

Reliability of different echocardiographic measures of Left Ventricular Output Diameter in a cohort of very preterm infants

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Background and aims

Following the recommendations of the European Association of Echocardiography, LVO is increasingly used by neonatologists to identify neonates at risk of hypoperfusion. LVO is assessed by measuring diameter from a long axis parasternal view and estimating flow velocity by Pulse Wave Doppler from an apical five chamber view. Given the lack of a gold standard, there is still no consensus on the best way to measure LVO diameter (LVOD). Three different locations are reported: between the hinges of the aortic valve (AV), at the aortic sinus (AS) and at the sinotubular junction (STJ). (Fig. 1)

Aim of the study was to assess the interobserver repeatability of these three methods of assessing LVOD in a cohort of very preterm neonates.

Methods

42 long axis clips of the aortic valve obtained for clinical purposes and digitally stored were retrospectively reviewed. LVOD was measured at the level of AV, AS and STJ by two different observers. Bland-Altman analysis was carried out to assess agreement.

Results

Median (range) weight and age at scan of the 42 neonates were: 950 g (580-1485) and 27,57 weeks (23,71-34,14) respectively. Measurements of LVOD at the level of AV showed a better interobserver repeatability (RI 10%, LAO $-0,03/+0,05$ cm) compared to the assessments of LVOD at the level of AS and STJ (RI 14%, LAO $-0,11\text{cm}/+0,07$ cm and RI 16%, LAO $-0,09/ +0,07$ cm respectively). (Fig. 2)

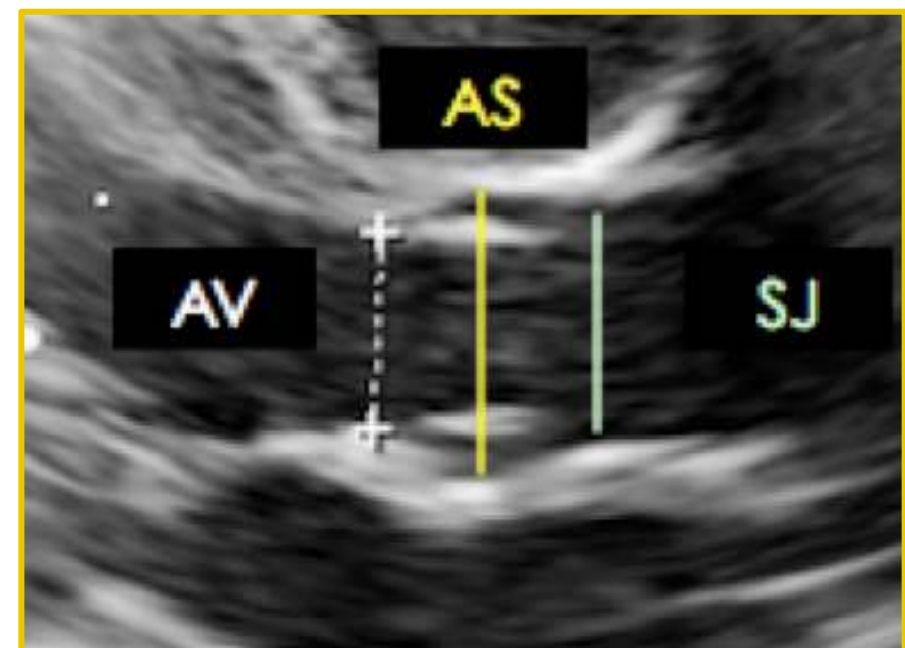


Fig. 1 Aortic Valve from a parasternal long axis view with the 3 measurements of aortic diameter (see text for details)

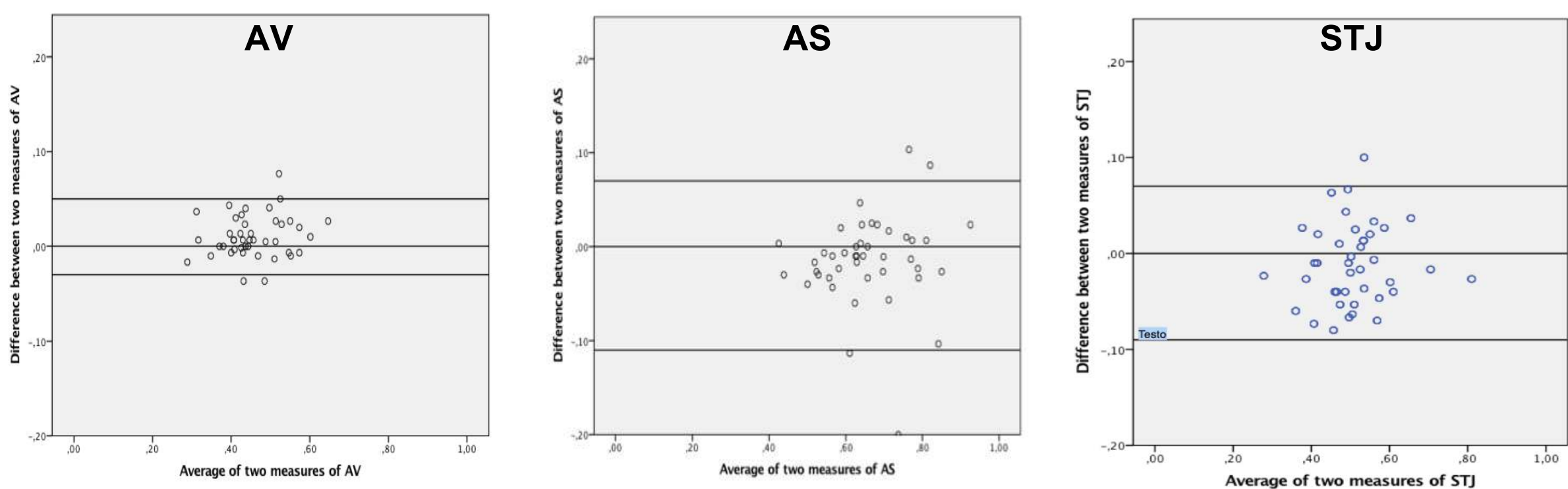


Fig. 2 Bland Altman plots of interobserver repeatability of AV, AS and STJ

Conclusions

The measurement of LVO allows assessment of systemic blood flow in neonates with closed PDA at the cotside in order to facilitate rapid decision making in neonatal intensive care unit (NICU).

Echocardiographic assessment of LVOD at the level of aortic valve showed the better repeatability and may be preferred by clinicians for the assessment of LVO.