Perfusion Index and Pulse Oximetry Screening for Congenital Heart Defects.

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OBJECTIVE: To evaluate the efficacy of combined pulse oximetry (POX) and perfusion index (PI) neonatal screening for severe congenital heart defects (sCHD) and assess different impacts of screening in tertiary and nontertiary hospitals.

STUDY DESIGN: A multicenter, prospective study in 10 tertiary and 6 nontertiary maternity hospitals. A total of 42 169 asymptomatic newborns from among 50 244 neonates were screened; exclusion criteria were antenatal sCHD diagnosis, postnatal clinically suspected sCHD, and neonatal intensive care unit admission. Eligible infants underwent pre- and postductal POX and PI screening after routine discharge examination. Targeted sCHD were anatomically defined. Positivity was defined as postductal oxygen saturation (SpO2) ≤95%, prepostductal SpO2 gradient >3%, or PI <0.90. Confirmed positive cases underwent echocardiography for definitive diagnosis. Missed cases were identified by consulting clinical registries at 6 regional pediatric heart centers. Main outcomes were incidence of unexpected sCHD; proportion of undetected sCHD after discharge in tertiary and nontertiary hospitals; and specificity, sensitivity, positive predictive value, and negative predictive value of combined screening.

RESULTS: One hundred forty-two sCHD were detected prenatally. Prevalence of unexpected sCHD was 1 in 1115 live births, similar in tertiary and nontertiary hospitals. Screening identified 3 sCHD (low SpO2, 2; coarctation for low PI, 1). Four cases were missed. In tertiary hospitals, 95% of unsuspected sCHDs were identified clinically, whereas only 28% in nontertiary units; in nontertiary units PI-POX screening increased the detection rate to 71%.

CONCLUSIONS: PI-POX predischarge screening provided benefits in nontertiary units, where clinical recognition rate was low. PI can help identify coarctation cases missed by POX but requires further evaluation in populations with higher rates of missed cases.