2.4; 95% CI, 1.9—2.9; class II OR, 1.7; 95% CI, 1.3—2.1; class III OR, 1.6; 95% CI, 1.3—2.1). As weight change increased, the predicted probability for cesareans and large for gestational age infants increased. The predicted probability of low birthweight never exceeded 4% for all obesity classes, but small for gestational age infants increased with decreased weight change. The lowest average predicted probability of adverse outcomes (cesarean, postpartum hemorrhage, small for gestational age, large for gestational age, neonatal care unit admission) occurred when women (class I, II, III) lost weight.

CONCLUSION: Optimal maternal and neonatal outcomes appear to occur when weight gain is less than current Institute of Medicine recommendations for obese women. Further study of long-term outcomes is needed with respect to gestational weight changes.

Key words: gestational weight gain, maternal, neonatal outcomes, obesity, pregnancy

Cite this article as: Kominiarek MA, Seligman NS, Dolin C, et al. Gestational weight gain and obesity: is 20 pounds too much? Am J Obstet Gynecol 2013;209:214.e1-11.

Obesity has reached epidemic proportions, estimated at 35.7% for adults in the United States.[1] The prevalence of obese reproductive age women (20-39 years) increased by 64% between 1988-1994 and 2007-2008, accounting for the greatest increase in obesity for women of any age category.[2] The obesity epidemic and its associated obstetric and neonatal complications has highlighted the issue of gestational weight gain (GWG). Regardless of maternal weight status, high GWG has been associated with both maternal (eg, cesarean deliveries, long-term weight retention) and offspring risks (eg, larger infants, childhood obesity).[3-8] Although the evidence is less consistent, an association between higher GWG and gestational diabetes and preeclampsia has also been reported.[9-12] On the other hand, low GWG and weight loss have also been associated with maternal ketonemia and fetal growth restriction.[13]

According to conventional wisdom, pregnancy is a time for weight gain, not for dieting or weight loss. Typically, an additional 300 calories per day is recommended for appropriate fetal growth and this was reflected in the 1990 Institute of Medicine report on Nutrition During Pregnancy.[14] More recently, in 2009, the Institute of Medicine published revised guidelines for GWG. Important updates included a range of 5—9 kg (or 11-20 lbs) for GWG in obese women, defined by a prepregnancy body mass index (BMI) ≥30 kg/m^2. This

From the Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology, College of Medicine (Drs Kominiarek and Hibbard), and the School of Public Health (Ms Gao), University of Illinois at Chicago, Chicago, IL; the Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology (Dr Seligman), University of Rochester Medical Center, Rochester, and the Department of Obstetrics and Gynecology (Dr Dolin), New York University School of Medicine, New York, NY; the Division of Maternal-Fetal Medicine, Department of Obstetrics and Gynecology (Dr Berghella), Jefferson Medical College of Thomas Jefferson University, Philadelphia, PA; and the Department of Obstetrics and Gynecology (Dr Hoffman), Christiana Hospital, Newark, DE. Institutions involved in the Consortium are listed in the Acknowledgments.

Received Jan. 30, 2013; revised April 9, 2013; accepted April 26, 2013.

This research was supported by the Intramural Research Program of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), National Institutes of Health (NIH) (MAK, MH, JH), through contract number HHSN267200603425C; by grant number K12HD055892 from the NICHD and NIH Office of Research on Women's Health (ORWH) (MAK); and by the University of Illinois at Chicago (UIC) Center for Clinical and Translational Science (CCTS), Award Number UL1RR029879 from the National Center for Research Resources (WG).

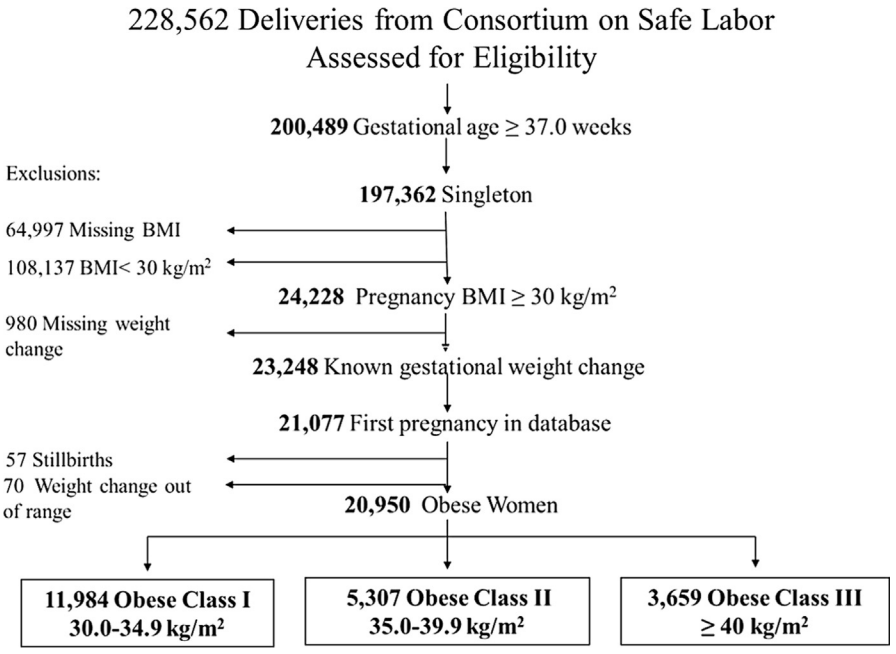
The authors report no conflict of interest.

Presented in oral format at the Eighth Annual Interdisciplinary Women's Health Research Symposium, Bethesda, MD, Nov. 17, 2011, and (in part) in poster format at the 30th annual meeting of the Society for Maternal-Fetal Medicine, Chicago, IL, Feb. 7-12, 2011.

Reprints not available from the authors.

0002-9378/$36.00 • © 2013 Mosby, Inc. All rights reserved. • http://dx.doi.org/10.1016/j.ajog.2013.04.035

FIGURE 1
Flow diagram for participant selection



BMI, body mass index.

Kominiarek. Weight gain obesity. Am J Obstet Gynecol 2013.

differed from the prior recommendation of "at least 15 pounds."[13] Notably, all obese women, were grouped into 1 category as a result of insufficient data from women in individual obesity classes (ie, obesity classes I-III) and the inability to draw statistically sound conclusions for GWG for the separate obesity classes. Behavioral interventions for women who are obese at conception have shown some success at meeting GWG recommendations,[15] but limited evidence suggests that lower GWG or weight loss (ie, gestational weight change) in this population may improve maternal and neonatal outcomes.[12,16,17] Given the nationwide rise in obesity as well as the influence of GWG on maternal and neonatal outcomes, we hypothesized that the current recommendations (up to a 20 pound weight gain) were too high for obese women and required closer scrutiny into each of the obesity classes. The objective of our investigation was to evaluate maternal and neonatal outcomes at birth in obese women by weight change and BMI class.

Materials and Methods

The Consortium on Safe Labor is a retrospective, observational, electronic database acquired from 12 institutions (19 hospitals) across 9 American College of Obstetricians and Gynecologists (ACOG) districts in the United States. The complete database contains 233,730 births resulting from 228,562 deliveries. Although the data were collected from 2002 to 2008, 87% of the births in the database occurred between 2005 and 2007. Extensive data were collected on each delivery including demographics, prenatal complications, labor and delivery information, and maternal and neonatal outcomes. Validation studies on 4 outcomes (shoulder dystocia, cesarean delivery for nonreassuring fetal heart rate, neonatal intensive care unit [NICU] admission for respiratory conditions, and neonatal asphyxia) were performed by hand-abstraction of eligible charts. Most variables reviewed were highly accurate when comparing data from the electronic database and the hand-abstraction. Further detail regarding the database is available.[18,19]

Inclusion criteria for the current study were a prepregnancy BMI $\geq$30 kg/m^2 and known gestational weight change in a singleton, term ($\geq$37.0 weeks), liveborn gestation. If a woman contributed more than 1 pregnancy to the database, only the first pregnancy was analyzed to maintain the independence of the observations. Class I-III obesity was defined according to the World Health Organization (WHO) criteria as class I 30.0-34.9 kg/m^2, class II 35.0-39.9 kg/m^2, and class III $\geq$40 kg/m^2.[20] Weight change was defined as the difference between the self-reported prepregnancy weight and delivery weight. The weight change categories were defined as weight loss, low (0-4.9 kg), normal (5.0-9.0 kg), and high (> 9.0 kg). The weight change categories were chosen for their simplicity, ease of clinical use, and were also modeled after those of another investigation.[21] Although the range of gestational weight change was $-$55 kg to 77 kg in the current cohort, this range was restricted to $-$20 kg to 50 kg to reflect a more clinically plausible value, also similar to the range chosen in another study.[22] In doing so, only 70 women or 0.3% of the cohort was excluded.

Maternal demographics and characteristics included age, race/ethnicity, marital status, insurance, parity, smoking status, prior cesarean delivery, pregestational diabetes, chronic hypertension, and gestational age at delivery. The primary maternal outcomes were operative vaginal delivery, cesarean delivery, and postpartum hemorrhage. The primary neonatal outcomes were birthweight, shoulder dystocia, 5 minute Apgar score <7, and NICU admission. Small and large for gestational age infants (SGA, LGA) were defined by birthweights <10th% or >90th%, respectively, for the gestational age at birth.[23] Low birthweight (LBW) and macrosomia were defined by birthweights <2500 g or >4500 g, respectively.

All analyses were stratified by obesity class (I, II, III). For the maternal demographics and characteristics, Pearson χ^2, and analysis of variance tests were used to statistically compare the association between categorical and continuous variables, respectively, and

Download English Version:

https://daneshyari.com/en/article/6146082

Download Persian Version:

https://daneshyari.com/article/6146082

Daneshyari.com