

# A Six Year Review of the Outcome of Pregnancy in Diabetic Patients in Irrua Specialist Teaching Hospital, Irrua, Nigeria

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**Abstract:** Diabetes mellitus is a common medical condition complicating pregnancy with poor outcome. Early diagnosis and proper blood glucose control may reduce complications. The incidence and outcomes of the disease in Irrua is not known. The aim of this study is to determine the incidence and outcomes of diabetes mellitus complicating pregnancy in Irrua. We carried out a six year retrospective review of the demographic characteristics of the patients, parity, clinical and booking status, number of hospital admissions for blood sugar control and pregnancy outcome of diabetes mellitus complicating pregnancy in Irrua Specialist Teaching Hospital, Irrua between January 1, 2000 and December 31, 2005. Data collected were analysed using SPSS window version 20.0 statistical package. In the study period, there were 5,460 pregnant women who booked for antenatal care in the hospital, out of these, 2,765 attended the antenatal carefully and eventually delivered in the hospital and 30 of them whose pregnancies were complicated with diabetes mellitus were studied. The incidence of diabetes mellitus complicating pregnancy in this study is 10.85 pregnancies per 1000 births. The mean age of the patients was 33 years. Multipara were affected in 62% of cases. Gestational diabetes predominated in 66.7% of cases. There were family history of diabetes in 73.3% of cases. All patients had both dietary and insulin therapy throughout antenatal period. Majority of the patients were admitted for blood glucose control once. Majority of the patients (76.6%) had vaginal deliveries while 23.3% had caesarian deliveries due to fetal and maternal complications. Over 73% of the patients delivered at term. The outcome of pregnancy was poor. The incidence of diabetes mellitus complicating pregnancy in Irrua is 10.85 pregnancies per 1000 births, this is high with relatively poor outcome. Preconceptional counseling, deliberate blood glucose tolerance testing and adequate blood glucose control in pregnancy is recommended.

**Keywords:** Pregnancy, Diabetes Mellitus, Gestational Diabetes, Management, Outcome, Irrua, Nigeria

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## 1. Introduction

Diabetes mellitus implies a relative or absolute insulin deficiency resulting in hyperglycaemia and glycosuria [1]. It is a common medical condition complicating pregnancy. Diabetes mellitus affects 1-3 pregnancies per 1,000 births [2].

Before the discovery of insulin in 1921 by Banting and Best in Toronto, diabetic women suffered from infertility and the few women achieving pregnancy faced a dismal prognosis [3]. Maternal death was a real threat and perinatal mortality was as high as 40-60% [4]. Following the introduction of insulin, the incidence of pregnancy in

diabetics rose steadily and maternal mortality fell dramatically, although fetal loss remained high. By the 1950s, perinatal mortality rate had fallen to 25% and even further to 10-15% in the later decade [5] and maternal mortality had fallen from 40% to less than 2% [3].

The incidence of diabetes mellitus complicating pregnancy varies from place to place. In America, it is 2.3%, [5] while it is approximately 3.4 per 1000 pregnancies in the United Kingdom [3, 6]. Diajomaoh and Wokoma reported the incidence of 0.13% and 2.98% in Benin and Port Harcourt respectively [7, 8]. Kinear and Owusu attested to the low

incidence of diabetes mellitus in pregnancy in Nigeria [9] and Ghana [10] respectively.

Pregnant women with diabetes mellitus are separated into those who were known to have diabetes before pregnancy (chronic diabetes) and those diagnosed during pregnancy (gestational diabetes). Gestational diabetes mellitus constitutes 90% of all pregnancies complicated by diabetes [4].

Risk factors or developing gestational diabetes include maternal obesity, maternal age over 30 years, previous history of macrosomic neonate, previous history of unexplained intrauterine fetal death, family history of diabetes among first degree relatives and previous history of congenital malformed babies [11]. The actual prevalence of gestational diabetes in Nigeria in antenatal population is not known. This is because previous studies of the problems of pregnancy and diabetes in parts of Nigeria failed to distinguish between gestational diabetes mellitus and pregnancy occurring in chronic diabetics [11]. However, Wokoma reported the prevalence of 2.98 per 1000 pregnancies which is within the global range of 0.15-3.0% [8].

Pregnancy complicated by diabetes mellitus is a high-risk pregnancy with significant consequences for mother and the fetus. Likewise, pregnancy affects normal carbohydrate metabolism. This is because there is a state of insulin resistance caused by increasing pregnancy hormones. Poor blood glucose control increases the incidence of maternal and fetal complication and is the single most important factor that determines the outcome of the pregnancy. The maternal complications include polyhydramnios, pre-eclampsia, urinary tract infection and preterm labour. With adequate control, these complications are minimized. Fetal complications include increased spontaneous abortion, congenital abnormalities, hypoglycaemia and polycythemia [12]. The infants of the diabetic mothers are also at risk of respiratory distress syndrome, hypocalcaemia and hyperbilirubinaemia.

The aim of the treatment is to maintain pre-prandial plasma glucose concentration between 4 and 6 mmol/l around the time of conception which reduces the incidence of congenital malformation [13].

There has been no study on pregnancy outcome in diabetic patients at ISTH, Irrua Edo State. The study was therefore designed to document the outcome of pregnancy in diabetic patients in our centre.

## 2. Objectives

- 1) To determine the incidence of diabetes mellitus amongst pregnant women in ISTH, Irrua.
- 2) To determine the characteristics of the patients-age, parity, booking and clinical status and family history of diabetes mellitus.
- 3) To determine pregnancy outcome in diabetic patients in ISTH, Irrua.

## 3. Methods

All cases of pregnancy complicated with diabetes mellitus managed at ISTH, Irrua between January 1, 2000 and December 31, 2005 were reviewed from the medical record department of the hospital. The number of pregnant women who booked, attended the antenatal carefully and eventually delivered in the hospital during the 6 years study period were analyzed and the number that were diabetic among them were recruited for the study. A blood sugar level of 10 mmol/l and above was diagnostic using oral glucose tolerance test (OGTT).

Excluded from the study were:

- 1) Those who booked but did not attend the antenatal care in the hospital,
- 2) Those who attended the antenatal care but did not deliver in the hospital,
- 3) Those who did not book or attend antenatal care but just came to deliver in the hospital and
- 4) Those who partly defaulted from antenatal care attendance but eventually came to deliver in the hospital.

The recruited cases include both overt and gestational diabetic patients. The diagnoses were made from the family history, past obstetric history and blood sugar tests. All the patients had both insulin and dietary treatment. The Information on age, parity, clinical, and booking status, number of hospital admissions for blood sugar control and pregnancy outcome were analyzed using SPSS window version 20.0 statistical package (IBM Corp. Released 2011. IBM SPSS Statistics for windows, version 20.0 Armonk, NY: IBM Corp).

## 4. Results

In the study period, there were 5,460 pregnant women who booked for antenatal care in the hospital; out of these, 2,765 attended the antenatal carefully and eventually delivered in the hospital and 30 of them whose pregnancies were complicated with diabetes mellitus were studied. The incidence of diabetes mellitus in this study is 10.85 pregnancies per 1,000 births.

The clinical status of the patients shows that majority 20 (66.7%) had gestational diabetes while the remaining 10 (33.3%) were known diabetics.

From the family history of the patients, twenty-two (73.3%) of the patients had a positive family history of diabetes mellitus, while 8 (26.7%) did not.

The age distribution of the patients is shown in Figure 1. The mean age was 33 years with the range of 28-41 years. Their age were between 31-35 years. One patient was 41 years of age, which represents 3.3%.

Figure 2 shows the parity distribution. Majority 18 (62%) of the primi (4) patients were multipara while nulliparous patient were 2, which represent 6.7% of the patients.

Figure 3 shows the number of antenatal admission for blood glucose control. Fifteen (50%) of the patients were admitted once, nine (30%) were admitted twice and one

(3.3%) did not require hospital admission.

Majority 23 (76.7%) of the patients had vaginal deliveries while 7 (23.3%) had caesarean sections.

Gestational age at delivery is shown in figure 3. Majority

22 (73.3%) of the patients delivered at term, preterm deliveries were 3 (10%) and 2 (6.7%) of the patient had spontaneous abortion.

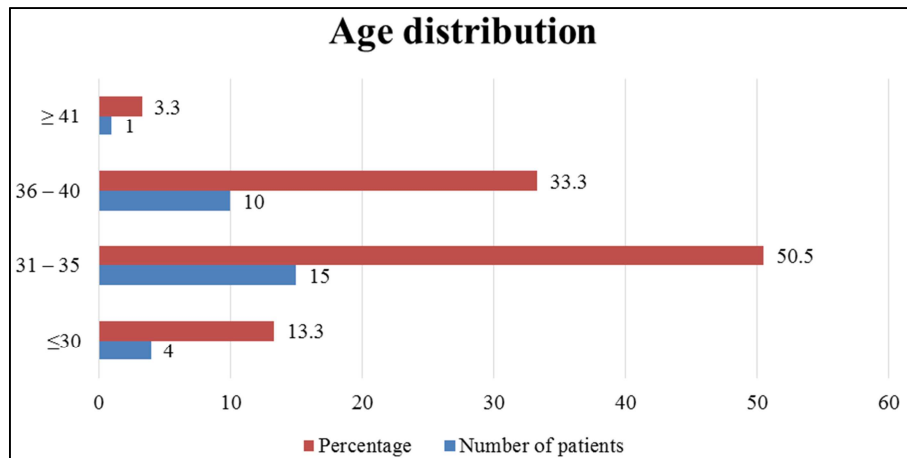


Figure 1. Age distribution.

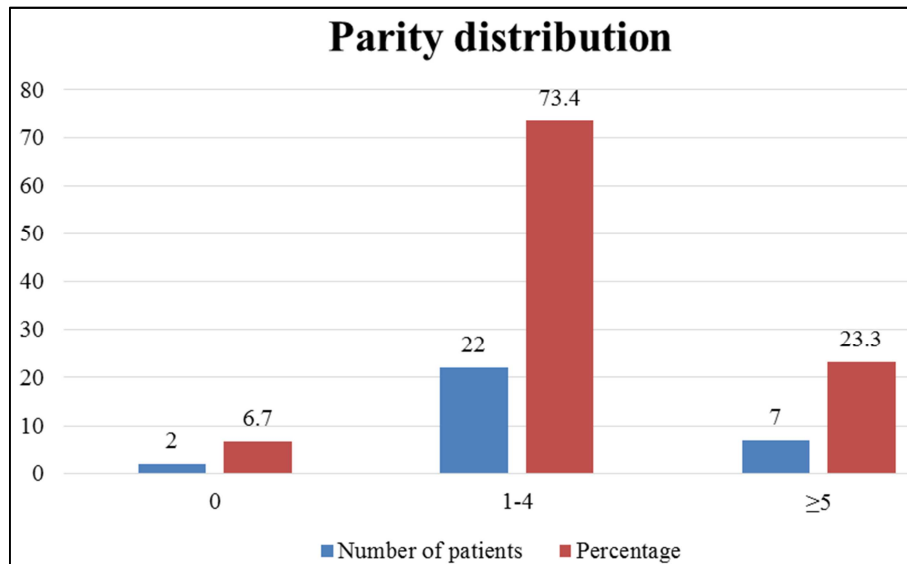


Figure 2. Parity distribution.

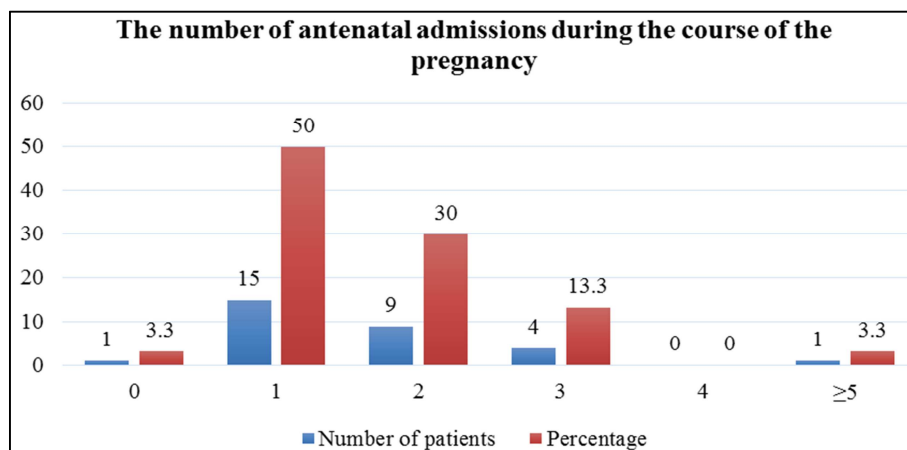


Figure 3. The number of antenatal admissions during the course of the pregnancy.

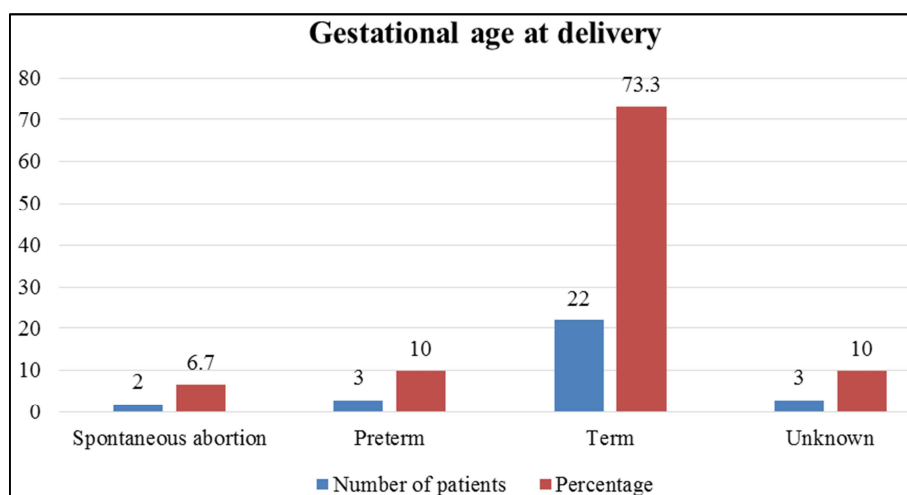


Figure 4. Gestational age at delivery.

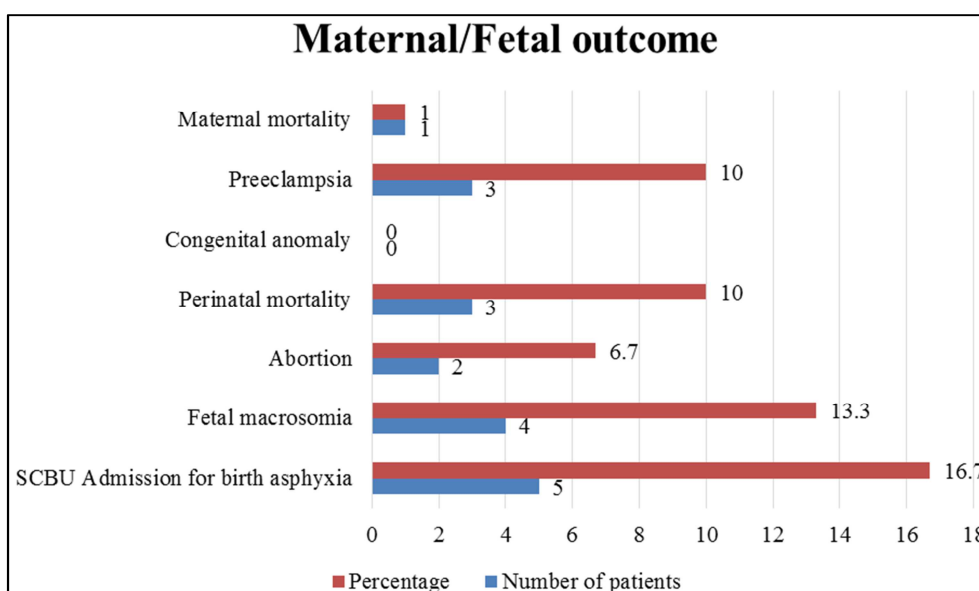


Figure 5. Maternal/Fetal outcome.

Figure 5 shows the outcome of the pregnancy. Five (16.7%) had birth asphyxia necessitating admission in special care baby unit (SCBU); while 4 (13.3%) of the babies were macrosomic (weight > 4.0kg). Perinatal mortality was 3 (10%) due to neonatal sepsis and Intra-uterine fetal death. Pre-eclampsia accounted for 3 (10%). There was one (3.3%) maternal mortality due to diabetic keto acidosis.

## 5. Discussions

In this study, diabetes mellitus affected 10.85 pregnancies per 1000 births in ISTH, Irrua. The incidence is higher than the global incidence of 1-3 pregnancies per 1000 births, [1] and the incidence of 2.98 pregnancies per 1000 births reported in Port Harcourt [8].

The mean age of the patients was 33 years with the range of 28-41 years. This is in keeping with mean maternal age of 31 years reported in other studies [1, 8]. Advanced maternal age is a risk factor for developing diabetes mellitus in

pregnancies [11, 14]. Other risk factors include maternal obesity (maternal wt > 90kg), previous history of gestational diabetes, previous history of fetal macrosomia, glycosuria on two or more occasions and family history of diabetes mellitus [4].

In keeping with other studies, [1, 11] diabetes in pregnancy is a common finding among the multipara accounting for 62% of cases in this review. The predominance of gestational diabetes of 66.7% in this review is in agreement with other studies [1, 12].

The majority (73.3%) of the patients had a positive family history of diabetes mellitus. This is in agreement with other studies [8, 11] as positive family history is a known risk factor for developing diabetes in pregnancy.

In this review, 50% of the patients were admitted once into the hospital for blood glucose control, while 30% were admitted twice. However, one patient did not have the need for hospital admission. She presented in spontaneous labour at term and had vagina delivery. All the patients in this study

had both dietary and insulin therapy throughout the antenatal period. Oral hypoglycemic agents were not used, since they cause neonatal hypoglycemia and some may be teratogenic [3].

Majority (76.6%) of the patient in this review had vaginal deliveries while 23.3% had caesarean section. The indications for the caesarean section include fetal distress, fetal macrosomia (estimated fetal weight of > 4kg), antepartum hemorrhage due to placenta praevia, two previous caesarean sections and abnormal presentation (breech). The caesarean section rate of 23.3% in this review is high compared to 10% reported in other study [8].

In this review, majority (78.3%) of the patient delivered at term and 10% had preterm deliveries. The preterm deliveries were due to poor maternal plasma glucose control, fetal distress and pre-eclampsia. The figure agrees with other studies [8, 15].

The complications observed in this study include birth asphyxia necessitating admission into the special care baby unit (SCBU), which accounted for 16.7%. This is not surprising as there is a well-established relationship between maternal diabetes and neonatal respiratory distress syndrome [16, 17]. Various explanations for this effect have been put forward such as comparative immaturity of the baby at birth, an enhanced effect of birth asphyxia and higher incidence of delivery by caesarean section [4].

Fetal macrosomia (fetal weight  $\geq$  4.0kg) accounted for 13.3% in this study. This is probably due to poor glucose control. There was no case of intrauterine growth restriction, as placental function does not seem to be compromised in diabetic patient unless hypertension or vascular complication is present [4].

About 10% of the patients had pre-eclampsia. This is comparable to other study [6] but this is lower than 26.7% reported in Port Harcourt Teaching Hospital [8].

In this study 6.7% of the patients had mid trimester abortion and intra-uterine fetal death respectively. This agrees with the report in other study [8]. Unexplained fetal deaths are mostly due to ketoacidosis in the fetus [3].

No congenital abnormality was observed or recorded in this study, in spite of the reported 10-fold increase risk of congenital malformation among diabetics [18]. This finding may be as a result of our policy on pre-conceptional counselling and proper blood glucose control in diabetics, or difficulties in the diagnosis of congenital malformation in the few macerated stillbirths.

## 6. Conclusions

In conclusion, the incidence of diabetes complicating pregnancy in ISTH, Irrua is 10.85 pregnancies per 1000 births. The outcome of pregnancy in this study is still poor compared to the general population, despite the availability of insulin therapy. Preconceptional counselling for known diabetics and proper blood glucose control will go a long way to improve the outcome of pregnancy in diabetics.

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