ABSTRACT

A426 – CO MEASUREMENT IN PRETERM NEONATES: VALIDATION OF USCOM AGAINST ECHOCARDIOGRAPHY

R Phillips 1; M Paradisis 2; N Evans 2; D Southwell 3; D Burstow 1; M West 1
1University of Queensland, Brisbane, Australia; 2University of Sydney, Sydney, Australia;
3USCOM Ltd, Sydney, Australia

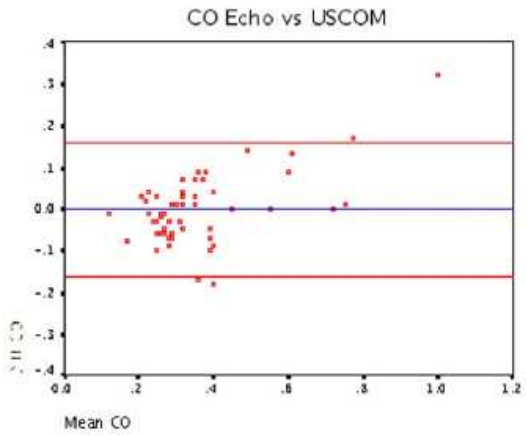
Introduction:
Objective measurement of cardiac output (CO) in preterm neonates is important for optimization of haemodynamic management, and may have outcomes benefits. Doppler ultrasound is the preferred method for measurement of CO however the pulmonary and aortic diameters for calculating flow volumes are small, and measurement using 2D ultrasound requires expertise and experience, particularly for analysis of transpulmonary flow. USCOM (USCOM Ltd, Sydney, Australia) is a novel 2D independent device using CW Doppler and anthropometrics to determine both right and left flow volumes. The device is simpler to operate and less expensive than conventional echo.

Method:
This study was to compare 2D echo and USCOM CO measurements in preterm neonates. After IRB approval 66 paired measures of transpulmonary CO were acquired in 37 preterm neonates (mean weight 1.13±0.47kg) using conventional echocardiography, combining 2D and CW Doppler, and the USCOM device. Signals were acquired and analysed independently and in a blinded fashion, and values compared by two tailed t–tests and Bland–Altman bias analysis.

Results:
Mean values of transpulmonary CO were 0.36±0.19l/min by echo and 0.37±0.14l/min by USCOM and not significantly different ($r=0.9134$, $p<0.005$). The mean difference between measures was 0.00±0.08l/min, with a mean of the means of 0.36±0.16l/min and a mean % error of −3.7%. The smaller SDs associated with USCOM convert to smaller 95% CIs and a possible increased sensitivity for detection of haemodynamic change.

Conclusion:
USCOM is an accurate method for measurement of neonatal cardiac output and may be more sensitive than conventional echo for the detection of haemodynamic change. USCOM is a simple, cost-effective alternative for neonatal haemodynamic management.

Image 1 :



Presented: International Symposium on Intensive Care and Emergency Medicine in Brussels, Belgium, March 24 2006