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Objectives
To compare the accuracy of two-dimensional (2D) and three-dimensional (3D) ultrasound (US) for the identification of fetal macrosomia at term.

Methods
Single centre prospective study which included women at risk for fetal macrosomia referred for fetal biometry between 34 and 36+6 weeks. The estimated fetal weight (EFW) was computed using 2D US and the Hadlock Model IV or through 3D US of fetal fractional thigh volume (Tvol) and the Model VI by Lee et al. The projection of the EFW at the delivery was performed by using Yudkin’s chart percentiles and the gestation-adjusted projection (GAP) method. The EFW at birth with either method was compared with the references for birthweight (cut off ≥4000 and ≥4500 grams) and birthweight centile (cut off ≥90th and ≥95th centile) using Pearson’s correlation coefficient and the Bland Altmann plot. The Receiver operating characteristic (ROC) curves were constructed and than compared with the DeLong method. Sensitivity, specificity, positive and negative predictive values (PPV and NPV), positive and negative likelihood ratios (LR+ and LR-) were calculated respectively for each method with EFW projections and cut off.

Results
Overall, 230 patients were included. A significant correlation between the EFW percentile and the birthweight percentile was found both for the 2D-US-EFW centile (0.654, r 0.430, p <0.001) and the 3D-US-EFW centile (0.678, r 0.460, p <0.001) as well as for the 2D-US-EFW-GAP and the 3D-US-EFW-GAP (0.600, r 0.360, p <0.001 and 0.629, r 0.396, p <0.001, respectively). At ROC curve no difference was found in the prediction of birthweight ≥90 centile using 2D-US-EFW or 3D-US-EFW (AUC 0.831, 95% CI 0.768-0.894 versus AUC 0.860, 95% CI 0.799-0.920, respectively, p 0.37) nor in the prediction of birthweight ≥95 centile with 2D-US-EFW compared to 3D-US-EFW (0.803, 95% CI 0.731-0.874 versus 0.866, 95% CI 0.805-0.926, respectively, p 0.07). Similarly, a non-significant difference in the accuracy of the prediction of birthweight ≥4000 grams (AUC 0.788, 95% CI 0.716-0.859 for 2D-US-EFW vs AUC 0.802, 95% CI 0.723-0.880 for 3D-USEFW, p 0.72) and ≥4500 grams (0.828, 95% CI 0.720-0.936 for 2D-US-EFW vs 0.858, 95% CI 0.759-0.956 for 3D-US-EFW, p 0.71) with the GAP method could be demonstrated.

Conclusions
Within a population at risk of fetal overgrowth the performance of 3D-US-EFW is not dissimilar to that of 2D-US-EFW in the prediction of fetal macrosomia at term regardless of the method used for the projection of the EFW. However, paired comparison of the two techniques yielded higher sensitivity for 2D US and while higher specificity, PPV and LR+ for 3D US techniques, suggesting the latter as a confirmation method following the 2D-US detection of fetal macrosomia.