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SPECIAL ARTICLE

Overweight and Obesity in Pregnancy

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ABSTRACT

The prevalence of overweight and obesity in pregnancy have been increasing worldwide for the last several decades. This has also led to an increase in the incidences of many adverse pregnancy outcomes known to be associated with overweight and obesity pregnancies. The aim of this article is to address the definition, prevalence, importance and how to manage overweight and obese pregnant women.

Keywords: overweight, obesity, pregnancy.

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Obesity is a disease that occurs because excessive body fat accumulation. The diagnosis is based on the body mass index (BMI), which is calculated by a person's weight in kilograms divided by the square of their height in meters (kg/m^2). Using the World Health Organization (WHO) definition, overweight and obesity are defined as having a BMI of 25-29.9 kg/m^2 and 30 kg/m^2 or greater, respectively[1].

Prevalence

Worldwide, the prevalence of overweight and obesity in reproductive and pregnant women has been increasing to epidemic proportions over the last two decades[1]. In Thailand, overweight and obesity are also considered as an important health problems. The prevalences of overweight and obesity of Thai adults in 2018 were reported to be 19.0% and 4.8%, respectively[2]. A report from Rajavithi Hospital in Bangkok in 2009 found that the prevalences of overweight and obese women attending antenatal care to be around 13% and 4%, respectively[3].

Importance

Overweight and obesity are associated with several reproductive problems. Overweight and obese women have reduced fertility and take longer time to conceive for various reasons including increasing anovulation cycle, irregular menstruation, and reducing the chance of conception. A previous study reported that successful pregnancy and implantation rates after assisted reproductive technology to treat infertility declined by 1% with each 5 kg/m^2 BMI increase[4]. Once pregnancy is achieved, the rates of adverse pregnancy outcomes are higher in overweight and obese pregnant

women when compare to pregnant women with a normal BMI[5]. Higher adverse pregnancy outcomes associated with overweight and obesity include gestational diabetes, preeclampsia, spontaneous and medically indicated preterm birth, risk of congenital fetal malformation, rate of labor induction, prelabor or elective cesarean delivery, cesarean delivery, shoulder dystocia, postpartum hemorrhage, pelvic infection, wound infection or complication, large for gestational age fetus and fetal macrosomia and stillbirth, etc[5-6]. Fetal birth defects associated with overweight and obese pregnant women are neural tube defects, congenital heart defects and orofacial cleft[7-9]. The malformations may be related to diabetes in overweight and obese pregnant women[10]. Although higher rate of birth defects have been documented, prenatal screening and diagnosis of fetal aneuploidy and fetal malformation are also limited in maternal overweight and obese pregnant women[11]. Both ultrasonographic and maternal serum screening for fetal trisomy 18 and 21 are more difficult in overweight and obese pregnant women. Increasing the frequency of inadequate ultrasonographic nuchal translucency and nasal bone measurement during first trimester screening of overweight and obese pregnant women have been reported[12]. Second trimester maternal serum levels of alpha-fetoprotein, unconjugated estriol, human chorionic gonadotropin and inhibin-A are diluted in overweight and obese pregnant women because of the larger blood volume when compare to normal weight pregnant women. Thus, adjustments for maternal weight are needed. However, studies have reported that the detection rate of trisomy 21 did not increase after weight adjustments and the adjustments also reduced the detection of neural tube defects and increased the false positive rates of trisomy 18[13-25]. In the noninvasive prenatal test (NIPT), a 3-4% fetal DNA fraction is generally required to ensure a reliable NIPT result. Obesity is associated with lower fetal fractions and higher rates of failed NIPT[16]. Moreover, non-obstetric procedures such as anesthesia for overweight and obese pregnant women are also challenging. Difficulty of epidural and spinal analgesia placement and also complications from failed or difficult endotracheal intubation have also been reported[5].

How to manage overweight and obese pregnant women

Preconception care

Proper management should be initiated for overweight and obesity reproductive women since negative pregnancy test (preconceptional care). Reducing weight before pregnancy is the best way to decrease the risk of adverse pregnancy outcome. Lifestyle modifications including regular exercise and a balanced diet with low glycemic are the main recommendations. Weight-loss medications and bariatric surgery may be options for very obese women or those who have medical health problems related to obesity. Evaluation of underlying diseases such as pregestational diabetes, chronic hypertension and dyslipidemia before getting pregnant is also important. Preconceptional folic acid supplements should be provided.

Reproductive outcomes

Prenatal care

During pregnancy, overweight and obese pregnant women should be closely monitored for early signs of pregnancy complications, including hypertension and diabetes. Ultrasonographic fetal screening for congenital malformation is recommended. Pregnant women undergoing ultrasonography and her family should be counselled that there are limitations in ultrasonographic accuracy due to the thickness of the abdominal wall in overweight and obese pregnant women. A previous study found that obesity decreased the capacity for detection of an anomalous fetus by standard or targeted ultrasonography by at least 20% when compared with normal BMI women[17]. Moreover, obese pregnant women complicated with pregestational diabetes was even less in detection[17]. Serial monitoring for fetal growth by ultrasonography and fetal-well being assessment by external fetal monitoring are usually indicated[5]. If there are no obstetric or medical contraindications, exercise is proper for overweight and obese pregnant women. Beginning with as little as 5 minutes of exercise a day and adding 5 minutes each

week is suggested. The target point is to stay active for 30 minutes every day. However, planning a safe exercise program should be individually discussed with obstetricians[18]. The institute of Medicine (IOM) has published maternal weight gain guidelines based on prepregnancy BMI. For overweight and obese pregnant women, the IOM recommends a range of total weight gain of 15-25 and 10-20 lb, respectively, and recommended rates of weight gain in the second and third trimesters should be around 0.6 and 0.5 lb/week, respectively[19]. Weight loss during pregnancy is discouraged.

Intrapartum and postpartum care

The risk of labor, intrapartum and postpartum complications increase in overweight and obesity pregnant women, such as the rate of labor induction, anesthesia risk, rate of cesarean sections, and surgical wound complications. In the aspect of labor induction, there is no evidence to support for elective labor induction to prevent fetal macrosomia. For cesarean section, low vertical or midline abdominal incision are individually desired depending on maternal body habitus. Risk of surgical wound infection is directly related to BMI. Higher BMI is associated with a higher risk of surgical wound infection[20]. Several methods are suggested for reducing the risk of surgical wound infection such as closure of subcutaneous tissue when at least 2 cm deep, higher doses of perioperative antibiotic prophylaxis and negative-pressure wound therapy[5]. Breastfeeding is recommended for overweight and obese women if there are no other breastfeeding contraindications. It also may help with postpartum weight loss[21].

Conclusion

Overweight and obesity are important obstetric health problems. Management for preventing adverse maternal and neonatal outcomes should be provided for all stages of the pregnancy, from preconceptional through the antenatal, intrapartum and postpartum periods.

References

1. Tanvig M. Offspring body size and metabolic profile-effects of lifestyle intervention in obese pregnant women. Dan Med J 2014;61:B4893.
2. Jinnarin N, Kosulwat V, Rojroongwasinkul N, Boonpraderm A, Haddock CK, Poston WS. Prevalence of overweight and obesity in Thai population: results of the national Thai food consumption survey. Eat Weight Disord 2011;16:e242-9.
3. Saereeporncharenkul K. Correlation of BMI in pregnancy outcomes in Thai women delivered in Rajavithi hospital. J Med Assoc Thai 2011;94:S52-8.
4. Stubert J, Reister F, Hartmann S, Janni W. The risks associated with obesity in pregnancy. Dtsch Arztebl Int 2018;115:276-83.
5. Cunningham FG, Leveno KJ, Bloom SL, Dashe JS, Hoffman BL, Casey BM, Spong CY, editors. Williams Obstetrics. 25th ed. New York: McGraw-Hill;2018:939.
6. Poston L, Caleyachetty R, Chattingius S, Corvalan C, Uauy R, Herring S, et al. Preconceptional and maternal obesity: epidemiology and health consequences. Lancet Diabetes Endocrinol 2016;4:1025-36.
7. Watkins ML, Rasmussen SA, Honein MA, Botto LD, Moore CA. Maternal obesity and risk for birth defects. Pediatrics 2003;111:1152-8.
8. Stothard KJ, Tennant PW, Bell R, Rankin J. Maternal overweight and obesity and the risk of congenital anomalies: a systematic review and meta-analysis. JAMA 2009;301:636-50.
9. Walker DK, Mills JL, Simpson JL, Cunningham GC, Conley MR, Lassman MR, et al. Are obese women at higher risk for producing malformed offspring?. Am J Obstet Gynecol 1994;170:541-8.
10. Biggio JR Jr, Chapman V, Neely C, Cliver SP, Rouse DJ. Fetal anomalies in obese women: the contribution of diabetes. Obstet Gynecol 2010;115:290-6.
11. Racusin D, Stevens B, Campbell G, Aagaard KM. Obesity and the risk and detection of fetal malformations. Semin Perinatol 2012;36:213-21.
12. Aagaard-Tillery KM, Flint Porter T, Malone FD, Nyberg DA, Collins J, Comstock CH, et al. Influence of maternal body mass index on genetic sonography in the FASTER trial. Prenat Diag 2010;30:14-22.
13. Wald NJ, Cuckle HS, Densem JW, Kennard A, Smith D. Maternal serum screening for Down's syndrome: the effect of routine ultrasound scan determination of gestational age and adjustment for maternal weight. Br J Obstet Gynaecol 1992;99:144-9.
14. Palomaki GE, Panizza DS, Canick JA. Screening of Down syndrome using AFP, uE 3, and hCG: effect of maternal weight. Am J Hum Genet 1990;7:a282.
15. Wald NJ, Kennard A, Hackshaw A, McGuire A. Antenatal screening for Down's syndrome. J Med

Screen 1997;4:181-246.
16. Kruckow S, Schelde P, Hatt L, Ravn K, Petersen OB, Uldbjerg N, et al. Dose maternal body mass index affect the quantity of circulating fetal cells available to use for cell-based noninvasive prenatal test in high-risk pregnancies?. Fetal Diagn Ther 2019;45:353-6.
17. Dashe JS, McIntire DD, Twickler DM. Effect of maternal obesity on the ultrasound detection of anomalous fetuses. Obstet Gynecol 2009;113:1001-7.
18. Obesity and pregnancy. Washington, DC: The American College of Obstetricians and Gynecologists. [updated 2016 April; cited 2019 Nov 13]. Available from: http://www.m.acog.org/.
19. American College of Obstetricians and Gynecologists. ACOG Committee opinion no. 549: obesity in pregnancy. Obstet Gynecol 2013;121:213-7.
20. Smid MC, Kearney MS, Stamilio DM. Extreme obesity and postcesarean wound complications in the Maternal-Fetal Medicine unit cesarean registry. Am J Perinatol 2015;32:1336-41.
21. Lopez-Olmedo N, Hernandez-Cordero S, Neufeld LM, Garcia-Guerra A, Mejia-Rodriquez F, Mendez Gomez-Humaran I. The associations of maternal weight change with breastfeeding, diet and physical activity during the postpartum peroid. Matern Child Health J 2016;20:270-80.