Original Article

Complications in Pregnancy and Foetal Outcomes in Gestational Diabetes – An Observational Study in a Tertiary Hospital in Nigeria

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Abstract

Background: A retrospective cohort study to compare the pregnancy complications and foetal outcomes in pregnancies complicated by diabetes mellitus. **Subjects and Methods:** One hundred and eighty five diabetic pregnant patients who delivered at the Department of Obstetric & Gynecology, University of Nigeria, Nsukka. during the 3-year-period formed the subjects of this study. There were 27(14.6%) (type 1) - insulin dependent diabetics, group 1, 19 (10.2%)(type 2), non insulin dependent diabetic patients who constituted group 2 and 139(75.2 %) gestational diabetic patients who made up group 3. Data extracted from the case files included maternal age, gravidity, parity , number of abortions, gestational age at booking, time of diagnosis of diabetes mellitus, complications during pregnancy, birth weight, placental weight. **Results:** There were no statistically significant differences in the three groups regarding the mean gravidity, parity, birth weight and placental weight ($p>0.05$). However, statistically significant differences were found with respect to the mean maternal age, gestation at booking, fasting blood sugar, and gestation at delivery ($p<0.05$). Out of 139 gestational diabetics, 23(16.5 %) were diagnosed by the 14" week of pregnancy while 24(17.2 %) were diagnosed between the 15- 27 weeks of gestation. The control of blood sugar was adjudged to be poor in 32% of gestational diabetics, 50% of type 2 diabetics and 69 % of type I diabetics, with statistically significant difference between the groups, ($p<0.05$). Although there was statistically significant difference between the groups regarding one of the pregnancy compli- cations(polyhydramnios) ($p<0.05$), none were found in other complications ($p>0.05$). The overall caesarean section rate was 48%. The overall perinatal mortality was 5.7%, all the deaths occurred in babies born to patients with gestational diabetes. **Conclusion:** Gestational diabetes accounted for all the fetal losses in this study, while polyhydramnios was the most common antenatal complication which was significantly higher in type 1 diabetics.

Keywords: Pregnancy, Gestational diabetes, Antenatal complications, Foetal outcomes.

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Introduction

One of the targets set was to improve the pregnancy outcome in women with diabetes, so that the risks of complications approached those of the non-pregnant population.' The strategies to achieve these targets include attempts to improve uptake of pre- pregnancy counseling, wider use of meters for home blood glucose monitoring and the development of specific treatment guidelines'.[1,2]
However, study showed dismal and disappointing pregnancy outcomes in diabetic women within the UK where the level of awareness is near optimal and multidisciplinary approach to the management of these women is the norm. Other reports' reiterated that in women with diabetes that predates pregnancy, strict metabolic control started before pregnancy is beneficial in reducing pregnancy complications.[3-5]
Gestational diabetes however is a heterogeneous entity and includes women with previously undiagnosed diabetes and those with pregnancy -induced glucose intolerance.6 It has been reported>° that between 40%-66% of cases of the presumed gestational diabetes could be detected during early pregnancy. This study aimed at comparing the pregnancy complications and perinatal outcomes in pre-gestational diabetic women with those whose diabetes was diagnosed during pregnancy, and therefore labeled as gestational diabetes.

Subjects and Methods

The hospital records of all pregnant patients with diabetes who had their delivery conducted at the Department of Medicine, University of Nigeria, Nsukka for the period of 2 years were retrieved from the labour ward delivery book. There were a total number of 12195 deliveries during the study period out of which 185 (1.51%) were from diabetic mothers. Data extracted from the case records included maternal age, gravidity, parity, number of abortions, booking status, type of diabetes, type of treatment during pregnancy, fasting blood sugar and post prandial blood sugar. Other data were complications during pregnancy, gestational age at delivery, mode of delivery, birth weight, placental weight, Apgar score at 5 minutes and perinatal outcomes. The data were coded, tabulated and entered into an IMB compatible

computer. Statistical analyses were carried out using the Statistical Package for Social Sciences (SPSS) v10. Simple ANOVA test was used to compare means of quantitative variables while the chi-square test was used for qualitative data. The level of significance was set at 0.05%

They were 185 women in all made up of 27 (14.6%) patients with insulin dependent diabetes mellitus (IDDM)- (group 1), 19(10.2%) women with non-insulin dependent diabetes-(NIDDM) (group 2) and 139 (75.2%) gestational diabetes(GD) women-(group 3). Booked patients were managed by both the diabetologist and the obstetrician during the pregnancy. At the booking antenatal clinic, all patients with random blood sugar of >140m¢/dl were subjected to a 75 gm oral glucose tolerance test (OGGT).Gestational diet alone or a combination of diet and insulin. Patients who were already on insulin before pregnancy were automatically started on insulin while the non-insulin diabetics would have either diet alone or a combination of diet and insulin. The patients were regularly followed up at both antenatal and diabetic clinics and were admitted either for pregnancy complications or poor control of diabetes. Poor glycaemic control was based on blood sugar results which were done at the outpatient clinic and also patient's compliance to treatment and attendance at the antenatal clinic. The policy was to allow pregnancy continue to term and have a delivery conducted by the expected date of confinement (EDC) if there were no complications. Caesarean section was done for obstetrical indications only.

Results

The maternal characteristics and some fetal data are shown in [Figure 1]. There were no statistically significant differences between the groups regarding the mean parity, ma- ternal weight at booking, birth weight, placental weight and the post prandial blood sugar (p>0.05), However, statisti- cally significant differences were discovered in the mean maternal age, fasting blood sugar and gestation at delivery (p<0.05).

Polyhydramnios was the most common antenatal complication observed in 21 patients (11.3%) followed by pre-eclampsia (10.8%). Although there was statistically significant difference in the rate of polyhydramnios among the groups (p<0.05) none was found between the groups with respect to other pregnancy complications (p>0.05). Eighty three (60%) of the gestational diabetics were treated with diet as compared with 1 (3.7%) and 1(5.2%) of types 1 and 2 diabetics respectively (p=0.00). No statistically significant differences were found in the rates of induction of labour and caesarean section between the groups, (p>0.05). Neonatal morbidity and mortality are shown in Figure 2. Although the perinatal mortality was 57/1000 in the gestational diabetes group, no Statistically significant difference was found between the groups. Equally, no statistically significant difference was found in the babies from the mothers in the 3 groups with regards to low Apgar score (<7 at 5 mins). Ambiguous genitalia was the most common congenital mal-formation among the babies, 4 from the mothers with gestational diabetes, 2 from type 2 diabetics and none in type 1 diabetic group. No statistically significant difference was diabetes was considered if two or more values met or exceeded the following cutoff points: fasting, lO5mg/dL; Lhour, 190mg/dL;2hours, 165mg/dL; and 3 hours, 145mg¢/dL.

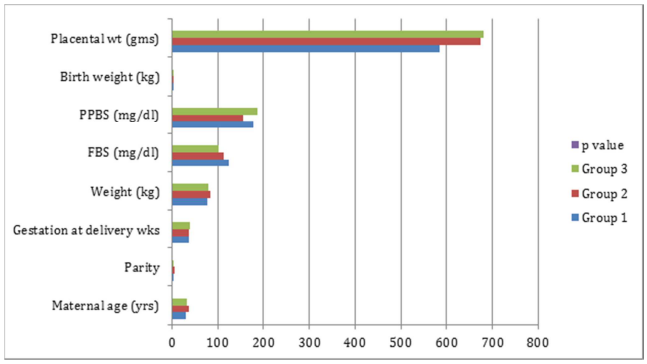

Figure 1: Maternal and fetal characteristics.

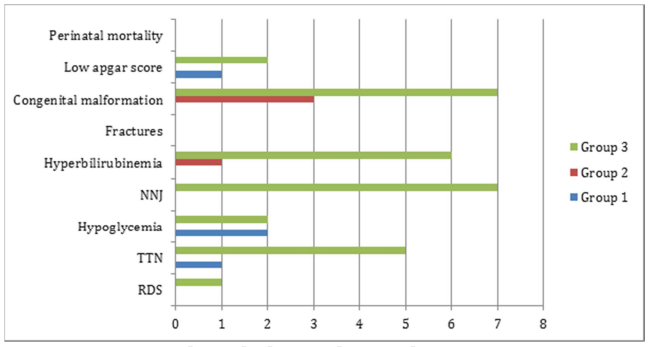

Figure 2: Perinatal morbidity and mortality.

Discussion

There is a continuing controversy amongst obstetricians regarding the benefit of routine screening for gestational diabetes. Although some authors found little evidence to support universal screening for glucose intolerance during pregnancy, others"? consider gestational diabetes to be a major public health problem associated with higher perinatal mortality and morbidity rates Recently, Brody et al!! in their systematic review concluded that there was very limited evidence regarding the potential adverse effects of screening for gestational diabetes. They showed that insulin treatment is probably only beneficial for women with severe degrees of hyperglycaemia in decreasing the incidence of macrosomia.[7-9]

In this study, about 42% of the gestatiorial diabetic patients received insulin while figures ranging {rom 34%- 86% have been reported by other authors.[10,11] It is therefore postulated that a more liberal attitude towards insuli11 treatment in gestational diabetic patients may go a long way reducing the complications during pregnancy. Our study showed that 23 patients (16.5%) of the GD were diagnosed in the first trimester while another 24 (17%) between 15-27weeks. In other reports however, 40%-60% of cases of GD were diagnosed during early pregnancy. It has been reported that women with early onset GD are at increased risk of perinatal deaths - and pregnancy complications'. In this study, 5 (52.5%) of the perinatal deaths occurred in babies whose mothers had GD diagnosed before 20 weeks of gestation.

The possibility exists however that some cases of early GD in this study were actually undiagnosed pregestational diabetes. Nevertheless, it has been shown that changes in carbohydrate homeostasis could start as early as 6 weeks of gestation.7°It is widely accepted that certain measures such as targeting early delivery, improved compliance, better glycaemic control during pregnancy and improved neonatal care are likely to contribute to improved pregnancy outcomes in diabetic patients. Notably, this excellent outcome was reported by some authors but this outcome is still far from the reach of many communities such as ours.[12] Regarding perinatal morbidity, although there was no statistically significant difference between the three groups, congenital malformation and neonatal jaundice were the most common problems amongst babies of gestational diabetic mothers. Platt et al' ,in their study found that the infants of women with type 1 diabetes had 6.4 times the reported risks of congenital malformations and 5.1 times the reported risks of perinatal mortality than infants in the general population. The overall caesarean section rate of 48% in this study falls within figures that have been quoted by other workers"?,[13] The high caesarean section rate in diabetic patients may be explained in part by the high incidence of macrosomia which could make vaginal delivery difficult. In this review, no statistically significant difference was found in the incidence of macrosomia and also in the rate of caesarean section between the groups studied.

Polyhydramnous was the most common antenatal complications in this review and there was statistically significant difference in the rates between the groups studied. This difference may be related to the difference in the mean fasting blood sugars. Nonetheless, it is difficult to explain why other antenatal complications did not reach levels of significance statistically. The overall control of blood sugars in this study was based on the mean fasting and post prandial levels, which showed a statistically significant difference between the groups. In theory therefore, we should have had significantly more complications in patients with type 1 diabetes, with presumably poorest control. It is obvious that estimation of blood sugar levels may not be the most accurate method of assessing adequate control of blood sugar during pregnancy. Therefore the estimation of glycosylated haemoglobin and or fructosamine which has been shown to correlate well with blood sugar control over a period of time should be available and offered to pregnant diabetic patients."[14] Jensen et al. showed that these complications were more common in gestational diabetic patients than non diabetics, it was suggested that tight glucose control during pregnancy would go a long way to reducing these antenatal complications."!

Conclusion

Our study has shown that in our community GM is a major contributor of perinatal mortality among diabetes pregnant, while polyhydramnios correlated well with the control of blood sugars in our patients patients.

References

1. Workshop Report: Diabetes care and research in Europe: The Saint Vincent declaration. Diabet Med 1990;19:360.
2. Jardine BC, Dawson A. The report of the pregnancy and neonatal care group. Diabet Med 1996;19: $43-S53.
3. Platt MJ, Stanisstreet IF, Casson CV. St Vincent's Declaration 10years on: outcomes of diabetic pregnancies. Diabet Med 2002;19 :216-220.
4. Goldman JA, Dicker D, Feldberg D, Yeshaya A. Pregnancy outcome in patients with insulin-dependent diabetes mellitus with preconceptional diabetic control: acom- parative study. Am J Obstet Gynecol. 1986; 155:293-297.
5. Meyer WSJ, Carbone J, Gauthier DW, Gottmann DA: Early gestational glucose screening and gestational diabetes. J Reprod Med 1996;41:675-679.
6. Super DM, Edelberg SC. Diagnosis of gestational diabetes in early pregnancy. Diabetes Care 1991;14:288-294,
7. Lucas MJ, Lowe TW, Bowe L, McIntire DD: Class Al gestational diabetes: a meaningful diagnosis? Obstet Gynecol 1993;82:260-5.
8. Hunter DS, Kierse MJ. Gestational diabetes. In : Chalmers I, Enkin M, Kierse MJ.,editors. Effective care in pregnancy and childbirth. New York: Oxford University Press;1991.p.403- 10.
9. Mills JL, Jovanovic L, Knopp R, Aarons J, Conley M, Park E, et al: Physiological reduction in fasting plasma glucose concen- tration in the first trimester of normal pregnancy: the diabetes in early pregnancy study. Metabolism 1998;47:1140-4.
10. Coustan DR: Management of gestational diabetes. Clin Obstet Gynecol 1991;34:558-64.
11. Brody SC, Harris R, Lohr K. Screening for gestational diabetes: a summary of the evidence for the U.U.Preventive Services Task Force. Obstet Gynecol 2003;101:380-92.
12. Linne Y, Barkeling B, Rossner S: Natural course of gestational diabetes mellitus: long term follow up of women in the SPAWN study. Br J Obs Gynaecol. 2002;109:1227-31.
13. Smith GCS, Pell JP, Walsh D: Pregnancy complications and maternal risk of ischaemic heart disease: a retrospective cohort study of 129 290 births. Lancet 2001;357:2002-2006.
14. Meyers-Seifer CH, Vohr BR: Lipid levels in former gestational diabetic women. Diabetologia 1996;19:1351-1356.

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