

Relationship of Birth Gestational Age with IGF Binding Protein 3 Beyond Influences of Gender, Small-For-Gestational-Age Status, Caesarean Section, Caloric Intake, Parenteral Nutrition, and Predominant Breast Milk Feeding in the Not-Life Threatened Newborn: Relevance of Not-Brain-Related Birth Body Weight

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Background/objective and hypotheses: Not-brain-related birth body weight (NBBW) relevance to known relationships of birth gestational age (GA) with blood serum IGF binding protein 3 (IB3) was studied in the not-life threatened newborn (NWB).

Method: SEX, GA (unit:complete week), postnatal age (PNA; unit:day), birth body weight (BW; unit:g), birth head circumference (HC; unit:cm), BW<10th centile for GA (SGA), caesarean section (CS), predominant oral/enteral breast milk feeding (BM), and parenteral nutrition (KIVD) were recorded in each NWB. IB3 RIA measurements in $\mu\text{M}/\text{dl}$ were performed in each NWB at one of the first 5 postnatal days (x), 5 days after x(y) and 10 days after x(z), caloric intake (KT) was calculated as total postnatal kcal intake before x in presence of PNA at $x(\text{PNA}x)<24$ h. In all other cases KT was calculated as total kcal intake over 24 h periods immediately preceding x, y and z. The presence of any among i) total KIVD, ii) KIVD calories deriving from substances other than dextrose, iii) life-threatening disease, iv) diabetes mellitus (DM), or v) mother with DM led to NWB exclusion. 78 NWBs with complete data were included in the study (males, $n=43$; CS, $n=52$; SGA, $n=20$; BM, $n, x=16, y=43, z=54$; KIVD, $n, x=46, y=34, z=17$; GA range=28-42; BW range=1200-4150; $\text{GA}\leq 36, n=46$; KT, 25th/75th percentile, $x=6.0/44.8, y=60.9/89.3, z=85.9/109.2$). Natural log-transformed IB3 (IB3-LN) resulted near-normally distributed. BRW (unit:g) was calculated as $'0.037\times\text{HC}^{2.57}'$ according to McLennan-Lindley. NBBW (unit:g) was calculated as BW minus BRW. Multiple linear regression (MLR) was used (computations; male SEX, SGA, CS, BM and KIVD; condition present=1, condition absent=0).

Results: MLR models with IB3-LNx-y-z as outcome showed 1) a significant partial correlation (r) of GA with IB3-LNx ($r: -0.409$; $P: 0.000359$), IB3-LNy ($r: -0.353$; $P: 0.002346$) and IB3-LNz ($r: -0.383$; $P: 0.000885$) adopting GA+SEX+PNAx+SGA+BRW+CS+BM+KT+KIVD as predictors, but 2) no significant r of GA with IB3-LN at x, y or z adopting i) GA+SEX+PNAx+BWR+CS+BM+KT+KIVD +NBBW or ii) GA+SEX+PNAx+BWR+CS+SGA+BM+KT+KIVD+NBBW as predictors (in all MLR models BM, KT and KIVD corresponded chronologically to the outcome and R^2 was significant).

Conclusion: NBBW could be relevant to GA-IB3 relationships in not-life-threatened NWBs even considering effect of SEX+PNAx+SGA+BRW+CS+BM+KT+KIVD.