BIRTH ESTIMATED BRAIN WEIGHT RELATION TO RATIOS BETWEEN INSULIN-LIKE GROWTH FACTOR-II AND INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN-3 IN THE NOT-LIFE-THREATENED NEWBORN: RELEVANCE OF AXILLARY TEMPERATURE

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Introduction.

Body temperature determinants include head-brain thermal homeostatic mechanisms and, in the human newborn (NWB), birth gestational age (GA).

Estimated birth brain weight (BRW) ratio to birth body weight (BW)/(BBR) resulted associated with GA and blood serum Insulin-like Growth Factor (IGF)-II (IG2) ratio to blood serum IGF Binding Protein-3 (IB3) (IG2 through chronologically-corresponding IB3, IG2/IB3R) in our previous NWB observations.

Here we evaluate BRW, BW, BBR and axillary temperature (TEMP) relations to IG2/IB3R in NWBs.

Methods.

NWBs with any among total parenteral nutrition, blood transfusion, therapeutic hypothermia, life-threatening disease, diabetes mellitus (DM), non-DM endocrine diagnosis, malformation, and mother with DM were excluded.

78 included NWBs presented complete data availability for 1) same-day records at one of the first 5 postnatal days (x), 5 days after x (y) and 10 days after x (z), of postnatal age (PNA, unit: day), TEMP (unit: °C), caloric intake (kcal/kg/24hrs, or kcal/kg/postnatal life hrs for PNA<1 day; K), and IG2-IB3 RIA measurements (unit: uM/dl), and for 2) gender (SEX), GA (unit: complete week; range=28–42), GA <=36 (PTB), BW (unit: g; range=1200–4150), head circumference (HC; unit: cm; range=27.0–36.0), BW <=10th centile for GA (SGA) (numerosity; male SEX, 43; PTB, 46; SGA, 20), BRW (unit: g) and BBR (calculations according to Lindley-McLennan; "BRW=0.037 × HC^{2.57}; "BBR=100 × (BRW/BW)"). IG2/IB3R was calculated at x, y and z.

Arithmetical means were calculated over x-y-x((x+y+z)/3) for TEMP (TEMPM), K (KM) and IG2/IB3R (IG2/IB3RM).

IG2/IB3RM van der Waerden normal score (IG2/IB3RM-NS) resulted near-normally distributed.

Spearman Correlation and Multiple Linear Regression (MLR) were used (MLR computations; male SEX, SGA; condition absent=0, condition present=1).

Results.

TEMPM range: 36.07°C-37.00°C.

Spearman Correlation as rho/significance; BRW vs. TEMP: .306/p=.006; BW vs. IG2/IB3RM: -.391/p<.001; BW vs. TEMP: .204/p=.073; BW vs. IG2/IB3RM: -.511/p<.001; BW vs. TEMP: -.059/p=.606; BW vs. IG2/IB3RM: .468/p<.001.

BRW MLR partial correlation with outcome IG2/IB3RM-NS(pc) was significant in MLR with predictors SEX+SGA+BRW+PNA at x (PNAx)+KM (pc coefficient=-.308, t=-2.669, p=.009) but not in MLR with predictors SEX+SGA+BRW+PNAx+KM+TEMPM (R^2 always significant).

Conclusions.

TEMPM could be involved in BRW-IG2/IB3RM-NS relationships in not-life-threatened NWBs.