

Influence of Maternal Obesity on Outcomes after Fetal Spina Bifida Repair

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Abstract

Prevalence of pre-pregnancy obesity has been rising over the last years. Obesity increases the risk for congenital anomalies, multiple different pregnancy complications, as well as operative complications. Following, these pregnancy complications will be briefly summarized. A special focus will be led on fetal Spina Bifida (fSB) that occurs more frequently in obese mothers, and will give an update regarding the outcomes of in-utero fetal Spina Bifida (fSB) repair in obese mothers.

Keywords: Fetal spina bifida; Fetal surgery; Obesity

Description

Over the last years, pre-pregnancy obesity has been rising, reaching a prevalence of 29% in the US in 2019 [1]. This fact causes challenges for obstetricians, since obesity increases the risk for multiple complications during pregnancy such as Gestational Diabetes (GDM), preeclampsia, gestational hypertension, fetal macrosomia, maternal venous thromboembolism, and preterm delivery [2-6]. Delivery complications include a higher risk for cesarean deliveries, as well as increased operative morbidity, such as surgical site infections [2,6]. Furthermore, fetuses of obese mothers are at increased risk for congenital anomalies such as congenital heart disease, omphalocele and neural tube defects including fetal Spina Bifida (fSB) [6].

The latter, namely fSB, represents one of the most common congenital anomalies and causes major morbidity and mortality, as well as medical care costs [7]. In utero-repair of fSB has become one treatment option since a randomized-controlled trial showed better neonatal motor outcomes and reduced need for shunting in case of in-utero compared to postnatal repair [8].

However, due to the above mentioned increased risks in obese mothers, women being pregnant with a fSB child and Body Mass Index (BMI)>35 kg/m² have so far mostly been excluded from the in-utero treatment option, by most centers offering fSB repair. A study by Sacco, et al., [9] that among global availability also analyzed inclusion and exclusion criteria of centers offering fSB repair, reported that only one out of 44 centers offered fSB to mothers with BMI up to 45 kg/m². In 2019, Hilton, et al., [10] published a single-institution study that analyzed outcomes of 11 women with BMI>35kg/m² that had in-utero fSB repair. Their results did not show any adverse outcomes associated with maternal obesity but earlier gestational age at delivery compared to the Management of Myelomeningocele Study (MOMS) trial [10].

To confirm these findings, and evaluate if an exclusion of women with BMI>35 kg/m² regarding in-utero fSB repair is justified, another

single-center cohort study analyzed data of 192 women with pregnancies affected by fSB that underwent in-utero surgery at the center for fetal diagnosis and therapy in Zurich [11]. The retrospective study divided women who had fSB repair into three groups, according to their BMI (Group 1=BMI<30 kg/m² (N=146); Group 2=BMI 30-35 kg/m² (N=28); Group 3=BMI>35 kg/m² (N=18)) and compared maternal and fetal outcomes. Results equally did not show any clinically relevant maternal or fetal adverse outcomes in women with BMI>35kg/m². In contrast to the study by Hilton, et al., [10], gestational age at delivery was around 36 weeks in all groups and therefore not lower compared to the MOMS trial.

Conclusion

Obesity is associated with increased obstetrical risks among others, an increased risk for congenital anomalies as for example a two-fold increased risk for fSB. This combination highlights the importance of results showing warranted safety for fSB repair in women with BMI>35 kg/m² and furthermore demands for continuously seeking for better knowledge concerning adequate prenatal care for this special collective.

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