Methods Observed study of 64 preterm neonates during their first five days of life with gestational age (GA) < 32 weeks or very low birth weight of < 1500 g. Total of 52 patients treated with caffeine and 12 controls without caffeine were included. Sleep-wake behavior was scored in wakefulness (W), active sleep (AS), and quiet sleep (QS) associated with physical and cerebral regeneration. Individual caffeine concentration of every neonate was simulated with a pharmacokinetic model.

Results For increasing caffeine concentration, W increased, AS decreased, and QS was unchanged for GA > or = 28 weeks. No caffeine effect for GA < 28 weeks could be demonstrated. Maturational effects could be seen when comparing preterm neonates of GA >32 weeks with a birth weight of < 1500 g with very preterm neonates born of GA < 32; Neonates born >32 weeks had a significantly higher amount of W and lower percentage of AS.

Conclusions Treatment of apnea and bradycardia as well as stabilization of respiration with standard caffeine treatment is not at cost of QS, i.e. time for physical and cerebral regeneration during sleep remains unchanged. There is an increased fraction of W, alertness and most probably also arousability.

Disclosure(s) Nothing to disclose

References


Conclusion CLOHEX was safely used to measure true GFR in critically ill children. eGFRSchwartz systematically underestimates GFR, especially in patients with ARC and seems not reliable in this patient population.

P25

COMPARISON OF RENAL FUNCTION ESTIMATION METHODS IN CRITICALLY ILL CHILDREN: A PILOT STUDY

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Background Accurate assessment of renal function is crucial in intensive care to guide therapy. Both acute kidney injury and augmented renal clearance (ARC) may compromise outcome. Common formulas to estimate glomerular filtration rate (GFR) are unreliable in critically ill adults. A comparison of a gold standard technique to assess GFR with these formula-based estimations has never been reported in pediatric intensive care (PICU) patients. Our aim was to evaluate the feasibility of measuring plasma iohexol clearance (CLOHEX) for GFR assessment in critically ill children and to compare CLOHEX with estimated GFR using the modified Schwartz formula (eGFRSchwartz).

Methods A prospective, interventional study was conducted at the PICU of the Ghent University Hospital, Belgium. Critically ill children without chronic kidney disease were included. After injection of a weight-dependent bolus of iohexol, serial blood samples were taken over a 6-hours interval. CLOHEX was compared to eGFRSchwartz. Correlation between both methods was assessed by a Pearson’s correlation coefficient (r). Bland-Altman plots were evaluated to assess bias and limits of agreement (LOA). ARC was defined as a GFR exceeding normal values for age plus two standard deviations.

Results 40 patients, median age 16 months (range 15 days to 13.6 years), 72.5% males, were included. No adverse effects related to iohexol were observed. Median CLOHEX was 121 ml/min/1.73m² (range: 43–221 ml/min/1.73m²). ARC was present in 20 patients based on CLOHEX. Median eGFRSchwartz was 81 ml/min/1.73m² (range: 31–131 ml/min/1.73m²). Only 1 patient was identified with ARC by eGFRSchwartz. eGFRSchwartz was systematically lower than CLOHEX. There was a good correlation between CLOHEX and eGFRSchwartz (r=0.69; p<0.01). Bias was 34 ml/min/1.73m² with LOA (-24.5, 93 ml/min/1.73m²).

Conclusion CLOHEX was safely used to measure true GFR in critically ill children. eGFRSchwartz systematically underestimates GFR, especially in patients with ARC and seems not reliable in this patient population.

REFERENCE