

# BIRTH CHEST CIRCUMFERENCE RELATIONS TO CIRCULATING INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN-3 IN THE NOT-LIFE-THREATENED NEWBORN: RELEVANCE OF BIRTHWEIGHT TO BIRTH CROWN-HEEL LENGTH RATIO AFTER CONTROL FOR A SMALL BIRTHWEIGHT FOR GESTATIONAL AGE, FOR RESPIRATORY SUPPORT MEASURES AND FOR CIRCULATING INSULIN-LIKE GROWTH FACTOR-I

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**Background:** Birth chest circumference(BC) may be related to Insulin-like Growth Factor(IGF)-Binding-Protein-3 blood serum levels(IB3) in the human newborn(NWB).

**Objective and hypotheses:** We evaluated the relevance of birth body weight(BW) to birth crown-heel length(BL) ratio(BW through BL,BW/BL) in BC relations to IB3 after control for BW for birth gestational age(GA)≤10.th centile(SGA), respiratory O<sub>2</sub> supplementation (O<sub>2</sub>S), assisted ventilation of any kind(AV) and IGF-I blood serum levels(IG1) in not-life-threatened NWBs.

**Method:** NWBs with any among total parenteral nutrition, life-threatening disease, diabetes mellitus(DM), endocrine diagnosis out of DM, malformation, clinically relevant trunk trauma and mother with DM were excluded. Each of the 78 included NWBs had available data for: a)gender(SEX), GA(unit:complete week; range=28-42), BW(unit:kg; range=1.200-4.150), BL(unit:m, range=0.360-0.550), BC(unit:cm; range=22.0-39.0), BW/BL(unit:kg/m; range=3.16-8.14), SGA, postnatal age(PNA;unit:day) and b)same-day records at one of the first 5 postnatal days(x), 5 days after x(y) and 10 days after x(z) for O<sub>2</sub>S, AV, as well as IG1 and IB3 RIA measurements(unit:uM/dL) (male SEX,n,43; birth at GA≤36,n,46; SGA,n,20; O<sub>2</sub>S,n,x=22,y=11,z=1;AV,n,x=8,y=4,z=1). Natural log-transformed IB3(IB3-LN) resulted near-normally distributed. Multiple Linear Regression(MLR) was used(computations; male SEX, SGA, O<sub>2</sub>S, AV; condition present=1, condition absent=0).

**Results:** MLR showed that the partial correlation(PC) coefficient(r) of BC PCs with outcomes IB3-LNx-y-z was significant when including as predictors 1)PNA, O<sub>2</sub>S and AV chronologically corresponding to IB3-LN, SEX, SGA and BC, all together(MLR1;BC vs. IB3-LN;x,r:.38,p<.0000;y,r:.50,p<.0000;z,r:.62,p<.0000), or 2)PNA, O<sub>2</sub>S, AV and IG1 chronologically corresponding to outcome, SEX, SGA and BC, all together(MLR2;BC vs. IB3-LN;x,r:.27,p..0231;y,r:.27,p..0228;z,r:.53,p<.0000) but no significant BP PCs with outcomes IB3-LNx-y-z was found after adding as predictor to MLR1 or to MLR2 either 3)BW/BL(MLR3) or 4)BW/BL and GA(MLR4)(R<sup>2</sup> of considered MLR models:.38-.68, always significant).

**Conclusion:** BW/BL may be involved in BC relations to IB3-LN not explained by SEX, SGA, PNA, O<sub>2</sub>S, AV and IG1 in not-life-threatened NWBs.