Reference ranges for fetal prenasal thickness in screening for chromosomal abnormalities at 16-24 weeks

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Objective
Aims of this study were to establish prenasal thickness (PNT) reference ranges throughout gestation and to evaluate its value for screening for chromosomal defects in a Chilean population.

Methods
1) To determine PNT reference ranges for our population, the fetal profile was examined in 3,904 consecutive euploid singleton pregnancy between 16 to 41 weeks gestation from April 2010 to October 2016. The data was log transformed and fitted using a second-order polynomial equation. 2) To determine the role of PNT as second trimester screening test for fetal aneuploidy, 3,249 pregnant women who underwent a routine ultrasound scan at 16+0 – 24+6 weeks gestation were included. Detection rate (DR), false positive rate (FPR) and likelihood ratio (LR) for increased PNT (>95th percentile) were obtained.

Results
There was a positive correlation between PNT and gestational age (R2=0.38; p < 0.001, second-order polynomial). Nomograms including the 5th, 50th and 95th percentiles were created for each gestational age. As expected, PNT increased from 2.7 mm at 16 weeks to 7.6 mm at 41 weeks. In the group of patients who were scanned between 16 to 24 weeks, there were 33 cases of chromosomal abnormalities, being 19 trisomy 21, 8 trisomy 18 and 3 trisomy 13. The PNT was increased in 156 (4.9%) of the 3,216 chromosomally or phenotypically normal fetuses and in 11 (57.9%) of the 19 fetuses with trisomy 21, being, therefore, the positive LR around 12. By contrast, the PNT was increased in just two of the 11 cases of trisomy 18 and 13. With a 5% false positive rate, the detection rate for trisomy 21, combining PNT and maternal age, was 68.4%.

Conclusion
PNT increases throughout gestation in chromosomally normal fetuses, although this is much thicker in an abnormal karyotype, and particularly in trisomy 21. NBP might be included as a second trimester soft marker for chromosomal abnormalities.