

Perinatal outcome in pregnancy complicated by Diabetes Mellitus

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ABSTRACT

An analysis of the perinatal outcome in patients with pregnancy complicated by diabetes mellitus was done over a 5 year period (1985-1989). There were a total of 5429 deliveries of which 38 patients (0.7%) were diabetics. Analysis was made of maternal age and parity, gestational age at delivery, perinatal death and neonatal morbidity. Respiratory distress syndrome, hypoglycemia and hyperbilirubinemia constituted the commonest perinatal problems (39.53%) with equal distribution among babies born to gestational diabetes group and in patients who had diabetes mellitus preceding pregnancy. Macrosomia was observed in 14 infants (36.8%) with an equal distribution in both groups. There were 3 intrauterine deaths (7.9%) and congenital malformations were detected in 3 babies (7.9%).

INTRODUCTION

Over the past decade advances in management of the diabetic pregnancy have been reflected in the continued reduction in the mortality and morbidity in the infants of diabetic mothers (1). While hypoglycemia, hyperbilirubinemia and polycythemia are common they can be managed with little difficulty in clinical practice.

The respiratory distress syndrome, once the bane of infants of diabetic mothers who survived their hostile intrauterine environment, is now largely preventable and so is macrosomia. The unresolved problem at present is the prevention of malformation in diabetic pregnancy.

A retrospective review of perinatal outcome in pregnancy complicated by diabetes mellitus was done over a 5 year period to evaluate the perinatal outcome of diabetic pregnant patients who delivered in our hospital.

An overall improvement in perinatal outcome of well managed diabetic pregnancies has been documented. Pregnancies complicated by diabetes

mellitus continue nevertheless to present a significant risk for congenital malformations and neonatal morbidity.

MATERIAL AND METHODS

A retrospective review of all diabetic pregnancies with delivery at St. John's Medical college Hospital from 1985 to 1989 was undertaken through a review of both maternal and neonatal charts. An analysis was made of maternal age and parity, infant birth weight, gestational age at delivery, mode of delivery and indications for delivery, perinatal death and neonatal morbidity .

Table 1

1. Study period 1985-1989	
2. Total No. of deliveries	5429
3. Total No. of pregnancies complicated by Diabetes mellitus	38
4. Distribution of type of DM (n=38)	
Gestational diabetes mellitus	26
Diabetes mellitus preceding pregnancy	12

RESULTS

Incidence

There were a total of 5,429 deliveries out of which only 38 patients had pregnancy complicated by diabetes mellitus, an incidence of 0.7% of all deliveries.

Distribution

All patients were grouped into those with gestational diabetes mellitus and diabetes mellitus preceding pregnancy. Among the 38 patients, 26 patients had gestational diabetes mellitus and 12 had diabetes mellitus preceding pregnancy.

Table 2
Perinatal outcome (n=38)

Respiratory Distress Syndrome	2 (5.2%)
Hypoglycemia	7 (18.4%)
Hyperbilirubinemia	6 (15.3%)
Polycythemia	4 (10.5%)
Macrosomia	14 (36.8%)
Intrauterine death	3 (7.9%)
Congenital malformations	3 (7.9%)

Distribution of parity and age

15 out of the 38 patients were primigravidas and 25 were multigravidas.

The age of the pregnant diabetics ranged from 18 to 40 years. There were 5 patients who were less than 20 years and 18 patients between 21 to 30 years. There were 15 patients between age group 31 and 40 years which constituted about 39%.

Gestational age and delivery

34 patients delivered at term i.e. beyond 38 weeks. Only 4 patients had pre-term delivery, the gestational age being between 34-36 weeks of which 2 were intrauterine deaths and the other 2 were admitted in established pre-term labour.

Antenatal complications

Twelve patients had pregnancy-induced hypertension (PIH) and 2 had hydramnios. One patient with hydramnios delivered a baby with vertebral anomalies.

Mode of delivery

28 out of the 38 (74%) patients underwent caesarean section. Only 10 patients had a normal vaginal delivery. Among the 28 patients who underwent

caesarean section, 15 patients (39%) had an elective lower segment caesarean section whereas the other 13 (35%) had an emergency lower segment caesarean section.

The various indications for caesarean section were cephalopelvic disproportion, foetal distress, breech presentation, obstructed labour, bad obstetric history, elderly primi with PIH and cord presentation.

Only 12 patients (33%) out of 38 had a normal perinatal outcome, i.e. birth weight for appropriate gestational age and no complications during perinatal period. Mean birth weight in our series was 3.2 kg. Respiratory distress syndrome (RDS), hypoglycemia, hyperbilirubinemia and polycythemia constituted the commonest perinatal problems and incidence of perinatal morbidity was about 39.63% with an equal distribution in both groups. Macrosomia was observed in 14 infants (36.8%), and the maximum birth weight was 6 kg. in one infant.

The perinatal mortality was 10.5% solely due to intrauterine deaths and one neonatal death due to severe birth asphyxia. There were 2 preterm intrauterine deaths and one was a post dated pregnancy. Congenital malformations were seen in 3 infants (7.9%). Among these, 2 infants were born to mothers who had gestational diabetes mellitus. There was one case each of Hirschsprung's disease, vertebral anomalies and hexadactyly.

DISCUSSION

In a study of 147 of diabetic patients made by Kitzmiller et al in 1978, 37.1% of the women had delivered beyond 38 weeks and caesarean section rate was 55%. The incidence of hyperbilirubinemia was 19%, hypoglycaemia 49% and RDS 7.6% (2). Where as in a largest study done by Robert et al in

Table 3
Perinatal outcome associated with 'Good' diabetic control

STUDY	GANNE et al (2)	KITZMILLER et al (4)	LEVENO et al (5)
Patients (number)	260	134	120
FPG (mg/dl)	109-140	105-121	145-153
PNM/1000	46	37	42
MACROSOMIA > 4 kg	22%	11%	12%
HYPOGLYCEMIA	39%	49%	28%

1976 of 805 infants of diabetic mothers 23% developed RDS compared to 1.3% infants of non diabetic mothers (3).

Macrosomia is a consequence of foetal hyperinsulinemia. In the study done by Kitzmiller et al, the incidence of macrosomia was 36% (4).

Birth defects are the leading continuing cause of increased perinatal mortality among children of diabetic women (4,5).

In a study done by M. Small et al over a period of 14 years perinatal mortality rate was 16/1000 solely due to congenital malformations (6). Incidence was 11.4% of all pregnancies. In a larger study of 646 diabetics and 389 control, major malformations were seen in 4.9% of patients in well controlled and 9% in uncontrolled as against 2.1% in the non-diabetic control group. Poor glycemic control explains some but not all diabetic malformations and there might be a multifactorial etiology (7). Preconceptional diabetic control and around the critical period of organogenesis (i.e. 7th-8th week after conception) will greatly reduce incidence of congenital malformation.

It is evident from our study that perinatal outcome is compromised in pregnancy complicated by diabetes mellitus. However, no differences were observed in the gestational diabetes mellitus group and those who had diabetes mellitus preceding pregnancy.

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