

## OVERT DIABETES IN PREGNANCY†

by

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The combination of diabetes mellitus and pregnancy represents a high-risk situation both for mother and fetus. Recent reports have shown that perinatal mortality rate (PMR) for insulin dependent diabetic patients varies from 5.8 to 15 per cent (Pederson *et al* 1974, Eugliucci *et al* 1976, Ayromloul *et al* 1977 and Drury *et al* 1977). Due to lack of knowledge about the precise cause of death of fetus in diabetic mothers, it has not been possible to bring down the PMR. Proper management of metabolic changes in the mother and the complications of diabetes, more frequent performance of cesarean section (CS) to avoid traumatic complications and use of recent tests to monitor fetoplacental function and to evaluate fetal maturity are the pillars of management of diabetic pregnancies aimed at bringing the PMR and maternal morbidity. This study describes the results of our experience during 8 years.

### Patients and Methods

During the 8 year period, from 1971 to

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1978, 83 pregnant women with overt diabetes were managed in the Department of Obstetrics and Gynaecology at the Postgraduate Institute of Medical Education and Research, Chandigarh. Cases of gestational diabetes have been excluded from this series.

All the patients were hospitalised on their first visit to have baseline data and to establish optimum control of diabetes. After discharge, they were advised to perform urinalysis 2 hours after meals every day. At least 2 post prandial blood sugar (PPBS) values were available on their subsequent visits. Attempts were made to maintain fasting blood sugar levels at 100 to 110 mg per 100 ml and PPBS levels at 140 mg per 100 ml. Urine cultures were performed every month. Urinary oestriol was estimated every week from 30 weeks of gestation and thrice a week after 34 weeks of gestation. All overt diabetics were hospitalised at 34 or 35 weeks of gestation.

The fetal lung maturity was evaluated in every patient before elective delivery by estimation of Lecithin Sphingomyelin ratio (L/S Ratio) and/or shake test. Termination of pregnancy was considered if (1) the patient reached 38 weeks of gestation and had a L/S Ratio of 2 or more, (2) if oestriol value dropped and there was immature L/S Ratio, 24 hours after the administration of betamethasone and (3) oestriol excretion fell by 30 per

cent or more from the mean of previous 3 highest values. Patient received no insulin in the morning of CS or elective induction of labour. Primary CS was performed if the fetal weight was estimated to be 4 kg or more. A neonatologist attended each delivery and newborn were managed in the neonatal intensive care unit.

### Results

Table I A shows the age and parity of the patients. 39.76 per cent of patients were 70 kg or more in weight. Past obstetric history was normal in only 23.77 per cent. Of the 213 deliveries in these women, the fetal salvage rate was 45.77 per cent. 25 per cent of patient had a

baby of 4 kg or more in weight at birth (Table I B). The patients were classified according to White (1971). This classification is based on the age at the onset of the disease and the duration of illness. The outcome of the pregnancies of these patients in the present study is given in Table II. There were 9 perinatal deaths in 76 patients in whom the pregnancy was supervised. In the remaining 7, no fetal heart sound was detected on admission and they sought admission for niabetic ketoacidosis and/or obstructed labour. The perinatal mortality rate for the whole group of patients was 192 per 1,000. Among the supervised pregnancies the perinatal mortality rate (PNM) was 118.4 per 1,000.

TABLE IA  
Distribution According to Age and Pregnancy

Age in years	Parity				Total	Percent
	0	1 & 2	3 & 4	5 and more		
21 to 25	4	5	3	0	12	14.5
26 to 30	3	20	8	3	34	40.2
31 to 35	0	7	10	7	24	28.9
36 to 40	0	5	2	5	12	14.5
41 to 45	0	1	0	0	1	1.2
Total	7	38	23	15	83	
Per cent	2.4	45.8	27.7	18.1		

TABLE IB  
Obstetric History in 83 Overt Diabetic Women

	No. of Patients	Per cent
Obese (weight 70 kg or more)	33/83	39.8
Family history of diabetes	16/83	19.28
Normal Obstetric history	18/76	23.7
Bad obstetric history		
— PET during previous pregnancy	14/76	18.4
— Previous history of large baby (4 kg or more)	19/76	25.0
— Perinatal deaths	84/213	
— Infants with congenital abnormality	3/213	40.8
— Abortions	33/213	15.5

TABLE II  
Fetal Outcome Related to Classification of White (1971)

White's classification	No. of Preg.	Per cent	Perinatal deaths	Per cent
B	73	78.9	8/767	11.9
C	4	4.8	1/4	25.0
D	5	6.02	—	—
E	1	1.2	—	—

No maternal death occurred. Seven patients suffered from the episodes of hypoglycemia and 2 others had hypoglycemic coma during their management. In one of these patients, IUD occurred few weeks after the hypoglycemic episode and does not seem to be related to hypoglycemia. The babies of other 8 women did fine. Diabetic ketoacidosis, on the other hand, had a bad implication on the outcome of pregnancy, as the fetuses of 2 out of 3 such patients died. Fetal salvage in relation to control of diabetes is shown in Table III.

patients had urinary tract infection. The PNM in these 44 patients with above mentioned complications was 297 per 1,000.

Among 5 intrauterine deaths in the supervised category, the death was attributed to toxemia in 2, maternal infection with premature rupture of membranes in 1 and Cushing's Syndrome with hypertension in 1. The cause of IUD remained unexplained in the fifth case. There were 4 neonatal deaths. Anaencephaly, intraventricular haemorrhage, respiratory distress syndrome and

TABLE III  
Correlation of Control of Diabetes with Fetal Salvage

Control of diabetes	Class of overt diabetes				Total PND (PND%)
	B	C	D	F	
Good (Blood sugar PP 140 or lower)	30 (3)	1	1	0	3 out of 33 (9.37%)
Fair (PP Blood sugar between 141 to 160)	21	1	1	0	nil out of 23
Poor (Blood sugar PP above 161)	22 (11)	2 (1)	3 (1)	1	13 out of 28 (46.4%)

Figures in parenthesis indicate number of perinatal deaths (PND).

The incidence of hypertensive disorders in overt diabetic women was 43.37 per cent. Pre-eclamptic toxemia (PET) was diagnosed in 21.68 per cent. Thirteen patients had hypertension complicating pregnancy, while 5 had toxemia superimposed over hypertension. Polyhydramnios was seen in 9 patients being associated with PET in 8 cases. Seven

pulmonary haemorrhage were considered to be causative factors in one case each. 48.2 per cent of these diabetic patients underwent cesarean section which is little more than two and half times the hospital rate of 18.2 per cent. Labour was induced in 17 of the other patients who delivered vaginally. The mean gestational age at the time of delivery was  $38.8 \pm 1.6$

weeks. Two infants, small for date, were born to severely toxæmic mothers. Table IV shows the incidence of large for

TABLE IV  
Large for Gestational Age Babies in Relation to White's Classification

White's class	Total	LGA	Per cent
B	73	29	39.7
C	4	2	50.0
D	5	2	40.0
F	1	0	0

gestational age (LGA) babies in relation to classification of White.

Urinary oestriol estimations were done regularly in 58 patients and in 9 they were abnormal necessitating induction of labour. In one patient with normal oestriol levels, the pregnancy ended with unexplained IUD.

#### Discussion

Diabetes in pregnancy is important because the disease worsenes or is exacerbated during pregnancy and requires careful management. Perinatal loss is higher in diabetic pregnant mothers inspite of optimum control of diabetes (Punjabi *et al* 1975). The PNM in diabetic pregnant women reported from India ranges from 125 per 1,000 (Gun and Chakraborty, 1976) to 308 per 1,000 (Pinto Rosario *et al* 1979). The PNM in diabetic women in the present series was 192.8 per 1,000. There were 5 still births and 4 neonatal deaths among the supervised pregnancies giving a PNM rate of 118.4 per 1,000.

A diabetic pregnant woman is exposed to the complications of both the disease as well as pregnancy. Toxaemia fre-

quently complicates diabetic pregnancy. The incidence reported from India varies from 15.5 per cent (Pinto Rosario *et al* 1979) to 30.45 per cent (Dhirwani *et al* 1973). 21.68 per cent of our patients had toxæmia. Ketoacidosis, when present, greatly worsens the foetal prognosis. In 2 out of 3 such patients in the present series stillbirths occurred, though the incidence of ketoacidosis was only 3.85 per cent.

Pinto Rosario *et al* (1979) found that the risk of foetal macrosomia was directly related to the severity of the disease. Seventy per cent of the severe cases in their series had large babies as compared to 20 per cent in mild. In the present series, the incidence of large for gestational age babies was 39.7 per cent in Class B and 50 per cent in Class C diabetes of White (1971).

Cesarean section is being increasingly used in the management of diabetic pregnancies. 48.2 per cent of our cases underwent cesarean section. Dhirwani *et al* (1973) had cesarean section rate of 22.5 per cent while Pinto Rosario *et al* (1979) had a rate of 36.5 per cent.

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