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APGAR SCORES PREDICT SHORT-TERM OUTCOME IN INFANTS BORN AT 25 WEEKS GESTATION

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Background: Several scoring systems have been developed for assessing the condition of the newborn infant at birth and for predicting mortality and morbidity. Apgar scores are generally used for evaluation of preterm infants although their predictive value has been debated.

Aim: To investigate whether Apgar scores and the clinical risk index for babies (CRIB) can predict short-term outcome in extremely preterm infants cared for with an active management strategy. **Method:** Prospectively recorded data in a regional perinatal database were investigated for the time-period 1995–2001 (n= 108000 births). Short-term outcome variables included mortality and severe intracranial pathology (IVH grade 3–4 or cystic PVL). Ninety-two liveborn infants, and five stillborn infants, with gestational age 25+0 to 25+6 weeks were identified in the register. Ten infants died within the first week of life, and 10 died later. Among the non-survivors were three infants with congenital malformations. Seventy-two infants were alive at a postnatal age of 180 days, 6 of these infants had IVH grade 3–4 or PVL. Four of the surviving infants were excluded from further analysis due to inappropriate Apgar scores.

Results: Apgar scores at 1, 5 and 10 minutes were significantly correlated with survival without severe intracranial pathology (p=0.016, 0.003, and 0.003, respectively). The strongest model for predicting survival without severe intracranial pathology was created from 5-minute Apgar scores and the CRIB-score (p=0.000). Survival without severe intracranial pathology was higher in single versus multiple births (p=0.030), but was not associated with infant gender (p=0.407), or mode of delivery (p=0.479).

Conclusion: Apgar scores, already at 1 minute after birth, are highly predictive of outcome in extremely preterm infants with gestational age 25 weeks. The accuracy of the prediction of outcome increases when the Apgar scores are combined with CRIB-scores.

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GROWTH, MOTOR SKILLS AND INTELLECTUAL DEVELOPMENT BETWEEN 9 AND 15 YEARS OF AGE IN VERY LOW BIRTHWEIGHT CHILDREN AND CONTROLS

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Background: Few follow up studies of Very Low Birthweight (VLBW) children are conducted longitudinally. We have performed repeated follow up examinations of a cohort of VLBW children and their controls. At 9 years of age the VLBW children lagged behind in anthropometric measurements, but also in academic achievements. The aim of this study was to investigate whether the differences noted at 9 years persisted at 15 years of age.

Methods: This is a population based study including all surviving VLBW children (n=86) born during a 15 month period in 1987 to 1988 within the Southeast region of Sweden and normal birth weight controls (n=86). The following assessments and tests were performed: anthropometric measurements, state of puberty, motor skills (Bruininks-Oseretsky test), intellectual ability (Raven's matrices at 9 years, Wechsler Intelligence Scale for Children; WISC-III at 15 years of age), reading ability and word decoding skills.

Results: Three children with cerebral palsy (CP) were not included in the follow up study. Two children with CP participated. 62 VLBW children and 56 controls could be examined up to 15 years. *Growth:* There were no differences between VLBW- and control-groups at 15 years of age in stages of puberty. VLBW boys and girls were significantly shorter and lighter, whereas VLBW girls had smaller head circumference compared with controls at both ages. *Motor skills:* There were no significant difference between female VLBW and controls in total score of motor skills, whereas male VLBW children showed impaired motor skills compared to male controls. *Academic achievement tests:* There were significant differences for most tests at both 9 and 15 years of age. VLBW children improved their reading skills as much as the controls between these investigations. However, the differences between VLBW children and controls in the WISC test seemed to increase between 9 and 15 years of age, both in composite and subscales.

Conclusion: VLBW children differed significantly from controls in growth both at 9 and 15 years of age. Differences in intellectual ability seemed to increase with time.

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SURFACTANT LUNG LAVAGE AND INHALED NITRIC OXIDE IN THE TREATMENT OF MECONIUM ASPIRATION SYNDROME 2- INFLUENCE ON DURATION OF MECHANICAL VENTILATION, INHALATION OF NITRIC OXIDE, HOSPITALIZATION, AND COMPLICATIONS

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The most severe clinical problem which coexist with the meconium aspiration syndrome /MAS/ is persistent pulmonary hypertension /PPHN/. **The aim of our study** was to evaluate the efficacy of treatment of MAS for selected clinical parameters. The designed therapeutic approach consisted of surfactant lung lavage /SLL/ and surfactant instillation together with Nitric Oxide inhalation /iNO/. The study population was randomized into two groups: group A /n=7/ treated with SLL, surfactant instillation and iNO, and group B /n=6/ treated with surfactant instillation and iNO. Criteria for inclusion: maturity > 35 weeks of gestation, time after delivery < 24hours, presence of fluid containing meconium below vocal cords, respiratory insufficiency demanding mechanical ventilation /Fi0240%/, radiological changes, and echocardiographic features of pulmonary hypertension. **Method:** SLL was performed with natural surfactant solution (Survanta, Ross Abbott Laboratories) in concentration of 5mg of phospholipids/1 ml 0,9% NaCl, a dose of 15ml of solution per 1 kg. A dose of 100 mg of Surfactant per 1 kg was applied. The initial NO dose was 20 ppm. The parameters analyzed: duration of IMV, duration of iNO, duration of hospitalization, air leaks and deaths.

Results: (mean value ±b SD). Duration of IMV: GROUP A- 6,6±b 2,5days vs. GROUP B- 7,3±b 1,7days (NS). Duration of iNO: GROUP A- 2,9 ±b1,5days vs. GROUP B- 3,5 ±b1,3days (NS). Duration of hospitalization: GROUP A- 16,4 ±b5,4 days vs. GROUP B- 19, ±b2,9 days (NS). Air leaks: GROUP A- 0 vs. GROUP B- 2 (NS). Deaths: GROUP A- 0; GROUP B- 2 (NS).

Conclusions: The associated treatment of SLL with natural surfactant solution together with iNO in the therapy of severe meconium aspiration syndrome with persistent pulmonary hypertension does not have a significant influence on the reduction of duration of IMV, iNO and the hospitalization time and on the reduction of occurrence of complications and deaths.

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SURFACTANT LUNG LAVAGE AND INHALED NITRIC OXIDE IN THE TREATMENT OF MECONIUM ASPIRATION SYNDROME 1- INFLUENCE ON OXYGENATION

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The aim of study was to evaluate the efficacy of treatment of severe meconium aspiration syndrome /MAS/ complicated with persistent pulmonary hypertension /PPHN/ in the improvement of oxygenation. The designed therapeutic approach consisted of surfactant lung lavage /SLL/ and surfactant instillation together with Nitric Oxide inhalation /iNO/. The study population was randomized into two groups: group A /n=7/ treated with SLL, surfactant instillation and iNO, and group B /n=6/ treated with surfactant instillation and iNO. Criteria for inclusion: maturity >35 weeks of gestation, time after delivery <24 hours, presence of fluid containing meconium below vocal cords, respiratory insufficiency demanding mechanical ventilation /Fi0240%/, radiological changes, and echocardiographic features of pulmonary hypertension. **Method:** SLL was performed with natural surfactant solution (Survanta) in concentration of 5mg of phospholipids/1 ml 0,9% NaCl, a dose of 15ml of solution per 1 kg. A dose of 100 mg of Surfactant per 1 kg was applied. The initial NO dose was 20 ppm. The parameters analyzed: Pa02, MAP, Fi02, IO, aADO2 at 0h, 1h, 2h, 4h, 24h, 48h of treatment.

Results: (Mean value ± SD). PaO2 0h- Group A- 48,4± 14,9mmHg vs. Group B- 45,0± 14,3mmHg (NS); 1h- Group A- 114,3± 49,8 mmHg vs. Group B- 46,7± 14,9mmHg (p<0,05). MAP 0h- Group A- 14,3± 4,1 vs. Group B- 13,8± 8,2 (NS); 24h- Group A- 4,0± 3,5 vs. Group B- 8,0± 3,7 (p<0,05). FiO2 0h- Group A- 95,7± 11,3% vs. Group B- 95,0± 12,2% (NS); 2h- Group A- 67,1± 19,9% vs. Group B 96,6± 8,1% (p<0,05); 4h- Group A- 57,1± 16,5% vs. Group B- 89,1± 5,6% (p<0,05). IO 0h- Group A- 29,8± 12,4 vs. Group B- 32,3± 24,9 (NS); 1h- Group A- 11,2± 12,4 vs. Group B- 28,8± 12,0 (p<0,05); 2h- Group A- 10,0± 5,5 vs. Group B- 26,7± 19,0 (p<0,05); 4h- Group A - 6,3± 6,4 vs. Group B- 22,1± 18,4 (p<0,05); 24h- Group A - 2,7± 2,2 vs. Group B - 10,4± 8,0 (p<0,05). a/ADO2 0h- Group A- 575,6± 91,0mmHg vs. Group B- 589,5±95,8mmHg (NS); 2h- Group A- 364,2±128,8mmHg vs. Group B- 581,18± 71,1mmHg (p<0,05); 4h- Group A- 306,3±122,8mmHg vs. Group B-506,2±112,6mmHg (p<0,05).

Conclusions: The associated treatment of SLL together with iNO allows a significant improvement of oxygenation and reduction of parameters of mechanical ventilation.

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INCREASED S100B URINARY MEASUREMENTS AT BIRTH MAY PREDICT NEONATAL DEATH IN PRETERM NEWBORNS

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Background: To date no effective biochemical/biophysical tools exist to predict, among preterm infants, the cases at higher risk for perinatal death. The present study is aimed at investigating whether the measurement of S100B protein in urine may represent a useful tool to early identify patients at risk of postnatal death.

Methods: A retrospective case-control study was performed to measure S100B protein in urine fluid of preterm infants (n= 165) admitted to three tertiary NICUs (from January 1, 1999 to May 31, 2003), of whom a subgroup (n= 11) suffered spontaneous early neonatal death within the first week of age. Routine laboratory variables, neurological patterns and urine concentrations of S100B protein were determined at four time-points (at first urination, and after 24, 48, 96 hour). Ultrasound imaging were assessed within the first 72 hours from birth.

Results: S100B levels, in infants who died within the first week of age, were already higher at first urination and progressively increased from 24 to 96 hour time-points than controls (p<0.001, for all). Multiple logistic regression analysis showed a significant correlation between S100B protein urine concentrations and the occurrence of neonatal death. An S100B concentration cut-off of 12.7 MoM at first urination had a sensitivity of 100 percent and a specificity of 98.3 percent for predicting an abnormal neonatal follow-up. The positive predictive value was of 78.57%, the negative predictive value was of 100%.

Conclusion: Measurement of S100B protein urine levels in newborns, could be aid to identify newborns at higher risk for developing neonatal death.

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A META-ANALYSIS OF THE USE OF ANTIBIOTICS FOR PRETERM LABOUR WITH INTACT MEMBRANES (PTL), OR PRETERM PRE-LABOUR RUPTURE OF MEMBRANES (PPROM) IN PREGANCIES ≤34 WEEKS

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Background: Chorioamnionitis (chorio) has a profound effect on neonatal outcomes, but previous meta-analyses examining therapy with antibiotics in preterm labour or PPROM, included infants near to term. We assessed the influence of prophylactic antibiotic therapy on infants ≤ 34 weeks GA, who are more susceptible to the complications of prematurity.

Methods: Two independent reviewers conducted literature searches (including a hand search of proceedings). Eligible papers were randomized controlled trials administering oral or intravenous antibiotics for > 24 hours to pregnant mothers ≤ 34wks GA. Following agreement on eligibility of 22 papers, data was extracted. Prior sub-group analysis was specified for preterm labour (PTL) with intact membranes; or Preterm Pre-labour Rupture of Membranes (PPROM). If possible data is shown by sub-group. Data for obstetric & Neonatal (NN) outcomes was analyzed using Revman 4.2 software. The data is presented as: Number of studies where outcomes were extractable (N St), number of subjects randomised to treatment (N Rx), number of subjects randomized to control (N C); & summarised as weighted mean differences (WMD) or Odds Ratio (OR) with 95% CI, * shows significance p<0.05.

Results: Relevant primary outcomes are grouped by presentation:

i) Obstetric Outcomes: Latency [days]

	N St	N Rx	N C	WMD
PPROM	4	192	197	0.3(0.2,0.5)*
PTL	4	181	167	5.6(0.3,10.9)*

ii) Infection Outcomes:

	N St	N Rx	N C	OR
Chorio PPROM	9	629	690	0.6(0.4,0.7)*
Chorio PTL	6	368	358	0.3(0.1,0.5)*
NN Infection PPROM	11	737	762	0.6(0.4,0.8)*
NN Infection PTL	9	502	487	0.5/0.3,0.7)*