International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2020; 4(5): 20-22
Received: 26-06-2020
Accepted: 03-08-2020

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Retrospective assessment of outcome of pregnancy of early detected gestational diabetes

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DOI: https://doi.org/10.33545/gynae.2020.v4.i5a.676

Abstract
Background: Gestational diabetes mellitus (GDM) is defined by the WHO as hyperglycemia first detected during pregnancy that does not meet diagnostic criteria for diabetes mellitus. Offspring of mothers with GDM are still at a higher risk for developing diabetes, obesity and metabolic disorders in the long term. The present retrospective study was undertaken for assessing the outcome of pregnancy of early detected gestational diabetes.
Materials & methods: Data records were readily assessed a total of 300 subjects were shortlisted for the present study. Two study groups were formed with 150 subjects in each group as follows: Early GDM group: GDM diagnosis before 6 moths of gestation, and Usual GDM group: GDM diagnosis after 6 months of gestation. Based on the data record files, pre-pregnancy weight and other parameters were recorded. Follow-up records were analysed and neonatal outcome was also assessed. All the results were analysed by SPSS software.
Results: Mean gestational age at the time of Oral glucose tolerance test (OGTT) was 18.2 weeks and 27.1 weeks among the subjects of Early GDM group and Usual GDM group. Significant results were obtained while comparing the mean gestational age at the time of OGTT, fasting blood glucose and type of anti-diabetic treatment among the subjects of Early GDM and usual GDM group. Pregnancy induced hypertension was present in 6% and 4.67% of the subjects of early GDM and usual GDM group. Neonatal hypoglycaemia was seen in 6% and 10.67 percent of the subjects of early GDM and usual GDM group. Neonatal outcome was worse in subjects of usual GDM group.
Conclusion: Prompt screening for gestational diabetes in subjects (with presence of risk factors) as early diagnosis and intervention is accompanied with an improved better outcome.

Keywords: Pregnancy, Gestational diabetes

Introduction
Gestational diabetes mellitus (GDM) is defined by the WHO as hyperglycemia first detected during pregnancy that does not meet diagnostic criteria for diabetes mellitus. Untreated, GDM can lead to a series of adverse outcomes including fetal macrosomia, fetal hypoglycemia and hyper-insulinemia, prematurity, need for C-section, and preeclampsia. However, GDM can often be asymptomatic in the mother [1-3].
The American College of Obstetricians and Gynecologists (ACOG) recommends that early GDM screening be considered for high risk groups (previous history of GDM, known impaired glucose metabolism, and obesity). Early screening may detect either pregestational diabetes or early onset GDM. The goal of early screening is to allow earlier treatment, thereby leading to earlier glycemic control and potentially improved perinatal outcomes [4, 5].
Following diagnosis, proper management (glycaemic monitoring, lifestyle changes, nutritional counselling, exercise and insulin use if appropriate, etc) of GDM in pregnant women will be beneficial in controlling maternal and neonatal short-term complications. However, offspring of mothers with GDM are still at a higher risk for developing diabetes, obesity and metabolic disorders in the long term. One potential reason is that these offspring were exposed to maternal hyperglycaemia prior to diagnosis. Therefore, current guidelines have noticed that early diagnosis of GDM may improve maternal, fetal and neonatal outcomes [6, 8]. Hence; the present retrospective study was undertaken for assessing the outcome of pregnancy of early detected gestational diabetes.

Materials & Methods
The present retrospective study was planned with the aim of evaluating the outcome of

pregnancy of early detected gestational diabetes. Screening of data a total of 560 pregnant subjects was done. Diagnosis of gestational diabetes was reached based on criteria described previously in the literature. Data records were readily assessed a total of 300 subjects were shortlisted for the present study. Two study groups were formed with 150 subjects in each group as follows:

- Early GDM group: GDM diagnosis before 6 moths of gestation
- Usual GDM group: GDM diagnosis after 6 months of gestation

Based on the data record files, pre-pregnancy weight and other parameters were recorded. Follow-up records were analysed and neonatal outcome was also assessed. All the results were analysed by SPSS software. Chi-square test and Mann Whitney U test were used for evaluation of level of significance.

Results

Mean age of the subjects of Early GDM group and Usual GDM group was 32.1 years and 33.8 years respectively. Mean pregnancy weight among the subjects of Early GDM group and Usual GDM group was 83.1 Kg and 82.7 Kg respectively. Mean BMI among the subjects of Early GDM group and Usual GDM group was 33.5 Kg/m^2 and 34.1 Kg/m^2 respectively. Mean gestational age at the time of Oral glucose tolerance test (OGTT) was 18.2 weeks and 27.1 weeks among the subjects of Early GDM group and Usual GDM group. Significant results were obtained while comparing the mean gestational age at the time of OGTT, fasting blood glucose and type of anti-diabetic treatment among the subjects of Early GDM and usual GDM group. Pregnancy induced hypertension was present in 6% and 4.67% of the subjects of early GDM and usual GDM group. Mean gestational age at the time of delivery among subjects of early GDM and usual GDM group was found to be 37.11 weeks and 38.82 weeks respectively. Recurrent vaginal infections were seen in early 2% and 1.3 % of the subjects of early GDM and usual GDM group. Cesarean section was done in early 50.67 percent and 41.33 percent of the subjects of early GDM and usual GDM group. Neonatal hypoglycaemia was seen in 6% and 10.67 percent of the subjects of early GDM and usual GDM group. Neonatal outcome was worse in subjects of usual GDM group.

Table 1: Baseline characteristics

Parameter		Early GDM (n= 150)	Usual GDM (n= 150)	p-value
Mean age (years)		32.1	33.8	0.11
Pregnancy weight (Kg)		83.1	82.7	0.75
BMI (Kg/m^2)	Less than 25	11	19	0.34
	50 to 29.9	40	38	
	30 or more	99	93	
Residence	Rural	69	78	0.88
	Urban	81	72	

Table 2: Glucose profile and profile of anti-diabetic treatment

Variable	Early GDM (n= 150)	Usual GDM (n= 150)	p-value
Mean gestational age at the time of OGTT (weeks)	18.2	27.1	0.00*
Fasting blood glucose (mmol/L)	5.9	4.1	0.02*
Metformin only	79	96	0.02*
Metformin plus insulin	63	49	0.00*
Insulin only	8	5	0.39

*: Significant

Table 3: Outcome

Outcome		Early GDM (n= 150)	Usual GDM (n= 150)	p-value
Maternal	Weekly gestational weight gain (Kg/week)	0.031	0.118	0.01*
	Pregnancy induced hypertension	9 (6%)	7 (4.67%)	0.77
	Gestational age at time of delivery (weeks)	37.11	38.82	0.00*
	Recurrent vaginal infections	3 (2%)	2(1.3%)	0.16
	Recurrent urinary tract infection	7(4.7%)	4(2.7%)	0.31
	Pre-term labour	31 (20.67%)	16 (10.67%)	0.00*
	Cesarean section	76 (50.67%)	62 (41.33%)	0.01*
Neonatal	Neonatal weight (Kg)	3.152	3.318	0.03*
	Respiratory distress	9 (6%)	14 (9.33%)	0.04*
	Neonatal jaundice	19 (12.67%)	17 (11.33%)	0.64
	Neonatal hypoglycaemia	9 (6%)	16 (10.67%)	0.00*

Discussion

The definition of gestational diabetes mellitus (GDM) is any degree of glucose intolerance with onset or first recognition during pregnancy. GDM can classify as A1GDM and A2GDM. Gestational diabetes managed without medication and responsive to nutritional therapy is diet-controlled gestational diabetes (GDM) or A1GDM. On the other side, gestational diabetes managed with medication to achieve adequate glycemic control is A2GDM. Gestational diabetes mellitus (GDM) is defined as hyperglycaemia first detected during pregnancy that is clearly not type 1 diabetes mellitus (T1DM) or type 2 diabetes mellitus (T2DM). There are not too many areas of diabetes that have generated as much debate, controversy and lack of consensus as GDM. The debates cover the diagnostic criteria, classification, timing of screening and method of screening. GDM is characterised by impaired pancreatic β-cell function that is insufficient to overcome the insulin resistance that occur at the second half of pregnancy, which is multifactorial and is largely influenced by placental hormones [7-9]. Hence; the present retrospective study was undertaken for assessing the outcome of pregnancy of early detected gestational diabetes.

In the present study, mean gestational age at the time of Oral glucose tolerance test (OGTT) was 18.2 weeks and 27.1 weeks among the subjects of Early GDM group and Usual GDM group. Significant results were obtained while comparing the mean gestational age at the time of OGTT, fasting blood glucose and type of anti-diabetic treatment among the subjects of Early GDM and usual GDM group. Feghali MN *et al*. compared demographics, blood sugars and outcomes between women diagnosed before (n=167) or after 24 weeks' gestation (n=1202). Women diagnosed with GDM before 24 weeks were more likely to be obese and they were less likely to have excess gestational weight gain. Early diagnosis was associated with more frequent therapy including glyburide and insulin. After propensity score modelling and accounting for covariates, early diagnosis was associated with an increased risk for macrosomia. Early diagnosis was not associated with other adverse outcomes. In a subgroup analysis comparing women treated with glyburide prior to 24 weeks compared to those diagnosed after 24 weeks, early diagnosis in women treated with glyburide was associated with an increased risk for macrosomia. Women diagnosed with GDM before 24 weeks have unique features, are at risk for adverse outcomes, and require targeted approaches to therapy [10].

In the present study, recurrent vaginal infections were seen in early 2% and 1.3 % of the subjects of early GDM and usual

GDM group. Cesarean section was done in early 50.67 percent and 41.33 percent of the subjects of early GDM and usual GDM group. Neonatal hypoglycaemia was seen in 6% and 10.67 percent of the subjects of early GDM and usual GDM group. Neonatal outcome was worse in subjects of usual GDM group. Szymańska M *et al.* examined the influence of time and diagnostic method of GDM on the prevalence of LGA and pregnancy outcome among patients with gestational diabetes. They analysed 211 women with gestational diabetes mellitus. They have reviewed the results of fasting plasma glucose, 50-g glucose screening test (GCT) and 2 hour 75-g glucose tolerance test in GDM patients with LGA and eutrophic newborns. LGA was diagnosed in 10.4% of patients. They did not find any significant differences in gestational age when GDM was diagnosed, results of fasting glucose GCT and OGTT among LGA (M) and control (K) group. However, when they compared the percentage of LGA in groups of women with different time of GDM diagnosis, the highest prevalence was noted in the group of first trimester diagnosis and between 28 and 32 weeks of pregnancy [11].

Conclusion

Under the light of above mentioned data, the authors conclude that prompt screening for gestational diabetes in subjects (with presence of risk factors) as early diagnosis and intervention is accompanied with an improved better outcome. However; further studies are recommended.

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