RESULTS

A total of 883 images were collected but 17.3% were discarded due to poor image quality or exclusion criteria, leaving 730 observations for the final analysis. The prevalence of neonatal respiratory morbidity was 13.8% (101/730). quantusFLM® predicted neonatal respiratory morbidity with a sensitivity, specificity, and positive and negative predictive value of 74.3% (75/101), 88.6% (557/629), 51.0% (75/147), and 95.5% (557/583), respectively. Accuracy was of a 86.5% (632/730) and positive and negative likelihood ratios were 6.5 and 0.3, respectively.

	Total n=730	[25.0-33.6] n=164	[34.0-38.6] n=566
NRM	101 (13.8%)	72 (43.9%)	29 (5.1%)
Sensitivity	74.4%	79.2%	62.1%
Specificity	88.6%	72.8%	91.3%
PPV	51%	69.5%	27.7%
NPV	95.6%	81.7%	97.8%
LR+	6.5	2.9	7.1
LR-	0.3	0.3	0.4

CONCLUSIONS

	Ac	Se	Sp	PPV	NPV
quantusFLM®	86.5%	74.3%	88.6%	51%	95.5%
L/S	81.6%	74.6%	82.5%	34.1%	96.4%
PG	57.5%	82.7%	54.4%	18.0%	96.3%
LBC	75.4%	84.2%	74.4%	27.9%	97.6%
TDxII	78.7%	88.5%	77.7%	28.5%	98.5%

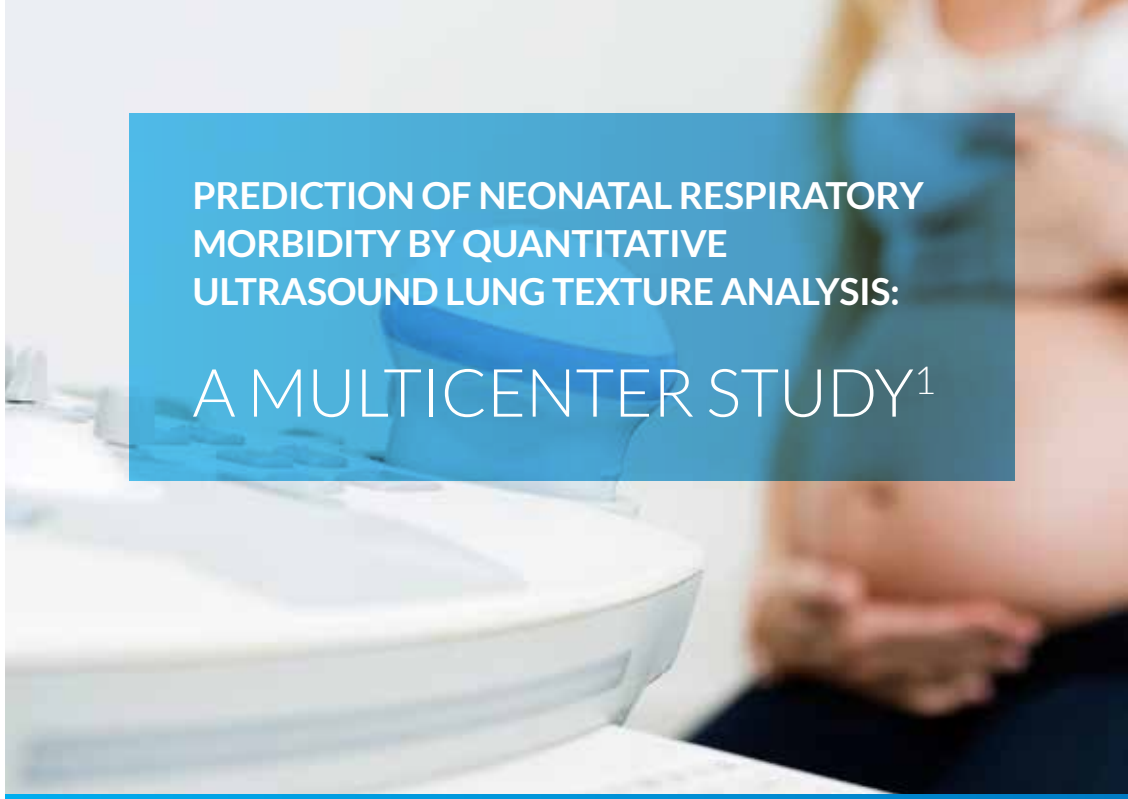
quantusFLM® predicted neonatal respiratory morbidity with an accuracy similar to that previously reported for other tests with the advantage of being a non-invasive technique.

ABBREVATIONS

NRM = Neonatal Respiratory Morbidity
PPV = Positive Predictive Value
LR+ = Likelihood Ratio Positive
Ac = Accuracy
Sp = Specificity
FLM = Fetal Lung Maturity
NPV = Negative Predictive Value
LR- = Likelihood Ratio Negative
Se = Sensitivity

REFERENCES

Palacio M, Bonet-Carne E, Cobo T, et al. Prediction of neonatal respiratory morbidity by quantitative ultrasound lung texture analysis: a multicenter study. Am J Obstet Gynecol 2017



PREDICTION OF NEONATAL RESPIRATORY MORBIDITY BY QUANTITATIVE ULTRASOUND LUNG TEXTURE ANALYSIS:

A MULTICENTER STUDY[1]

[1] *Montse Palacio et al. on behalf of the Fetal Lung Texture Team*

BACKGROUND

Prediction of neonatal respiratory morbidity may be useful to plan delivery in complicated pregnancies. The limited predictive performance of the current diagnostic tests together with the risks of an invasive procedure, limit the use of fetal lung maturity assessment.

OBJECTIVE

To evaluate the performance of quantitative ultrasound texture analysis (quantusFLM®) to predict neonatal respiratory morbidity in preterm and early-term (<39.0 weeks) deliveries.

quantus FLM

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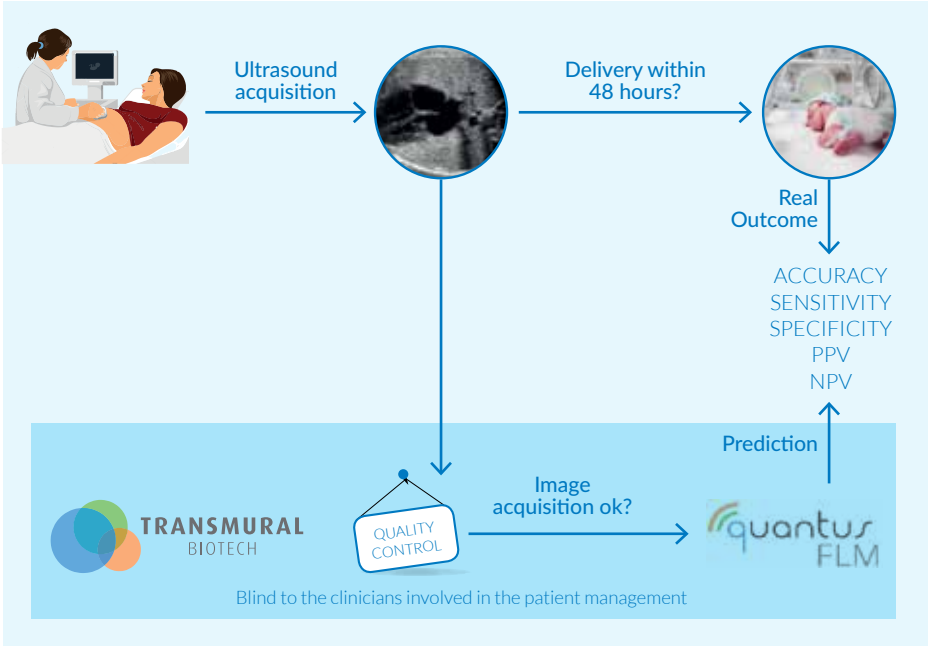
STUDY DESIGN

A prospective multicenter study in 20 centers worldwide. Fetal lung ultrasound images were obtained at 25.0-38.6 weeks' gestation within 48 hours of delivery, stored in DICOM format and analyzed with quantusFLM®. Physicians were blinded to the analysis. At delivery, perinatal outcomes and the occurrence of neonatal respiratory morbidity, defined as either respiratory distress syndrome or transient tachypnea of the newborn, were registered. The performance of the ultrasound texture analysis test to predict neonatal respiratory morbidity was evaluated.



INCLUSION CRITERIA

Eligible cases included pregnancies between 25+0 and 38+6 weeks gestation and in whom an ultrasound was obtained within 48h of delivery.

Cases were considered non-eligible if corticosteroids were used for lung maturity between the ultrasound and delivery, when maternal BMI was ≥ 35 and when fetuses had known congenital malformations.

Table 1. Clinical Characteristics Of The Women Included In The Sutdy

	Total n= 685	GA range at scan [25.0-33.6] n=145	GA range at scan [34.0-38.6] n=540
Maternal age	32.3 (5.8)	31.4 (5.8)	31.3 (5.8)
Nulliparity	340 (49.6%)	70 (48.3%)	270 50%)
Ethnicity			
Caucasian	400 (58.4%)	93 (64.1%)	307 (56.7%)
Black	40 (5.8%)	9 (6.2%)	31 (5.7%)
Asian	44 (6.4%)	0	44 (8.1%)
Hispanic	121 (17.7%)	24 (16.6%)	97 (18.0%)
Other	53 (7.7%)	18 (12.4%)	35 (6.5%)
Multiple pregnancy	65 (9.5%)	21 (14.5%)	44 (8.1%)
Maternal or fetal relevant condions			
Preterm labor	48 (7%)	26(17.9%)	22 (4.1%)
PPROM	158 (23.7%)	70 (48.3%)	88 (16.3%)
Preeclampsia	116 (16.9%)	40 (27.6%)	76 (14.1%)
IUGR	148 (21.6%)	32 (22%)	116 (21.5%)
Pre-gestiational diabetes	15 (2.2%)	3 (2.1%)	12 (2.2%)
Antepartum hemorrhage	10 (1.5%)	3 (2.1%)	7 (1.3%)
Other	160 (23.4%)	31 (21.4%)	129 (23.9%)

PARTICIPANTS