Background
Large-for-gestational-age fetuses are at increased risk of perinatal morbidity and mortality. Magnetic resonance imaging seems to be more accurate than ultrasound in the prediction of macrosomia; however, there is no well-powered study comparing magnetic resonance imaging with ultrasound in routine pregnancies.

Objective
This study aimed to prospectively compare estimates of fetal weight based on 2-dimensional ultrasound and magnetic resonance imaging with actual birthweights in routine pregnancies.

Study Design
From May 2016 to February 2019, women received counseling at the 36-week clinic. Written informed consent was obtained for this Ethics Committee-approved study. In this prospective, single-center, blinded study, pregnant women with singleton pregnancies between 36 0/7 and 36 6/7 weeks’ gestation underwent both standard evaluation of estimated fetal weight with ultrasound according to Hadlock et al and magnetic resonance imaging according to the formula developed by Baker et al, based on the measurement of the fetal body volume. Participants and clinicians were aware of the results of the ultrasound but blinded to the magnetic resonance imaging estimates. Birthweight percentile was considered as the gold standard for the ultrasound and magnetic resonance imaging—derived percentiles. The primary outcome was the area under the receiver operating characteristic curve for the prediction of large-for-gestational-age neonates with birthweights of ≥95th percentile. Secondary outcomes included the comparative prediction of large-for-gestational-age neonates with birthweights of ≥90th, 97th, and 99th percentiles and small-for-gestational-age neonates with birthweights of ≤10th, 5th, and 3rd percentiles for gestational age and maternal and perinatal complications.

Results
Of 2914 women who were initially approached, results from 2378 were available for analysis. Total fetal body volume measurements were possible for all fetuses, and the time required to perform the planimetric measurements by magnetic resonance imaging was 3.0 minutes (range, 1.3–5.6). The area under the receiver operating characteristic curve for the prediction of a birthweight of ≥95th percentile was 0.985 using prenatal magnetic resonance imaging and 0.900 using ultrasound (difference=0.085, P<.001; standard error, 0.020). For a fixed false-positive rate of 5%, magnetic resonance imaging for the estimation of fetal weight detected 80.0% (71.1–87.2) of birthweight of ≥95th percentile, whereas ultrasound for the estimation of fetal weight detected 59.1% (49.0–68.5) of birthweight of ≥95th percentile. The positive predictive value was 42.6% (37.8–47.7) for the estimation of fetal weight using ultrasound, and the negative predictive value was 99.0% (98.6–99.3) for the estimation of fetal weight using magnetic resonance imaging and 98.0% (97.6–98.4) for the estimation of fetal weight using ultrasound. For a fixed false-positive rate of 10%, magnetic resonance imaging for the estimation of fetal weight detected 92.4% (85.5–96.7) of birthweight of ≥95th percentile, whereas ultrasound for the estimation of fetal weight detected 76.2% (66.9–84.0) of birthweight of ≥95th percentile. The positive predictive value was 29.9% (27.2–32.8) for the estimation of fetal weight using magnetic resonance imaging and 26.2% (23.2–29.4) for the estimation of fetal weight using ultrasound, and...
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*BW*, birthweight; *CI*, confidence interval; *DR*, detection rate; *FPR*, false-positive rate; *LGA*, large-for-gestational-age; *MRI*, magnetic resonance imaging; *SGA*, small-for-gestational-age; *US*, ultrasound.

the negative predictive value was 99.6 (99.2—99.8) for the estimation of fetal weight using magnetic resonance imaging and 98.8 (98.4—99.2) for the estimation of fetal weight using ultrasound (Table). The area under the receiver operating characteristic curves for the prediction of large-for-gestational-age neonates with birthweights of ≥90th, 97th, and 99th percentiles and small-for-gestational-age neonates with birthweights of ≤10th, 5th, and 3rd percentiles was significantly larger in prenatal magnetic resonance imaging than in ultrasound (P<.05 for all).

**Conclusion**

At 36 weeks’ gestation, magnetic resonance imaging for the estimation of fetal weight performed significantly better than ultrasound for the estimation of fetal weight in the prediction of large-for-gestational-age neonates with birthweights of ≥95th percentile for gestational age and all other recognized cutoffs for large-for-gestational-age and small-for-gestational-age neonates (P<.05 for all).