Should we start a nationwide screening program for critical congenital heart disease in Turkey? A pilot study on four centres with different altitudes


**Background:** To investigate the feasibility of critical congenital heart disease (CCHD) screening test by pulse oximetry in four geographical regions of Turkey with different altitudes, before implementation of a nationwide screening program.

**Methods:** It was a prospective multi-centre study performed in four centres, between December, 2015 and May, 2017. Pre- and post-ductal oxygen saturations and perfusion indices (PI) were measured using Masimo Radical-7 at early postnatal days. The results were evaluated according to the algorithm recommended by the American Academy of Pediatrics. Additionally, a PI value <0.7 was accepted to be significant.

**Results:** In 4888 newborns, the mean screening time was 31.5 ± 12.1 hours. At first attempt, the mean values of pre- and post-ductal measurements were: saturation 97.3 ± 1.8%, PI 2.8 ± 2.0, versus saturation 97.7 ± 1.8%, PI 2.3±1.3, respectively. Pre-ductal saturations and PI and post-ductal saturations were the lowest in Centre 4 with the highest altitude. Overall test positivity rate was 0.85% (n = 42). CCHD was detected in six babies (0.12%). Of them, right hand (91 ± 6.3) and foot saturations (92.1 ± 4.3%) were lower compared to ones with non-CCHD and normal variants (p <0.05, for all comparisons). Sensitivity, specificity, positive and negative predictive values, and likelihood ratio of the test were: 83.3%, 99.9%, 11.9%, 99.9%, and 99.2%, respectively.

**Conclusion:** This study concluded that pulse oximetry screening is an effective screening tool for congenital heart disease in newborns at different altitudes. We support the implementation of a national screening program with consideration of altitude differences for our country.