GLYCAEMIC VARIABILITY IN PREGNANT WOMEN WITH GESTATIONAL DIABETES

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INTRODUCTION

The accurate and comprehensive assessment of glycemic control in pregnants with gestational diabetes(GDM) is important for preventing fetal complications. We aimed to determine glycaemic variation on women with GDM with using a continuous glucose monitoring system (CGMS) and to investigate the relationship between reflecting glucose markers such as Glycated hemoglobin (A1C), Fructosamine (FRM) and 1,5-Anhydroglucitol (1,5-AG).

MATERIAL AND METHOD

31 women with GDM on diet therapy only (mean age 31,9±6,9 yrs, gestational week≥35) were recruited from outpatient clinic. Those patients were screened by self monitoring blood glucose(SMBG) and monitored for three consecutive days to obtain mean daily glucose data; glycaemic fluctuations were evaluated using postprandial incremental Area Under Curve(AUC) and percent of Mean Absolute Difference(MAD%). Venous blood samples were collected to measure A1C, FRM and 1,5-AG.

Table-1: Demographic and clinical characteristic features of the study group

		Median	Min-Max	Ave.±s.s.	n	n%
Number of patient (n)					31	
Age (year)		32	20-47	31,9±6,9		
Family history of diabetes	yes				20	64,5%
	no				11	35,5%
Gestational Age		36	35-38	35,8±0,7		
Body Mass Index (kg/m²)		26,4	17,3-44,1	26,2±5,9		
Weight before pregnancy (kg)		66	46-110	67,0±15,0		
Weight during pregnancy(kg)		13	5-19	12,2±3,5		
Obstetric examination	Polyhydroamnios				2	6,4%
	Oligohydroamnios				1	3,2%
	Doubt of trisomy 21				2	6,4%
	Cleft palate-lip				1	3,2%
Obstetric history (History of abortus, stillbirth or macrozomia)	yes				16	51,6%
	no				15	48,4%
Additional Dissease	yes				4	12,9%
	no				27	89,1%

Table-2: Biochemical parameters

n:31

	Median	Min-Max	Ave.±s.s.
HbA_{1c} (%)	5,0	4,4-5,8	5,0±0,3
Fructozamine (µmol/L)	2,2	1,5-2,6	2,1±0,2
1,5-Anhydroglucitol (ng/mL)	15,4	3,8-27,4	17,0±4,9
Triglyceride(mg/dL)	186	86-401	204,3±72,3
HDL (mg/dL)	64	40-110	65,5±17,3
LDL (mg/dL)	164	79-230	151,5±38,7

Table-3: CGMS and SMBG parameters

n:31	Median	Min-Max	Ave.±s.s.
Highest glucose in 3 days (mg/dL)	127	99-185	131,1±22,5
Lowest glucose in 3 days(mg/dL)	52	40-88	54,7±11,6
Average glucose in 3 days (mg/dL)	85	72-117	86,1±10,3
MAD %	5,8	2,0-15,8	6,7±3,1
Total excursions of gluocose in 3 days	6	1-16	5,8±3,6
AUC Above-140 mg/dL	0,0	0,0-1,5	0,2±0,4
AUC Below-70 mg/dL	1,0	0,0-3,7	1,3±1,2
Mean glucose measured by SMBG(mg/dL)	81,5	54,8-110,1	82,9±10,2

Table-4: Infant's demographic and clinical characteristic features

n:31		Median	Min-Max	Ave.±s.s	n	n%
Infant Birth Weight(gr)		3190	2390-3800	3142,9±366,2		
Infant Birth Length (cm)		48	42-53	47,7±2,6		
Infant Head Circumference(cm)		34	32-38	34,3±1,3		
Jaundice	Prolonged jaundice				1	3,2%
	Neonatal jaundice				13	41,9%
	No				17	54,8%
Respiratory Distress	Yes				2	6,5%
	No				29	93,5%
Other neonatal complications	Gallbladder atresia				1	3,2%
	Eye infection				1	3,2%
	Neonatal hypoglycaemia				0	0%

RESULTS

Prepregnancy BMI of participants was 26,2±5,9 kg/m², weight gain during pregnancy was obtained as 12,2±3,5 kg; levels of reflecting glucose markers were measured as following: A1C % 5,0±0,3, FRM 2,1±0,2 µmol/L,1,5-AG 17,0±4,9 ng/ml; according the results of CGM, MAD % was found as %6,7±3.1,the total number of fluctuations in glucose levels were counted as 5,8±3,6. Glucose figures,measured by SMBG or CGMS were found similar (82,9±10,2 and 86,1±10,3mg/dL); I statistically, there wasn't any correlation between determinants of CGM and other glucose reflection parameters. It was realized that birth of weight and size of head circumference of babies were affected by maternal glucose levels.

CONCLUSION

Although it seems that normoglycaemia is sustained, there should be glucose variability in diabetic patients especially during pregnancy and all known glucose reflecting parameters do not show fluctuations. CGMS is an alternative method for detecting glucose variations in spite of having difficulties to afford and apply the tool. We concluded that higher glucose fluctuations were observed on pregnants with GDM who have high triglyceride at fasting and high glucose levels at 3rd hour of OGTT at the beginning