

## ***Abstract from Current Literature***

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### **Exercise modality and metabolic efficiency in children**

Bob G. F. Verweij, Lee Stoner, Sarah P. Shultz

Current exercise prescription guidelines for children recommend at least 60 min of moderate-to-vigorous physical activity every day. However, little is known about the efficacy of different cardiorespiratory exercise modalities prescribed to the pediatric cohort. Sixteen healthy children (8–12 years) completed 5-min trials of treadmill walking, cycling, and elliptical training in a randomized order. The treadmill walking speed was determined from measurements collected during a self-selected walking trial. The workloads for treadmill walking, cycling, and elliptical training were matched (40.3 W). Mechanical efficiency (ME%), perceived exertion (RPE), oxygen uptake, metabolic equivalents, and net energy expenditure were measured. ME% in walking was significantly higher than in cycling ( $P=0.001$ ) and elliptical training ( $P<0.001$ ), and cycling was significantly higher than elliptical training ( $P=0.003$ ). RPE in walking was significantly lower than in elliptical training ( $P=0.006$ ) but not from cycling ( $P=0.314$ ), and cycling resulted in significantly lower RPE than elliptical training ( $P=0.021$ ). Conclusion: Treadmill walking appears to be the most efficacious exercise prescription for otherwise healthy children; however, longitudinal studies need to be implemented to investigate the long-term benefits of each exercise modality.

*Eur J Pediatr (2013) 172:1191–1196*

### **Bronchopulmonary dysplasia and neurodevelopmental outcome in extremely preterm neonates**

J. K. Trittmann, L. D. Nelin, M. A. Klebanoff

We tested the hypothesis that the use of supplemental oxygen (sO<sub>2</sub>) at discharge from the NICU in extremely preterm neonates is associated with a greater risk of neurodevelopmental impairment (NDI) at 18 months corrected gestational age (CGA) than the risk of NDI of those neonates discharged in room air. Four hundred twentyfour charts were retrospectively reviewed from

infants born at <27 weeks and transferred to Nationwide Children's Hospital from December 1, 2004 to June 14, 2010. Use of sO<sub>2</sub> was evaluated on day of life (dol) 28, at 36 weeks postmenstrual age (PMA), and at discharge. Logistic regression was used to identify postnatal risk factors associated with sO<sub>2</sub> at discharge and NDI. At dol 28, 96 % of surviving patients received sO<sub>2</sub>, and therefore had bronchopulmonary dysplasia (BPD) by definition from a National Institutes of Child Health and Human Development workshop. At 36 weeks PMA, 89 % continued on sO<sub>2</sub> (moderate/severe BPD), and at discharge, 74 % continued on sO<sub>2</sub>. When factors associated with NDI were examined, the need for mechanical ventilation  $\geq 28$  days (adjOR=3.21,  $p=0.01$ ), grade III–IV intraventricular hemorrhage (IVH) (adjOR = 4.61,  $p<0.01$ ), and discharge at >43 weeks PMA (adjOR = 2.12,  $p=0.04$ ) were the strongest predictors of NDI at 18 months CGA. There was no difference in Bayley Scales of Infant Development, third edition composite scores between patients with no/mild BPD and patients with moderate/severe BPD (cognitive  $p=0.60$ , communication  $p=0.53$ , motor  $p=0.19$ ) or those scores between patients on and off oxygen at discharge (cognitive  $p=0.58$ , communication  $p=0.70$ , motor  $p=0.62$ ). Conclusions: The need for sO<sub>2</sub> at discharge is not associated with an increased risk of NDI in these patients. The strongest predictors of poor neurodevelopmental outcome in this population were prolonged positive pressure support, grade III–IV IVH, and discharge at >43 weeks PMA.

*Eur J Pediatr (2013) 172:1173–1180*

### **Effects of birth size, post-natal growth and current size on insulin resistance in 9-year-old children: a prospective cohort study**

Melissa J. Whitrow, Michael J. Davies, Lynne C. Giles, Bianca L. De Stavola, Julie A. Owens, Oana Maftei, Vivienne M. Moore

The influence of pre-natal conditions on later type 2 diabetes risk factors such as insulin resistance (IR) may be mediated by post-natal growth trajectory. We aimed to investigate the association of body size at birth and 9 years with IR at 9 years. Using data from

a prospective Australian cohort study, we examined the influence of body size from birth to 9 years [z-score for weight or body mass index (BMI)] on IR at 9 years (estimated by homeostasis model assessment). At age 9 years, 151 children provided a fasting blood sample. z-BMI at age 9 was positively associated with IR. Birth z-BMI was inversely associated with IR only after adjustment for z-BMI at age 9 years. This may be interpreted as an effect of accelerated growth between birth and 9 years on IR. There was a statistically significant interaction between birth and 9-year z-BMI. Results from regression models including z-BMI at all available time points (birth, 6 and 12 months, and 2, 3.5 and 9 years) indicate a possible inverse association between body size at 3.5 years and HOMA-IR at 9 years. Results were similar when the analyses were repeated with z-weight substituted for z-BMI. These results add to the body of evidence concerning the importance of growth in early life for later IR, and highlight a possible interaction between pre- and post-natal growth. The potential influence of growth at around 3.5 years for HOMA-IR at 9 years warrants further investigation.

**Keywords** Birth weight. Body mass index. Body weight. Childhood obesity. Growth. Insulin resistance

Eur J Pediatr (2013) 172:1207–1214

### **Procalcitonin: diagnostic value in systemic infections in chronic kidney disease or renal transplant patients**

Raluca Dumea, Dimitrie Siriopol, Simona Hogas, Irina Mititiuc, Adrian Covic

**Purpose** Although procalcitonin (PCT) has been described as a marker of infection and inflammation, it has not been extensively studied in patients with chronic kidney disease (CKD), end stage renal disease, or renal transplant. **Methods** PCT was routinely tested in 82 (56 dialyzed patients and 28 renal transplant recipients) consecutive cases with a strong clinical suspicion of infection, during a 6-month period, in a single referral unit. **Results** During the study period, 58/82 cases had confirmed infections as per definition. Patients with confirmed infections had higher values for PCT [median = 2.5 ng/mL, interquartile range (IR) = 0.9–5 ng/mL] than those without (median = 0.3 ng/mL, IR = 0.1–0.5 ng/mL),  $p < 0.001$ . Overall, for a cutoff value of 0.5 ng/mL, the sensitivity of the test was 93.1 % and the specificity 78.6. **Conclusion** Our data indicate that significantly elevated PCT concentrations offer good sensitivity and specificity for the early diagnosis of systemic bacterial infection in patients with CKD.

*Springer Science+Business Media Dordrecht 2013*