SCREENING FOR GLUCOSE INTOLERANCE IN PREGNANCY UTILIZING RANDOM PLASMA GLUCOSE ASSAY

By

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SUMMARY

The low renal threshold for glucose during pregnancy renders tests for glycosuria less specific for diagnosis of glucose intolerence during pregnancy. However routine oral glucose tolerance test (OGTT) in each trimester of pregnancy is impractical in a hospital like ours with 9000 deliveries per year. We describe a simple method for screening all pregnant women for glucose intolerance. Random plasma glucose (RPG) estimation was done at the time of first antenatal check-up in all pregnant women irrespective of the period of gestation, and time at which they had their last meal. If the random plasma glucose value was more than 100 mg%, a 2 hour, 75 g oral glucose tolerance test was performed. This method of screening was found to be simple, more practicable and had a pick-up rate of 4.9% which was higher than that found on conventional methods of screening.

Introduction

Conventionally, screening pregnant women for gestational diabetes has been based upon the presence of stigmata said to be associated with the disease. These stigmata include glycosuria, previous unexplained still birth or neonatal death, birth of a large baby (more than 4 kg or congenitally abnormal baby, family history of diabetes, polyhydramnios and obesity (O'Sullivan *et al*, 1973).

A glucose tolerance test performed on all pregnant women at an appropriate stage in pregnancy would detect almost all patients with diabetes but at a prohibitive cost in terms of finance, staff and patient inconvenience. In the present study we employed random plasma glucose sampling to screen our pregnant population at the first antenatal check-up. The aim of the study was to reduce the number of glucose tolerance tests performed without diminishing the efficiency and the accuracy of pickup.

Material and Methods

All pregnant women attending the antenatal clinic at Nowrosjee Wadia Maternity Hospital, Bombay, between 1st November 1987 to 30th June 1988 were included in the study. During this period 7897 women presented for antenatal registration. At the first visit venous blood (2 ml) was obtained by venepuncture from an antecubital vein, anticoagu-

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lated in fluoride containing tube and plasma glucose was estimated within three hours of collection using glucose oxidase method. The plasma glucose values were estimated and 100 mg% was selected as an arbitrary cutoff point. Those women whose plasma glucose levels were more than 100 mg% were subjected to a 2 hour oral glucose tolerance test (OGTT) using 75 gms glucose load and estimating fasting and 2 hours post glucose plasma glucose levels (WHO, 1980). The OGTT was done at 28-32 weeks of gestation.

Criteria for abnormal GTT

The criteria for abnormality recommended by WHO (1980) were used. If the 2 hour venous plasma glucose level was more than 198 mg% the test was diagnostic of diabetes. When the 2 hour value was between 144-198 mg% the diagnosis of impaired glucose tolerance was made.

Results

The plasma glucose concentration at the first antenatal checkup is shown in Table I.

TABLE I
Random Plasma Glucose (R.P.G.) Levels at First Antenatal Checkup (in = 7897)

R.P.G. levels in mg%	No. of patients (%)
Less than 100	7072 (89.6)
101-120	644 (8.2)
121-140	156 (1.9)
More than 140	25 (0.3)

Of the 7897 women who were subjected to a random plasma glucose sampling, (10.47%) had random plasma glucose value more than 100 mg%. Three hundred eighty four of these 825 patients were further subjected to OGTT. An abnormal GTT was demonstrated in 19 patients i.e. 4.9%.

TABLE II
Outline of Screening Programme

Total number of cases screened	7897
Total number of cases with R.P.G. more than 100 mg%	825 (10.4%)
Total number of GTTs performed	384
Number of glucose intolerance detected on GTTs	19 (4.9%)

Discussion

Screening for diabetes must be simple, convenient and efficient. Screening test of blood glucose determination one hour after a 50 G oral glucose load (Gilmer *et al*, 1980; Lavin *et al*, 1981) is inconvenient since it requires the subject to remain for an additional one hour in the clinic. Lind and McDougall (1981) have advocated screening by random blood glucose sampling at 28 weeks. Screening by random plasma glucose sampling at a time when women are having blood test done for other reasons causes least inconvenience to the patients and staff.

We cannot claim that every diabetic patient in the obstetric population screen is detected. Lavin *et al* (1981) found 1.5% incidence of gestational diabetes in patients with risk factors. Hatem and Dennis (1987) found 1.5% incidence of gestational diabetes based on random plasma sampling. In the current study, utilising random plasma glucose levels as a basis for further OGTT resulted in a 4.9% pickup rate of glucose intolerance in pregnancy. Thus a higher detection rate was achieved, while resorting to fewer GTTs.

In conclusion, the detection of diabetes in pregnancy constitutes an essential part of comprehensive antenatal care. We recommend screening based on random plasma glucose sampling since it is a simple, reliable and effective method. When random plasma glucose level is more than 100 mg% the patient should be subjected to an OGTT. This substantially reduces the number of GTTs to be performed with the added benefit of a higher detection rate of 4.9% of glucose intolerance in pregnancy.

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