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Mini review
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Obesity in Obstetrics

Mircea Onofriescu*

First Department Obstetrics and Gynecology, University of Medicine "Gr.T. Popa" Iași, Romania

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***Corresponding author:** Mircea Onofriescu, First Department Obstetrics and Gynecology, University of Medicine "Gr.T. Popa" Iași, Romania

Mini review

The people in industrialized countries have experienced a dramatic increase in obesity in recent times. Prevalence of obesity has doubled in the last 25 years. In the United States, 17-th on the list of most obese places in the world - average BMI 28.8 Kg/m^2, more than 60% of reproductive-age women are overweight and 35% are obese, representing a 70% increase in pre-pregnancy obesity. In Romania, 75th on the list- average BMI is 22.2 Kg/m^2, the lowest average BMI in the European Union (9.4% obesity in 2016). [1] One of three Romanians is overweight, and one of four is obese. There are over 3.5 million obese in Romania. The highest obesity rate is recorded in Moldova, where the percentage is 23.8%. Only 10% of them see a doctor. Only one percent are included in a national obesity education program [2].

Not all ethnic groups are at equal risk. Of particular concern is the rapid increase in adolescent overweight and obesity. Concordantly, pregnancy obesity rates are also increasing. Obesity is associated with increased morbidity and 6- to 12-fold increase in mortality. Obesity is highly complex in terms of etiology and prevalence. Genetic predisposition, race, socioeconomic status, built environment (e.g., the presence of sidewalks or community design), accessibility of healthy and affordable foods, sleep habits, and geographic region all play a role. Lifestyle changes, which include consuming foods and beverages with a high glycemic index, increased food portion sizes, decreased structured physical activity, and increased screen-based sedentary behavior, have influenced the prevalence of obesity.

Antenatal Monitoring

An evaluation of dietary intake and exercise habits can provide insight into women at risk. All pregnant women without contraindications should participate in regular exercise. During prenatal visits women should be questioned and advised about their diet and exercise habits. Where available, nutritional counselling can be a helpful adjunct for women not meeting the weight gain recommendations.

The sonographer's ability to evaluate fetal structures is largely dependent on maternal size. Approximately 15% of normally visible structures will be sub optimally seen in women with a BMI above the 90th percentile. In women with a BMI above the 97.5th percentile, only 63% of structures are well visualized. Obstetric care providers should take BMI into consideration when arranging for fetal anatomic assessment in the second trimester. Anatomic assessment at 20 to 22 weeks may be a better choice for the obese pregnant patient.

Use all available technical tools improving image quality in obesity: lower transducer emission frequencies; harmonic imaging; compound imaging; speckle reduction filters. Consider approaching the fetus through the four major abdominal areas with least subcutaneous fat: periumbilical area, suprapubic area, right and left iliac fossae. Consider using the transvaginal approach for the assessment of the central nervous system (CNS) in fetuses in vertex presentation.

Gently inform the patient and her partner that obesity will reduce the diagnostic accuracy of the scan. Consider including the BMI value among the demographic data in the report to document the presence or absence of maternal obesity. Report other cofactors of limited acoustic window, such as previous cesarean section (for the scar), twinning and myomata.

Pregnancy Complications

The risk of spontaneous abortion is increased in obese women. Lashen et al. identified an odds ratio for spontaneous abortion of 1.2 (95% CI 1.01 to 1.46) for obese women (BMI > 30 kg/m2). The authors also identified an increased risk of recurrent early miscarriages (more than 3 successive miscarriages < 12 weeks' gestation) in the obese population, odds ratio 3.5 (95% CI 1.03

to 12.01).[8] Similar risks have been identified in obese women undergoing in vitro fertilization treatment [3].

Pre-gestational diabetes is more prevalent in obese women. Therefore, testing during early in pregnancy for women with risk factors is recommended. Obese women are also at increased risk of developing gestational diabetes (GDM). Not surprisingly, obese women are also at increased risk of having a macrosomic child. Physical activity is inexpensive and can significantly reduce the risk of gestational diabetes. More relevant to the obese population, they also reported a 34% reduction in the development of gestational diabetes in women who did not participate in vigorous exercise but who did participate in brisk walking compared with those who participated in easy pace walking. Women with GDM have a 30% chance of developing type 2 diabetes later in life [4].

Intrapartum Complications and Management

Macrosomia and shoulder dystocia

The use of antenatal ultrasound to detect fetal macrosomia is associated with such obstetric interventions as labor induction and cesarean section. The rate of cesarean section is affected. Higher cesarean section is more frequent when ultrasound examination indicates a macrosomic fetus.

Fetal monitoring

The obese abdominal wall may make monitoring more difficult than in other cases, and of course, the positive predictive value of antenatal testing (e.g. cardiotocography, nonstress testing, biophysical profile assessment) is limited. There is no evidence to support the routine use of internal fetal monitoring in this population, but it may be more effective in some women. Monitoring contractions and ensuring adequate labor in obese women poses a special challenge. Obese women require more oxytocin in labor. Consider allowing longer first stage of labor before performing a cesarean for labor arrest. Although most obstetric care providers rely on manual palpation and/or external tocometry, the use of an intrauterine pressure catheter may be advantageous in some cases.

Cesarean section

The risk of cesarean section is increased in the obese parturient. The increase in cesarean section rate may be partly due to the fact that overweight and obese nulliparous women have a slower progression of the first stage of labor. When faced with lack of descent in the second stage of labor, some practitioners may opt for cesarean section rather than operative vaginal delivery because of concerns about fetal macrosomia and shoulder dystocia. This may explain the low rate of operative vaginal delivery in some series [5]. Obese women undergoing caesarean section experience more complications, including blood loss > 1000 mL, increased operative time, increased postoperative wound infection and endometritis, and need for vertical skin incision. The obese diabetic women who undergo cesarean section have an odds ratio for postoperative wound infection of 9.3 (95% CI 4.5 to 19.2), and those who require a vertical skin incision have a 12% rate of wound complication serious enough to require opening the incision [6].

For morbidly obese patients, two standard 50-cm-width operating tables secured together may be necessary. Specially constructed wider operating tables would be ideal. Weighing scales suited for obese patients are necessary not only to measure weight and evaluate weight gain during pregnancy, but also for calculating medication dosages. A wider delivery bed that is easy to move around and that may be used at all stages of delivery, including cesarean section, without the need to move the patient into another bed is most useful. Nursing care of obese patients requires ergonomic adaptation and knowledge about the special risks involved in caring for these patients. More trained nurses are necessary to care for morbidly obese patients.

The decision-to-delivery interval may be longer when an emergent or urgent cesarean section is required in obese parturient. Causes for this delay may include patient transport and bed transfer, the time to establish adequate anesthesia, and the operative time from incision to delivery. The 30-minute rule of emergency cesarean section is an arbitrary threshold rather than an evidence-based standard.

Vaginal birth after cesarean section

In the absence of contraindications, women who have had their first child by cesarean section are asked to consider vaginal birth in subsequent pregnancies. The success of vaginal birth after cesarean section is commonly quoted at 80% [7]. Obese women are less likely than their lean peers to be successful in delivering vaginally after previous cesarean section (VBAC). In women with a BMI > 29 kg/m^2 the success rate is 54% to 68% [8]. The success rate is further reduced in even heavier women. Chauhan et al. found a 13% VBAC success rate in women >300 lbs (136 kg) [9].

Thromboembolism

The risk of thromboembolism is high in obese parturients. Edwards et al. reported 683 obese women (BMI > 29 kg/m^2) who were matched to 660 normal weight women (BMI 19.8 to 26.0 kg/m^2). The incidence of thromboembolism was 2.5% in the obese women, and only 0.6% in the controls.[29] BMI >30 plus one additional risk factor qualify for seven days of postpartum Clexane; BMI >30 plus two additional risk factors require Clexane antenatally and for 6 weeks postpartum; BMI>40 should be regarded as already having two risk factors. Clexane dosage should be calculated by weight:

Early mobilization and T.E.D. anti-embolism stockings are clinically proven to reduce the incidence of deep vein thrombosis by up to 50% and to promote increased blood flow velocity in the legs 138% of baseline by compression of the deep venous system.

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Perinatal outcomes

Maternal obesity is also an established risk factor for stillbirth. The reported risk of stillbirth is 2-5 times higher in obese compared with normal-weight women. The risk of stillbirth associated with obesity increases with gestational age. Infant mortality rates increase from 2.4/1000 among normal weight women (BMI 18.5-24.9) to 5.8/1000 among women with grade 3 obesity (BMI ≥ 40.0). Maternal overweight and obesity are associated with increased risks of infant mortality due to increased mortality risk in term births and an increased prevalence of preterm births. Maternal obesity may increase the risk for intellectual disability or cognitive deficits in offspring from 1.3- to 3.6-fold. Maternal pre-pregnancy obesity and high gestational weight gain of > 18 kg was associated with a 3-fold increase in offspring IQ deficit (mean of 6.5 points lower) [10]. The majority of studies that have examined a link between high maternal BMI and childhood diagnosis of autism spectrum disorders have found a significant positive association. This risk may be further augmented by intrauterine growth restriction (IUGR), preterm birth, high gestational weight gain, gestational or pre-gestational diabetes, and preeclampsia [11].

Conclusion

A national information campaign is required to exploit women's interest in having as healthy a pregnancy as possible by giving them the information they need to become fit and have a normal BMI before they consider pregnancy. Periodic health check-ups and other appointments for gynecologic care prior to pregnancy offer ideal opportunities to raise the issue of weight loss before conception. Women should be encouraged to enter pregnancy with a BMI < 30 kg/m^2, and ideally < 25 kg/m^2. Although obesity is not an indication for the transfer of routine obstetric care, consultation with or referral to physicians with expertise in obesity may be appropriate if the obstetrician cannot safely and effectively care for the patient because of the lack of the specialized training, experience or institutional resources.

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