need of medical care and respiratory support were included. After uncomplicated postnatal transition of 15 min, the cerebral oxygenation (TOI) was measured on the right forehead using NIRO 200NX. The diameter of PFO was measured using echocardiography. The influence of PFO on TOI was investigated by applying correlation-analysis.

Results 25 term neonates after uncomplicated adaptation period of 15 min (APGAR: 9/10/10) were included. The mean gestational age was 38.7 ± 0.9 weeks and the mean birth weight 3114.0 ± 423.9 g.

The mean cerebral oxygen saturation was 76.6 ± 8.9% and the mean diameter of PFO was 2.3 ± 0.7 mm.

The correlation-analysis could show a trend of negative correlation between the cerebral oxygen saturation and the diameter of PFO, but this correlation was not statistically significant.

Conclusion In term neonates after uncomplicated transition, the diameter of PFO has no influence on the cerebral oxygen saturation.

O-027 MICROCIRCULATION WITHIN THE FIRST MINUTES AND FIRST 24 HOURS OF LIFE IN HEALTHY TERM NEWBORNS

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Background and aims Microcirculation is important to ensure adequate tissue oxygenation and nutrient delivery. Clinical findings, perfusion index (PI) measurements are used to assess microcirculation. Side stream dark field (SDF) imaging is a noninvasive method of assessing microcirculation by means of a videomicroscope.

This study aimed to assess microcirculation in healthy term newborns born either by spontaneous vaginal delivery (SVD) or caesarean section (C/S).

Methods The assessments were done within the first 30 min of life (T0) and repeated at the 24th hour of life (T1). Microcirculation was assessed from axillary skin by using SDF technique with Microscan device where total and perfused vessel density (TVD, PVD) and microvascular flow index (MFI) were calculated, as well as by using microcirculation score (MS) based on capillary refill time, skin colour and warmth and PI measured by Masimo Radical7 pulse oxymeter. Vital signs were also recorded. Nonparametric tests were used for statistical analysis.

Results Twelve newborns born by SVD and 25 newborns born C/S were included. The mean, SD, median values for temperature, TVD, PVD, MFI, MS, and PI at T0 and T1 are as follows;

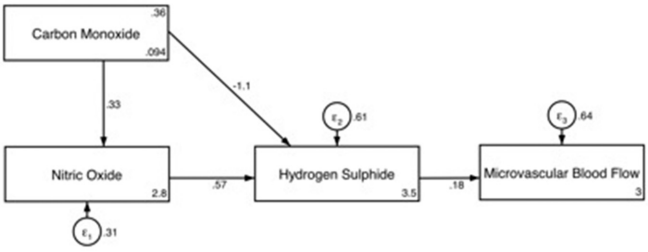
T0: Temp:36 ± 0,44(36,1), TVD: 18,79 ± 1,49(18,81), PVD: 18,73 ± 1,5(18,81), MFI: 3,07 ± 0,25(3), MS: 2,14 ± 1,36(2), PI: 1,84 ± 0,97(1,75).

T1: Temp:37,1 ± 0,26(37,1), TVD: 18,93 ± 2,1(18,73), PVD: 18,9 ± 2,13(18,73), MFI: 3,17 ± 0,32(3,1), MS:1,65 ± 0,48(2), PI: 1,9 ± 0,8(2).

Temperature was significantly and MFI was slightly higher at T1 compared to T0 (p = 0,001 and p = 0, 04).

No difference was observed between SVD or C/S groups or at different times within the same group.

Conclusions Peripheral microcirculation in general is not affected by mode of delivery in term healthy newborns and doesn't seem to change significantly within the first 24 h of life.



Abstract O-028 Figure 1

O-028 MICROVASCULAR TONE IN THE PRETERM NEONATE: GASOTRANSMITTER INTERACTIONS MAY BE THE KEY

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Background and aims Hydrogen sulphide (H_2S) can be produced by one of two enzymes: CSE or CBS. H_2S is associated with transitional microvascular tone dysregulation in the preterm infant. We have animal model evidence that increases in H_2S associated with microvascular dysregulation are driven by CSE-dependent mechanisms. Nitric oxide (NO) and carbon monoxide (CO) also play a role in the transitional circulation of preterm neonates. The aim of this study was to characterise the interrelationships of all 3 gasotransmitters using structural equation modelling analysis.

Methods 90 preterm neonates were studied at 24h postnatal age. Microvascular studies were performed by laser Doppler. Arterial COHb levels (a measure of CO) were determined through co-oximetry. NO was measured as total nitrate and nitrite in urine. H_2S was measured as urinary thiosulphate by liquid chromatography.

Results We observed a positive relationship between NO and H_2S (p = 0.008, r = 0.28) and an inverse relationship between CO and H_2S (p = 0.01, r = –0.33). No relationship was observed between NO and CO (p = 0.18, r = 0.18). Structural equation modelling was used to examine the combination of these effects on microvascular blood flow. The model with the best fit (χ^2 = 1.11) is presented.

Conclusions NO production positively related to H_2S production. Previous studies report that NO inhibits H_2S production via the enzyme CBS but induces CSE expression. These results suggest that in the preterm newborn, CSE expression is significantly modulated by NO. The relationship between NO and CSE/H_2S may thus be critical to the deleterious higher microvascular blood flow.

O-029 NEONATAL CIRCULATION MEASURED USING NEAR-INFRARED SPECTROSCOPY (NIRS) DIFFERS BETWEEN PRETERM AND TERM BORN INTRAUTERINE GROWTH RESTRICTED (IUGR) INFANTS

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Abstract O-029 Table 1

	Day 1			Day 2			Day 3		
	preterm	term	*P* value	preterm	term	*P* value	preterm	term	*P* value
rSO_2 cerebral	81.9	78.3	n.s.	84.1	79.8	n.s.	78.6	77.0	n.s.
rSO_2 renal	79.9	92.9	0.001	68.5	84.3	0.022	65.9	88.1	0.007
rSO_2 abdominal	64.9	78.2	0.045	62.6	69.2	n.s.	59.8	81.1	0.041
SaO_2	96.0	98.0	0.002	94.8	98.3	0.001	94.7	97.7	0.014
FTOE cerebral	0.13	0.22	0.030	0.10	0.19	0.002	0.17	0.22	n.s.
FTOE renal	0.16	0.04	0.001	0.27	0.13	n.s.	0.30	0.12	0.012
FTOE abdominal	0.29	0.16	n.s.	0.34	0.31	n.s.	0.37	0.18	0.047

Background and aim IUGR fetuses display redistribution of fetal blood flow to vital organs. This can be different in preterm and term IUGR fetuses. It is not known whether the distribution of the neonatal circulation is still affected by IUGR, and if it differs between these groups. Our aim was to compare the neonatal circulation in preterm and term IUGR infants, measured by NIRS.
Methods Preterm and term infants were prospectively included between May 2012 and April 2014 when IUGR was diagnosed. Cerebral, renal and abdominal regional tissue oxygen saturations (rSO_2) were measured for 2 h continuously using NIRS on days 1 to 3 after birth. Fractional tissue oxygen extraction (FTOE) was calculated using rSO_2 and arterial oxygen saturation (SaO_2) values: $(SaO_2–rSO_2)/SaO_2$.
Results We included 42 IUGR infants (21 preterm/21 term), gestational age median 31.3 weeks (IQR 28.5–33.2), and 38.6 weeks (37.7–39.1), respectively; birth weight 1100 grams (770–1510), and 2420 grams (2027–2645). Results are shown in Table 1.
Conclusion In the first 2 days after birth, preterm IUGR infants showed lower renal and abdominal rSO_2 (higher FTOE) when compared with term IUGR infants, indicating altered neonatal circulation. Furthermore, cerebral rSO_2 was higher and cerebral FTOE was lower indicating increased cerebral perfusion. This may be interpreted as brain sparing continuing after birth. However, the difference with term IUGR (higher cerebral FTOE indicating no brain sparing) vanishes. We conclude that preterm IUGR infants experience brain sparing in the first 2 days, whereas term IUGR infants do not.

Circulation/PDA

O-030 NEW IBUPROFEN DOSING STRATEGY FOR OPTIMAL PATENT DUCTUS ARTERIOSUS CLOSURE IN PRETERM NEONATES

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Background and aims Ibuprofen is the drug of first choice to close a patent ductus arteriosus (PDA) in preterm neonates. The most commonly used 10–5–5 mg/kg/3days bolus dosing schedule is only effective in about 60% to 80% of patients, dependent on post natal age. We provide a new dosing regimen for ibuprofen, based on current available pharmacokinetic/pharmacodynamic (PK/PD) evidence that would result in the highest PDA closure rate.

Abstract O-030 Table 1 Suggested ibuprofen bolus and continuous doses

PNA (days)	Cl (ml/hr)	T1/2 (hr)	Bolus dose (mg/kg)	Infusion rate (mg/kg/hr)
1	1,20	216	15	0,04
2	3,36	77,16	15	0,12
3	6,15	42,17	15	0,22
4	9,44	27,47	15	0,33
5	13,17	19,70	15	0,46
6	17,28	15,01	15	0,60
7	21,74	11,93	15	0,76
8	26,53	9,78	15	0,93

Methods Simulation of different ibuprofen treatment strategies using NONMEM to predict the best pharmacodynamic effect based on available PK/PD data. Based on current evidence we assumed that ibuprofen efficacy depends on the cumulative time of threshold plasma level above 15 mg/l and that the volume of distribution is independent of postnatal age.
Results We show that the predicted plasma concentrations fit best after a 15 mg/kg ibuprofen loading dose followed by a postnatal age dependent continuous ibuprofen dose (table1). With this dosing schedule predicted plasma levels of 90% of patients continuously remain above threshold.
Conclusions Based on PK/PD evidence, we suggest that the 10–5–5 mg/kg ibuprofen dosing schedule that has been used for PDA closure around the world during last decades is insufficient and should be improved. Our new dosing strategy needs further validation in daily clinical practice, but we expect a very high PDA closure rate.

O-031 COMPARISON OF BNP AND NT-PRO-BNP FOR ASSESSMENT OF THE PATENT DUCTUS ARTERIOSUS IN VERY PRETERM INFANTS

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