Background Hypoxic-ischaemic encephalopathy leads to neurologic impairment or even death. Secretoneurin (SN), a neuropeptide with angiogenic and anti-apoptotic properties, provided strong neuroprotection in an adult animal model of cerebral ischaemia.

Aim To evaluate the effect of SN in established *in vivo* and *in vitro* models of neonatal hypoxic-ischaemic brain injury.

Methods Seven day old mice underwent *unilateral common carotid artery ligation*, followed by *exposure* to hypoxia (8% oxygen). Thereafter, mouse pups were randomly injected intraperitoneally with SN (0.25 µg/g body weight) or vehicle. As endpoint we determined the histological injury score and the number of caspase-3 positive cells 24 h after the insult. Primary cultured hippocampal neurons were treated with oxygen glucose deprivation (OGD) on day 10. Neurons were assigned to the following groups: i) control ii) OGD iii) OGD+SN (1, 10 or 50 µg/l). As primary outcome parameter, cell death was evaluated via real time live confocal imaging using calcein-AM and propidium iodide (PI).

Results SN displayed a non-significant trend to lower mean values of histological injury score compared to control (n = 11–12, p > 0.05) and significantly reduced the number of cells stained positively for activated caspase-3 (n = 6, p < 0.05). *In vitro* SN application on hippocampal neurons (OGD+SN) significantly reduced the number of dead cells assessed by the PI/calcein ratio compared with the untreated OGD group (n = 8, p < 0.05).

Conclusion We provide first evidence that SN is neuroprotective in established *in vitro* and *in vivo* models of neonatal hypoxic-ischaemic brain injury and might therefore be considered a promising therapeutic option.

PO-0398 INVOLVEMENT OF THE CORPUS CALLOSUM AFTER PERINATAL ASPHYXIA DEMONSTRATED USING DIFFUSION WEIGHTED MRI IS RELATED TO NEURODEVELOPMENTAL OUTCOME

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Background Previous studies in 10-year-old children have shown an association between size of the corpus callosum and neurodevelopmental outcome.

Aim In the present study we examined whether diffusion changes in the corpus callosum shortly after birth are associated with outcome in full-term infants with perinatal asphyxia.

Subjects/methods From 2002 to 2013, 127 full-term infants with perinatal asphyxia were examined using diffusion weighted MRI within 7 days after birth (median 4 days; IQR 2 days). To calculate ADC values, regions of interest were manually selected in the anterior and posterior part of the corpus callosum, and ADC values were related to outcome. Adverse outcome was defined as death (n = 33), cerebral palsy or delayed

development at 18 months (Griffiths DQ <85): n = 12. Sixty-nine of the infants (54.3%) received therapeutic hypothermia.

Results ADC values (10⁻⁶ mm²/s) showed anterior-to-posterior differences, and values were analysed separately. ADC values are presented in the table.

Differences between groups were significant (ANOVA p < 0.001).

Conclusions Low ADC values during the first 7 days after birth, in particular of the posterior part of the corpus callosum, are associated with an adverse outcome in asphyxiated term neonates.

PO-0399 NEURODEVELOPMENTAL AND BEHAVIOUR OUTCOME OF PRETERMS (GA

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Background and aims We aimed to identify the neurodevelopmental and behaviour outcome of preterms (GA <30 wks) at 8 years by age appropriate psychometric evaluations to see whether tests used at younger ages could predict worst outcomes at older ages in relation to some neonatal factors.

Method Along with neurologic examinations, 33 infants were prospectively evaluated at 3, 6, 12, 18, 24 months of corrected age with Bayley Scales of Infant Development – II (BSID-II), at 3, 5 years with Stanford-Binet, at 8 years with WISC-R.

Results 72% of children had no (IQ >85), 24.3% had mild (IQ 74–84), 3% had major (IQ <70, blindness) impairments. 24.2% had special education, 15.2% ADHD, 6.1% autism, 9.1% learning/language, 6.1% anxiety disorders. The probability of neurodevelopmental test and IQ scores of VLBW infants <1000 gr being lower than healthy children at same age was 10.5 times higher (OR 4.7, 95% CI 0.92–24.5) at 8 years of age. Oxygen treatment >30 days adversely affected the scores up to 18th month (OR 2.1, 95% CI 0.44–9.8). Babies having low scores of the 18th month-cognitive and motor sub-test of BSID-II had 16 times higher probability of having low WISC-R total IQ scores at 8 years. (p < 0.05). 19 children with sepsis at 8 years had lower performance and total IQ scores (p < 0.05).

Conclusion Prolonged oxygen therapy and having and sepsis are significant factors affecting later IQ of VLBW infants. Lower BSID-II scores at 18th month may predict future lower total IQ scores. Longitudinal follow up and early intervention is of paramount importance.

PO-0400 NEUROPROTECTIVE EFFECT OF PENTOXIFYLLINE IN RAT PUPS WITH HYPOXIC-ISCHAEMIC ENCEPHALOPATHY

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Abstract PO-0398 Table 1

	Favourable	CP or delayed development	Died
Corpus callosum anterior	1094 ± 131	1033 ± 286	899 ± 233
Corpus callosum posterior	1064 ± 130	921 ± 265	812 ± 225

Background and aims Hypoxic-ischaemic (H-I) brain injury in the human perinatal period often leads to significant long-term neurobehavioral dysfunction in the cognitive and sensory-motor domains. The aim of the present study investigated that effect neuroprotective of different dosages of pentoxifylline in neonatal rat model of HIE.

Methods H/I was performed according to the Levine-Rice model on postnatal seven-day-old. Wistar rat pups were randomly divided into four groups as: sham-operated group (n = 17), H/I (n = 16), H/I and intraperitoneal Pentoxifylline 60 mg/kg-treated group (n = 17) and HI and intraperitoneal Pentoxifylline 100 mg/kg-treated group (n = 17). Twenty-three rat pups, twenty-four hours after hypoxia, the animals were killed for histopathological evaluation to detect apoptosis by caspase-3 immunohistochemistry method. The other rat pups were grown to 11 weeks. The synaptic plasticity and cognitive function of rats were evaluated using long term potentiation (LTP) and Morris water maze (MWM) test on D77–D82, respectively.

Results Pentoxifylline 60 mg/kg two doses treatment decreased the number of caspase-3 positive cells that showed the typical morphological features of apoptosis in only hippocampus (p0.05) but, total numbers of degenerative cell significantly diminished.

Conclusions Low dose pentoxifylline treatment is protective against both brain injury and memory impairment and synaptic plasticity.

PO-0401 IL-6 POLYMORPHISM AT POSITION-174 IN NEWBORN INFANTS WITH PERINATAL ARTERIAL ISCHAEMIC STROKE: ASSOCIATION WITH ADVERSE OUTCOME

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Background Inflammation has been proposed as a hallmark in the pathophysiology of stroke. A functional polymorphism in the interleukin (IL)-6 gene at position-174, encoding for the pro-inflammatory cytokine IL-6, is associated with an increased risk of neonatal brain injury or development of cerebral palsy. The aim was to study whether the IL-6-174 G/C polymorphism increased the risk of perinatal arterial ischaemic stroke (PAIS) or subsequent adverse sequelae.

Methods Infants born at or above 37 weeks gestation with PAIS diagnosed by neonatal MRI (n = 63) were included. Genotyping of the IL-6-174 G/C polymorphism was performed and compared to 1008 random population controls. Perinatal variables of case infants were reviewed.

Results There were no differences in IL-6-174 genotype between infants with PAIS and population controls. In a multi-variable analysis, independent risk factors for adverse outcome after PAIS in a middle cerebral artery territory included CG genotype (OR 5.9; 95% CI 1.02–33.9) and male sex (OR 4.2; 95% CI 1.04–17.2).

Conclusion The distribution of the IL-6-174 C >G promotor polymorphism did not differ between infants with PAIS and

population controls and therefore do not seem to play a role in stroke risk. However, the IL-6-174 GC genotype was more common among infants who had an adverse outcome following PAIS in the middle cerebral artery territory, suggesting that the level of inflammation does play a role in outcome after PAIS. This may be relevant for neuroprotective strategies.

PO-0402 CHALLENGING CURRENT CONCEPTS REGARDING LATERALITY AND DIRECTION OF BOLD SIGNAL CHANGES IN NEONATAL FUNCTIONAL BRAIN IMAGING

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Background Functional magnetic resonance imaging (fMRI) in preterm infants has been introduced as a non-invasive method to study information processing in the developing brain and to identify early signs of dysfunction. Studying the sensorimotor system, fMRI has so far delivered inconsistent brain activation patterns regarding laterality and direction of BOLD signal changes.

Aims To study evoked responses to unilateral passive sensorimotor stimulation in preterm infants using a customised neonatal head coil.

Patients/methods 14 preterm infants born less 30 weeks gestation were scanned using a block design (10 × 30 sec ON-OFF) at 3 T (Achieva, Philips, Best, NL) using a customised neonatal head coil (J. Nordmeyer-Massner and K. Pruessmann, ETH Zürich) at term equivalent age. Data were pre-processed (slice-time-correction, motion correction, anatomical co-registration with high-resolution T2-weighted structural images, 6mm³ smoothing) and analysed on an individual level using SPM8. Only activation clusters surviving p < 0.05 (FWE-corrected) were considered as statistically significant.

Results 5/14 scans had to be withdrawn due to movement artefacts (n = 4) or technical failure (n = 1). In the remaining sample of 9/14 subjects, unilateral passive sensorimotor stimulation elicited primarily positive BOLD responses, which were located in contralateral (8/9) and ipsilateral (1/9) primary sensorimotor cortex (SMC).

Conclusions The study results indicate that improved sensitivity of a size-optimised neonatal head coil is crucial for detection of primary SMC activity on an individual level and question the hypothesis of unfocused negative and bilateral BOLD responses in the premature brain.

PO-0403 USEFULNESS OF THE EVALUATION OF CEREBRAL BLOOD VOLUME TO PREDICT ADVERSE OUTCOMES IN INFANTS WITH ASPHYXIA

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Background and aims Increased cerebral haemoglobin oxygen saturation (rSO₂) and decreased cerebral fractional tissue oxygen