Effects of obesity on pregnancy

In 2015-2016, the CDC found 71. 6% of the American adult population exceed healthy weight standards. More of the population was considered obese at 39. 3% compared to 31. 8% for the overweight population (Center for Disease Control and Prevention, 2019b). Overweight is defined as having a body mass index (BMI) of 25 or greater and obesity as a BMI of 30 or greater (Center for Disease Control and Prevention, 2019a). The pandemic of overweight and obesity has not eluded the pregnant population as 58. 5% of women are overweight or obese in their childbearing years (20-39) and have the potential to enter pregnancy obese (Catalano & Koutrouvelis, 2015). The obesity crisis is also prevalent in the military population as 44% of TRICARE beneficiaries exceed the recommended gestational weight guidelines (Fahey et al, 2018). Obesity has many complications in the nonpregnant adult population that progress to further complications in pregnancy. Being overweight or obese can contribute to infertility, a difficult pregnancy, and a difficult recovery which can then affect the readiness of our active duty military population. Nurse practitioners must be cognizant of each step that obesity plays in family planning and educate patients accordingly.

Roles in Family Planning

When compared to women of normal BMI (equal to or greater than 18. 5 and less than 25), women with a BMI that puts them into the overweight or obese category are shown to experience delays in becoming pregnant (Dodd & Briley, 2017). Obese women are disproportionally represented in infertility treatment clinics and have a higher rate of abnormal menstruation as well as miscarriage (Coad & Dunstall, 2011). Women in these categories are also more likely to be diagnosed with polycystic ovarian syndrome (PCOS) which

compromises rates of fertility. While not all women with PCOS are obese, the symptoms associated with PCOS increase in severity as body weight increases (Coad, Dunstall, 2011). However, it appears that difficulty becoming pregnant is not strictly related to the weight of the female, but also that of the male partner. It is believed that lower rates of successful assisted reproduction in couples with an obese male can be contributed to imbalanced hormone levels, impaired spermatogenesis, impaired DNA integrity, and reduced sperm counts (Dodd & Briley, 2017; Palmer, Bakos, Fullston, Lane, 2012). Prenatal care of obese women is extremely important as they are at increased risk for congenital anomalies to include neural tube defects as folic acid appears to lose its protective effect in pregnancies complicated by increased body habitus (Coad & Dunstall, 2011). Military providers cannot dismiss the role obesity plays in infertility difficulties as the psychological component infertility places onto the couple can impact military readiness greatly. The active duty member can experience increased stress which can impede focus on their duties as well as increase the likelihood of experiencing depression effecting work production (Catalano & Koutrouvelis, 2015).

Roles in Pregnancy

Maternal obesity complicates pregnancy in almost every risk category. These include pregnancy specific complications (complications that arise in pregnancy only), but also the fact that the woman is entering pregnancy with an increased chance of having pre-existing diagnoses that can be further complicated by pregnancy (Dodd & Briley, 2017). Complications include increased risk for the development of gestational diabetes, gestational

hypertension, preterm labor, infection, thromboembolic events, perinatal death, impaired recovery, and recent research has shown the development of cerebral palsy (CP) (Dodd & Briley, 2017; Villamore et al., 2017). Maternal obesity is also correlated with poorer labor outcomes including induction of labor, prolonged labor course, increased risk for cesarean delivery (C/S), and instrumented delivery to include forceps/vacuum (Coad & Dunstall, 2011). Obese women who are undergoing a trial of labor after C/S delivery are almost two times the risk for maternal morbidity and at five times the risk for neonatal injury (Catalano & Koutrouvelis, 2015). There are also increased risks to the fetus as obese women are more likely to have a marcrosomic fetus or an infant that is large for gestational age. Villamor et al. (2017) found a statistically significant association among Swedish mothers between cerebral palsy and the mother's early BMI they believed to be partly mediated through asphyxia-related neonatal complications. Villamore et al. (2017) found mothers with a BMI of 25-29. 9 had a 22% increased risk, mothers with a BMI of 30-34. 9 had a 28% increased risk, mothers with a BMI of 35-39. 9 had a 54% increased risk and mothers with a BMI greater than 40 had a 202% increased risk of having an infant develop cerebral palsy.

Finally, monitoring an overweight or obese woman can be difficult, especially regarding fetal size. With increasing BMI, it becomes difficult to estimate fetal size with palpation alone and ultrasound (US) is needed for accurate assessment. However, maternal obesity can still hinder accurate US assessment with the most error reported at the highest maternal BMIs and the extremes of fetal weight resulting in poorer assessment of fetal status (Dodd & Briley, 2017). Maternal obesity is one most important modifiable risk

factors in stillbirth prevention that is not linked to genetic or shared familial environmental factors across developed nations (Dodd & Briley, 2017). According to Catalano & Koutrouvelis (2015) obese pregnant woman are 40% more likely to experience a stillbirth and that risk increases with BMI.

Roles in the Postpartum Period

Increased complications in the labor course leads to increased complications in the postpartum course for both mother and infant. A mother may experience a difficult recovery from C/S delivery, increased risk for wound infection or dehiscence, difficulty moving and adjusting to a new role as a caregiver while trying to recover from surgery, and increased risk of thromboembolism development (Dodd &Briley, 2017). Obese women are found to have decreased initial breastfeeding rates and decreased rates for prolonged breastfeeding which can partly be contributed to the increased risk of medical complications and C/S delivery (Dodd &Briley, 2017). This could potentially impact maternal and newborn bonding as well as the newborn needing supplementation or admitted to the neonatal intensive care unit for hypoglycemia protocol (Dodd & Briley, 2017). Obese mothers are also at risk for future metabolic dysfunction as excess gestational weight gain is a significant factor in postpartum weight retention which could have an impact on any future additional pregnancies (Catalano & Koutrouvelis, 2015).

The Effect on Military Readiness

Obesity has a large and detrimental impact on military readiness. TRICARE spends one billion dollars annually on health processes contributed to

obesity (Fahey et al., 2018). At a time when congress is looking to decrease the healthcare budget with large healthcare system reorganization and downsizing, a one-billion-dollar expenditure will not be tolerated going forward. TRICARE spends more on pregnancy and delivery care than any other type of hospital admission at 782 million dollars (Fahey et al., 2018). High risk pregnancies are at the center of this cost. High risk pregnancies mean more missed work days for appointments as they require more appointments than an uncomplicated pregnancy. Many complicated pregnancies require nonstress testing two days a week with more frequent US once a certain stage in the pregnancy is reached. This equates to more missed time at work as well as more burden on the healthcare system (Fahey, et al., 2018).

Secondly, readiness is affected because the active duty woman may not be ready to deploy. While the pregnant woman is non-deployable up until the first year postpartum, being overweight or obese has an extreme effect on readiness. The woman must be ready to pass a physical fitness test at the year end mark (per Air Force regulations) and as a new mother with difficulty losing weight and other life challenges, this goal can be exceeding difficult especially if there happens to be excessive weight to lose. Among all active duty personnel who are women, postpartum females had significantly lower fitness test scores six months after delivery compared to their pre-pregnancy scores (Fahey et al., 2018). If her delivery and postpartum course was complicated by C/S delivery making recovery difficult or other complications like needing an episiotomy to deliver a large infant, then she may have even more difficulty getting back into testing shape. If the active duty member

went into her pregnancy overweight or obese, she now has more weight to lose. The risk of not passing physical fitness tests can be drastic with potential discharge from the military and thus, the end of a career. This not only affects the woman’s livelihood but costs the military money. Recruiting and training new personnel can be as much as 50, 000 dollars or more per individual (Fahey et al., 2018).

Patient Education

Prior to pregnancy is the ideal time to lose weight as even small decreases in weight prior to pregnancy have shown to have improved outcomes, however it is not too late to intervene once a woman becomes pregnant (Catalano & Koutrouvelis, 2015). Basic education should be provided to the patient regarding definitions of overweight and obesity as well as the ideal amount of weight the woman should gain during her pregnancy based on her BMI. The Center for Disease Control and Prevention (2019c) states the appropriate weight gain per BMI are as follows: underweight or BMI of less than 18. 5 should gain 28-40 pounds, normal weight or BMI of 18. 5- 24. 9 should gain 25-35 pounds, overweight or BMI 25- 29. 9 should gain 15-25, and obese or BMI 30 or greater should gain 11-20 pounds. Education has shown to be successful regarding nutrition as well as light exercise plans to include walking and measuring steps with a pedometer (Maturi, Afshary, & Abedi, 2011). The patient must be educated on the complications and potential negative outcomes that being obese during pregnancy can have on both her and her fetus/baby. Obese mothers are more likely to have their children grow up to be obese, increased risk of asthma development, altered behavior to include autism spectrum disorders, developmental delay and

attention-deficit/hyperactivity disorder (Fahey et al., 2018; Catalano & Koutrouvelis, 2015). Education on future family planning to include spacing should not be forgotten. Short interval pregnancies pose risks to an uncomplicated pregnancy, but those that are complicated by excess weight and potential other complications like prior C/S delivery should be cautioned about short interval pregnancies and the risk they pose to include uterine rupture and preterm labor. As mentioned above, a woman is at increased risk of postpartum weight retention with excess weight gain in pregnancy and have an increased likelihood of entering the next pregnancy above healthy weight standards.

The provider may utilize motivational interviewing techniques in order to help patients change their unhealthy habits to include diet and exercise changes (Catalano & Koutrouvelis, 2015). Spieker et al. (2015) found the ideal environment to conduct education regarding diet and exercise was during prenatal and well-child visits which could potentially lessen the weight gain in both the mother and infant. Spieker et al. (2015) utilized dissonance-based health promotion, ideal for this time period of transition, as this method consists of interventions that capitalize on the basic human desire to have one’s words and actions remain congruent. This program specifically discusses the high-risk behaviors of poor diet, sedentary lifestyle and how the effects of obesity can lead to adverse outcomes in pregnancy and encourages mindful behavior rather than focusing on weight loss (Spieker, et al., 2015). Many women view pregnancy as an alternative health state and try adjusting their behaviors to better suit the pregnancy (reduction in

smoking and alcohol consumption) which dissonance-based counseling appeals to (Spieker, et al., 2015).

Conclusion

Obesity is a modifiable disease with far reaching arms into every aspect of American lives to include pregnancy and the military. While obesity has great health effects prior to pregnancy, obesity complicates current medical diagnoses and can make a normal healthy pregnancy an unhealthy one. Obesity has very concerning implications to the mother, fetus and infant to include preconceptionally, during pregnancy and postpartum. Military readiness is greatly affected by this diagnosis. Some ways the nurse practitioner can intervene is to encourage a healthy lifestyle prior to pregnancy, continue to encourage healthy eating, and prescribe daily exercise routines suited to the individual pregnancy. With education and cheerleading, the nurse practitioner can have a large impact on the mother, her infant, and the expanding family.

References

- Dodd, J. M., & Briley, A. L. (2017). Managing obesity in pregnancy- An obstetric and midwifery perspective. *Midwifery, 49,* 7-12. http://dx. doi. org/10. 1016/j. midw. 2017. 03. 001
- Catalano, P. M., & Koutrouvelis, G. O. (2015). Practice Bulletin No 156: Obesity in pregnancy. *Obstertrics & Gynecology, 126(* 6), 112-126. doi: 10. 1097/AOG. 0000000000001211

- Center for Disease Control and Prevention. (2019a). Defining adult overweight and obesity. Retrieved from https://www. cdc. gov/obesity/adult/defining. html
- Centers for Disease Control and Prevention. (2019b). Obesity and Overweight. Retrieved fromhttps://www. cdc. gov/nchs/fastats/obesity-overweight. htm
- Center for Disease Control and Prevention. (2019c). Weight gain during Pregnancy. Retrieved fromhttps://www. cdc. gov/reproductivehealth/maternalinfanthealth/pregnancy-weight-gain. htm
- Coad, J., & Dunstall, M. (2011). *Anatomy and physiology for midwives.* Great Britain: Elsevier
- Fahey, M. C., Talcott, G. W., Cox Bauer, C. M., Bursac, Z., Gladney, L., Hare, M. E.... Krukoski, R., A. (2018). Moms fit 2 fight: Rationale, design, and analysis plan of a behavioral weight management intervention for pregnant and postpartum women in the U. S. military. *Contemporary Clinical Trials, 74,* 46-54. https://doi. org/10. 1016/j. cct. 2018. 09. 012
- Maturi, M. S., Afshary, P., & Abedi, P. (2011). Effect of physical activity intervention based on a pedometer on physical activity level and anthropometric measures after childbirth: a randomized controlled trial. *BMC Pregnancy and Childbirth, 11* (103), 1-8. http://www. biomedcentral. com/1471-2393/11/103
- Palmer, N. O., Bakos, H. W., Fullston, T., & Lane, M. (2012). Impact of obesity on male fertility, sperm function and molecular composition. *Spermatogenesis, 2* , 253–263.

- Spieker, E. A., Sbrocco, T., Theim, K. R., Maurer, D., Johnson, D., Bryant, E., . . . Stephens, M. B. (2015). Preventing obesity in the military community (POMC): The development of a clinical trials research network. *International Journal of Environmental Research and Public Health, 12,* 1174-1195. doi: 10. 3390/ijerph120201174
- Villamor, E., Tedroff, K., Peterson, M., Johansson, S., Neovius, M., Petersson, G., & Cnattingius, S. (2017). Association between maternal body mass index in early pregnancy and incidence of cerebral palsy. *JAMA, 317* (9), 925-936. doi: 10. 1001/jama. 2017. 0945