

Accuracy of ultrasonographic parameters in detection of growth restricted fetuses

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Abstract

The main objective of this study was to review the diagnostic accuracy of different single ultrasonographic parameters in predicting intrauterine growth restricted fetuses as defined by Ponderal Index at birth. The study sample composed of two sets of data from Iran and Australia. The Iranian samples consisted of 296 Iranian women. All the study women received prenatal care and delivered at Fatemieh Hospital in Shahrood, Iran. The data from 200 Australian fetuses were obtained from the ultrasound section at the Wollongong Hospital in Australia. Ultrasonographic measurements of Biparietal diameter (BPD), femur length (FL), head circumference (HC), abdominal circumference (AC), amniotic fluid index (AFI) and Doppler from umbilical arteries (S/D ratio) were obtained. Only those pregnancies were included in which the estimated date of delivery (EDD) by LMP (last menstrual period) agreed within 14 days with the estimated date of delivery determined by the initial ultrasound examination. Sensitivity (SE), specificity (SP), positive predictive value (PPV) and negative predictive value (NPV) were calculated for single proposed ultrasound parameters in the both Iranian and Australian samples. When different variables are compared, with a cut off point at or below the 10th percentile, AC and HC had the highest sensitivities in the Australian sample while AC was the most sensitive parameter for IUGR detection in the Iranian sample. BPD has a reasonably high sensitivity at this threshold. The AFI ratio had the lowest sensitivity in predicting IUGR in the Australian sample. Positive predictive values were low in all of the parameters in both the Iranian and Australian samples. Our results indicate that reduced AC was the best single parameter in discriminating between IUGR and non-IUGR fetuses with the highest sensitivity among the proposed parameters in the both Iranian and Australian sample. However the positive predictive value of this parameter is low. This means that a high number of false positive cases is detected using each parameter which reduces the usefulness of identification. Other ultrasound obstetrical parameters may also have a reasonable level of sensitivity, however the positive predictive value of all parameters is low. On the whole our results show that although the examined ultrasonographic criteria may detect a group of fetuses that need close antepartum surveillance, none of these parameters is appropriate enough to be used in isolation in clinical practice. Using single ultrasound parameters does not have high sensitivity and positive predictive values in detection of fetal growth restriction. This limits both accuracy and utility of these tests in the detection of IUGR fetuses.

Key words: Pregnancy, Ultrasonographic parameters, IUGR, Fetus growth.

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