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# Amniotic fluid volume measurement and correlation to fetal biometric parameters

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## Objective

Estimation of amniotic fluid volume (AFV) is part of routine obstetric sonography which reflects maternal-fetal circulation efficiency, fetal hemodynamic status, and a parameter for predicting adverse neonatal outcome. Fetal weight is positively correlated with AFV. Therefore, our objective is to provide a new nomogram of AFV indices and to evaluate the relation between AFV and fetal biometric parameters.

## Methods

Retrospective cohort study between 2011 and 2018, at a large tertiary medical center. Data were collected from medical charts of prenatal sonographic evaluation of normal pregnancies, including routine estimation of AFV by using amniotic fluid index (AFI). Generalized estimating equations model was used to study the association between AFI, gestational age and fetal biometric parameters. Centiles were calculated using the Generalized Additive Models for Location, Scale, and Shape model. Box-Cox-t distribution and smoothing splines were used.

## Results

Analysis included 28,650 pregnancies. From 25 to 41 weeks gestation, the median and fifth percentile AFI gradually decreased from 174 (IQR 157-193) to 138 mm (IQR 107-173) and from 125 to 68 mm, respectively. The change in the 95$^{th}$ percentile was less significant, ranging around 230 mm throughout pregnancy. Multivariate regression analysis demonstrated a significant correlation between AFI and maternal body mass index (B = -0.147; CI = -0.27 to -0.02), gestational age (B = -11.8; CI = -12.5 to -11.4), estimated fetal weight (EFW) (B = 0.05; CI = 0.049-0.053) and abdominal circumference (AC) (B = 0.94; CI = 0.95-1). There was no correlation between AFI and other fetal biometric parameters.

## Conclusion

We suggest new AFI indices of singleton pregnancies. We found a positive correlation between AFI and EFW and AC.