

Abstract

The prevalence of child obesity in city of Colombo is rising steeply and the precise reason for the epidemic still remains unclear. However, the intrauterine environment is suggested to be critical for the development of obesity (Loos *et al.*, 2002). A retrospective cohort study aimed to find out the association between size at birth and body composition and fat distribution in late childhood was conducted using 360 randomly selected school children aged 10-12 years in city of Colombo. Body composition was measured using bioelectrical impedance method and birth weight and length data were gathered from obstetric records. Current weight, height, waist, hip and mid upper arm circumferences, triceps and medial calf skinfold thicknesses were measured and socio-demographic and pregnancy history data were collected through a self administered questionnaire. The current study revealed that, birth weight was positively associated with fat mass (FM) ($P = 0.002$) and negatively with lean body mass (LBM) ($P = 0.023$) alone with dry lean mass (DLM) ($P = 0.047$) and total body water (TBW) ($P = 0.018$), late in childhood. Each 1 g increase in birth weight, rose the FM by 0.39 – 0.42 g, while the LBM, DLM and TBW were declined by 0.17 g, 0.01- 0.015 g and 0.14 – 0.19 ml respectively. Birth weight was positively associated with relative adiposity ($P < 0.05$) and negatively with central adiposity ($P = 0.001$). Both birth length and ponderal index were negatively associated with the FM ($P = 0.001$) and per each 1 cm reduction in birth length and $1\text{kg}/\text{m}^3$ decline in ponderal index incorporated 10 % more fat than did higher birth weight in children where as, LBM alone with DLM and TBW were positively ($P < 0.05$) associated and increased by 0.20-0.22 g, 0.02 g and 0.22-0.30 ml respectively for each 1cm increase in birth length and rose by 0.22- 0.29 g, 0.02 g and 0.25-0.32 ml respectively per each $1\text{kg}/\text{m}^3$ increase in ponderal index. The relative and central adiposity were increased with increasing birth length and ponderal index. The higher birth weight than the lower birth weight; lower length and ponderal index at birth are critical for the development of obesity in late childhood, where as, LBW and higher birth length and ponderal index predict more central obesity. Hence, child obesity is a consequence of *in utero* programmed body composition and fat distribution.

Key words: child obesity, body composition, birth weight, birth length, ponderal index

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