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The efficacy of prenatal and postnatal screening for critical congenital heart defects

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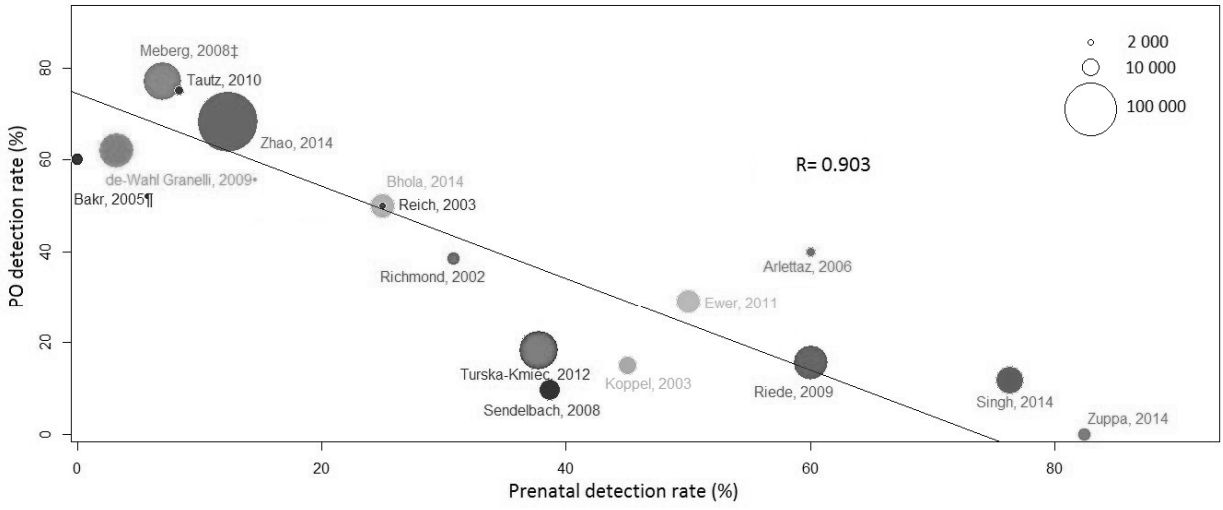
Introduction: The addition of pulse oximetry (PO) to routine postnatal care may lead to a higher detection rate of critical congenital heart defects (CCHD) before hospital discharge. However, there still is little information about the efficacy of PO screening for CCHD relative to the prenatal detection with fetal ultrasound screening. Aim of this study was to explore the efficacy of PO screening in relation to the prenatal detection rate of CCHD.
Methods: A literature search in PubMed was performed. Data were extracted and used to calculate prenatal and PO detection rates, standard error and the false positive rate. Data have been used for regression analysis weighted by study cohort size and weighted by standard error. Data have also been used to determine which CCHD are diagnosed most frequently by PO screening.
Results: 20 studies were included. A clear relationship between PO detection rate and prenatal detection rate was found. Correlation coefficients of R= 0.903 and R= 0.857 were determined with regression analyses weighted by study cohort size and standard error respectively. High prenatal detection rates were associated with lower PO detection rates, and vice versa (figure 1). A wide variety in false positive rate of PO screening was found, and there appears to be a relationship between prenatal detection rate and false positive rate.
Conclusion: Results of PO screening are strongly influenced by the prenatal detection rate of CCHD. Thus, prenatal detection rate should be taken into account when making the decision to implement PO screening in routine postnatal care.



• Prenatal detection rate represents the whole region (West-Götaland)
¶ Prenatal diagnosis not available in hospital during study period
‡ Prenatal detection rate for all congenital heart defects

Figure 1: Bubble chart of pulse oximetry (PO) and prenatal detection rates for individual studies with regression line weighted by study cohort size (y= 74.421 – 1.007x).