Prediction of neonatal respiratory morbidity assessed by quantitative ultrasound lung texture analysis in small for gestational age fetuses

Moreno-Espinosa AL, Hawkins-Villarreal A, Coronado-Gutierrez D, Trigo L, Martínez-Portilla RJ, Gratacos E, Palacio M.
1- BCNatal - Fetal Medicine Research Center, (Hospital Clínic and Hospital Sant Joan de Déu), University of Barcelona, Institut d'Investigacions Biomèdiques August Pi i Sunyer, Barcelona, Spain

Objective

To evaluate the performance of quantitative ultrasound of the fetal lung texture analysis to predict neonatal respiratory morbidity (NRM) in small for gestational age fetuses (SGA).

Methods

This was an ambispective study involving consecutive cases of SGA fetuses. Prospective data was collected from January 2018 to February 2020 and retrospective data was identified from a database designed for a multicenter study (recruited from June 2011 to December 2014). Eligible included cases between 27-38.6 weeks of gestation and for which an ultrasound image of the fetal thorax was obtained within 48 hours of delivery. The primary outcome of the study was (NRM) defined as the occurrence of either transient tachypnea of the newborn (TTN) or respiratory distress syndrome (RDS).

Results

We included 147 fetuses (147 images), stratified in 3 groups, from 25-33.6 weeks [22/147 (15.0%)], 34-36.6 weeks [35/147 (23.8%)] and 37-38.6 [90/147 (61.2%)]. NRM occurred in 17% (25/147) of cases and it was predicted by quantusFLM analysis with a sensitivity, specificity, positive predicted value, negative predicted value of 60% (15/25), 94.3% (115/122), 68.2% (15/22), and 92% (115/125), respectively. Accuracy was of 88.4% (130/147), positive likelihood ratio (LHR) was of 10.5, and negative LHR was of 0.4.

Conclusion

The performance of quantusFLM to predict NRM in SGA fetuses is comparable to the previous published in general population and provides a non-invasive tool that could be helpful in the clinical decision-making process of this high-risk population, particularly in the late preterm period.