regression analyses were adjusted for maternal demographic factors (education, marital status, income, and body mass index) and fetal sex.

RESULTS: Allelic differences in one SNP of hTERT (rs2853690) were significantly associated with both PTB (p = 1.49e-06, aOR = 2.37, 95% CI 1.67-3.36) and with pPROM (p = 7.78e-07, aOR 6.52, 95% CI 3.10-13.73) in maternal DNA. There was no significant association between any of the hTERT SNPs and either PTB or pPROM in the infant samples.

CONCLUSION: hTERT polymorphisms in fetal DNA do not associate with PTB or pPROM risk; however, maternal genetic variations in hTERT may play a contributory role in risk of PTB and PPROM. Data replication and hTERT functional studies are underway.

19 Ultrasonic assessment of cervical heterogeneity for prediction of spontaneous preterm birth

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OBJECTIVE: To examine the utility of a novel sonographic marker, cervical heterogeneity index (HI), in predicting spontaneous preterm birth (PTB).

STUDY DESIGN: Retrospective cohort study in singleton gestations with cervical length measurement performed at 14 - 28 weeks gestational age. Multiple gestation, placenta previa, delivery <24 weeks and indicated preterm deliveries were excluded. Transvaginal images were obtained using either an iU22 (Philips Healthcare, Bothell WA); 4 - 9 MHz frequency probe or a Voluson E8 or 730 system (GE Healthcare, Milwaukee WI); 3 - 10 MHz frequency probe. Images were analyzed in Matlab (Mathworks, Natick MA) to assess the relative heterogeneity of the cervical tissue using an image processing technique that calculated the Fourier transform spectra of greyscale images (Figure 1). The program allowed for selection of three regions of interest along the length of the anterior cervical stroma. The algorithm then calculated the error between the three Fourier frequency spectra and the average of the errors was defined as the HI. Logistic regression analysis was used to examine the association between preterm birth (<37 weeks) and HI. The optimal cut-off for the HI was derived from the receiver operating characteristic curve by selecting the point that yielded the highest sensitivity and specificity. Analysis was carried out in SAS Version 9.3 (Cary NC).

RESULTS: 151 subjects were included. The 42 women who delivered preterm had significantly shorter cervical lengths (p<0.0001) and lower HI values (8.28±3.73; median=7.24 vs. 12.35±5.8, median=11.47, p<0.0001). Decreased tissue heterogeneity was associated with PTB while increased tissue heterogeneity was associated with delivery at term (Figure 2). For every unit increase in HI, likelihood of PTB was decreased by 16% (OR=0.84; 95% CI 0.77-0.92), and for every 5-unit increase in HI, likelihood was decreased by 58% (OR=0.42; 95% CI 0.26-0.66). The optimal cut-off for HI was determined to be 8.5, which yielded a sensitivity of 62% and specificity of 72% for prediction of PTB. The positive and negative predictive values were 46% and 83%, respectively.

CONCLUSION: Measurement of cervical HI is a promising screening method to predict preterm birth. Premature cervical remodeling may to lead changes in stromal structure making it less heterogeneous. A prospective, longitudinal study is ongoing.

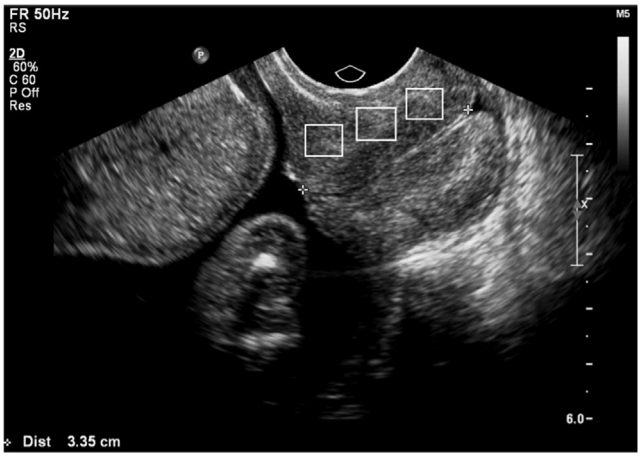

Figure 2: Box Plot of HI in Deliveries >=37 weeks and < 37 weeks