Submitted by Esmot Ara Begum

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INTRODUCTION: Kangaroo care (KC) has been thought of as an important intervention for improving the care of low birth weight infants; however, the physiological effect of KC is still controversial.
OBJECTIVE: The aim of this study was to investigate physiological responses during KC.
METHODS: Sixteen low birth weight (<1600 g) infants with gestational ages of 24 to 32 weeks were studied. Heart rate (HR), respiration rate, pulse oxygen saturation (SPo_2), and regional cerebral oxygenation (rSo_2) were obtained in 3 periods continuously: before, during, and after KC. Spectral analysis was performed. Total amplitude, the power of low-frequency (LF; 0.06–0.10 Hz) band, high-frequency (HF, 0.15–0.40 Hz) band, and the ratio of LF/HF were calculated. Three groups were compared by analysis of variance.
RESULTS: Significant differences were not observed during KC in terms of mean HR, SPo_2, and rSo_2. By amplitude, these parameters were significantly decreased during KC ($P < .001$) and increased after KC ($P < .001$). The power of LF or HF was either significantly decreased during KC in HR, SPo_2, and rSo_2 ($P < .05$); however, the ratio of LF/HF was increased during KC in HR, whereas the ratio was decreased in rSo_2 ($P < .05$).
CONCLUSIONS: These results suggest that KC influences the stability of rSo_2 as well as HR and SPo_2. Discrete results in the LF/HF ratio of rSo_2 may indicate that KC has different effects on rSo_2 associated with cerebral function.

AMNIOTIC FLUID TRANSFORMING GROWTH FACTOR β AND THE DEVELOPMENT OF NEONATAL CHRONIC LUNG DISEASE

Submitted by Hiroyuki Ichiba

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INTRODUCTION: Chorioamnionitis can initiate fetal lung injury and result in neonatal chronic lung disease (CLD). Although neonates with CLD have higher amniotic fluid concentrations of proinflammatory cytokines, overexpression of transforming growth factor β (TGF-β) also seems to be important in the pathogenesis of neonatal CLD.
OBJECTIVE: Our goal was to investigate how TGF-β is related to fetal lung injury induced by chorioamnionitis.
METHODS: Forty-four amniotic fluid samples were obtained at delivery from preterm infants (median gestational age: 28 weeks; median birth weight: 908 g). TGF-β and interleukin 6 (IL-6) concentrations in amniotic fluid were measured with enzyme-linked immunosorbent assays.
RESULTS: TGF-β concentration in amniotic fluid correlated with IL-6 concentration ($P < .0001$). Both TGF-β and IL-6 concentrations in amniotic fluid increased with increasing histologic severity of chorioamnionitis (each $P < .0001$). Coexisting presence of neonatal CLD and histologic chorioamnionitis was associated with significantly higher amniotic fluid TGF-β and IL-6 concentrations than presence of neonatal CLD without histologic chorioamnionitis or absence of both (mean TGF-β level: 454.3 vs 119.2 vs 151.8 pg/mL [$P < .0001$]; mean IL-6 level: 5.14 vs 0.99 vs 1.64 ng/mL [$P = .0005$]). Both TGF-β and IL-6 concentrations in amniotic fluid correlated with duration of neonates' need for oxygen administration (each $P < .0001$).
CONCLUSIONS: Amniotic fluid TGF-β may be important in chorioamnionitis-induced fetal lung injury that results in neonatal CLD.

AGE-RELATED SERIAL PLASMA CITRULLINE LEVELS IN PRETERM NEONATES

Submitted by Hariklia Ioannou

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INTRODUCTION: Citrulline is a nonessential amino acid that is synthesized almost exclusively in the small intestine. In adults and children with short-bowel syndrome, citrulline has served as a reliable index of the remaining small intestine length. Citrulline is also a precursor of arginine, the role of which is crucial for neonatal metabolism and growth.
OBJECTIVE: We sought to determine serial plasma citrulline levels of preterm neonates to assess levels in accordance with age and intestinal maturation, which may serve as a baseline in the event of intestinal abnormalities such as necrotizing enterocolitis (a devastating complication in this age group).

METHODS: We measured serial plasma citrulline levels in 18 clinically stable neonates (gestational age: ≤32 weeks; birth weight: 1000–1750 g) on days 2, 7, 14, 21, and 28. Quantitative analysis of plasma citrulline levels was performed by ion-exchange chromatography with postcolumn derivatization.
RESULTS: In the study population, mean plasma citrulline levels showed a statistically significant increase from 19 ± 4 μmol/L on day 2 and 20 ± 4 μmol/L on day 7 to 23 ± 4 μmol/L on day 14, 29 ± 5 μmol/L on day 21, and 31 ± 5 μmol/L on day 28 ($P < .01$). The route of feeding did not seem to have an affect on plasma levels of citrulline (similar values were obtained from neonates who were fed enterally and parenterally on day 7).
CONCLUSIONS: Citrulline levels in normal preterm neonates seem to be age-related and may serve as reference values, which facilitates the evaluation of compromised intestinal function in preterm neonates with severe gastrointestinal problems.

SHORT-TERM AND LONG-TERM OUTCOME OF 596 INFANTS BORN TO MOTHERS WITH CARDIAC DISEASE

Submitted by Yumi Kono
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INTRODUCTION: The number of pregnancies of women with cardiac disease (CD) has been increasing. Previous studies on outcomes were reported mainly on maternal cardiac outcome.
OBJECTIVE: We focused on the outcome of infants who were born to mothers with CD.
METHODS: Study subjects consisted of 596 singleton live-born infants who were born at Tokyo Women's Medical University Hospital from 1991 to 2005. Women with maternal CD included 295 with congenital heart disease (CHD), 184 with arrhythmias, 84 with acquired valvular disease, 18 with cardiomyopathy, and 16 with miscellaneous CD. Gestational age, birth weight (BW), mortality rate, and complications in the subjects and long-term outcome of the preterm infants (<37 weeks' gestation) were evaluated.
RESULTS: Preterm birth was found in 74 (12.4%) infants, 3 of whom were born at <28 weeks' gestation. Low BW was found in 117 (19.6%) infants, 12 of whom weighed <1500 g. Rates of preterm birth (61%) and low BW (61%) in the infants of mothers with cardiomyopathy were significantly higher than those with other maternal CD. The overall mortality rate was 0.7%; 3 died (1 with Down syndrome with CHD, 1 with neonatal Marfan syndrome, and 1 extremely low BW infant born at 23 weeks' gestation) in the neonatal period, and 1 infant with CHD died at 1 year of age. Seven of the preterm infants (9.5%) had CHD. Other complications included anomalies/chromosomal disorders (5), cerebral palsy (1), mental retardation (2), borderline mentality (1), and hearing impairment (1). The prevalence of major neurologic handicap was 4%.
CONCLUSIONS: The rates of preterm birth and low BW were very high. Adverse outcome of infants born to mothers with CD was related to congenital disorders including CD of offspring and extremely preterm birth.

INVESTIGATION OF HEARING IMPAIRMENT IN POST–NEONATAL INTENSIVE CARE UNIT INFANTS BY USING AUTOMATED AUDITORY BRAINSTEM RESPONSE

Submitted by George Mitsiakos
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INTRODUCTION: Hearing impairment affects 2% to 4% of NICU graduates and is associated with several risk indicators.
OBJECTIVE: Our goal was to investigate the prevalence of hearing impairment in newborns hospitalized in an NICU and its association with risk indicators.
METHODS: Subjects consisted of 422 post-NICU infants who fulfilled 34 weeks of gestational age and were examined between March 2005 and December 2006. The following parameters were evaluated: perinatal asphyxia, craniofacial deformities, furosemide and aminoglycoside therapy (duration of administration), meningitis, duration of mechanical ventilation, and nursing duration in an incubator. Screening was performed with the last-generation automated auditory brainstem response (AABR) equipment, ALGO 3 (Natus Medical Inc, San Carlos, CA).
RESULTS: Results were considered normal when the newborn showed response to a 35-dBNA signal bilaterally. Newborns with hearing impairment were referred for early intervention. Multivariate analysis with logistic regression was used to identify the independent risk factors for hearing disturbances. The prevalence of AABR impairment was 2.84% (12 of 422 newborns); the impairment was unilateral in 7 of the infants and bilateral in 5 of them. These 12 infants were examined with conventional ABR with the following results: 6 of them showed normal responses, and in the other 6 infants the pathologic result was confirmed. Multivariate

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