

A STUDY ON DIABETES MELLITUS DURING PREGNANCY AND LABOUR

by
U. GOYAL*

and
S. N. MUKHERJEE**

Diabetes is a metabolic disorder, which may remain silent for many years and may clinically be diagnosed for the first time during pregnancy and labour. Though the patient may not complain of anything but there may be suggestive history of large weight babies, previous history of stillbirths or a positive family history.

Incidence.

Incidence of diabetes in pregnancy is increasing because of 2 factors—first, with increased experience in diabetic control more and more diabetic women are retaining normal fertility and secondly, diabetes is diagnosed at an earlier stage than before. The incidence varies from place to place. Incidence of diabetes with pregnancy in our present series is 0.62%.

Collection of cases were done from out-patient Department, antenatal clinic and from indoor, labour rooms of obstetric and gynaecological department of Safdarjung Hospital, New Delhi. In the present investigation, total number of cases studied were 44 only.

*Registrar. Now working as Lecturer in Obstetrics and Gynaecology, Maulana Azad Medical College, New Delhi.

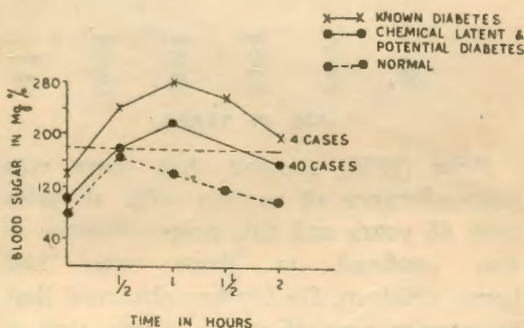
**Sr. Obstetrician and Gynaecologist, Dept. of Obstetrics and Gynaecology, Safdarjung Hospital, New Delhi. Now, working as Deputy Commissioner, Ministry of Health and Family Welfare, Nirman Bhawan, New Delhi.

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Clinical Categories of Diabetes

According to classification recommended by the British Diabetic Association and adopted by World Health Organisation, our cases fall into following groups (Fig. 1).

FIG. 1. CLINICAL TYPES OF DIABETES



- | | |
|-----------------------|----------|
| I Clinical diabetes | 4 cases |
| II Chemical diabetes | |
| III Latent diabetes | 40 cases |
| IV Potential diabetes | |

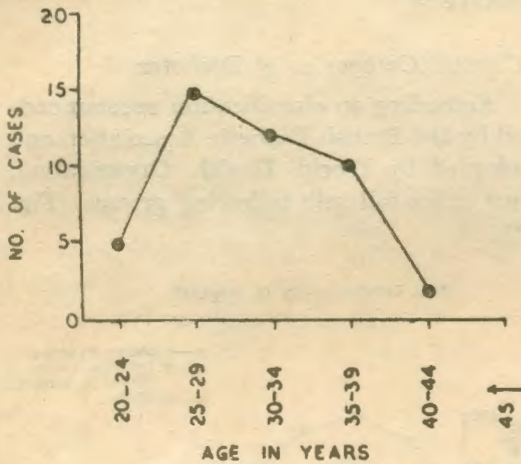
It is difficult to differentiate between chemical diabetes and latent diabetes during pregnancy. In chemical diabetes patient is asymptomatic. Out of 40 cases, 4 had a bad obstetric history with overweight babies. Two had previous stillbirths and others had history of neonatal deaths of over-weight babies.

In every case routine urine examination for sugar and glucose tolerance test was done.

Age

The age of patients ranged from 20 to 45 years. Maximum number of cases (16) belonged to the age group of 25-29 years (36.3%).

FIG. 2. AGE DISTRIBUTION

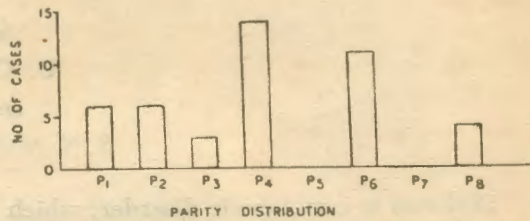


Pyke (1956) showed that there was preponderance of women with diabetes over 45 years and this preponderance of was confined to those who had borne children. He further observed that in women over 45 years, there was a direct relationship between the incidence of diabetes and parity. Fitzgerald *et al* (1961) and Walker and Brown (1964) also reported that incidence of diabetes increases with each pregnancy. But, Jackson (1961) could not find any abnormal glucose tolerance in normal pregnancy. He considered that pregnancy was only diabetogenic in patients who have inborn error of carbohydrate metabolism.

Parity

The maximum number of patients belonged to para 4 or above, which suggests that increasing parity has a definite diabetogenic effect (Vide Fig. Fig. 3).

FIG. 3



Cruickshank (1960) concluded that there was no statistical difference between multipara and those of the same age group who did not have children.

Here, 2 factors need special mention, Firstly, clinical diabetes manifests itself for the first time during pregnancy. Secondly, temporary or subclinical or latent diabetes is diagnosed only by abnormal glucose tolerance which occur during pregnancy and disappear after pregnancy.

Complications during Pregnancy

Pre-eclamptic Toxaemia

Diabetic mothers are more prone to pre-eclamptic toxaemia as compared to non-diabetic pregnancy. There is a wide range of variation in the incidence, which varies from 8% (Peel, 1955) to 46% (Given *et al*, 1950). Such a wide variation in incidence is due to difference in diagnostic standards. White (1952) concludes that pre-eclampsia is 11 times more common in diabetic women.

In the present series of 44 cases, 12 had pre-eclamptic toxaemia (27.2%). All cases had mild to moderate toxaemia. No one had severe pre-eclamptic toxaemia or eclampsia. Peel (1959) considered that the adoption of a regime of strict control with bed rest resulted in lowering of the incidence of pre-eclamp-

sia. When the diabetic is hypertensive, she is more prone to pre-eclampsia.

Intra-Uterine Deaths

Ten cases in the present series were admitted either with suspected Intra-uterine death with doubtful foetal heart, or with intra-uterine death. The cause of high intra-uterine death is not very well understood. The contributory factors may be (i) placental insufficiency leading to foetal hypoxia, especially when diabetic vascular changes are present in the mother, (ii) severe ketosis in the mother, (iii) large babies leading to difficult deliveries, and (iv) superimposed toxæmia and hydramnios.

Hydramnios

The reason for association of hydramnios in a diabetic pregnancy is unknown. But, it is a fact that incidence varies from 20 to 50% and when it is present, perinatal mortality rate goes up. Jones (1958) showed that hydramnios in diabetic pregnancy is due to metabolic disorder and congenital malformation. Only 2 cases (4.5%) had severe hydramnios in the present study.

Foetal Abnormalities

Increased incidence of foetal abnormalities is seen in diabetic pregnancy. Peel and Oakley (1949) gave an incidence of 6.3% as compared with 0.94% in non-diabetic pregnancy. White (1952) reported an incidence of 14% while Pederson *et al* (1964), in a most recent survey found an over-all incidence of 6.4% with a control figure of 2.1%. Out of 44 cases of the present series, only 2 had congenital foetal abnormalities (4.5%).

Vulvitis

Two cases had *Candida Albicans* vulvovaginitis. Glycosuria predisposes to vulvo-

vaginitis due to above mentioned parasite in poorly controlled diabetics.

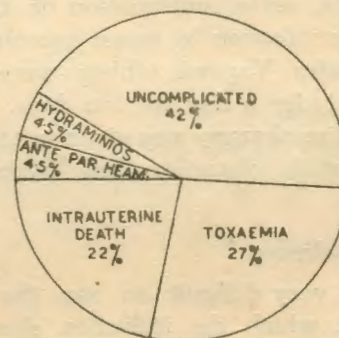
Twins

Two cases out of 44 had twin pregnancy in our series.

Ante-Partum Haemorrhage

This occurred in 2 cases, 1 had twin pregnancy with placenta praevia and the other had haemorrhage of unknown origin. (Pye diagram showing complication during pregnancy) Fig. 4.

FIG. 4. PYE DIAGRAM SHOWING DIABETES AND ASSOCIATED ANTENATAL COMPLICATIONS



Management

Diabetic cases were managed under joint consultation with the physicians-in-charge of diabetic clinic (a special diabetic clinic functions at Safdarjung Hospital).

Known diabetic cases (4) were admitted between 30th to 32nd weeks of pregnancy and were kept under constant supervision and rest. Out of 4 cases with bad obstetric history, 2 on investigation were found to be diabetic and they were hospitalised. Twenty-two cases had emergency admissions, routine examination of urine showed yellow or red precipitate, and next morning glucose tolerance test was done. Remaining 16 cases were admitted either for toxæmia or for hydramnios or for

suspected intrauterine death, later turned out to be diabetic.

In all cases, plain insulin was given according to the colour of urine and a diabetic chart was maintained. When, after few days, diabetes was controlled in some cases, patients were switched to lente insulin.

No oral antidiabetic drug or hormone was given to any patient. Routine funduscopy was done in every diabetic pregnant woman.

Diabetic diet, as advised by physician was given to the patient. In cases associated with toxæmia, salt restricted diet was prescribed. In 2 cases of vulvovaginitis, after confirmation of *Candida albicans* infection by smear examinations, Mycostatin Vaginal tablets were given locally twice a day for ten days. Other supportive therapy was given in toxæmia cases with diuretics and hypotensive drugs.

Time Delivery

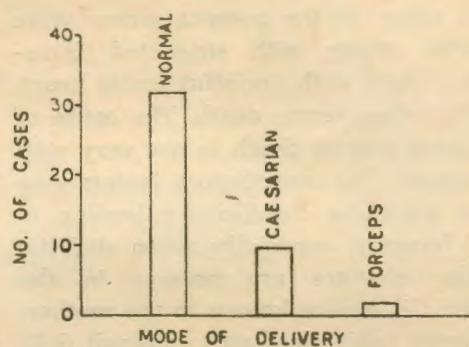
It is very difficult to say the exact time at which the induction should be done. We have mostly induced our cases between 35-37 weeks and elective caesarean sections were planned between 36-38 weeks of pregnancy.

Mode of Delivery

Normal spontaneous delivery occurred in 12 cases; they were those who were especially admitted in emergency during labour.

Induction of labour was done in 26 cases at about 35-37 weeks in cases of intrauterine death, toxæmia and bad obstetric history. For induction, routine soap water enema was given, followed by low amniotomy; 8 cases went into labour afterwards. In 18 cases, syntocinon intravenous drip (with one unit of syntocinon to start with and

FIG. 5. MODE OF TERMINATION OF PREGNANCY



increased upto two units in 500 ml. of 5% glucose solution) were given. Twenty cases had normal vaginal delivery without any maternal or foetal complication. In the remaining 6 cases, I ended with forceps and 5 had lower segment caesarean section for foetal distress.

Only 2 cases, out of 44, had forceps deliveries; 1, after induction to cut short second stage of labour and 1 for foetal distress. Ten cases had lower segment caesarean sections. Five cases had it after induction of labour and because of foetal distress, and the other 5 cases had elective caesarean sections. Two patients were primigravidae with toxæmia and conceived after 8 years of married life and other 3 were multiparae with bad obstetric history. The incidence of caesarean section in diabetic pregnancy is quite high, because of great risk to the foetus during the last 4 weeks of pregnancy.

Incidence of caesarean section given by various authors is shown in Table I.

The maximum incidence of 35.8% has been reported by Garnet (1960) and minimum of 15.3% by Horger (1967). In the present series, the incidence of caesarean section is 22.7%. The incidence for

TABLE I
Incidence of Caesarean Section in Various Series

S. No.	Year	Author	Percentage of Caesarean section
1.	1959	Pederson et al	32.0%
2.	1960	Garnet	35.8%
4.	1967	Horger	15.3%
3.	1967	Saraf	26.6%
5.	1968	Adatia	27.5%
6.	1973	Present series	22.7%

caesarean section in diabetics is the same almost in every series, and the indications are, diabetes difficult to control, large baby above 4 kg. marked hydramnios with normal baby, or other obstetrical complications.

Puerperal or Post Partum Management

Insulin requirements may fall to great extent immediately after delivery. So, four-hourly urine examination and daily blood sugar estimation were performed. In cases where the patient delivered in

cases of caesarean section. Out of the other 34 cases, only 3 needed antibiotics. Puerperium was febrile in 13 cases, but was controlled with antibiotics.

Maternal and Perinatal Mortality

Maternal Mortality is nil in the present series. This is due to better control of diabetes. Previously in preinsulin era and in poorly controlled diabetes the maternal mortality was recorded upto 15-20%. Table II shows the maternal and perinatal mortality in the present study.

TABLE II
Maternal and Perinatal Mortality

(A) Maternal Mortality —	Nil
(B) Perinatal Mortality —	31.7%
	(a) Still Birth — 10 (22.7%)
	(b) Neonatal Death — 4 (9%)

the afternoon or by evening, insulin was given by urine colour index, and in some cases, half the dosage of insulin she was receiving before delivery was given.

Breast feeding was not prohibited though only about 50% cases had good lactation. Diabetic mothers lactate poorly. It is said that post partum diabetic control is poor in lactating mothers. But because of good control of diabetes, we did not face any such difficulty in our patients.

Antibiotics were given routinely in

With better control of diabetes and improved care and better understanding of bio-chemical changes in diabetic new born, perinatal mortality is reduced from 40-50% to 15-20% i.e. just half. Main causes of neonatal deaths are hypoglycemic coma, regurgitation of stomach contents and respiratory distress syndrome. Though the diabetic babies are heavy weight, they behave like premature babies and the care is given on the same lines.

In the present series, total number of

babies were 46 (2 cases of twins), their body weights in Kilogrammes are shown in Table IV.

5. No one had oral antidiabetic drugs but all were given plain insulin or Lente insulin.

TABLE III
Weight in Kg.

2 Kg.	2.1 to 3 Kgs.	3.1 to 3.5 Kgs.	3.6 to 4 Kg.	4.1 Kg.
9	20	5	7	5

Total Nos. of babies 46, two twins.

Two babies had congenital anomalies— one had gross renal anomalies leading to neonatal death on 4th day, the other had mild variety of talipes, not incompatible with life.

Total number of stillbirths were 10 and first week neonatal deaths were 4 and thus the total perinatal mortality was 14, the incidence being 31.7%.

Perinatal mortality rate is quite high in our series. The main reason for this high perinatal loss is that patients come too late to the hospital and so very little can be done to save the baby.

Summary and Conclusions

1. Total cases studied were 44 and the incidence of diabetes during pregnancy was 0.62%.

2. Only 4 cases were clinically diabetic, while 40 belonged to chemical and latent diabetic group. Out of these 40 cases, 4 had bad obstetric history.

3. Age of patients ranged from 20 to 45 years and maximum cases belonged to age group of 25 to 29 years (36.3%). The disease was found more commonly in multipara.

4. Pregnant diabetics had other complications such as, toxæmia, intra-uterine death, antepartum haemorrhage, hydramnios, congenital malformations and vulvitis.

6. Out of 44 cases, 32 had normal delivery with or without induction of labour, 10 had caesarean section and 2 had forceps deliveries.

7. Maternal mortality was nil and perinatal mortality was 31.7%.

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