Influence of Birth Weight and Gestational Age on Cognitive Performance in Primary School Children- An Observational Study

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ABSTRACT

BACKGROUND
Cognitive performance of children is influenced by various factors like birth weight, gestational age, socio economic factors, environmental factors, and nutritional status. We wanted to assess the influence of birth weight and gestational age on cognitive performance in school children.

METHODS
100 school children in the age group of 9 - 12 years were included in the study. Based on birth weight and gestational age, they were classified into three groups. Group I: Full term (>38 weeks of gestational age) and normal birth weight (> 2500 g) Group II: Full term (>38 weeks of gestational age) and low birth weight (< 2500 g) Group III: Preterm (<37 weeks of gestational age). Cognition was measured using differences between choice and simple visual and auditory reaction time (CVRT - SVRT) (CART - SART) & MMSE scores. Statistical analysis was done using SPSS Software version 20. Intergroup variations in means were assessed using one-way ANOVA and intragroup variations by using Tukey's post hoc analysis. Pearson's correlation & linear regression analysis was done to assess the relationship between birth weight and gestational age on cognitive function.

RESULTS
ANOVA with Tukey's post Hoc analysis shows significant difference in mean in CVRT-SVRT, CART-SART & MMSE across the three groups, and the difference in means is significantly higher between full term normal weight and preterm born children. $(F= (2, 97)= 24.132, p= 0.000**)$ $(F= (2, 97)= 6.395, p= 0.002*)$ $(F (2, 97)= 26.168, p= 0.000**)$. Pearson's correlation matrix shows that there is significant negative correlation between birth weight and gestational age with reaction time. $(r= -0.449*, r=-0.464*)$. Linear regression shows significant association between birth weight and gestational age with cognition. Reaction time (ms)= $0.818 - 0.041*$ (birth weight) $- 0.013*$ (gestational age) $(F (2, 97) = 17.285, p< 0.000)$ with an R^2 of 0.263.

CONCLUSIONS
Both birth weight and gestational age are significant predictors of cognition in primary school children. Amongst them, gestational age plays a crucial role.

KEY WORDS
Gestational Age, Birth Weight, Cognition, School Children, Reaction Time