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COGNITIVE OUCOME OF PRETERM INFANTS IS RELATED TO MAXIMAL TOTAL SERUM BILIRUBIN

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Background: The relation between total serum bilirubin (TSB) and neurodevelopmental outcome in preterm infants is unclear. Free bilirubin (Bf) and the bilirubin/albumin (B/A) ratio may be more reliable predictors of bilirubin neurotoxicity than TSB, but prospective data regarding neurodevelopmental outcome are lacking.

Aim: To determine the relation between TSB, Bf, B/A ratio and neurodevelopmental outcome in preterm infants.

Methods: TSB, Bf, and serum albumin levels were measured in preterm infants of 32 or less weeks of gestation during the first 10 postnatal days. The peroxidase method, was used for Bf. Composite cognitive and motor scores were assessed by the Bayley Scales of Infant Development III at 24 months corrected age. Spearman's correlation coefficient (R) was calculated.

Results: Demographic data are shown in Table 1. Cognitive scores were significantly correlated to maximal TSB, but not to mean TSB levels (R= -0.32 ($p< 0.05$). Maximal and mean B/A ratios were not significantly correlated to cognitive scores (R=-0.28 and -0.17, resp.) Maximal and mean Bf measurements did not correlate with cognitive scores (R = -0.14 and -0.1, resp.). Motor scores did not correlate with any of the bilirubin parameters.

Characteristic	
Number (n)	43
Male/ female (n)	23/20
Gestational age (weeks)	29.4 (26 - 32)
Birth weight (grams)	1274 (605 - 1975)
TSB max (µmol/L)	212 (132- 348)
TSB mean (µmol/L)	151 (91 - 218)
B/A ratio max (µmol/g)	6.8 (4.4 - 11.2)
B/A ratio mean (µmol/g)	5.0 (3.2 - 7.3)
Bf max (nmol/L)	67 (17 - 229)
Bf mean (nmol/L)	29 (9 - 97)
Motor Score	96 (±13)
Cognitive Score	95 (±11)

Data are shown as mean (± SD) or median (ranges); 17.1 µmol/L = 1 mg/dL bilirubin

[Table 1. Demographic, bilirubin and outcome data]

Conclusion: Cognitive, and not motor outcome, is only related to maximal TSB levels in preterm infants of 32 or less weeks of gestation. Neither B/A ratios nor free bilirubin levels are related to outcome.