

## Abstract

Insulin-like growth factor (IGF) system has been implicated to play a major role in fetal growth. IGF-I in the fetus is shown to promote growth by many, but not all investigators. IGF binding protein-1 (IGFBP-1) appears to have inhibitory effects on fetal growth. However, its secretory pattern during pregnancy has shown inconsistent results. IGF-I and IGFBP-1 have complex regulatory mechanisms involving placental hormones as well. Studies on correlations between components of IGF system, major placental hormones and maternal and infant anthropometric variables are scarce. These variables have not been studied in a Sri Lankan population.

Longitudinal observational study was carried out on 35 healthy women who had uncomplicated pregnancies and delivered appropriately grown for gestational age (AGA) infants at term. Mothers were examined at  $14\pm 2$ ,  $28\pm 2$  and  $36\pm 2$  weeks of amenorrhea (WOA), at delivery, at 6 weeks and 6 months postpartum. Their weight and height were measured. Samples of blood were collected at all examinations. Infant anthropometric measurements were obtained at delivery and postnatal examinations. Paternal height and weight were obtained. Cord blood samples were collected. Placental weight was measured in some of the participants. IGF-I, IGFBP-1, placental lactogen (PL), human chorionic gonadotrophin, oestradiol, progesterone and prolactin levels were measured using enzymeimmunoassay methods. Spearman rank correlation test and repeated measures ANOVA with post test for linear trend was used to analyse data.

Mean total weight gain of mothers was 10.51 kg. IGF-I and IGFBP-1 levels progressively increased throughout gestation and declined thereafter. Placental hormone secretion followed the established pattern for other populations. Maternal IGF-I levels at 14±2, 28±2 WOA correlated positively with cord blood IGF-I. Prolactin level correlated positively with maternal IGF-I level at 14±2 WOA. Maternal IGFBP-1 and progesterone correlated positively at 28±2 WOA. Chest circumference at birth correlated positively with cord blood IGF-I level but negatively with PL levels. Cord blood IGFBP-1 level significantly and negatively correlated with birth weight. Placental weight showed significant positive correlation to birth weight and head circumference. Maternal serum analytes did not show any correlation with maternal or infant anthropometry. Parental anthropometry did not show any correlation to infant anthropometry.

In uncomplicated pregnancies resulting in AGA infants, maternal IGF-I and IGFBP-1 levels increase progressively with gestational age. Maternal IGF-I levels at early and mid gestation affects cord blood IGF-I levels. There are positive effects between prolactin and IGF-I during early gestation and progesterone and IGFBP-1 during mid gestation. Infant anthropometric variables show correlations to IGF-I and IGFBP-1 levels in cord blood but not in maternal blood. Parental anthropometry does not contribute considerably to birth size. Placental weight appears to be a major determinant of birth size even among AGA infants.