

Neonatal Pulse Oxymetry Screening for Detection of Congenital Heart Disease in Asymptomatic Newborns: A Cross-sectional Study from a Tertiary Care Hospital

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Introduction: Screening for Congenital Heart Diseases (CHD) depends on the antenatal ultrasonography and clinical examination of the newborn, however both these methods have low detection rates and often life-threatening congenital heart diseases are missed. Pulse Oximetry (PO) is an easy, accurate, rapid, non invasive method of detecting hypoxaemia. The purpose of using PO to identify Critical Congenital Heart Disease (CCHD) is that clinically non detectable minimal hypoxaemia can be detected by pulseoximetry.

Aim: To study the accuracy of pulse oxymetry as a screening tool for early detection of critical congenital heart diseases in asymptomatic newborns.

Materials and Methods: This cross-sectional study was conducted in the Department of Paediatrics and the Postnatal Ward of Obstetrics and Gynaecology at Sri Venkateswara Medical College, Tirupathi, Andhra Pradesh, India, from January 2017 to December 2020. All the term asymptomatic newborns of age more than 24 hours were screened using PO. Screening was positive if a: PO was <90% in right hand or foot at any stage of screening, b was 90% to <95% on both; there was >3% absolute difference in oxygen saturation between the right hand and foot on three consecutive measures (each separated by one hour). All the screen positive babies were subjected to 2D echocardiography. All statistical analyses were performed using OpenEpi website epicalculator, and Chi-square's test was used to calculate the p-value.

Results: The mean gestational age (weeks) was 38 ± 4 days. Out of 14,400, PO screening was positive in 45 babies, and subsequent echocardiography detected CHD in 30 babies. The sensitivity was 66.67%, positive predictive value was 66.67%, negative predictive value was 99.90%, with a diagnostic accuracy of 99.79%. On 2D electrocardiography, 30 were true positive cases, whereas, false positives and false negatives were 15 each. Remaining 14340 newborns were true negatives.

Conclusion: Pulse oximetry is a safe, accessible, feasible test that can be used for early detection of CCHD's that are often undetected on antenatal ultrasonography.