Aims:

- (1) Generation of ideas for articles to be discussed.
- (2) Articles posted two weeks prior to the club.
- (3) Held on the first Tuesday of each month.
- (4) Findings from the journal club will be disseminated to the team.
- (5) Where appropriate guest speakers will be invited to attend. These aims are achieved by clear advertising and generation of ideas within the nursing team prior to the journal club.

This is a non-hierarchical club where all grades of staff attend we have strong links with the university as part of one of the first Academic Health Science centres in the country, which enables the opportunity for academics and practitioners to share ideas and work together. In the future the journal club will be opened up to all Nursing staff and allied health professionals to enable the sharing of information and knowledge and improve collaboration (Hunt and Topham, 2002).

502**PRETERM BIRTH: MANAGEMENT OF MATERNAL STRESS**

E. Pichler-Stachl¹, G. Pichler¹, S. Gramm², W. Müller¹, B. Urlesberger¹

¹Department of Paediatrics/Division of Neonatology, ²Department of Obstetrics and Gynaecology/Division of Obstetrics, Medical University Graz, Graz, Austria

Background: Management of stress is a very important factor of coping positive and negative life events. In this study mothers of preterm infants with different gestational age were examined in terms of their stress strategies.

Methods: The management of stress positive strategies (abasement/hostility, diversion and control), negative strategies, searching for social support and avoidance of stress was assessed by SVF 120 in mothers of preterm infants (born between 28 and 33 weeks of gestation) within the first three days after delivery. Socio-demographic data were recorded.

Results: 16 mothers (aged 32±6 years) of preterm infants (gestational age 30.7±1.4 weeks; birth weight 1637±250g) have participated in the study

by now. With decreasing gestational age maternal management of stress with diversion ($p=0.010$), control ($p=0.040$), searching for social support ($p=0.034$) and avoidance of stress ($p=0.026$) increased. Maternal management of stress with abasement/hostility and negative strategies was independent of the gestational age.

Conclusion: The results show, that the maternal management of stress at preterm birth depends on the gestational age. These differences should be taken into account in the care and support of mothers of preterm infants in order to improve mother-child interaction.

Learner objectives: Management of maternal stress, gestational age, mother-child interaction

503**PLASMA ENDOTHELIN-1 LEVELS IN PRETERM NEWBORNS WITH CONGENITAL PNEUMONIA**

D. Dmytriiev

*Vinnitsa National Medical University,
Vinnitsa, Ukraine*

Objective: Increased pulmonary vascular resistance in preterm newborn infants with **congenital pneumonia** is suggested, and endothelin-1 plays an important role in pulmonary vascular reactivity in newborns.

Methods: We determined plasma (second sample) levels of endothelin-1 in 12 preterm newborns with **congenital pneumonia** and 15 without **congenital pneumonia** (gestational ages: 28,20 ± 1,22 and 28,01 ± 1,12 weeks, respectively). Blood and a second blood sample taken 18 to 40 h after birth were used for endothelin-1 determination by enzyme immunoassay.

Result: Plasma levels ET-1 concentrations were higher than second sample ET-1 levels in both groups ($P < 0.001$). There was a significant positive correlation between second sample ET-1 and SNAPPE II ($r = 0.32$, $P = 0.01$). There were no correlations between plasma ET-1 levels first sample and second sample ET-1 concentrations and 5-min Apgar score < 5 . Duration of mechanical ventilation had a significant positive correlation with second sample ET-1 ($r = 0.478$, $P = 0.02$). Plasma level ET-1 levels did not differ between control and **congenital pneumonia** (10.02 and 14.20 pg/mL, respectively, $P = 0.90$). Second sample ET-1 levels

had significantly higher ET-1 levels than controls (1.88 and 3.82 pg/mL, respectively, $P = 0.001$)

Conclusion: Our newborn infants with and without **congenital pneumonia** had similar plasma ET-1 levels, whereas ET-1 levels were higher in **congenital pneumonia** than in control newborns 18 to 40 h after birth. The increased vascular resistance in **congenital pneumonia** may be related to high ET-1 levels.

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EFFECTS OF REDUCED ELECTRODE TEMPERATURE ON THE ACCURACY AND PRECISION OF TRANSCUTANEOUS CARBON DIOXIDE MEASUREMENTS

L.C. Sorensen¹, L. Brage¹, G. Greisen^{1,2}

¹Departm. of Neonatology, National University Hospital; Rigshospitalet, ²Faculty of Health Sciences, University of Copenhagen, Copenhagen, Denmark

Background and aims: The harmful effect of hypocapnia on the neonatal brain emphasizes the importance of monitoring arterial carbon dioxide tension (PaCO₂). Transcutaneous monitoring of carbon dioxide (tcPCO₂) reduces need of arterial blood sampling. Drawbacks are high electrode temperature causing short application time and risks of skin burning. The aim of this study was to determine the accuracy and precision of tcPCO₂ at reduced electrode temperature.

Methods: Forty newborns (GA 24.9- 41.7) were included. Two tc-monitors were applied (TCM4, Radiometer, Copenhagen). The metabolic constant was 0.53 kPa. Arterial blood gas sampling and recording of the tcPCO₂-level at different electrode temperatures was done simultaneously (39°C, 40°C, 41°C, 42°C, 44°C). The Bland and Altman method was used for analysis. PaCO₂-tcPCO₂ difference was expressed in fraction of the mean.

Results: Mean PaCO₂ was 5.8 kPa [3.2; 7.9]. The mean PaCO₂ - tcPCO₂ difference (bias) increased from 5% at 44°C to 17% at 39°C, but did not differ significantly between 41°C and 40°C (14.8% vs. 11.8%). The precision of the tcPCO₂ at each temperature ranged from +7% to +10%. After correction for the temperature-dependent overreading, the Bland-Altman plot showed increasing PaCO₂ - tcPCO₂ difference with increasing PaCO₂, approx. 2% pr. kPa increase of CO₂. Sequence of electrode temperatures

did not matter. Only mild transient erythema was observed.

Conclusions: A lower electrode temperature in tcPCO₂-monitoring increases systematic overreading of the tc-electrode. However, in very preterm babies, monitoring at 40°C or 41°C is possible provided bias correction of 12-15%.

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ELECTRICAL IMPEDANCE TOMOGRAPHY (EIT) CAN RAPIDLY DETECT SMALL PNEUMOTHORACES

R. Bhatia^{1,2}, G. Schmolzer^{1,2}, P.G. Davis^{1,2,3}, D.G. Tingay^{1,2,3,4}

¹Newborn Research, The Royal Women's Hospital, ²Murdoch Childrens Research Institute, ³Dept of Obstetrics and Gynaecology, University of Melbourne, Melbourne, ⁴Dept of Neonatology, The Royal Children's Hospital, Melbourne, VIC, Australia

Background: Diagnosis of pneumothorax currently relies on clinical suspicion and chest radiography and is often delayed.

Aims: To determine whether EIT can accurately identify the location of surgically created pneumothoraces of varying sizes.

Methods: Six anaesthetised and muscle-relaxed piglets with saline lavaged surfactant-deficient lungs (AaDO₂ >350mmHg in F_{IO2} 1.0) were studied. A chest drain was inserted into the right ventral chest and increasing amounts of air (10 to 200 mL in 10-20mL aliquots) were instilled into the pleural space. At the end of these instillations, a Heimlich valve was attached to the chest drain. At each instillation, regional end-expiratory volumes (EELV) were measured using EIT concurrently with SpO₂, heart rate and arterial blood pressure (BP).

Results: At all volume instillations, mean impedance within the right ventral (RV) quadrant was significantly higher than all other quadrants ($p < 0.0001$ ANOVA). A significantly greater EIT time-course signal was identified in the RV quadrant after as little as a 10 mL instillation ($p < 0.0001$; ANOVA). Impedance in the RV quadrant fell from mean (SD) 46 (39.5) c.u. to 18.3 (20.5) suggesting a 60.3% resolution of the pneumothorax within 60-secs following attachment of the Heimlich valve ($p < 0.001$; ANOVA). A deterioration in SpO₂ to 89 (6)% did not occur until 100 mL instillation ($p < 0.001$;