

CORD BLOOD AND MATERNAL SERUM INSULIN-LIKE GROWTH FACTOR-I,II(IGF-I,II) , INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN-3 (IGFBP-3) LEVELS IN OVERWEIGHT PREGNANTS

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Background: It has been known that increased glucose and over nutrient transfer from mother to fetus secondary to gestational diabetes leads to an increase in fetal pancreatic insulin secretion which stimulates fetal growth. Likewise obesity or excess weight gain in pregnancy period cause increased insulin secretion even if glucose screening test is normal. The growth promoting effect of insulin may release somatotrophic hormones, such as IGF-1,II and its binding proteins are involved in the regulation of fetal growth. In this study, we determined the changes of intrauterine growth factors (IGF-I, II, and IGFBP-3) in pregnant gained over weight during pregnancy period and evaluated its relation with birth weight

Methods: The patient group consisted of pregnant women (n=75) attending the Obstetric outpatient clinic gained more than recommended amount of weight (mean. 18.6kg) during pregnancy period, compared with control pregnant (n=46) gained the recommended amount of weight (mean 11.2 kg). All had in the last pregnancy period and normal glucose screening test was performed with 50gr glucose. Maternal blood samples were obtained between 34-36 gestation weeks before delivery and cord blood samples were taken after delivery for hormonal analysis. Insulin and c-peptide measured by ICMA, and IGF-1,II, and IGFBP-3 were analysed by ELISA. In each subject, an insulin resistance score (HOMA-IR) was calculated. Statistical analysis were performed using SPSS release 10.0 software package, and unpaired-t test and Pearson's correlation coefficient were used.

Results: There were no significant differences in the ages and pregestational BMI between two groups(mean age of patients:28.6 years and BMI(kg/m²): 24.2±8.3 , mean age of controls 26.5 years and BMI: 25.6 (kg/m²). All infants were born on term, and no difference between their gestational ages could be detected. Birth weight of newborns in the patient group (3.9 kg) were significantly high when compared with the control group (3.2 kg) (p<0.05). Fasting maternal insulin and HOMA-IR values and maternal and cord blood IGF-I,IGF-II ,IGFBP-3 values were shown at Table-1. In woman with normal pre-pregnancy BMI, excess weight gain was associated with increased birth weight.

Table-1. Maternal and cord blood hormone levels in patient and control group

	Patient group maternal	Control group maternal	Patient group Cord blood	Control group cord blood	P value
Fasting insulin (µU/ml)	20.5±3.8 \varnothing	15.9±2.5	13.3±1.6 \varnothing	9.5±3.1	<0.05
HOMA-IR	4.12 \varnothing	2.4	1.9 \varnothing	1.7	<0.05
IGF-1(ng/ml)	167.13±65	133.67±57	86.24±46	62.5±48	>0.05
IGF-II(ng/ml)	615±112 \varnothing	411±128	476±67 \varnothing	205±70	<0.05
IGFBP3(ng/ml)	3386±678 \varnothing	2278±544	1532±692 \varnothing	1154±399	<0.05

\varnothing : p<0,05

Conclusion: : In our study, maternal and cord blood insulin, HOMA-IR, IGF-II , IGFBP-3 levels were significantly higher in patient group with excess weight gain , and these parameters were correlated with increased birth weight. To become overweight or obese in pregnancy period may be responsible increased fetal IGF-II level and nutrient flux due to hyperinsulinemia can lead to increased birth weight.

References:

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