Cardiology in the Young

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Letter

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Prevention of delayed diagnosis in congenital heart disease

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To the Editor- in- Chief,

High-risk pregnancies have increased over the past decades in Europe. A nationwide study of the Netherlands reported a prenatal detection rate of severe CHD in an unselected population of 59.7%.[1] A German study reported a prenatal detection rate by echocardiography in 12.1% of all CHD cases; 96% were diagnosed within the first 3 months of life.[2] In contrast, a 20-year experience of Wren et al concerning 690.215 newborns reported a 30% detection rate after discharge.[3]

Detection rates depend on technical developments, availability of modern ultrasound equipment, education of the sonographer, practical scanning experience, and feedback on the cases. In Europe, these important issues differ enormously in the countries and between the countries. In consequence, a significant proportion of newborns with critical CHD is still missed in diagnosis. Several working groups around the world stated pulse oximetry screening as a promising additional method to detect CHD in a newborn to prevent cardiovascular collapse and death.[4,5] A statement of the Association of European Pediatric and Congenital Cardiologists is still missing, which is the aim of this Working Group.

Pulse oximetry screening is a safe and non-invasive method that is easy to perform and has proven to detect critical CHD in newborns.

Practical guidelines should be shortly recommended as follows:

- Measurements of pulse oxygen saturation are recommended before 48 hours after birth, at least before discharge for all term and late pre-term newborns. One meta-analysis showed that the false-positive rate for detection of critical congenital heart defects was particularly low when newborn pulse oximetry was done after 24 hours from birth than when it was done before 24 hours (0·05% [0·02–0·12] versus 0·50 [0·29–0·86]; p = 0·0017).[6]
- The gold standard is a measurement on the right arm and one foot, at least on one foot to minimise false-positive results. Using the left hand is not recommended because of its proximity to the ductus arteriosus.[7]
- It is important to measure with a motion-tolerant pulse oximeter that can read despite low perfusion. This particular signal extraction technology provides more consistent and accurate reporting of oxygen saturation values and appears to be more resistant to effects of motion artefacts.
- The newborn passes if oxygen saturation is above 95% or has a difference of hand and foot measurement <3%. It fails if oxygen saturation is <90% or has a difference of hand and foot measurement >4% or three repeated measurements are between 90 and 94% within maximum 1 hour. If failed, it is important to contact immediately the pediatric cardiologist/neonatologist for further medical action.
- It has to be considered that pulse oximetry screening can also help to detect other causes of hypoxemia, including infections and respiratory disorders requiring treatment in newborns.

In summary, a combination of prenatal ultrasound, detailed physical examination at birth, and pulse oximetry screening is the ideal method to improve the detection rate of critical CHD in newborns and is therefore recommended by this Association of European Pediatric and Congenital Cardiology Working Group.

On behalf of all authors.

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