



Inter-observer variability in Lung area measurement in fetuses with left CDH

Namdeo S, Krishnan V

Amrita Institute of Medical Sciences, Kochi, Kerala, India

Objective

For fetuses with congenital diaphragmatic hernia (CDH), the prognostic as well as selection for fetal therapy relies on ultrasound (US) estimation of contralateral lung size. The method of assessment should be reliable, consistent and with a minimum inter observer variability. Our objective was to determine the inter-observer variability in our team and propose objective criteria for quality control of lung size measurement in fetal CDH.

Methods

Lung area to head circumference ratio (LHR) was measured by 2 consultants, in fetuses with left CDH, between 18-37 weeks' gestation. The lung areas were measured by manual tracing method, in 3 different loops, by each consultant and the mean value was used for comparison. Head circumference was measured according to ISUOG guidelines and calculated by $(OFD+BPD) \times 1.62$. A total of 34 observations were made by each consultant and inter observer variability was assessed. Inter-observer variability was determined by intra class correlation coefficient (ICC) as an estimate of reliability or consistency of measurements. Bland-Altman analysis was used to compare the agreement of measurement by both consultants. Standard error of measurement (SEM) was calculated as an estimate of precision.

Results

The intra class correlation coefficient for the LHR measured by both observers was 0.98 (range 0-1, > 0.9 excellent) and the standard error of measurement was 0.92.

Conclusion

Inter-observer variability and standard error of measurement were low for lung area measurements; standard error of measurement may be used as a guiding tool for trainee assessment as it provides results in the units of specified measurement and hence, is easier to monitor. These measurements might be useful for quality control of prenatal severity assessment and identification of candidates for fetal therapy in fetuses with CDH.