A New, Population Based Approach to Ultrasound Term Prediction Models

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Abstract

Hardly without exception, all currently used systems for ultrasound fetal size and age assessment have been constructed from a relatively small selection of pregnant women with "certain" last menstrual period, from which fetal growth charts have been constructed, using a "standard recipe" such as fractional polynomial regression. However, the arguably most important clinical application of the charts has been to predict birth term, a purpose for which they are not really designed. We show how new charts can be designed, based on direct birth term prediction in population data, using, for instance, local quantile regression models. There is the added challenge that births such as planned Cesarean sections must be treated as censored data. Recent population evaluations show that the population-based models perform markedly better than the old growth charts. The differences have important consequences for clinical risk assessment and have lead to much heated debate in the Norwegian obstetric communities. Our new prediction models are currently in use in the majority of Norwegian birth clinics.

Keywords: Growth curves; Local quantile regression; Censoring; Population based; Ultrasound term prediction.

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