

	Number	GA	PDA diameter (mm)	CRIB score	Mechanic ventilation
G1	250 (77%)	29,4± 2,1	0,78± 0,84	2,07± 2,85	35 (14%)
G2	75 (23%)	26,9± 2,2*	1,91± 0,56*	4,3± 3,53*	36 (48%)*

[table 1]

* p < 0, 01 G1 vs G2

Conclusions: Accurate and early diagnosis of PDA seems to be necessary and the diameter of the duct > 1.5mm is a significant echocardiographic parameter indicating infants to be treated. Only 23% needed a pharmacological treatment for a significant PDA, while 99% of not treated-neonates had the duct spontaneously closed at discharge. Treated infants had a significantly lower gestational age, higher CRIB score and needed more ventilation support. Multivariate analysis underlined gestational age is the first factor correlated to the treatment of PDA.

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CARDIAC OUTPUT MEASUREMENT IN JUVENILE ANIMALS WITH A SURGICALLY CONSTRUCTED EXTRA CARDIAC LEFT-TO-RIGHT SHUNT USING THE TRANSPULMONARY THERMODILUTION TECHNIQUE

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Introduction: Cardiac output measurement using the transpulmonary thermodilution (TPTD) technique is considered the gold standard in pediatric patients in no-shunt circulation. Goal of this study was to validate TPTD cardiac output measurement in an animal model with a left-to-right shunt.

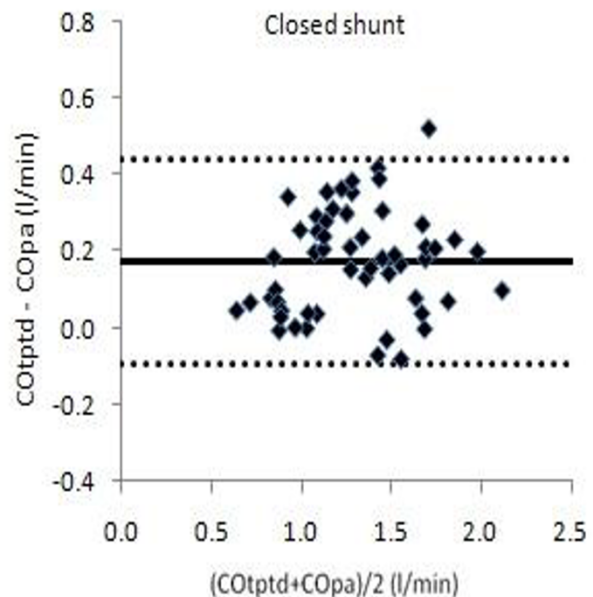
Method: We prospectively studied 7 mechanically ventilated lambs under general anaesthesia with a surgically constructed aortic-pulmonary (left-to-right) shunt that could be opened and closed. Cardiac output measured with the TPTD technique (CO_{TPTD}) was performed with the PiCCOplus (Pulsion, Germany). An ultrasound perivascular flow probe (Transonic Systems, USA) around the pulmonary artery proximal to the shunt entrance

(CO_{PA}) served as reference method. During the experiment animals were bled into hypovolaemic shock and were subsequently volume resuscitated. We compared all measurements of CO_{TPTD} and CO_{PA} using Bland Altman analysis.

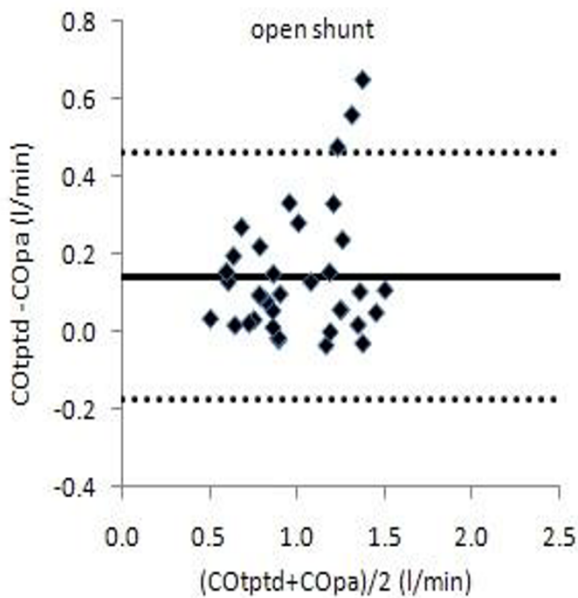
Results: A total of 90 (36 with open shunt) simultaneous measurements were analyzed. The mean CO_{PA} with closed shunt was 1,21 (range 0,61 - 2,06) l/min and with open shunt 0,93 (range 0,48 - 1,45) l/min.

Bland Altman analysis showed a mean bias of 0,17 l/min (limits of agreement (LOA) ± 0,27 l/min) with closed shunt and 0,14 l/min (LOA ± 0,32 l/min) with open shunt. The percentage errors were 22% with closed and 34% with open shunt.

Conclusions: The transpulmonary thermodilution technique can measure cardiac output in a juvenile animal model with a surgically constructed left-to-right shunt, however results are less reliable.



[Bland Altman plot closed shunt]



[Bland Altman plot open shunt]

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CEREBRAL AND SYSTEMIC OXIMETRY USING NEAR-INFRARED SPECTROSCOPY IN MANAGEMENT OF CONGENITAL CARDIAC POSTOPERATIVE PERIOD

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Introduction: Near infrared spectroscopy allows non-invasive assessment of cerebral and systemic oxygen saturation on the management of congenital cardiac surgery.

Objectives: To know the median values of oxygen cerebral and systemic in newborns who undergo cardiac surgery.

Materials and methods: Observational prospective study from June 2009 to February 2010. The studied variables were gestational age, type of congenital heart disease, inotropic support, mean arterial pressure, oxygen extraction, cerebral and systemic oxygen saturation, central venous pressure, left atrial pressure, diuresis, level of lactate, oxygen saturation, FiO₂, postoperative complications and need for extracorporeal membrane oxygenation (ECMO).

Results: 22 patients were studied. Transposition of great arteries was the most frequent cardiac disease, median gestational age was 38+4 weeks. Mean values of cerebral saturation was 62% ± 9% and systemic saturation 59% ± 14%. Median values for the variables were: median blood pressure 49,9 ± 4mmHg; oxygen extraction 40 ± 11; lactate 2,3 ± 1mmol/L; paO₂ 72 ± 9mmHg; FiO₂ 37 ± 13%; central venous pressure 7 ± 2mmHg; left atrial pressure 6 ± 3mmHg. Dopamine being used in all cases at 8mcg/kg/min and milrinone in 21 cases at 0,9mcg/kg/min. Epinephrine was used in 17 at 0,08mcg/kg/min. In 21 cases furosemide was used at 0,65mg/kg/hr, with diuresis of 4,9mL/Kg/hr. Five required ECMO.

Conclusions: Cerebral and systemic oxygen saturation supplies easily acquired data that provides information on the haemodynamical situation in the postoperative neonatal cardiac surgery. It is of special importance to consider the tendency of the values thanks to its continue recording.

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EXPRESSION OF NO SYNTHASES AND REDOX ENZYMES IN UMBILICAL ARTERIES FROM NEWBORNS BORN SMALL, APPROPRIATE, AND LARGE FOR GESTATIONAL AGE

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Background: Modified expression of NO synthases and prooxidative and antioxidative enzymes accompany endothelial dysfunction, the first stage of atherosclerosis. Humans born small (SGA) and large (LGA) for gestational age are at higher risk to develop atherosclerosis later in life than humans born appropriate (AGA) for gestational age. We hypothesized that indicators of endothelial dysfunction could be detectable already at birth.

Aims: To find out whether the expression patterns of NO synthases (eNOS, iNOS, nNOS), of prooxidative enzymes (components of NADPH oxidases, NOX1, NOX2, p22phox, p47phox), and of antioxidative enzymes (superoxide dismutase 1, 2, and 3, catalase, glutathion peroxidase 1) in umbilical arteries differ between SGA, LGA, and AGA newborns.

Methods: Protein expression was determined by Western blotting in homogenised samples of