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Please e-mail the abstract to David Stevenson (dks750@stanford.edu) with copies to Michael Weindling (a.m.weindling@liv.ac.uk) and Jean-Michel Hascoët (j.hascoet@chru-nancy.fr).

**ABSTRACT FORM**

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Title of abstract (USE ALL CAPS FOR TITLE): CEREBRAL BIOMARKERS IN EXTREMELY PRETERM INFANTS WITH A PATENT DUCTUS ARTERIOSUS

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Introduction: Patent ductus arteriosus (PDA) is considered a shunt that steals blood flow from the cerebral circulation. We hypothesized that a large PDA in preterm neonates affects cerebral biomarkers of oxygenation and maturity.

Methods: Infants less than 29 w with no congenital abnormalities or preexisting intraventricular haemorrhages (IVH) were included. We measured PDA (including diameter, LA/Ao ratio) using echocardiography, cerebral oxygenation using near infrared spectroscopy (cTOI), cerebral electrical activity with amplitude integrated electroencephalography (aEEG) using the Burdjalov score (a marker of maturity), HeRO score (a marker of autonomic function based on heart rate variability metrics) and anterior cerebral artery pulsatility index (ACA PI) on Days1, 2, 3, 7, 14, 21 and 28 after birth.

Results: 52 neonates were recruited (Male 33, median GA 26.6 w, BW 905g). Ten neonates had an IVH>Grade 1, and there were 43 survivors. Considering the effect of PDA on brain oxygenation (cTOI) and maturity (aEEG), the different PDA measures were broadly similar.

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| --- | --- |
|  | PDA diameter |
|  | DAY 1N=16 | DAY 2N=31 | DAY 3N=45 | DAY 7N=37 | DAY 14N=25 | DAY 21N=16 | DAY 28N=16 |
| cTOI | P=0.053 | P=0.042 | NS | NS | P=0.001 | NS | NS |
| aEEG  | NS | NS | NS | NS | NS | NS | NS |
| HeRO | NS | P=0.010 | P=0.047 | P=0.020 | NS | P=0.023 | NS |
| ACA PI | NS | P=0.004 | P=0.003 | P=0.049 | P=0.000 | P=0.045 | P=0.034 |

Considering babies with no IVH or grade 1 IVH only. On D7 (n=27), PDA diameter and LA/Ao ratio correlated with decreased brain maturity as indicated by the aEEG score (p=0.018 p=0.048 respectively). On Day 14 (n=18), PDA diameter and LA/Ao ratio correlated with decreased brain oxygenation (cTOI) (p=0.001 and 0.007 respectively).

Conclusion: Neonates with larger PDA have consistently higher HeRO score and ACA PI. In babies with no or a small IVH, a PDA shunt may affect brain oxygenation and functional maturity.