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COMMENTARY

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Can we improve the diagnosis of fetal macrosomia?

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Fetal macrosomia, defined as a birthweight >90th centile or > 4000, is associated with an increased risk of complication for both the mother and the newborn.[1] Indeed, shoulder dystocia, brachial plexus injury, prenatal asphyxia, and adverse perinatal outcome have been reported to be associated with macrosomia.[2] Similarly, maternal complications include prolonged labor, an increased incidence of cesarean or operative delivery, postpartum hemorrhage, third- and fourth-degree perineal tears and pelvic floor dysfunction.[2] Further there are several reports showing that intrauterine overgrowth is associated with long-term health risks such as type II diabetes and hypertension.[3] Such risks could potentially be reduced by a prompt and reliable prenatal diagnosis leading to prenatal intervention on maternal lifestyle and alimentation and the subsequent early induction of labor to reduce the increase in fetal size with advancing gestational age.

Despite the importance of an accurate identification before birth, the current models used mainly based on fetal biometry and the subsequent estimated fetal weight (EFW). In this issue of the Journal of Clincal Ultrasound[4] retrospectively analyzed 380 cases of macrosomia delivered in 1-year interval at their unit. In more than 50% of the cases, there was underestimation >300 g in the antenatal evaluation of EFW. Despite they reported a relationship between expertise of the sonographer and the rate of misdiagnosis, their data underline how ultrasonographic EFW is inaccurate in predicting LGA particularly when performed remotely from term.[5]

There are however evidences that the integration of ultrasonographic EFW with maternal and fetal hemodynamic characteristics improve the diagnosis. Indeed, algorithms integrating EFW with maternal overweight, history of pregestational diabetes, parity and the previous delivery of a macrosomic newborn significantly increase the diagnostic performance[6] Further LGA fetuses have lower values of impedance to flow in umbilical artery secondary to bigger placentas and their role has a further integration for improving the diagnostic accuracy of LGA.[7,8] Fetal overgrowth is also associated with an increase in umbilical vein flow (UVBF) and fetal intrahepatic shunts[9,10]. As a consequence, new models have recently developed integrating UVBF to EFW and maternal characteristics. It is noteworthy that umbilical vein flow has been shown to be already effective as early as 11 weeks of gestation,[11] Indeed, multiparametric models that include UVBF with maternal and biochemical parameters allows prenatal screening for LGA already in the first trimester, Availability of an objective screening test for LGA in the first trimester is essential and has the potential to improve the outcome of these pregnancies by allowing adequate prenatal counseling.

This may be translated into nutritional and behavioral changes that may improve metabolic health of the woman and reduce the risk of developing LGA.

As a consequence, a two-stage approach should be considered for stratifying the pregnancies at low and high risk to develop macrosomia as shown in Figure 1.

A first approach at the time of 11–14 weeks of gestation scan in which maternal characteristics, routinely tested biochemical variables such as pregnancy-associated plasma protein-A (PAPP-A) maternal serum concentrations and UVBF may allow to early identify high-risk cases to develop macrosomia.

A second approach at 36 weeks combining EFW with maternal characteristics and UVBF to plan the management and timing the delivery.

This strategy is likely to have a higher predictive performance for LGA neonates than screening only by ultrasonographical EFW >90th percentile. Future implementation studies will define the performance of this combined approach in antenatal prediction of macrosomic newborns and on the subsequent reduction in adverse maternal and perinatal outcome.

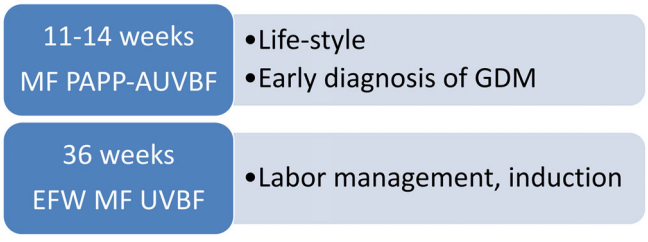

FIGURE 1 Two-stage approach to stratify pregnancies at risk of macrosomia and subsequent management strategies

CONFLICT OF INTEREST

All Authors report no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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