

GLUCOSURIA IN PREGNANCY

Seshiah V., Sundaram A., Hariharan R.S., Ramanakumar T. K., Ganesan V. S.,
and Sam G. P. Moses

Glucosuria during pregnancy is common, nearly 42% of pregnant women spilling glucose in urine following an oral glucose load. Of the glucosurics during pregnancy, only 1 in 4 is a gestational diabetic. On the other hand, not all gestational diabetic women have glucosuria. Thus, glucosuria is less specific as a screening test and blood glucose determination is essential for the detection of glucose intolerance during pregnancy.

Materials and Methods

Three hundred and forty two consecutive pregnant women attending the Govt. Women and Children Hospital, Egmore, Madras were subjected to a 100G Oral Glucose Tolerance Test after O'Sullivan and Mahan to determine their glucose tolerance. Glucosuria was looked for using specific glucose-oxidase coated strips, DIASTIX on the second fasting urine sample and a urine sample collected 2, hours after the glucose load.

The pregnant women were said to have normal glucose tolerance when the OGTT values were less than 90 mg%, 170 mg%, 145 mg% and 125 mg% at 0, 60, 120 and 180 minutes respectively on the OGTT. The various patterns of glucose intolerance met with depending upon their response to the Glucose Tolerance Test were :

- a) Gestational Diabetes Mellitus (GDM) when 2 or more of the values mentioned above were met or exceeded on the OGTT.
- b) Impaired Gestational Glucose Tolerance (IGGT'), when the 2 hour value alone was ≥ 100 mg% but less than 145 mg% with the other blood glucose values on the OGTT being less than the values mentioned above.
- c) IGGT Plus, when one other value on the OGTT was abnormal in addition to the 2 hour OGTT value being in the IGGT range.
- d) Isolated Blood Glucose abnormality, when any one value on the OGTT alone is elevated.

During the analysis of data, a broad classification of the subjects was made under the following categories :

- i. Those with normal glucose tolerance.
- ii. Those with GDM.
- iii. Those with abnormal glucose tolerance not amounting to GDM (AGT) : All those with IGGT, IGGT Plus and isolated BG abnormality were grouped together as AGT.

*Department of Diabetology, Madras Medical College & Govt. General Hospital, Madras-60003.

Results

Prevalence of Glucosuria in Pregnancy

Fasting Glucosuria was present in 78 (22.80%) of the 342 pregnant women studied, while glucosuria 2 hours after glucose load was seen in 142 (41.52%). (Table 1).

Table 1 : Glucosuria in Pregnancy

n=342

Glucosuria	Number	Percentage
Fasting	78	22.80
2 hour after glucose load	142	41.52

On Oral glucose tolerance testing, only 18 (23.08%) of these with fasting glucosuria had diabetes by O'Sullivan & Mahan's criteria, while 41 (28.87%) of those with glucosuria after glucose load had diabetes. Thus, approximately only a fourth of glucosurics during pregnancy were diabetics (Table 2).

Table 2 : Diabetes in Glucosurics During Pregnancy

n = 342

Glucosurics (No. of subjects in parentheses)	Diabetics (O'Sullivan & Mahan)	
	No.	%
Fasting (78)	18	23.08
2 hours post-glucose load (142)	41	28.57

Only about 1 in 4 Glucosurics during pregnancy is a diabetic.

Contrarily, an analysis of the 57 Gestational diabetic women revealed that 18(31.58%) of them had fasting glucosuria and 41 (71.93%) had glucosuria following a glucose load (Table 3).

Table 3 : Glucosuria in Gestational Diabetes

n = 57

Glucosuria	Number	Percentage
Fasting	18	31.58
2 hour post-glucose load	41	71.93

Sensitivity and specificity of glucosuria in the diagnosis of diabetes in Pregnancy :- Sensitivity of a test denotes its ability to correctly classify those who have the disease, while specificity denotes its ability to correctly classify those who do not have the disease.

Positive predictive value of a test represents proportion of true positives among those who test positive; negative predictive value represents proportion of true negatives among those who test negative. An analysis on these lines indicates that fasting glucosuria has 31.58% sensitivity, 78.95% specificity, 23.08% positive predictive value and 85.23% negative predictive value, while post-glucose load glucosuria has 71.93% sensitivity, 64.56% specificity, 28.87% positive predictive value, and 92% negative predictive value (Table 4).

Table 4 : Sensitivity & Specificity of Glucosuria

Fasting DIABETES			Post-Glucose Load DIABETES			
	+	--		+	--	
+	18	60	78	41	101	142
-	39	225	264	16	184	200
	57	285		57	285	
	31.58 %			Sensitivity	71.93 %	
	78.95 %			Specificity	64.56 %	
	23.08 %			Positive predictive	28.87 %	
	85.23 %			Negative predictive	92.00 %	

Summary

Glucosuria is common during pregnancy. In this series, 22.80% of pregnant women have glucosuria in the second fasting urine while 41.52% spill glucose in urine following an oral glucose load. One fourth of these glucosuric pregnant women alone are gestational diabetic. Contrarily, only 31.58% of gestational diabetic woman in this series have glucosuria in second fasting urine. This is at variance with the observation of Stowers¹ who found glucosuria in the second fasting specimen to be a true indicator of glucose intolerance during pregnancy. Our observations indicate that glucosuria is less reliable and therefore blood glucose estimation is essential for the detection of glucose intolerance during pregnancy.

Reference

1. Stowers J.M. and Beard R.W. : Special features of Diabetic pregnancies and their progeny in *Complication of Diabetes-Second Edition*, Edward Arnold, 1982 Ed. H. Keen & J. Jarrett.