

(120.3 mL/kg/min (35.1) vs. 167.4 mL/kg/min (67.3); p value <0.001) but remained stable by 10 min (189.2 mL/kg/min (26.2); ns). The increase in LVO was significantly correlated to an increase in HR and left ventricle end diastolic diameter (14.3 mm at 2 min, 16.0 mm at 5 min and 16.6 mm at 10 min; $p<0.001$). We observed a bidirectional ductal flow in the first minutes, but large inspirations following a cry overruled the bidirectional ductal flow causing a large left to right shunting.

Conclusion At birth, the most significant hemodynamic change occurred in the first 5 minutes whereby an increase in preload and heart rate increased LVO. Inspirations had a major influence on ductal flow, causing large left to right shunting. Blood pressure at birth remained stable.

106 EARLY POSTNATAL CHANGES IN SPLANCHNIC CIRCULATION IN HEALTHY TERM NEWBORNS

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Objective To characterize hemodynamic changes in celiac artery (CA) and superior mesenteric artery (SMA) in healthy term newborns during the first six hours after birth by means of Doppler ultrasonography.

Materials and methods The study included 30 healthy term newborns. The ultrasound examinations using Aloka α -10 were performed at the age of 2.4 and 6 hours after birth. The statistical analysis of Doppler variables was performed using the non-parametric Friedman test with all pairwise multiple comparisons. Presented results are shown as median (interquartile range).

Results A reversed blood flow in SMA, documented by negative values of end diastolic velocity (EDV) [-10.90 cm.s⁻¹ (-13.21–0.00)], changed to positive during the first six hours after birth (7.08 cm.s⁻¹ (6.29–13.48), $p<0.001$). In CA, EDV increased in this period, but negative values were not recorded [11.83 cm.s⁻¹ (9.34–13.86) and 18.03 cm.s⁻¹ (14.20–27.57)].

Conclusion Dramatic changes occur in splanchnic circulation during the first six hours after birth. In superior mesenteric artery, the negative diastolic blood flow turns to positive as a part of circulatory transition in the presence of a ductal steal.

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107 SURVIVAL OF VERY PRETERM CHILDREN BORN IN 2011: FIRST RESULTS OF THE EPIPAGE 2 COHORT STUDY

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Aims The number of neonates born preterm is increasing and children born at low gestational ages face a range of risks. We present the first results of the EPIPAGE 2 study, a national cohort of very and moderately preterm children in France.

Methods EPIPAGE 2 is a prospective population-based cohort study conducted in 25 regions of France in 2011 including extremely (22–26 weeks, 8-month recruitment), very (27–31 weeks, 6-month recruitment) and moderately preterm (32–34 weeks, 1-month recruitment) children. It aims to examine short and long term outcomes (survival, health and development) of these children and their determinants. Data on pregnancy, delivery, and neonatal events were extracted from the obstetric and neonatal records.

Results A total of 5565 births were included in the EPIPAGE 2 study: 1752 were born extremely preterm (898 (51%) stillbirths and 854 (49%) live births), 2728 very preterm (298 (11%) stillbirths and 2430 (89%) live births), and 1085 moderately preterm (28 (2.5%) stillbirths and 1057 (97.5%) live births). The survival rates for extremely preterm babies were 23% of all births and 48% of live births. The corresponding survival rates were respectively 83% and 93% at 27–31 weeks and 96% and 99% at 32–34 weeks. In 1997 (EPIPAGE 1 study), the survival rates were 20% of all births and 46% of live births at 22–26 weeks and 76% of all births and 88% of live births at 27–31 weeks.

Conclusion Survival has improved among very preterm children, but has not changed at extremely low gestational ages.

108 ALTERED FRONTO-TEMPORAL NEUROANATOMY IN VERY PRETERM BORN ADULTS DURING COMPLETION OF A VERBAL FLUENCY TASK

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Background and aims Several studies have described poorer cognitive performance in various aspects of language such as comprehension, naming, expressive language and verbal fluency in individuals who were born very preterm compared to controls. Neuroimaging investigations have also described structural and functional changes that could underlie such language deficits. In this pilot study we used functional MRI to explore whether alterations in the neuroanatomy of phonological verbal fluency persisted into adulthood following very preterm birth.

Methods Twenty-two young adults (26–28 years old, females=11, males=11) were examined. Eleven individuals were born very preterm (gestational age: <33 weeks) and 11 were full-term born controls. All participants underwent functional MRI using a 3T scanner while completing a phonological verbal fluency task. All data pre- and post-processing was performed using FSL (www.fmrib.ox.ac.uk/fsl).

Results During successful verbal fluency trials, very preterm-born individuals showed significantly decreased blood-oxygen-level-dependent signal compared to controls in several brain areas including the orbitofrontal/medial frontal cortex bilaterally ($x=8$ mm, $y=52$ mm, $z=-28$ mm) and the left fusiform/parahippocampal gyrus ($x=-34$ mm, $y=-30$ mm, $z=-24$ mm), $p<0.05$ family wise-error corrected (FWE). On-line performance did not significantly differ between the groups.

Conclusions Previous studies with functional MRI in younger samples have shown neuroanatomical alterations (increased and decreased activation) in fronto-temporal and fronto-striatal networks in very preterm born individuals when performing different cognitive tasks. Our results suggest that neuroanatomical alterations during language processing persist into adult life following very pre-term birth, and specifically involve fronto-temporal networks, with important implications for a wide range of high order cognitive functions.

109 NEONATAL CEREBRAL OXYGENATION IS ASSOCIATED WITH NEURODEVELOPMENTAL OUTCOME OF PRETERM INFANTS AT 2 TO 3 YEARS OF AGE

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Background and aims Disturbed cerebral oxygenation during the neonatal period might pose preterm infants at risk for neurological deficits. Our aim was to determine whether regional cerebral tissue oxygen saturation ($r_c\text{SO}_2$) and fractional tissue oxygen extraction (FTOE), measured by near-infrared spectroscopy, were associated with neurodevelopmental outcome of preterm infants at 2–3 years of age.

Methods We included 83 preterm infants (gestational age < 32 weeks) and measured $r_c\text{SO}_2$ and calculated FTOE on days 1, 2, 3, 4, 5, 8, and 15 after birth: $(\text{tcSaO}_2 - r_c\text{SO}_2) / \text{tcSaO}_2$. Additionally, we determined the area under the curve (AUC) of $r_c\text{SO}_2$ and FTOE during the first 2 weeks. Cognitive, motor, neurological and behavioural outcome was determined at 2–3 years of age. Multiple linear regression analyses were used to determine whether $r_c\text{SO}_2$ and FTOE contributed to outcome.

Results We included 67 infants for follow-up. Lower quartile (P_{25-50}) and highest quartile (P_{75-100}) of $r_c\text{SO}_2$ values on day 1 were associated with poorer cognitive outcome ($p=0.044$ and $p=0.008$, respectively). Lower AUC of $r_c\text{SO}_2$ was associated with poorer cognitive outcome ($p=0.014$). Lower quartile (P_{25-50}) AUC of $r_c\text{SO}_2$ was associated with poorer fine motor outcome ($p=0.004$). The amount of time $r_c\text{SO}_2 < 50\%$ on day 1 was negatively associated with gross motor outcome ($p=0.002$). The highest quartile of FTOE values on day 1 was associated with poorer total motor outcome ($p=0.041$).

Conclusions Neurodevelopmental outcome at 2–3 years of age was associated with cerebral oxygen saturation during the first 2 weeks after birth in preterm infants. Both high and low $r_c\text{SO}_2$ values had a negative influence on neurodevelopmental outcome.

110 GUIDED IMAGERY: BEYOND PROCEDURAL FEAR AND PAIN - TECHNIQUES FOR CHILDREN, ADOLESCENTS AND YOU, THE HEALTH PROFESSIONAL

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'You have had blood tests before, haven't you?'
'Yeah, but never this exciting!'

The response to the question quoted above came from an 11 year-old boy with special needs following his venepuncture 'in imagery'. The procedure was 'exciting' because he was playing his favourite game - cricket. He hit a fantastic score, got 'run out' and won the game, all in the space of seven (7) minutes from the beginning to the end of the procedure.

Guided Imagery is a therapeutic technique that enables a top-down shift in experience from pain and fear to a chosen reality in imagery. It is used to help a child gain a sense of being in control in the face of fear, anxiety and pain during medical procedures.

This presentation will include:

- an overview of guided imagery
- video of a child undergoing a procedure in imagery;
- mindfulness and Acceptance and Commitment Therapy - ACT (Hayes & Smith, 2005) in relation to procedural pain and fear; and,
- moving from patterns of 'avoidance and bravery' to 'acceptance and achievement' in managing pain.

Delegates attending this presentation will have an opportunity to engage in a mindfulness exercise.

Hayes, S.C. & Smith, S. (2005). *Get out of your mind and into your life: The new acceptance and commitment therapy*. Oakland: New Harbinger.

111 THE EFFECT OF KANGAROO CARE ON PAIN SEVERITY DURING HEEL STICK IN PREMATURE INFANTS

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Objective Pain is a multi-dimensional and complex experience which influences all people physically, emotionally and socially. The process of care and pain relief is the duty of nurses. Today, pain is assessing as the fifth human vital signs. Therefore, the standards of nursing care should be prioritized. The objective of this study was to assess the efficacy of kangaroo care (KC) on pain severity during the heel stick in premature infants.

Material and method In this interventional study, a total of 20 premature infants recruited during 4 months were enrolled in this study. The inclusion criteria were premature infants with gestational age 27–36 weeks and aged 3–28 days, stable respiratory status. In need of heel stick and Apgar score more than 6 at 5 minutes. In this randomized interventional study the blood is taken from each infant once by using KC and another time by incubator care(IC). In each method, PIPP was used to evaluate the severity of pain. Data were analyzed using by SPSS for Windows. Paired sample t-test was used for data analysis.

Findings The severity of pain as the result of heel stick is different in 2 methods. The mean pain score in the KC method was 4.9 ± 2.92 vs IC 11 ± 4.22 and that is, significantly lower than the (IC) ($P < 0.001$).

Conclusion KC that starting 30 minutes before and continuing 10 minutes after heel stick was found to be effective in decreasing pain before and after heel stick in premature infants.

112 A PILOT STUDY INVESTIGATING THE USE OF HEATED HUMIDIFIED OXYGEN AND DRY OXYGEN THERAPY IN CHILDREN WITH ACUTE RESPIRATORY ILLNESS

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Background and aims Low flow oxygen can be delivered either as a dry or heated humidified gas. Little evidence exists about which is most beneficial to the paediatric patient. The aim of the study is to investigate whether children aged < 2 years with acute respiratory illness requiring low flow oxygen (< 2 litres) would benefit from heated humidified oxygen when compared to dry oxygen therapy.

Methods A prospective randomised controlled pilot study of 117 children aged < 2 years with an acute respiratory illness requiring low flow oxygen therapy. 54 participants were randomised to receive dry oxygen and 63 participants were randomised to receive heated humidified oxygen. Hours on oxygen therapy, hours to ready to discharge and hours to hospital discharge were recorded.

Results Median hours on dry oxygen therapy totalled 43 hours versus 39 hours in the heated humidified oxygen group. Wilcoxon rank test ($p=0.05$) returned P value 0.77. Hours from randomisation to ready to discharge equated to 66 hours dry oxygen and 52 hours heated humidified oxygen. Wilcoxon rank test ($p=0.05$) calculated $p=0.36$. The total median length of hospital stay was 53 hours in the dry oxygen group and 47 hours in the heated humidified oxygen group. Wilcoxon rank test ($p=0.05$) determined $p=0.70$.

Conclusion No statistically significant difference in hours on oxygen therapy, time to ready to discharge and length of hospital stay between the dry oxygen and heated humidified group. No significant benefit to the administration of heated humidified oxygen at low flows was found.

113 HOW A CESAREAN CAN AFFECT WITH BREASTFEEDING?

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