

become available, compounding practices for drug formulations in neonates should be evaluated to guarantee the correct dosing, product stability and safety.

IS-031 ACUTE LIVER TOXICITY – IS IT REALLY THE PARACETAMOL? OR HOW A NEW BIOMARKER MAY AID

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Paracetamol is the most frequently prescribed analgesic in children. Intentional and unintentional overdoses are associated with acute liver failure. Around half of all cases of acute liver failure are due to paracetamol. This led the US Food and Drug Administration this year to reduce adult dosage units of paracetamol prescription products to 325 mg per unit and to post a Boxed Warning highlighting the potential for acute liver failure. In cases of evident paracetamol overdoses with toxic levels, the causal relationship with acute liver failure is evident, as is the case in viral hepatitis. However, in many cases of acute liver failure no underlying cause can be identified. Controversy exists as to the possibility of therapeutic doses of paracetamol to be associated with acute liver failure. Due to the complicated metabolism of paracetamol, toxicity may occur despite therapeutic doses and concentrations. Underlying disease state or co-medication may alter paracetamol metabolism resulting in increased levels of the toxic metabolite NAPQI. NAPQI binds with proteins to form protein adducts, which exert their toxic effect in liver and kidney. Recently, an assay was developed to accurately measure these adducts and subsequent research showed clear relationships with adduct levels and acute liver failure. We will illustrate the use of this new biomarker in critically ill children with acute liver failure after therapeutic doses of paracetamol.

Cerebrosinovenous Thrombosis in the Newborn

IS-032 CEREBROSINOVENOUS THROMBOSIS IN THE NEWBORN: TO TREAT OR NOT TO TREAT WITH ANTICOAGULATION THERAPY

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Cerebral sinovenous thrombosis in the newborn: to treat or not to treat with anti-coagulation therapy Neonatal cerebral sinovenous thrombosis (CSVT) is increasingly recognised by neonatologists, paediatricians, paediatric intensivists and paediatric neurologists in recent times due to increasing awareness and improved neuroimaging techniques. Following a confirmed diagnosis of CSVT, one of the major dilemmas for the treating physician is whether or not to extrapolate Anticoagulation therapy (ACT) related data in adults and older children to newborns and initiate ACT. A major impediment for the treating physician in starting ACT is the presence of intracranial haemorrhage (ICH) in many babies at diagnosis. Based on our current understanding of CSVT, this ICH is a result of the underlying pathophysiology of the thrombus

occluding the venous system. However, due to 1) the presence of ICH at diagnosis and the fear of its worsening due to ACT and 2) the uncertainty of the effect of ACT on long term outcome from CSVT, most physicians are hesitant to offer ACT to the baby. But data now show that non-treatment (with ACT) of neonatal CSVT results in worsening (propagation) of the venous thrombus in nearly a third of babies and this is associated with increased risk of brain injury as well. The lecture will cover the controversies and challenges to anticoagulation therapy in neonatal CSVT and endeavour to provide a practical bedside approach to the management of CSVT in newborns.

IS-033 NEURO-IMAGING IN CEREBROSINOVENOUS THROMBOSIS

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Cerebral sinovenous thrombosis (CSVT) in neonates is a rare diagnosis that is increasingly being recognised with better neuro-imaging techniques. Since presentation is non-specific, neuro-imaging techniques are needed to confirm the diagnosis. Cranial ultrasound may suggest the diagnosis and Colour Doppler US (CDUS) can also be used for evaluation of cerebral venous sinuses in neonates. CDUS was routinely used in a large cohort of 249 asymptomatic preterm infants with a gestational age of less than 29 weeks, showing CSVT in almost 5%, most often involvement of the transverse sinus (Raet *et al* Radiology, 2014). The CSVT was confirmed with MRI in the majority.

The presence of associated brain lesions, such as haemorrhagic infarction, carries a worse outcome. The spectrum of associated brain lesions recognised in neonates with CSVT, depends on their gestational age at the time of developing CSVT. Extensive white matter lesions throughout the periventricular white matter are the predominant pattern of injury associated with CSVT in symptomatic preterm infants, while an IVH associated with a predominantly unilateral thalamic haemorrhage and punctate white matter lesions (PWML) are most often seen in the full-term infant.

Routine CDUS in both preterm and full-term infants will provide more insight in the incidence of CSVT. In newborn infants admitted with seizures and/or neonatal encephalopathy CSVT should be part of the differential diagnosis. MRI including magnetic resonance venography (MRV) remains superior to cranial ultrasound and is still required in making the diagnosis of CSVT and to decide whether anticoagulation therapy should be considered.

Ex-Preterm Young Adult Psychological and Social Outcomes? 1980s/90s Cohorts

IS-034 THE HEALTH, WEALTH AND SOCIAL RELATIONSHIPS OF EX VERY PRETERM/VERY LOW BIRTH WEIGHT (VP/VLBW) CHILDREN AT 26 YEARS OF AGE? THE BAVARIAN LONGITUDINAL STUDY (BEST, 1985–86 COHORT)

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This presentation will focus on “real” life outcomes including health, wealth, crime and risky behaviour and social adaptation. Previous evidence of studies in childhood that suggest that very preterm/very low birth weight (VP/VLBW) children are at higher risk for autism spectrum symptoms and may have more social problems with peers but may be less risky in their behaviour in adolescence. Social integration is a central feature of overall life satisfaction.

The BEST investigated health, wealth, risky and crime behaviour and social relationships from birth to 26 years in VP/VLBW and full term borns. We found that ex-VP/VLBW adults reported significantly lower health, less wealth (e.g. less further education, more often periods of unemployment, less income), and in particular, more social relationship problems with peers (e.g. less friends, less friend support, being bullied more often, less sexual relationships) but equally good relationships and support from their parents compared to full term comparisons. VP/VLBW adults also reported broader spectrum of autism symptoms such as rigidity in daily routines or communication problems more often. However, they were significantly less likely to be involved in risky behaviour or crime. Overall, VP/VLBW adults reported lower quality of life and less life satisfaction and these were related to their poorer social relationships with peers.

VP/VLBW children need more support in forming and maintaining social relationships with peers. No or few friends and failing to partner by early adulthood may increase the burden on parents and on health and social services.

Factors Associated with Nurses' Competence in Neonatal Intensive Care Units

IS-035 HOW TO IMPROVE TEAM WORKING IN NICUS

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Patient safety and teamwork are closely related in the medical profession, especially in an ICU setting. The PICU in the ErasmusMC Sophia Children's Hospital started with team training in the form of CRM training in 2005 for all personnel working on the ICU. In 2007 a number of nurses and doctors from the team went to the centre for advanced paediatric and perinatal education in Stanford, USA for a teach the teacher course in paediatric medical simulation. Ever since, simulation training is an inseparable part of the patient safety management system in the Erasmus MC-Sophia. Simulation training in a team setting improves team functioning in the complex work setting of an intensive care by allowing the team to practice skills and communication in safe surroundings. Different learning theories show that this way of teaching is very efficient for the adult learner. Also literature shows that teams function better, there is better leadership, and patient safety increases after the implementation of simulation team training. The systemic approach reduces the chance of team failure and reduces the number of medical errors.

The presentation focusses on the set-up of the patient safety management system on the PICU. It illustrates the need and usefulness of team training embedded in a larger patient safety management system.

IS-036 NURSE COMPETENCY IN NICU

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Factors Associated with Nurses' Competence in Neonatal Intensive Care Units

The survivor rate of premature and low birth weight neonates is increasing; however the number of newborns who require admission to NICUs is increasing. The hospitalised neonates and their parents need to receive competent care. Competent is a multi-faceted and it is difficult to provide a single definition for it. Although having broad range of knowledge and technical skills can be considered among the most important aspects of competency, it seems these are not the only criteria for assessing neonatal nurses' competency. The purpose of this paper is elaborating on the different components of competency among neonatal nurses. Integrating skills and knowledge with some other important elements such as critical thinking, leadership and mentoring ability, tendency to do research, safe and ethical practice along with effective communication, professional development, understanding the nonverbal of the neonates and planning based on their individual needs can be considered as necessary aspects of providing competent care in NICUs.

Free Radicals Related Diseases of the Fetus and Newborn: Good and Bad Deeds

IS-037 ANTENATAL FACTORS THAT INFLUENCE NEONATAL OUTCOME

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Dramatic increases in the rates of obesity have occurred in the United States (most states >20%). Women of reproductive age are part of this trend, with obesity during pregnancy associated with increases in inflammation, immune dysregulation, and other complications of pregnancy (e.g. pre-eclampsia, prematurity, diabetes, etc.). Infants can be macrosomic with more NICU admissions, congenital anomalies, and autism. These effects appear to be transgenerational with infants born to obese mothers having an increased risk of childhood and adult obesity. The immune dysregulation leads to increased infections, especially chorioamnionitis and funicitis which are associated with low Apgar scores, encephalopathy, seizures and cerebral palsy. Developing novel interventions to prevent obesity during pregnancy should have a significant impact on short and long term neurodevelopmental outcome. Misuse of opioids during pregnancy is also a significant problem in the US.

Neonatal abstinence syndrome (NAS) affects most infants exposed to opioids *in utero* and genetic factors influencing the incidence and severity of NAS have not been studied. We analysed single nucleotide polymorphisms (SNPs) and epigenetic changes in the mu opioid receptor (OPRM1) and catechol-O-methyltransferase (COMT) genes (pharmacogenetic modulators of opioid action) and correlated this with short term outcomes. Genetic variation and epigenetic changes do appear to influence the incidence and severity of NAS. The results of ongoing studies will enhance our understanding of the pathogenesis of NAS, define best treatment practices, promote early identification of those at highest risk for neurodevelopmental impairment, and facilitate targeted interventions to improve outcome in these high risk infants.