

Gestational Diabetes Mellitus: A Perspective

Parul T Shah*, Hina Ganatra**, Rina V Patel***, Kruti J Delliwala****, Mohini Bhagat*****

* Head of Department, ** Third Year Resident, *** Associate Professor, **** Assistant Professor, ***** Second Year Resident, Department of, Obstetrics And Gynaecology, V.S. Hospital, Ahmedabad, Gujarat, India

Abstract: Background: Gestational diabetes mellitus (GDM) is increasing in prevalence due to prevalence of overweight and obesity in women of childbearing age. Much controversy surrounds the diagnosis and management of gestational diabetes, emphasizing the importance, relevance and consequences. If newly proposed criteria are adopted universally a significantly growing number of women will be diagnosed as having GDM, implying new therapeutic challenges to avoid fetal and maternal complications related to the hyperglycemia of gestational diabetes. This review provides an overview of clinical issues related to GDM, including the challenges of screening and diagnosis, the treatment and prevention of GDM and the long and short term consequences of gestational diabetes for both mother and offspring. Methodology: A study was done between July 2016 to July 2017. A total of 54 patients were included in the study. Results: The incidence of gestational diabetes mellitus is about 17.8%. Majority of the patients were primi para between 25-29 years age group. 22.2% patients had family history of diabetes. Majority of the patients showed good response to insulin. 51.9% patients had vaginal delivery and 48.1% patients had LSCS. Conclusion: Gestational Diabetes Mellitus can be treated and have a better outcome by Pre-pregnancy counseling, good glycaemic control, regular antenatal care, proper monitoring of blood glucose level and timely management which can reduce maternal and fetal morbidity and mortality. [Parul S NJIRM 2017; 8(6):79-82]

Key Words: Gestational Diabetes, hyperglycemia, glucose intolerance

Author for correspondence: Parul Shah, B-304, Mandar Apartments, Opp. St. Kabir School, Naranpura, Ahmedabad – 380013 E-Mail: parulshah11@hotmail.com M: 9825098276

Introduction: Gestational Diabetes Mellitus (GDM) is defined as^{1,2} Any degree of glucose Intolerance with onset or first recognition during pregnancy. Diabetes has become a global pandemic because of³ sedentary life style, urbanization and increasing incidence of obesity. As the incidence of diabetes is rising in epidemic proportion, more women of childbearing age are at increased risk of diabetes during pregnancy.

In this respect, detection of GDM becomes an important health issue⁴. In overt Diabetes, pre-pregnancy counselling and care plays key role which includes Advice and practical measures to achieve glycaemic control before conception.

This study was planned to find clinical profile and fetomaternal Outcome in patients of pregnancy with diabetes (both GDM and overt diabetes) At tertiary care medical college hospital from the period of July 2016 to July 2017. The patients were screened during their regular antenatal visits and then were admitted for further evaluation.

Aims of Study: To study proportion of diabetes in pregnancy, both gestational and diabetes, along with maternal characteristics like age, parity and family history. To study, effects of diabetes on pregnancy and effect of pregnancy on diabetes. To study fetomaternal outcome and complication in pregnancy with diabetes. To plan management of pregnancy with

diabetes and to decrease fetomaternal morbidity and mortality.

Methods: Study Type: There was a study conducted on 54 Diabetic Patients at our tertiary care centre at Ahmedabad and the fetomaternal outcome was analyzed.

Duration: From July 2016 to July 2017

Inclusion Criteria: Patients who had pregnancy with diabetes (gestational and overt) were included in this study. All cases, registered or emergency, were included in study.

Risk Factors: Categorizing groups at risk for gestational diabetes mellitus⁵

Risk category	Clinical characteristics
High risk	• Marked obesity
	• Diabetes in first degree relative
	• Current glycosuria
	• Previous history of GDM or glucose intolerance
Average risk	• Previous poor obstetric outcome (e.g. an infant with macrosomia)
	• Neither high nor low risk
Low risk	• Age <25 years

	• No history of poor obstetric outcomes
	• Belongs to low risk ethnic groups
	• No diabetes in first degree relative
	• No history of abnormal glucose tolerance
	• Normal pre-pregnancy weight and pregnancy weight gain

hours 75gm OGTT with a threshold plasma glucose concentration of greater than 140 mg/dl at 2 hours. WHO procedure also has a shortcoming in that, the criteria suggested for diagnosis of GDM was also not based on the maternal and fetal outcome but probably the criteria was recommended for its easy adaptability in clinical practice. The same procedure was used at our centre.

Diagnosis: WHO Procedure⁶: To standardize the diagnosis of GDM, the WHO recommends using 2

GDM diagnostic threshold values from various organization

Organization	OGTT , Glucose load	Plasma glucose concentration thresholds(mg/dl)			
		Fasting	1-hours	2-hours	3-hours
ADA	100g	95	180	155	140
ACOG	100g	105	190	165	145
WHO	75g	126	-	140	-
IADPSG	75g	92	180	153	-

Diagnosis of GDM if two or more glucose values equal to or exceeding the threshold values.

Results: Result are shown in tables below:

1. Outcome Of Maternal Risk Factors

Table 1: Age of patients

Age	No (n=54)	Percentage
20-24	14	25.9
25-29	22	40.7
30-34	10	18.6
35.39	8	14.8

Pregnancy with diabetes is more common in younger age group

Table 2: Family History

Family History	No(n=54)	Percentage
Present	12	22.2
Absent	42	77.8

Pregnancy with diabetes has a strong association with family history.

Table 3: Gravidity

Gravida	No(n=54)	Percentage
Primi	22	40.7
Second	6	11.1
Three or more	26	48.2

Majority of the patients were primi para.

Table 4: Blood glucose monitoring on admission in L.R

Rbs Level on admission in LR		
RBS (Mg/dL)	No(n=54)	Percentage
<100	20	37
100-140	14	26
141-180	12	22.2
181-200	6	11.1
>200	2	3.7

Table 5: Ultrasonographic findings on admission

Parameter		No(n=54)	%
Maturity	<28 weeks	2	3.7
	28-34 wks	14	26
	34-37 wks	16	29.6
	>37 wks	20	37
Liquor	Oligo	10	18.5
	Adequate	32	59.3
	Poly	10	18.5
Cardiac activity	Present	40	74.1
	Absent	12	22.2

Table 6: Treatment on admission

	No(n=54)	%
Oral hypoglycaemic agents	12	22.2%
Insulin	42	77.8%

2. Effect on Pregnancy and Pregnancy Outcome:

Table 7: Mode of deliveries

	Diabetic (n=54)	
	No	%
Vaginal	28	51.9
Spontaneous	16	57.1
Induced	12	42.9
LSCS	26	48.1

3. Complications:

Table 8: Maternal Complications

Complications	No	%
PIH	10	18.5
Vulvo-vaginitis	8	14.8

Septicaemia	6	11.1
Wound gap	2	3.7
HELLP syndrome	2	3.7
Diabetic Ketoacidosis-Mortality	2	3.7

Table 9: Neonatal Outcome

Neonatal outcome	No (n=54)	%
Live birth	16	29.6
SB	2	3.8
Weight <2.5 Kg	14	25.9
Weight >2.5 Kg	10	18.5
NICU admission	8	14.8
Expired	4	7.4

Table 10: Neonatal Complications

Complications	No (n=54)	%
Prematurity	10	18.5
Hypoglycaemia	6	11.1
RDS	4	7.4
Congenital malformation	2	3.7
Neonatal Mortality	6	11.1

Management: Pre-conceptual Care⁷: The ADA has defined optimal pre-conceptual glucose control using insulin to include self monitors pre-prandial glucose levels of 70 to 100 mg/dL and postprandial values <140 mg/dL and <120 dL at 1 and 2 hours, respectively. Folate 400 microgram/day is given preconceptionally and during early pregnancy to decrease the risk of neural tube defects. Weight reduction is advised if obese. Symptoms of hypoglycemia are informed and need for immediate treatment is explained.

During Antenatal Period: Overtly diabetic women during early pregnancy are hospitalized to institute an individualized glucose control program and to provide education concerning the months of pregnancy.

Diet and Nutrition: ADA recommends a caloric intake of 30-35 kcal/kg, taken as three meals and three snacks daily. An ideal dietary composition is 55% carbohydrate, 20% protein, and 25% fat with less than 10% as saturated fat diet rich in fiber and low in glycaemic index has been advocated.

Exercise: Physical activity during pregnancy reduces risk of GDM. Light exercise in the form of brisk walking especially after a meal reduces postprandial glucose levels.

Medical Management: Insulin treatment⁸: Insulin therapy is usually recommended when standard dietary management does not consistently maintain fasting plasma glucose at <95 mg/dL or 2-hour postprandial plasma glucose <120mg/dL as per ACOG. Maternal glyceic control can usually be achieved with multiple daily insulin injections and adjustment of dietary intake.

Insulin Management during Labor and Delivery:

- Usual dose of intermediate acting insulin is given at bedtime.
- Morning dose of insulin is withheld.
- Intravenous infusion of normal saline is begun.
- Once active labor begins or glucose levels decrease to <70mg/dl, the infusion is changed from saline to 5-percent dextrose and delivered at a rate of 100-150ml/hr to achieve a glucose level of approximately 100mg/dl.
- Glucose levels are checked hourly using a bedside meter allowing for adjustment in the insulin or glucose infusion rate.
- Regular (short-acting) insulin is administered by intravenous infusion at a rate of 1.25U/hr if glucose levels exceed 100mg/dl.

Oral Hypoglycemic Agents: The ACOG acknowledges that both Glyburide and Metformin are appropriate as is insulin for first line glycaemic control in women with gestational diabetes.

Obstetrical Management:

- Frequent antenatal checkups: Every monthly up to 20 weeks, then every 2 weekly upto 32 weeks and then weekly till delivery.
- Routine first (11-13weeks) and second trimester anomaly scan (18-20 weeks) and USG every 4 weeks after 32 weeks.
- Daily Fetal Movement count from 32 weeks onwards. NST once weekly from 32 weeks onwards & twice weekly after 36 weeks.
- Induction after 38 weeks if spontaneous labour does not start
- CS for obstetric indications or macrosomia

Postpartum Advice: OGTT 6-12 weeks postpartum and every 3 yearly thereafter if there is normal postpartum glucose screening.

Contraception: Because of risk of vascular disease, hormonal contraceptives are not recommended.

Intrauterine device (IUCD) is the method of choice for contraception. Barrier contraception or if the family is complete methods of sterilization is also advised.

Discussion: During this study, the risk factors of diabetes in pregnancy, their effect on pregnancy and pregnancy outcome and the complications of diabetes were studied. Pregnancy with diabetes was more common in younger age group, has a strong association with family history (77.8%). Majority of these patients were primi para (40.7%)

On admission, majority of the patients had a random blood sugar level between 141-180. Ultrasound on admission showed polyhydramnios and 22.2% fetuses on ultrasound showed intra uterine death. 77.8% of patients were given insulin and had controlled blood sugar level with the same.

Gestational diabetes was associated with an increased incidence of cesarean delivery (48.1%) 10 patients also developed associated pre-eclampsia, 8 patients developed vulvovaginitis, 6 patients developed septicemia, and 2 patients developed diabetic ketoacidosis. Thus, gestational diabetes is associated with high maternal morbidity and mortality.

25.9% of neonates were low birth weight, 14.8% of neonates were admitted in neonatal intensive care unit. Therefore, neonates of diabetic mothers are at an increased risk of prematurity and respiratory distress syndrome.

The above results suggest that good glycemic control is essential in gestational diabetes to improve maternal and neonatal outcome.

Conclusion: Pre pregnancy counselling⁹ in patients with pre-gestational diabetes with good glycemic control can reduce congenital malformations in diabetes patients. Educating the patients about regular antenatal care and proper monitoring of blood glucose level are important measures to reduce maternal and fetal - neonatal morbidity and mortality.

Universal screening and management by a team approach comprising of an obstetrician, diabetologist anesthetist, physician and neonatologist can avoid fetal- neonatal- maternal morbidity and mortality associated with pregnancy with diabetes.

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