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Original Research Article

Study of Management of Diabetes in Pregnancy in South Karnataka Population

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Abstract:

Background: The risk factors for GDM are high BMI, nutritional intake, long-term use of contraceptives, physical inactivity, and hyperthyroidism. If not managed meticulously, it may cause morbidity and mortality for both mothers and newborns.

Method: 54 diabetic pregnant women were studied with classifying first trimester pregnancy, second trimester pregnancy, and third trimester pregnancy – HbA_1C BUN_1 TSH, Urine protein to creatinine ratio, USG, with different intervals to assess the viability and fetal umbilical Doppler for fetal movements.

Results: 22 (40.7%) had pre-existing diabetes, 32 (59.2%) had GDM. The types of pregnancy were 19 (35.1%) multigravida, 35 (64.8%) primi gravida. The types of delivery were 35 (64.8%) had LSCS, 19 (35.1%) had spontaneous vaginal delivery, 2 (3.7%) hydrocephalus, congenital heart anomalies, still births and macrosomia were studied.

Conclusion: The present pragmatic study will be helpful to obstetricians and gynecologists to treat such patients efficiently to avoid morbidity and mortality in mother and fetus.

Keywords: Gestational And Diabetes, Pre-Existing Diabetes, Fetal Outcome, Maternal Outcome, HbA_1C.

Introduction

Gestational diabetes mellitus (GDM) is defined as glucose intolerance of variable degree with onset or first recognition during pregnancy [1]. This condition is associated with persistent metabolic dysfunction in women [2]. Infants of mothers with pre-existing diabetes mellitus experience double the risk of serious injury at birth, triple the likelihood of cesarian delivery and an abnormal fetus and has to be admitted to the newborn intensive care unit (NICU) [3].Risk factors for GDM include high BMI, nutritional intake, long-term contraceptive use, physical inactivity, and hyperthyroidism [4]. The majority of females with pregnancies are unaware of their lethal outcomes; hence, an attempt is made to evaluate pre-existing and gestational diabetes and their outcomes.

Material and Method

54 (fifty four) pregnant diabetic women regularly visiting the obstetrics and gynecology departments of Srinivas Institute of Medical Sciences and research center Mukka, Surathkal, Mangaluru-574146 were studied.

Inclusive Criteria: Preexisting type-I or type-II diabetes mellitus and gestation diabetes. The patient who gave their consent in writing for study were selected for study.

Exclusion Criteria: The patients associated with cardiovascular disease who had undergone cardiac surgery and HIV-positive pregnant women were excluded from the study.

Method: The post-diagnostic testing included.

A. In first trimester pregnancy: Laboratory studies were HbA_1C, BUN (blood urea nitrogen) Sr. creatinine, TSH, urine protein to creatinine ratio, and blood sugar levels.

B. In the second trimester of pregnancy, laboratory tests were urine-protein to creatinine, study in women with elevated values in the first trimester is repeated, HbA_1C and Ultrasonography are done.

1. First trimester for assessment of pregnancy dating (EDD) and viability.
2. Second trimester- anomaly scan to rule out anomalies and echo cardiogram of fetus in case of elevated maternal blood glucose levels in the first trimester.

3. In the third trimester to assess the fetal size, every four weeks from 26-36 weeks in women with pre-existing diabetes and USG for assessment of fetal size at least once in 36-37 weeks for women with GDM.

Apart from this, dietary therapy is to avoid single large meals and foods with a large percentage of simple carbohydrates and advise taking complex carbohydrates with cellulose. Insulin was given to achieve glucose profiles similar to those of non-diabetic pregnant women, and glyburide and metformin were also used. Although insulin is an efficient and safe drug during pregnancy, quite effective and least harmful to the fetus has been observed, long-term adverse effects are not known. Fetal heart rate and fetal movements were assessed by USG and fetal umbilical Doppler. The duration of the study was February 2022 to January 2023.

Statistical analyses: Various evaluations were classified with percentages. The statistical study was done in SPSS software.

Observation and Results

Table 1: Study of types of diabetes in pregnant women 22 (40.7%) had preexisting (type-I or type-II), and 32 (59.2%) had gestational diabetes.

Table 2: Study of pregnancy in diabetes 19 (35.1%) were multigravida, 35 (64.8%) were primi gravida.

Table 3: Study of deliveries in diabetic women: 35 (64.8%) had a lower segment caesarean section, and 19 (35.1%) had spontaneous vaginal delivery.

Table 4: Comparison of neonate/fetal complications in GDM and pre-existing diabetes

- Still births 1 (1.85%) in GDM, 2 (3.7%) in pre-existing
- Intrapartum death 1 (1.85%) in GDM, 1 (1.85%) in pre-existing.
- Shoulder dystocia: 1 (1.85%) in pre-existing
- Hydrocephalus 1 (1.85%) in GDM, 2 (3.7%) in pre-existing.
- Congenital heart anomalies were 1 (1.85%) in GDM, 2 (3.7%) in pre-existing,
- Marcosomia 1 (1.85%) in GDM, 2 (3.7%) in pre-existing.
- Jaundice 1 (1.85%) pre-existing.

Table 1: Study of types of Diabetes in Pregnant women

Sl. No	Type of Diabetes	No. of Patients (54)	Percentage (%)
1	Pre-existing Diabetes (type-I or type-II)	22	40.7
2	Gestational Diabetes	32	59.2

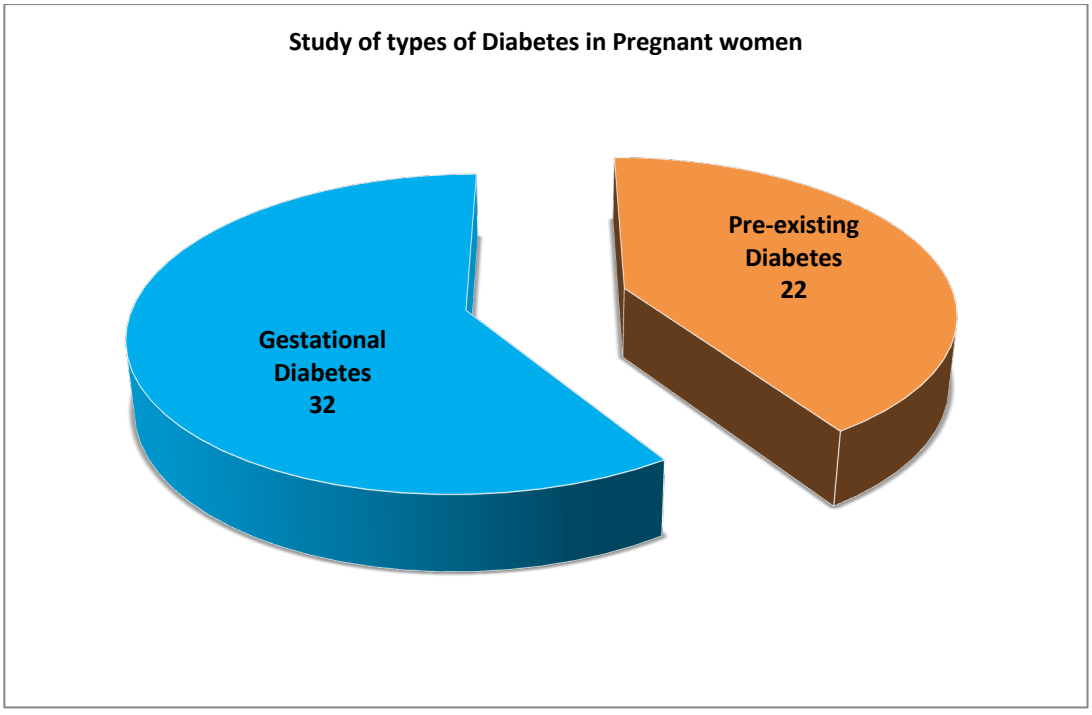

Figure 1: Study of types of Diabetes in Pregnant women

Table 2: Study of Pregnancy in Diabetes

Sl. No	Types of Pregnancy	No. of Patients (54)	Percentage (%)
1	Multi gravida	19	35.1
2	Primi gravida	35	64.8

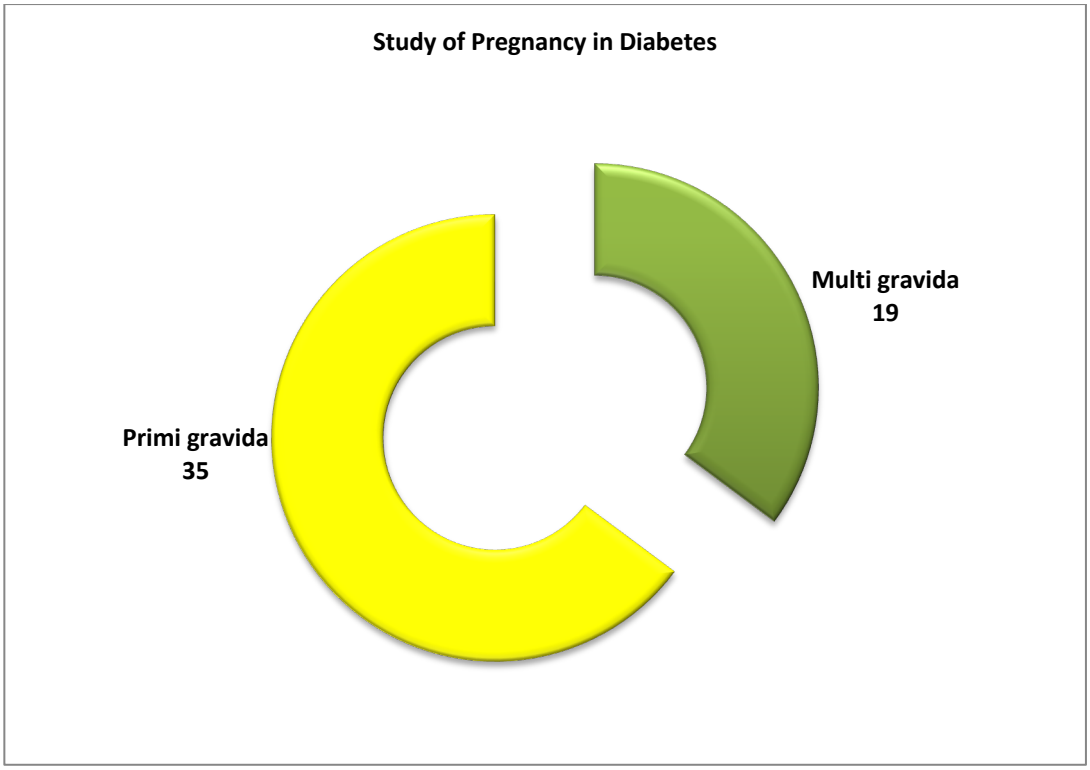

Figure 2: Study of Pregnancy in Diabetes

Table 3: Study of type of Deliveries in Diabetic women

Sl. No	Particular	No. of patients (54)	Percentage (%)
1	Lower segment caesarean section	35	64.8
2	Spontaneous Vaginal delivery	19	35.1

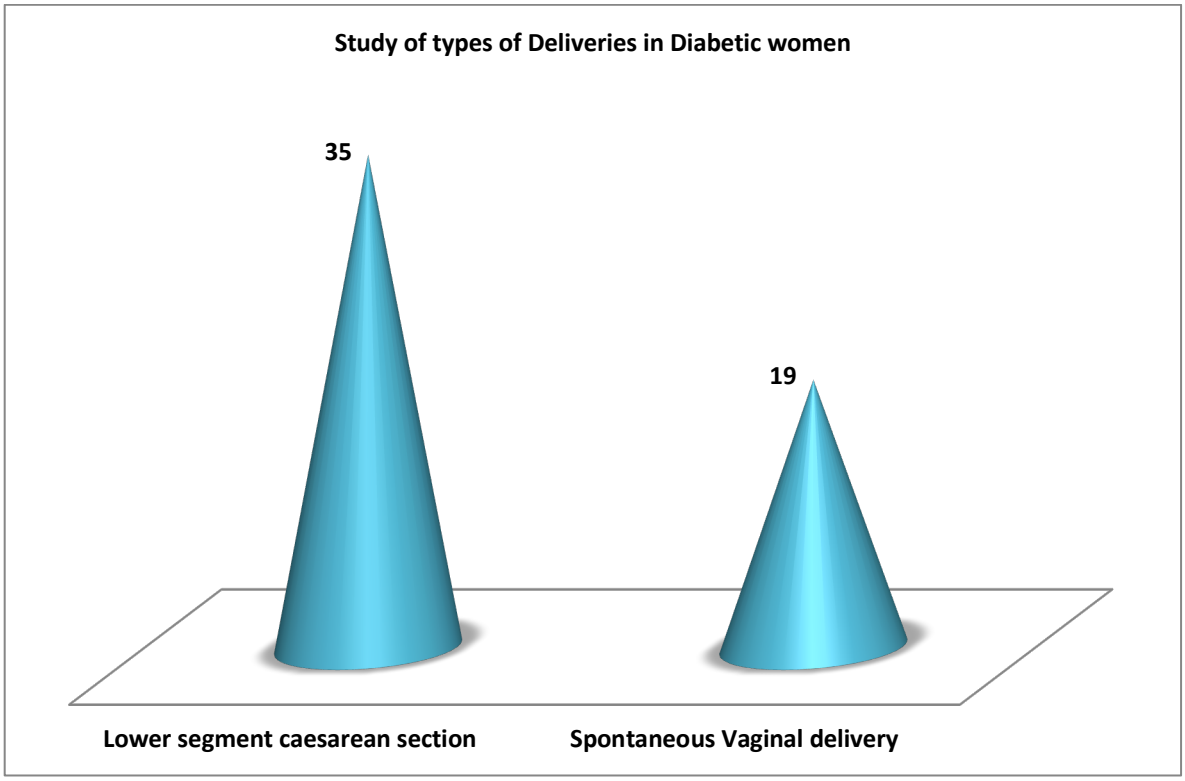

Figure 3: Study of types of Deliveries in Diabetic women

Table 4: Comparison of Neonatal fetal complication in GDM and pre existing Diabetes

Sl. No	Complications	GDM		Pre-existence	
		Incidence	Percentage	Incidence	Percentage
1	Still Birth	1	1.85	2	3.7
2	Intra partum Death	1	1.85	1	1.85
3	Shoulder Dystocia	-	-	1	1.85
4	Hydrocephalus	1	1.85	2	3.7
5	Congenital heart anomaly	1	1.85	2	5.7
6	Marcosomia	1	1.85	2	3.7
7	Jaundice	-	-	1	1.85

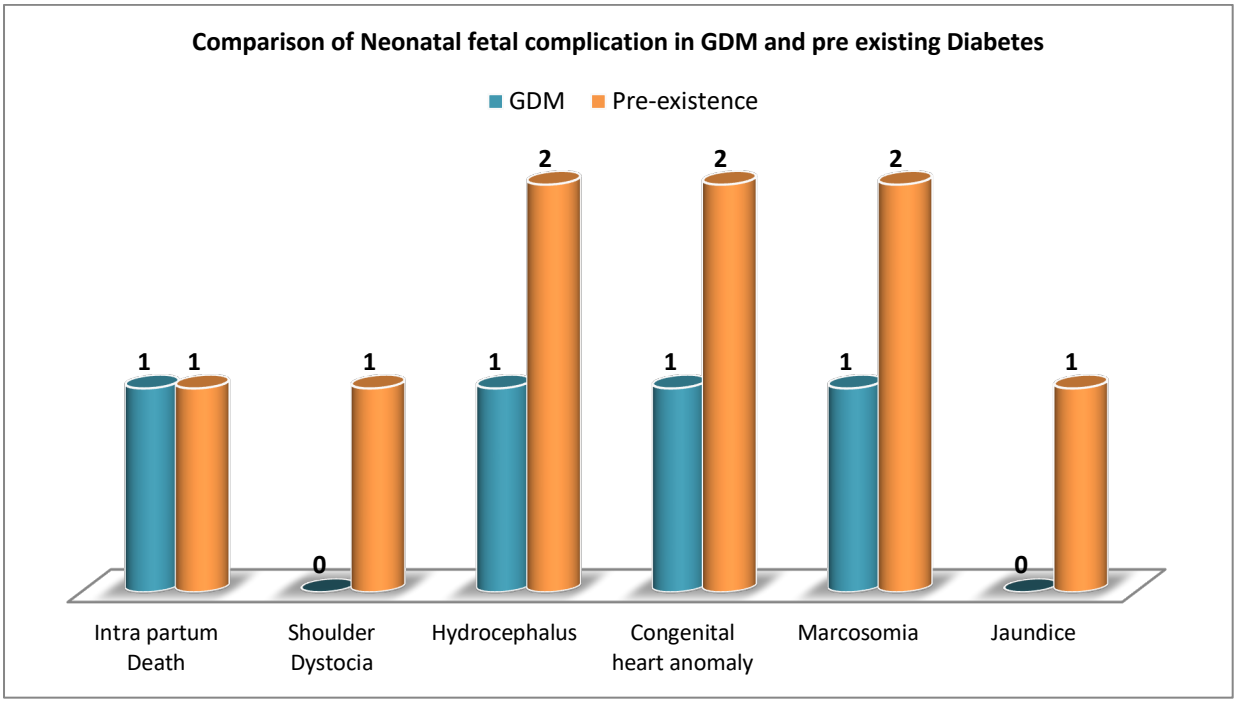

Figure 4: Comparison of Neonatal fetal complication in GDM and pre existing Diabetes

Discussion

Present study of management of diabetes in pregnancy: 22 (40.7%) had pre-existing, 32 (59.2%) in GDM (Table 1). Types of pregnancy were 19 (35.1%) were multigravida, and 35 (64.8%) were primi gravida (Table 2). Types of delivery were 35 (64.8%) had LSCS, and 19 (35.1%) were spontaneous vaginal delivery (Table 3).

The comparison of neo-natal or fetal complications in GDM and pre-existing diabetes 2 (3.7%) still birth, hydrocephalus congenital heart anamolies microsomia 1 (1.85%) were observed in pre-existing diabetes pregnancy, while 1 (1.85%) complications were observed in GDM (Table 4). These findings are more or less in agreement with previous studies [5,6,7].

In type-I diabetes diagnosed during pregnancy most often presents with unexpected coma. Early pregnancy may provoke diet and glycemic control instability in patients with occult diabetes. Though it is rare but life-threatening [8], in type II D.M., a mother experiences double the risk of serious injury at birth, triple the likelihood of caesarean delivery, and needs to be admitted to the NICU (newborn intensive care unit).

Gestational diabetes accounts for 90% of cases of pregnancy, while pre-existing type-2 accounts for 8% of cases [9]. It was also observed that increased risk of diabetic embryopathy leads to anencephaly, microcephaly, congenital heart disease, and even spontaneous abortion. Hence there must be regular follow-up in elevation in HbA1C values [10].

Diabetic management in pregnancy: HbA1C, thyroid stimulation hormone, creatinine, urine albumin to creatinine ratio testing, review of medication list for potentially teratogenic drugs (i.e., ACE inhibitors, statins). It may also cause intrauterine fetal demise, neonatal hypoglycemia, and neonatal hyperbilirubinemia [11].

It is an established fact that in hyperglycemias the blood has more viscosity. This viscosity retards or affects the proper blood flow; hence, there will not be sufficient blood flow in the micro- and macro-circulation of blood, which causes multiple pathophysiological hazards as mentioned earlier (Table 5). Moreover, hyperglycemic blood mainly acts

upon cardio-vascular (maternal) and growing fetuses, and a meticulous and regular check of blood glucose is necessary to prevent morbidity and morbidity in both mother and fetus.

Summary and Conclusion

Present study of management of diabetes in pregnancy among south Karnataka population. The HbA_1C level was remarkably high in the pre-existing diabetes group rather than the GDM group. Insulin is a drug of choice in diabetic pregnancy, which reduces both maternal and fetal complications. Hence, insulin administration is advised for such patients. But this study demands further nutritional, genetic, and hormonal study because the exact mechanism of insulin crossing the placenta barrier is still unclear.

Limitation of Study:

Owing to the tertiary location of the research center, the small number of patients, and the lack of the latest techniques, we have limited findings and results.

This research work was approved by the Ethical Committee of Srinivas Institute of Medical Sciences and research center Mukka, Surathkal, Mangaluru-574146.

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