The Risk of Future 'IRS' Among Women With History of Gestational Diabetes

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BACKGROUNDS and AIMS

The history of gestational diabetes (GDM) predisposes to cardiovascular disease (CVD) in the future. The aim of this study was to evaluate risk factors predicting the development of glucose intolerance and insulin resistance syndrome (IRS) in women with history of GDM in the future.

MATERIALS and METHODS

55 women who had GDM 11 2 years before were enrolled into the study. After clinical examination 75 g OGTT and inflammatory markers (hsCRP, uric acid, interleukin-6"IL-6", tumor necrosis factor-α"TNF-α", visfatin, plasminogen activated inhibitor-1"PAI-1", asymmetric dimetilarginine "ADMA", adiponectin) was performed to evaluate of current metabolic status after a decade of delivery. Based on IDF criteria participants were classified into two groups as Normal (Group1) and with IRS (Group 2). We evaluated the relationship between metabolic status and possible risk factors such as; age, BMI, family history of DM, poor obstetric history, A1C and OGTT glucose levels at diagnosis of GDM; weight gain and insulin requirement during index pregnancy. SPSS 21 was used to analyze data.

RESULTS

51% of participants developped IRS after tenth year of delivery. No predictive factor was found except screening time, 1st hour glucose level at the diagnosis of GDM and insulin requirement during index pregnancy. Although difference was not significantly, patients in Group 2 were found to have higher BMI, much more family history of DM before pregnancy and also they put less excess weight during pregnancy (Table 1).

Table 1: Demografic features of participants at the begining of pregnancy, at 11±2 years ago.

	Normal (Group 1)	With IRS (Group 2)	P
n: 55 (%)	27 (% 49)	28 (% 51)	
Age (years)	31.42± 5.24	27.18 ± 6.15	0.39
BMI (kg/m²) Weight (cm)	29. 53± 5.08 73.55± 12.67	30.41± 4.86 75.73± 12.11	0.08
Family history of diabetes (yes/no)	13/14	16/12	0.11
Diagnosis week	31.80 ± 5.27	28.70± 6.01	0.013
OGTT results(75 gram glucose) Basal 1hr (mg/dl) 2hr (mg/dl) 3hr (mg/dl)	 93.40± 21.92 192.50± 34.47 166.27± 22.34 121.40 ±30.75	 106.76± 24.86 233.87± 46.86 222.64± 57.08 145.21± 56.92	 0.867 0.012 0.740 0.387
A1c (%)	5.22± 0.80	4.82 ± 1.09	0.912
Weight excess (kg) during pregnancy	12.40± 4.50	9.90± 5.00	0.05
İnsulin requirement (%)	46.4	53.6	0.02
Delivery week	39.00± 1.00	38.00±2.00	0.07

As compared inflamatory parameters between two groups; HOMA-IR, hsCRP, visfatin, IL-6, PAI-1 levels were detected istatistically higher; on contrary adiponectin level was less in Group 2 than Group 1. And currently, 43% of all participants were found that they had at any level glucose intolerance and higher insulin levels at basal and 1st hour of OGTT (Table 2).

Table 2. Current status of participants

	Normal (Group 1)	With IRS (Group 2)	P
Age (years)	40.11± 5.2	38.86± 7.23	0.39
Weight (kg)	71.67± 11.88	78.29± 11.89	0.08
Waist circumference (cm)	91.58± 12.09	102.30± 8.63	0.001
Hip circumference (cm)	102.67± 7.15	112.93± 10.08	0.003
Blood pressure (mmHg) Systolic Diastolic	 114.81± 12.67 74.41± 7.36	 129.82± 15.84 81.79± 10.47	 <0.001 0.004
A1C (%)	5.73± 0.49	6.75± 1.27	<0.001
OGTT results (75 gram glucose) Basal 1hr (mg/dl) 2hr (mg/dl) 3hr (mg/dl)	 88.96± 22.96 152.77± 43.92 105.36± 34.96 66.82 ± 22.50	 112.11± 43.15 182.63± 41.66 125.26± 43.51 75.26±21.20	 0.01 0.11 0.002 0.003
Basal insulin 1. hr insulin U/ml 2. hr insulin U/ml 3. hr insulin U/ml	8.33± 4.03 75.50± 40.18 43.80± 24.87 22.00±10.35	13.49± 7.18 101.15± 39.50 86.47± 53.70 26.01±17.11	0.002 0.001 0.003 0.001
HOMA-IR	1.54± 0.87	3.38± 1.83	<0.001
LDL-chol (mg/dl)	117.70± 25.52	124.11± 34.12	0.435
HDL- chol (mg/dl)	58.22± 12.07	45.71± 9.41	< 0.001
Triglyceride (mg/dl)	94.42± 33.82	157.82± 80.36	< 0.001
CRP * (mg/L)	2.95± 2.93	4.31± 2.87	0.01
Uric acid (mg/dl)	3.74± 0.84	4.16± 1.01	0.100
ADMA* (µmol/L)	0.65± 0.18	0.68± 0.21	0.96
SADMA	0.35± 0.10	0.35± 0.17	0.43
ADMA/SADMA	1.95± 0.59	2.09± 0.60	0.216
Visfatin* (ng/ml)	2.55± 2.09	2.55± 1.63	0.50
IL-6* (pg/ml)	0.55± 0.67	4.19± 12.54	0.001
TNF-α* (pg/ml)	1.32± 1.49	3.50± 7.79	0.60
PAI-1* (pg/ml)	53.09± 21.57	73.79± 26.27	0.001
Adiponectin* (ng/ml)	5.28± 2.81	4.18± 1.98	0.02
C peptid (ng/dl)	1.11± 0.55	3.27± 21.90	0.001

CONCLUSION

Early screening of GDM and following the patient during gestational period is important but it's much more important to follow those individuals who had high BMI, family history of DM and high glucose at 1st hr of OGTT at the beginning; they should be monitored closely postpartum and at least yearly follow-up should be done based on increased risk for developping IRS and therefore CVD.

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