

Random Plasma Glucose Estimation for abnormal glucose tolerance in antenatal cases

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Summary : A study was conducted on 300 pregnant women attending Department of Obstetrics and Gynaecology S.G.T.B. Hospital, Govt. Medical College, Amritsar, for abnormal glucose tolerance and to observe their fetal outcome. Random plasma glucose levels were estimated at the first antenatal visit and at 28-32 weeks of gestation. Women, whose blood glucose levels were $>100\text{mg}\%$ were subjected to 2 hour oral glucose tolerance test using WHO criterion. Abnormal carbohydrate metabolism in the form of gestational diabetes and perinatal mortality were observed more in patients with conventional risk factors than in patients without risk factors and incidence of diabetes was also observed more with increasing age and parity.

Introduction

Diabetes has long been known to be associated with a number of maternal and foetal complications. Till recently it was believed that only women with risk factors e.g. obesity, hydramnios, PIH, birth of a large for gestational age infant, family history of diabetes etc. needed to be screened for diabetes. However it was seen that a large number of diabetic patients would go undetected if only these criteria were used (O' Sullivan et al, 1973). Therefore screening the women in pregnancy for abnormal glucose tolerance is necessary to reduce the perinatal mortality in women with impaired carbohydrate tolerance.

Material and Methods

The study was conducted on 300 pregnant women attending the antenatal clinic at S.G.T.B. Hospital, Amritsar who subsequently were admitted in the antenatal ward for their delivery from March, 1996 to September, 1997. Patients with diabetes diagnosed before pregnancy were excluded. At the first visit, patients were subjected to random plasma glucose estimation along with other routine investigations (like Hb, BT, CT, Rh, ABO, urine, routine, VDRL). Those women whose blood glucose levels were $>100\text{mg}\%$ were subjected to a 2 hour oral glucose tolerance test (OGTT) using 75 g glucose load and estimation of fasting and 2 hour post glucose levels using WHO criteria (WHO, 1980). The blood glucose values were estimated by O'Toluidine method (Hyvaria and Nikkila, 1962).

Observations and Results

In the present study 300 pregnant patients were screened. The patients were divided into two groups viz. group A and group B.

Total number of patients 300.

Group A: Without any associated risk factors 217 patients.

Group B: With conventional risk factors = 83 patients.

Patients were screened for diabetes at booking visit and at 28-32 weeks of gestation.

Maximum number of patients (53%) in group A were below the age of 25 years while maximum number of patients (61.4%) in group B belonged to the age group of 25-35 years.

Majority of the cases (96) in group A were primigravidae, 62 were 2nd and 39 were 3rd gravidae. In group B, most of the patients (41) were 2nd and 3rd gravidae and only 19 were primigravidae. Comparing gravidity and parity of patients, gravidity is more important than parity because of unexplained abortions associated with diabetes.

Table I shows that there were only 2 patients in group A at <20 weeks of gestation and the plasma glucose tolerance test (GTT) was also abnormal in them. In group B, 11 patients at booking visit had raised plasma glucose levels, 9 of them had normal GTT and 2 cases had abnormal GTT. At 28-32 weeks of gestation there were

Table I
Period of Gestation

	Booking visit				28-32 weeks			
	Group A		Group B		Group A		Group B	
	No.	%age	No.	%age	No.	%age	No.	%age
No. with raised plasma glucose level	2	0.92	11	13.25	9	4.14	14	16.86
No. with normal glucose tolerance test	-	-	9	10.80	8	3.68	12	14.45
No. with abnormal glucose tolerance test	2	0.92	2	2.40	1	0.46	2	2.40

Table II
Mode of Delivery

Group	NVD		Breech		Forceps		LSCS	
	No.	%age	No.	%age	No.	%age	No.	%age
A	125	57.60	3	1.38	15	6.92	74	34.10
B	37	44.60	2	2.40	9	10.84	35	42.16

Table III
Fetal Outcome

Group	No. of cases	Live birth	Still Birth				Neonatal death	PNMR (%)	
			Fresh		Macerated				
			No.	%age	No.	%age			
A	217	118	2	20.00	2	20.00	6	60.00	4.60
B	83	77	3	50.00	1	16.60	2	33.40	7.22

9 patients in group A and 14 patients in group B who had raised plasma glucose levels. GTT was found to be abnormal in only 1 in group A, 2 in group B.

Table II shows that in group A, 125 (57.60%) patients had normal vaginal delivery and 3(1.38%) had breech delivery, 15(6.92%) had forceps delivery (indication of forceps being fetal distress) and 74 (34.10%) had to undergo LSCS. In group B, 37 (44.60%) patients had normal vaginal delivery, 2(2.40%) had breech delivery, 9(10.84%) had forceps delivery and 35(42.16%) had to undergo LSCS.

Table III shows that in group A there were 10 perinatal deaths and out of these, 2(20%) were fresh still births, 2(20%) macerated stillbirths and 6 babies expired in perinatal period.

In group B, there were 6 perinatal deaths, out of which 3(50%) were fresh stillbirths, 1(16.6%) was macerated stillbirth and 2 babies (33.4%) died in the neonatal period. This shows that perinatal mortality was more in group B patients i.e. one or more conventional risk factors compared to that in group A patients.

Discussion

The present study advocates random plasma glucose levels as an efficient and cheap method of screening for abnormal GTT. O'Sullivan et al (1973), Lind and Mcdougall (1981) and Hatem and Dennis (1987) also proposed the same. In the present study, positive screening values were found in 11(5.06%) cases of group A and 25(30.12%) cases of group B patients. On performing GTT after giving 75 g glucose load, abnormal

glucose test was found in 1.38% cases in group A and 1.81% cases in group B patients.

Hatem and Dennis (1987) reported 1.6% incidence of diabetes based on random plasma glucose sampling and 1.4% in those with conventional risk factors. In the present study, the overall incidence of gestational diabetes was 2.33%. Al-Shawaf et al (1988) reported an incidence of gestational diabetes to be 1.9%.

In the present study, most of the patients with positive screening value and abnormal GTT during pregnancy belonged to the age group of 25-35 years. Similar results have been reported by O'Sullivan et al (1964), Sikadar et al (1980), Mestman et al (1971) and Kitzmiller et al (1978) reported a primary caesarean section rate 40% in diabetic pregnancies. In the present study incidence of primary CS was 28.57%. Miller et al (1944) reported a PNMR of 5.4% in general population and 22.9% in the diabetic mothers. In the present study PNMR was 4.60% in group A and 7.22% in group B.

Chakraborty and Gun (1976) also reported that the improved management and effective control of maternal diabetes helps to achieve maternal mortality figures of almost zero but the PNMR still remains high due to certain complications that still occur as a good percentage of patients reported late for their first antenatal booking.

Conclusions:

Patients with gestational diabetes are at the same risk of perinatal mortality and morbidity as the patients with overt diabetes. Therefore, it is important to screen all the women in their antenatal period for detecting impaired glucose tolerance. Random plasma glucose estimation

is efficient and cheap method of screening patients for abnormal carbohydrate tolerance.

To have the outcome of pregnancy in diabetes equivalent to that of uncomplicated pregnancies, diagnosis of this condition at an early date efficient control of this metabolic disorder during pregnancy and perfect management during labour are needed.

References:

1. Al-Shawaf, T; Akiel, A; Moghraby, SAS; Br. J. of Obstet. and Gynaec., 95: 84, 1988
2. Chakraborty, BN and Gun, KM; J. Obst. and Gyn. India, 26: 209, 1976.
3. Hatem, M; Dennis, KJ; Brit. J. Obst. and Gyn., 94: 213, 1987.
4. Hyvaria, A and Nikkila, E; Clin. Clim. Acta, 7: 140, 1962.
5. Kitzmiller Cloherty, JP; Younger, MD, Tabatabain, A; Rothchild, SB, Sesenkeid; Fpstein, M.F., Singh, S; Neff, R.K; Am. J. Obst. Gyn., 131: 560, 1978.
6. Lind, T and McDougall, AN; Br. J. Obst. and Gyn., 88: 346, 1981
7. Mestman, JH; Anderson, GV; Burton, N; Am J. Obst and Gyn. 109: 41, 1971.
8. Miller, HC; Hurtwita, D; Kunder, K; J.A.M.A., 124: 271, 1944.
9. O'Sullivan, JB; Mahan, CM; Diabetes, 13: 278, 1964.
10. O'Sullivan, JB; Charles, D; Mahan, CM; Dandrow, R.V; Am. J. Obst and Gyn., 116:901; 1973a
11. O'Sullivan, JB; Charles D; Mahan CM; Dandrow R.V; Am. J. Obst and Gyn. 116: 895, 1973b
12. Sikadar, K; Dutta, J; Roy Chowdhary NN; J. Obst. and Gyn. India, 30: 235, 1980.
13. WHO Expert Committee on Diabetes mellitus; Technical Report series, 646, 1986.