

# 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<=10.th 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<sup>2.57</sup>"; "BBR=100 x (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. TEMPM: .306/p=.006; BRW vs. IG2/IB3RM: -.391/p<.001; BW vs. TEMPM: .204/p=.073; BW vs. IG2/IB3RM: -.511/p<.001; BBR vs. TEMPM: -.059/p=.606; BBR 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=-.300, t=-2.669, p=.009) but not in MLR with predictors SEX+SGA+BRW+PNAx+KM+TEMPM(R<sup>2</sup> always significant).

## Conclusions.

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

