Predictive Factors in Management and Prognosis of Korean Women with Gestational Diabetes Mellitus

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OBJECTIVES

The number of gestational diabetes mellitus (GDM) patients is increasing globally. GDM is defined as glucose intolerance that occurs to pregnant women. Its prevalence has increased from 10% up to 100% globally and in case of Korea, it increased from 2% of women in 1995 to 10.5% in 2011. However, factors known to predict the prognosis of GDM were limited. The correlations between levels of Oral Glucose Tolerance Test (OGTT) for screening and diagnosis and the clinical progress of GDM were evaluated.

METHODS

Data of pregnant women diagnosed as GDM in Busanpaik hospital from 2010 January 1st to 2015 February 28th were investigated. All gestational diabetes mellitus patients received two-way diagnosis including 50g OGTT screening test and 100g OGTT confirmation test. Patient whose blood glucose level was not controlled by nutritional therapy and light exercise was applied with insulin. Insulin dosage was recorded on the assumption of administered insulin including basal and meal time insulin.
Correlations between patients' OGTT and expected percentile of fetus abdomen circumference/weight on fetal sonography in gestational age 24 to 28 weeks, BMI before pregnancy, and the prognosis of GDM (insulin usage and dose, postpartum 75g OGTT, neonatal APGAR) were analyzed.

RESULTS

Among 97 patients, 35% required insulin treatment. 50g OGTT result showed correlation with receiving insulin treatment in the future (p=0.021). AUC of 100g OGTT result showed correlation with use of insulin in the future (p=0.006, table 1). The distribution of patients according to glucose metabolism classification by postpartum 75g OGTT showed correlation with the distribution of initial 100g fasting glucose, AUC of 100g OGTT values (p=0.030 and 0.022, table 2). Fasting glucose level of 75g OGTT after delivery in the group that used insulin therapy was significantly higher compared to the group that controlled by just diet modification(p=0.039). Initial 100g OGTT except for 1 hour value, which is fasting, 2 hour and 3hour 100g OGTT all showed close correlation with neonatal 1 minute APGAR score(p=0.035, 0.021, 0.033). 5 minute APGAR score showed relationship with 2hour 100g OGTT value only.

Table 1. Correlation between initial indices and usage of insulin

	Mean±SD		p-value
	Use insulin	Not use insulin	
Age	34.4±4.62	34.1±3.98	0.748
50g OGTT	192.0±30.18	166.8±23.00	0.021
100g Fasting OGTT	105.7±19.07	94.3±16.95	0.642
1hour 100g OGTT	206.1±34.83	185.6±29.74	0.876
2hour 100g OGTT	198.2±36.22	168.9±27.27	0.156
3hour 100g OGTT	169.6±44.64	152.7±84.55	0.344
AUC* of 100g OGTT	859.6±119.95	767.0±105.71	0.006
Fetal abdominal circumference	66.0±23.74	64.7±26.49	0.820
Fetal Weight	50.0±12.12	47.7±12.74	0.327
Maternal Weight	63.37±10.433	61.96±13.093	0.599
Maternal BMI	24.564±3.244	24.024±4.580	0.576

*AUC : area under the three-hour blood glucose response curve

Table 2. Correlation between initial OGTT and postpartum 75g OGTT diagnosis

	Normal	IGT	IFG	IFG and IGT	Overt DM	p-value
50g	172.7±28.37	160.2±19.97	178.5±12.90	200.6±33.48	198.0±32.47	0.138
100g fasting	90.5±12.33	90.8±14.87	91.8±9.88	105.3±13.47	111.4±13.65	0.030
100g 1 hour	178.5±42.00	204.7±26.79	186.8±25.55	204.3±16.34	228.0±34.91	0.100
100g 2 hour	183.4±19.54	171.7±21.30	172.4±21.88	194.3±47.99	209.2±48.21	0.335
100g 3 hour	156.4±20.26	145.2±17.41	142.2±25.90	177.4±38.00	158.0±52.51	0.429
100g AUC	780.0±49.10	775.0±78.95	777.8±50.49	905.4±63.86	855.5±104.43	0.022

IGT: impaired glucose tolerance, IFG: impaired fasting glucose

CONCLUSIONS

From this study, we can conclude that some initial' indices of GDM could be predictive factors of the progress of GDM, which is represented by insulin usage and dose, or fetal/maternal complications. Fetal complications are represented by 1 minute and 5 minute APGAR score and they are both influenced by initial 2 hour 100g OGTT. Maternal complications are represented by postpartum 75g OGTT and it is influenced by initlal fasting 100g OGTT and AUC of 100g OGTT. Moreover, maternal complications get worse if the progress of GDM needed insulin. The consistent correlation between initial OGTT and insulin usage seemed relative with correlation between insulin usage and postpartum OGTT. Further study about the possibility of the linear relationship among initail OGTT, insulin usage and postpartum OGTT is required.

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