When comparing all the pigs treated with NACA vs. saline after hypoxia Fold Change of ASC in cortex was significantly reduced, p (Table 2).

In hippocampus, cortex and Striatum Fold Change of IL-1b was elevated in all the hypoxia groups compared with the control group, p

Conclusion NACA reduces the protein expression of Il-1beta and mRNA-expression of ASC in cortex after hypoxia. This may indicate that NACA has some neuroprotective abilities after perinatal asphyxia.

Upcoming analyses of histopathology and injury markers will elucidate possible neuroprotective effects of NACA treatment following birth asphyxia.

PS-337 WITHDRAWN

PS-338 CONCURRENT ALLOPURINOL AND HYPOTHERMIA TREATMENT IN A TERM NONHUMAN RAT MODEL OF HYPOXIC ISCHAEMIC ENCEPHALOPATHY

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Background and aims Hypoxic-ischaemic encephalopathy (HIE) has been associated with long-term disabilities. Hypothermia is effective but does not provide complete neuroprotection, adjunctive therapies are necessary. Allopurinol has been proved as a good neuroprotector, but it has never been tested associated with hypothermia. The aim of the present study was to examine therapeutically effectiveness of dual therapy (hypothermia + allopurinol) versus hypothermia, in a neonatal rat model of HIE.

Methods 120 Wistar pups at postnatal day 10 were used and divided into 5 groups: Sham-Operated, Hypoxic-ischaemic (HI) aggression, HI aggression + Allopurinol, HI aggression + Hypothermia, HI aggression + Hypothermia + Allopurinol.

At 25 day of life, spatial memory was assessed via water maze test. Finally, rats were anaesthetised and sacrified. In order to assess possible alterations in the hippocampal synaptic network, 3 specific synaptic proteins (PSD95, SNAP25, synaptophysin) were tested by Western Blot.

Results There were differences in the learning outcomes among hypoxic, hypoxic + allopurinol, hypothermia, hypothermia + allopurinol and sham operated ($p < 0,05$). The worst group was the hypoxic one.

Synaptophysin and SNAP25 levels were higher in controls and treatment groups compared with hypoxic untreated animals. However, the highest level of PSD95 corresponded to the hypoxic group.

Conclusions Hypothermia and allopurinol seem to improve learning in HIE pups.

Increased levels of presynaptic proteins in the treatment groups suggest that hypothermia and allopurinol improve synaptic plasticity compared with untreated group.

PSD95 was also described in the literature as a suppressor of dendritic arbour development, so this could explain our results in the hypoxic group.

PS-339 THERAPEUTIC HYPOTHERMIA IN THE ASPHYCTIC NEWBORN: IMMUNOHISTOCHEMICAL COMPARISON OF THREE COOLING TARGET TEMPERATURES IN THE PIGLET BRAIN

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Background and aims Therapeutic hypothermia has now become standard of care for neonatal hypoxic-ischaemic brain injury, as it reduces death and neurological sequelae without neurodevelopmental disabilities. There are however around 40% of infants who, despite treatment, have an adverse neurodevelopmental outcome. We aimed to assess brain regional cell death and microglial activation with cooling to 35°C, 33.5°C, and 30°C after hypoxia-ischemia (HI) in the piglet asphyxia model.

Methods Following HI and resuscitation, 28 newborn piglets were randomised to: (i) normothermia (38.5°C throughout), or whole-body cooling 2–26 h post-insult to (ii) 35°C, (iii) 33.5°C, or (iv) 30°C (all groups $n = 7$). At 48 h after HI, regional neuropathological analysis was performed to assess delayed cell death (quantitative analyses of both TUNEL-positive cells and cleaved caspase 3 immunoreactivity) and microglial activation (Iba-1 staining).

Results Compared with normothermia, cooling to 33.5°C showed a strong reduction in delayed cell death in periventricular white matter, hippocampus, caudate, putamen, thalamus and midtemporal cortex, a beneficial effect also extended to other cortical areas when analysing microglial activation. Cooling to 35°C was also beneficial, but in fewer regions than at 33.5°C. On the contrary, cooling to 30°C neither reduced delayed cell death nor maintained the microglial ramification index, showing a global neuropathological pattern similar to that observed in the normothermic group.

Conclusions In our piglet perinatal asphyxia model, the optimum therapeutic hypothermia temperature is 33.5°C, thus suggesting that the extent of neuroprotection might not proportionately increase with temperature decreases.

PS-340 AGE-RELATED CHANGES AND EFFECTS OF MILD HYPOTHERMIA ON CAROTID ARTERY REACTIVITY IN NEWBORN RATS

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Introduction Therapeutic hypothermia has become a standard neuroprotective treatment in term newborn infants following perinatal asphyxia. Hypothermia-induced changes in the reactivity of the vessels supplying the brain might play a role in its therapeutic or side effects. We investigated the putative age-related changes and the effect of clinically relevant cooling (33°C) on the reactivity of the newborn rat carotid artery.

Methods Carotid artery rings from 2–3 d-old and 9–10 d-old rats were mounted in myographs and studied at 33 and 37°C.
Results Hypothermia did not significantly affect the contractions induced by KCl and U46619, nor the relaxations induced by acetylcholine (ACh), the nitric oxide (NO) donor sodium nitroprusside (SNP), the NO-independent stimulator of soluble guanylate cyclase (sGC) BAY 41–2272, the β-adrenoceptor agonist isoproterenol, the adenylate cyclase activator forskolin, and acute hypoxia (PO_2 3 kPa). The relaxations induced by ACh, isoproterenol, the β_2-adrenoceptor agonist salbutamol, the β_3-adrenoceptor agonist CL-316243 and hypoxia increased with postnatal age and were impaired by endothelium removal or by inhibition of NO synthase (L-NAME) or sGC (ODQ). By contrast, the relaxations induced by SNP, BAY 41–2272 and forskolin were endothelium-independent and did not change with age.
Conclusions Mild hypothermia (33°C) does not affect the reactivity of neonatal rat carotid arteries. Our data suggest a reduced NO bioavailability in the carotid artery during the first days of life. This transient reduction in endothelium-dependent relaxation might play a role in the adaptation of the circulatory system to birth and in the neonatal vascular response to insults such as hypoxia.

PS-341 LEARNING DIFFICULTIES AND UNDERNUTRITION. IS THERE A PROBLEM IN THE SYNAPSES? STUDYING IT WITH AN ANIMAL MODEL

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Backgrounds and aims Intrauterine growth restriction (IUGR) and rapid postnatal weight gain increase susceptibility to metabolic syndrome during adult life. Longitudinal studies have also revealed high incidence of learning difficulties in children with IUGR.

The aim of the present study was to investigate the effect of nutrition on learning memory in an IUGR animal model.
Methods We use a mouse model of IUGR induced by caloric maternal undernutrition during late gestation. During the suckling period, dams were either fed *ad libitum* or food restricted. Pups were dived into: control-control (CC), undernutrition-control (UC), control-undernutriton (CU) and undernutrition-undernutrition (UU), indicating the prenatal-postnatal experimental conditions.

At 4 weeks of age, memory was assessed via water maze test. Finally, rats were anaesthetised and sacrified. To assess possible alterations of the hippocampal synaptic network, 3 specific synaptic proteins (PSD95, SNAP25, synaptophysin) were tested by Western Blot.
Results CC, UC, CU exhibited shorter escape latencies (EL) along the days. UU hardily changed its EL, indicating a poor spatial memory performance. Learning differences between CC and UU were statistical significant ($p < 0,01$). CC animals had the higher protein synaptic levels in the hippocampus compared to all other groups ($p < 0,05$).
Conclusions Nutrition plays an important role in learning. A poor pre and postnatal nutrition is associated with learning and memory alterations. Catch-up growth group showed an improvement in learning compared to UU. A decreased level of synaptic proteins in animals with a deficient nutrition (pre, postnatal or both), suggests that malnutrition results in less functional or efficient synapses.

Preterm Brain Injury – Experimental

PS-341a NEW GENERATION LIPID EMULSION PROTECTS AGAINST LPS-INDUCED BRAIN INFLAMMATION IN PREMATURE PIGLETS

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Background Premature infants provided parenteral nutrition (PN) high in n-6 polyunsaturated fatty acids (PUFA) have increased risk of inflammatory disease, such as nosocomial sepsis. The pro-inflammatory insult can also contribute to injury and delayed neuronal growth in the perinatal brain. Provision of high long chain n-3 PUFA in parenteral lipids is associated with decreased inflammation and incidence of sepsis. The provision of n-3 PUFA, especially docosahexaenoic acid (DHA) also is critical for neurodevelopment in premature infants.
Aim To determine whether a new generation lipid emulsion high in n-3 PUFA (SMOFlipid) protects against inflammation and improves neuroprotection in response to lipopolysaccharide (LPS) compared to a lipid emulsion high in n-6 PUFA (Intralipid).
Methods Preterm piglets delivered 7 d preterm were assigned into two groups receiving complete TPN containing either Intralipid or SMOFlipid at 10 $g*kg^{-1}*d^{-1}$ for 10 d. On day 10, subgroups of piglets were assigned to receive either an 8-hr infusion of lipopolysaccharide (2 mg/kg) or control saline and target gene expression in brain tissue was analysed.
Results LPS increased brain gene expression of pro-inflammatory cytokines IL-6, IL-8, and TNF in the Intralipid group, but not the SMOFlipid group. The gene expression of the anti-inflammatory cytokine Il-10 was increased in both LPS-treated lipid groups. Brain-derived neuronal growth factor, a marker of neuronal proliferation, was deceased in the LPS-treated SMOFlipid group, but not the LPS-treated Intralipid group.
Conclusions SMOFlipid protected against LPS-induced inflammation, but did not acutely increase the expression of the neuroprotective protein, BDNF, in the presence of LPS.

Primary Care General I

PS-342 MOTHER'S DEPRESSIVE SYMPTOMS AND THEIR COMMUNITIES' SOCIAL CAPITAL

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Background Previous studies have documented the association between mothers' personal social support and mothers' depressive symptoms. Maternal depressive symptoms have a pernicious effect on women's ability to function effectively as a mother. This study expands the concept of mothers' 'social connectedness' to include mothers' perception of their communities' support capital.