

IMPLICATION OF DIAGNOSIS OF GLUCOSE INTOLERANCE DURING PREGNANCY : PERINATAL MORTALITY AND MORBIDITY

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SUMMARY

Out of 507 pregnant women attending the high risk antenatal clinic of AIIMS over a period of one year, 28 women (5.5%) were found to have gestational diabetes. Of these 57% had past history of fetal wastage. These women were managed and monitored throughout their pregnancies. There was no fetal loss during the index pregnancy. 89.3% of these babies were in the weight group of 2.5 - 4.0 kg. One baby weighed 4.3 kg at birth (3.6%). One baby had spina bifida. Apgar Score of 9/10 was present in all babies at one and five minutes.

This good fetal outcome in these gestational diabetes with institution of adequate dietary measures to achieve good metabolic control, reflects the need of timely detection and management of patients with gestational diabetes.

Abbreviations

GDM : Gestational Diabetes Mellitus
PNM : Perinatal mortality
GTT : Glucose tolerance test

INTRODUCTION

Gestational diabetes which might better be termed "glucose intolerance during pregnancy" deals with pregnant women in whom the onset of diabetes or impaired glucose

tolerance occurs during the pregnancy. Timely detection of patients with gestational diabetes, who constitute of 90% of all pregnant diabetics, is crucial to the successful outcome of pregnancy. Most recent authors report perinatal mortality rates for gestational diabetic pregnancies which are similar to those seen in the general population (Gebbe

et al, 1977), provided that the condition is diagnosed promptly and the patient is followed closely. The present study emphasizes the screening of high risk pregnant women with 3-hour oral glucose tolerance test to diagnose GDM.

METHODS AND MATERIAL

The study was conducted in the Department of Obstetrics & Gynaecology, AIIMS, Delhi.

507 women attended the antenatal high risk clinic of the unit during the period of July 91 to June 92. Of these, 137 were subjected to 100 gm, 3 hour oral glucose tolerance tests (OGTT). The indications for performing the OGTT were :

1. history of diabetes in a first degree relative.
2. history of one or more abnormal pregnancies (i.e. pregnancies complicated by still birth or spontaneous abortion, fetal malformation, or heavy-for-date baby).
3. maternal obesity.
4. advanced maternal age.
5. multiparity (five or more pregnancies).
6. Glucosuria

Table I

Thresholds for 100 gms oral GTT

	Whole blood O'Sullivan mg%	Plasma NDDG mg%
Fasting	90	105
1 hour	165	190
2 hour	145	165
3 hours	125	145

If any two values are met or exceeded, gestational diabetes is diagnosed.

7. abnormal blood sugar values at first visit.

Table I summarizes the diagnostic criteria for diabetes during pregnancy which were originally proposed by O'Sullivan and Mahan 1973 and adopted by the National Diabetes Group in 1979.

The pregnant women with gestational diabetes were followed up and monitored carefully clinically, biochemically with blood sugar profile and ultrasonographically (Table II).

Table II

Therapeutic Intervention

Monitoring of circulating glucose at regular intervals

- weekly glucose profile

AIM -

- fasting plasma glucose < 105
- 2 hr postprandial values < 120

Maternal hyperglycemia requires timely intervention

Intervention

Identify a potentially compromised fetus to avoid intrauterine death

- daily fetal movement score

From 36 weeks

- weekly nonstress test
- weekly biophysical profile

earlier of more frequent surveillance

- hypertension
- poor metabolic control
- poor fetal growth
- decreased fetal movements
- postterm pregnancy

Identify a macrosomic fetus

The dietary recommendations for these women were based on those of the Committee on Food and Nutrition of the American Diabetes Association.

RESULTS

Of the 507 pregnant women, 28 were found to have gestational diabetes mellitus (5.5%) during the present pregnancy.

The age of the women with gestational diabetes varied from 21-38 years (Mean age - 28.5 years).

Four out of 28 women (14.2%) had history of diabetes in a first degree relative.

Sixteen women with gestational diabetes (57%) had fetal wastage in previous pregnancies.

Two patients had associated pregnancy induced hypertension during this pregnancy whereas one had chronic hypertension.

All 28 women with GDM were put on diabetic diet (35 kcal/kg/day).

The period of gestation at the time of delivery and mode of delivery are shown in Table III. The indications of operative procedures are shown in Table IV.

The outcome of the pregnancies in the study group was analysed to determine the effect of glyceimic control on fetal outcome (Table V). Among the 28 gestational diabetic, there was no fetal loss. Two babies were low birth weight. Out of those, one woman had associated pregnancy induced hypertension with oligohydramnions and she had preterm delivery and the baby had spinabifida. One baby born weighed 4.3 kg. i.e. 3.6% of babies were large for dates. The mother of this baby

Table IV

Indications of caesarean sections	
Breech	3
Fetal distress	1
CPD PROM	2
Labor	1
Prolonged leaking + ST	1
Oblique Lye + Prev CS	1
PIH + OligoHy	1
Postdated + Unfavourable Cervix	1

Table III

Period of gestation and mode of delivery in GDM

	No. of patients	(%)
Period of Gestation		
< 37 weeks	6	(21.4)
37 - 40 weeks	21	(75.0)
> 40 weeks	1	(3.6)
Mode of delivery		
Vaginal	14	(50.0)
Forceps	3	(10.7)
LSCS	11	(39.3)

Indications of Forceps

Outlet forceps	2
fetal distress and prophylactic for prev scar	
Low Midcavity	1
meconium with prev scar	

Table V

Outcome of GDM pregnancies

Weight of the baby	Number	(%)
< 2.5 kg.	2	(7.1)
2.5 - 4.0 kg.	25	(89.3)
> 4.0 kg.	1	(3.6)

Table VI

Obstetric Outcome in GDM

Fetal Loss	0
Congenital malformation	1
Apgar score 9/10 1 min	28
Macrosomia (4.3 kg)	1
Low birth weight (1.5, 2.1)	2
Neonatal Morbidity	
Asymptomatic hypoglycemia	1
Hyperbilirubinemia	6
Hypocalcemia	1
Resp distress syndrome	1

had hydramnios during the index pregnancy. All babies had Apgar score of 9/10 at 1 and 5 minutes. The neonatal morbidity is shown in Table VI.

DISCUSSION

Gestational diabetes occurs in 1% to 5% of all pregnancies (Coustan and Carpenter, 1985). In the present study, involving 507 pregnant women attending the high risk antenatal clinic of a particular unit during a period of one year, 28 (5.5%) were found to be gestational diabetics.

Perinatal mortality in diabetes has been falling due to early detection and adequate control of blood sugar levels (Gillmer et al 1984). PNM is closely related to the severity of the diabetes whether this is judged by the concentration of plasma glucose (Karlsson and Kjellmer, 1972) or by the White's Class. Sullivan et al (1973) found a fourfold increase in PNM amongst those mothers with untreated gestational diabetes as compared with a control group with normal carbohy-

drate tolerance. The perinatal mortality in diabetes complicating pregnancy varies from 5-8% (Molsted - Pederson, 1980). Because of early diagnosis of GDM and by establishing good metabolic control in the study group, we could avoid fetal loss.

Infants of diabetic mothers who require insulin during pregnancy suffer a much higher rate of congenital anomalies (6.6-13%) than the progeny of non diabetic (2-3%). Recent work in rats (Backer et al 1981) has shown that lumbosacral defects in fetus could only be induced if the mother was diabetic in the first seven days of pregnancy, which corresponds with the period when organogenesis is occurring in the rats. In the present study, only one baby had spina bifida. The women had associated PPH also with oligohydramnios.

In a study by Coustan and Carpenter (1985), if the patients with glucose intolerance during pregnancy were managed without special diets or insulin, 17.8% of the women gave birth to infants of 4000 gm weight or greater. In the present study, one baby weighing more than 4000 gm (3.6%) was born. This woman had hydramnios also, which is a valuable sign of poor glycemic control of the mother and of risk to the fetus. Moreover, excessive growth increases the risk of trauma during vaginal delivery. But this baby was delivered by caesarean section because of poor integrity of previous scar of the uterus.

Screening the high risk pregnant women for glucose intolerance helps to detect the approximately 5% women who have glucose intolerance. Early diagnosis of gestational diabetes followed by diet and insulin control, the following objectives can be achieved :

1. PNM rates which are similar to those seen in general population.
2. Birth of large babies can be avoided because 18% of untreated GDM will have an infant weighing 4000 gm or more.

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A total number of 6321 newborns were studied during a period of 12 months from Nov. 01 to Jan. 31, 1985 and their perinatal outcome is related to different birth weights were noted. The overall perinatal mortality rate was 11.7/1000 and 17.5/1000 above 1500 gm of birth weight, was found to be 11.7/1000. This we could expect by accepting the modern methods of surveillance without increasing the primary cesarean section rate which is 17.4%

by Doppler. In this study we aim at the impact of such management on the perinatal rate as well as the cesarean section rate in our institution.

MATERIALS AND METHODS
 The study includes all the cases admitted in about ward for a period of 12 months from Nov. 01 to Jan. 31, 1985. Newborns were classified according to their birth weights and their perinatal outcome noted (Table I). 17418 is the number and that above 1500 gm of birth weight was found out (Table II). A total of 6321 newborns were included in this study. The various factors responsible for perinatal mortality were also noted (Table III).