Relationship of Birth Gestational Age with the Ratio between IGF2 and IGF Binding Protein 3 in Blood Serum Beyond Influences of Gender, Small-For-Gestational-Age Status, Caesarean Section, Caloric Intake, and Predominant Breast Milk Feeding in the Not-Life-Threatened Newborn: Relevance of Parenteral Nutrition

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Background/objective and hypotheses. Parenteral nutrition (KIVD) relevance to known birth gestational age (GA) relations to the blood serum IG2/blood serum IGF binding protein 3 (IB3) ratio (IG2 through chronologically corresponding IB3, IG2/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), GA≤36 (PTB), BW<10th centile for GA (SGA), caesarean section (CS), predominant oral/enteral breast milk feeding (BM), and KIVD were recorded in each NWB. IG2 and IB3 R.I.A. measurements in µM/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 (PNAx)<24 h. In all other cases KT was calculated as total Kcal intake over the 24 h 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; PTB, n=46; 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; KT, 25th/75th percentile, x=6.0/44.8, y=60.9/89.3, z=85.9/109.2). IG2/IB3 standardized according to Van der Waerden (IG2/IB3-S), resulted near-normally distributed. Multiple linear regression (MLR) was used (computations; male SEX, SGA, CS, BM, and KIVD; condition present=1, condition absent=0).

Results. MLR models with IG2/IB3-S as outcome showed i) a significant partial correlation (r) of GA with IG2/IB3-Sx (r: −0.409; P=0.000359), IG2/IB3-Sy (r:−0.353; P=0.002346) and IG2/IB3-Sz (r:−0.383; P=0.000885) adopting GA+SEX+PNAx+SGA+CS+BM+KT as predictors, but ii) no significant r of GA with IG2/IB3-Sx, IG2/IB3-Sy, or IG2/IB3-Sz adopting GA+SEX+PNAx+SGA+CS+BM+KT+KIVD as predictors (in all MLR models BM, KT, and KIVD corresponded chronologically to the outcome and R^2 was significant).

Conclusion. KIVD could have been involved in GA relations to IG2/IB3 in not-life-threatened NWBs beyond possible influences of SEX+PNAx+SGA+CS+BM+KT.