

## **The risk of respiratory morbidity assessed by QuantusFLM® in fetuses under surveillance for placental disease**

Moreno-Espinosa AL, Hawkins-Villarreal AM, Lip-Sosa DL, Castelazo S, Palacio M  
BCNatal Fetal Medicine Research Center, Barcelona, Spain

### **Objective**

To evaluate the risk of respiratory morbidity (RM) in fetuses with placental disease by ranges of gestational age with fetal lung texture analysis.

### **Methods**

Prospective study including pregnancies from 26.0 to 38.6 weeks of gestation under surveillance for placental disease (defined as fetuses with estimated fetal weight less than 10<sup>th</sup> percentile with or without pre-eclampsia) compared to pregnancies not exposed to this condition. An ultrasound image of the fetal thorax in axial section, at the level of the 4-chamber cardiac view were obtained at different gestational ages following a detailed acquisition protocol. The images were labeled according to the gestational age and included in one of three ranges of gestational age: 26.0-29.6 weeks (group 1), 30.0-33.6 weeks (group 2) and 34.0-38.6 weeks (group 3). Twelve cases from the group of placental disease had an image taken within 48 hours of delivery for prediction of neonatal respiratory morbidity (NRM). All study images were collected and stored in the original Digital Imaging and Communication in Medicine Format (DICOM) and then loaded via internet to the commercial software web site using quantusFLM® ([www.quantusflm.com](http://www.quantusflm.com); Transmural Biotech, Barcelona, Spain). The software provided categorical results (high or low risk for RM).

### **Results**

39 pregnancies under surveillance for placental disease and 65 pregnancies without this condition were included. A total of 134 images were analyzed using quantusFLM® and classified as follows: group 1 (8 images in the placental disease group and 18 images in the non-exposed group); group 2 (19 images in the placental disease group and 30 images in the non-exposed group) and group 3 (29 images in the placental disease group and 30 images in the non-exposed group). The mean gestational age and mean birthweight at delivery for the placental disease group was 36.7 weeks (SD: 1.3); 2313 g (SD: 635) and 39.3 weeks (SD: 1.6); 3292 g (SD: 528) for the non-exposed group. We found no statistical difference between high and low risk result in any group evaluated. Nevertheless, in study group 2, we observed a slight difference that did not reach statistical difference ( $p=0.06$ ) between groups. The same difference as in group 1 were observed in group 3, where both showed 90% of low risk results. We found eleven cases with low risk QFLM results and one with high risk QFLM result within 48 hrs. from delivery. The mean gestational at delivery was 35.1 weeks (30.0-39.1). Three cases presented respiratory distress syndrome (RDS), two of them with a low risk QFLM result for NRM ( $p=0.25$ ). The third case, with a high risk QFLM result for NRM, was delivered at 30.0 weeks due to severe pre-eclampsia. This newborn developed respiratory distress syndrome and required non-invasive ventilatory support.

### **Conclusion**

According to our results, below 30 weeks the risk for RM remains high. Above 34 weeks, there is no significant difference in the risk for RM. Although further studies are needed, individualisation of the risk of respiratory morbidity between 30 to 34 weeks with fetal lung texture analysis might prevent respiratory distress in fetuses under surveillance of placental disease.