Diabetes Asia Journal
Vol. 2, Issue 1, April 2025, Edition: Online
Publisher: Diabetes Asia Journal under JHRC
eISSN: 3048-8192
Cross Ref DOI: https://doi.org/10.62996/daj.50042025
Journal Homepage: https://diabetesasia.org/journal/

Review of spot Test and significance of Post Prandial Blood Glucose (PPBG) ≥110 mg/dl in 8-10 weeks of Pregnancy

VeerasamySeshiah[1], Rajesh Jain[2].

[1]Hony Distinguished Professor of the Tamilnadu Dr. MGR. Medical University Chennai, India;[2]Jain Hospital and Research Centre, Kanpur, India.

Submitted: 10 April 2025; Accepted: 25 April 2025; Published: 29 April 2025

Corresponding Author: Dr Rajesh Jain, Consultant Diabetes, [2]Jain Hospital and Research Centre, Kanpur, India.
email: jainhospitals@gmail.com

Abstract

Abstract: The Metformin & MNT by the 8-10 weeks of pregnancy to prevent gestational diabetes. According to Dr. Seshiah, when fetal insulin secretion begins, significant changes occur in maternal metabolism, Hyperglycemia can lead to non-communicable diseases later in life, which is why gestational diabetes is often referred to as a precursor to these conditions. It is important to avoid the transgenerational transmission of diabetes. Spot Test discovered by V Seshiah group 40 years ago with 105 mg/dl by plasma lab value and now 110 mg/dl by plasma calibrated Glucometer are Just equal value.

Key world: Spot Test, Medical Nutrition Therapy, Post Prandial Blood Glucose**.**

Introduction: Low renal threshold for glucose during pregnancy renders glucosuria less specific for the diagnosis of glucose intolerance during pregnancy. The normally lower blood glucose levels during pregnancy makes extrapolation of the non-pregnant blood glucose criteria to pregnancy unsuitable. OGTT after O'Sullivan and Mahan (1964) during each trimester of pregnancy in every pregnant woman is impractical in a country where 17000 child births per year take place in one hospital alone. Therefore, blood glucose was estimated in 971 randomly selected pregnant women at the time of consultation at various stages of gestation, irrespective of the time at which they had had their last meal. The time interval between the last meal and the time of blood collection was calculated and corrected to the nearest 30 minutes; intervals of over 3 hours were interpreted as fasting (zero hour) sample. The +2SD figures of 85, 95, 105, 105, 95 and 90 mg% (venous whole blood glucose) at 0, 30, 60, 90, 120, 150 and 180 minutes respectively is recommended as the cut-off point beyond which a lOO gm OGTT (O'Sullivan)) is indicated. Thus the "Spot Test" for Blood Glucose is a convenient screening test for glucose intolerance during pregnancy [1].

An ideal thing would have been to carry out OGTT in all the subjects to confirm their glucose tolerance, but, as a test measure. 100 randomly select women from among the study group were subjected to OGTT. Their OGTT value are shown in Fig. 4. On a comparative analysis of the 95 per centile values obtained on Spot Test and OGTT with the O'Sullivan and Mahan's (1964) diagnostic criteria, it is found that though the OGTI values are significantly higher than the: spot test values (Fig. 5), they are still significantly lower than the O'Sullivar diagnostic criteria (Fig. 6). It is therefore evident that pregnant women whose spot test results are within the +2SD figures quoted above (Table II) would in fact have normal glucose tolerance on formal glucose challenge [2]

"Spot Test" for blood Glucose in Pregnancy published by Seshiah et al in 1985 in Journal of Obstetrics & Gynecology (JOGI) from Department of Diabetology, Madras Medical college and Government General hospital, Madras-600003, accepted for Publication on 4.01.1985.

Since the above article is not available online, the following pages have been scanned and provided. A request has been sent to editor, JOGI for use of these pages and scan copy to be used in this article for non-commercial use (Article is open access & free of APC). These articles will support the framework for screening Early Gestational Glucose Intolerance (EGGI) during the early weeks of pregnancy, specifically between 8 and 10 weeks. V. Seshiah proposes a cut-off value of 110 mg/dL in 8-10 weeks of gestation to predict and prevent Gestational Diabetes in the second and third trimesters, and potentially beyond.

"SPOT TEST" FOR BLOOD GLUCOSE IN PREGNANCY

by

V. Seshiah
R. S. Hariharan
A. Sudaram
T. K. Ramanakumar
V. S. Ganesan
Kumari Jyothi G.
and
Sam G. P. Moses

SUMMARY

Low renal threshold for glucose during pregnancy renders glucosuria less specific for the diagnosis of glucose intolerance during pregnancy. The normally lower blood glucose levels during pregnancy makes extrapolation of the non-pregnant blood glucose criteria to pregnancy unsuitable. OGTT after O'Sullivan and Mahan (1964) during each trimester of pregnancy in every pregnant woman is impractical in a country where 17000 child births per year take place in one hospital alone. Therefore, blood glucose was estimated in 971 randomly selected pregnant women at the time of consultation at various stages of gestation, irrespective of the time at which they had had their last meal. The time interval between the last meal and the time of blood collection was calculated and corrected to the nearest 30 minutes; intervals of over 3 hours were interpreted as fasting (zero hour) sample. The +2SD figures of 85, 95, 105, 105, 95 and 90 mg% (venous whole blood glucose) at 0, 30, 60, 90, 120, 150 and 180 minutes respectively is recommended as the cut-off point beyond which a 100G OGTT (O'Sullivan)) is indicated. Thus the "Spot Test" for Blood Glucose is a convenient screening test for glucose intolerance during pregnancy.

Introduction

Glucose intolerance developing during pregnancy is a correctable cause of foetal wastage. Low renal threshold for glucose during pregnancy renders glucosuria less specific for its detection. The normally lower blood glucose levels during pregnancy makes extra-polation of the non-pregnant blood glucose criteria to pregnancy unsuitable. Glucose Toler-

From: Department of Diabetology, Madras Medical College and Government General Hospital, Madras-600 003.

Accepted for publication on 4-1-85.

Fig. 1
LDH—1, 2 and 3 were observed during 8-12 weeks of gestation.

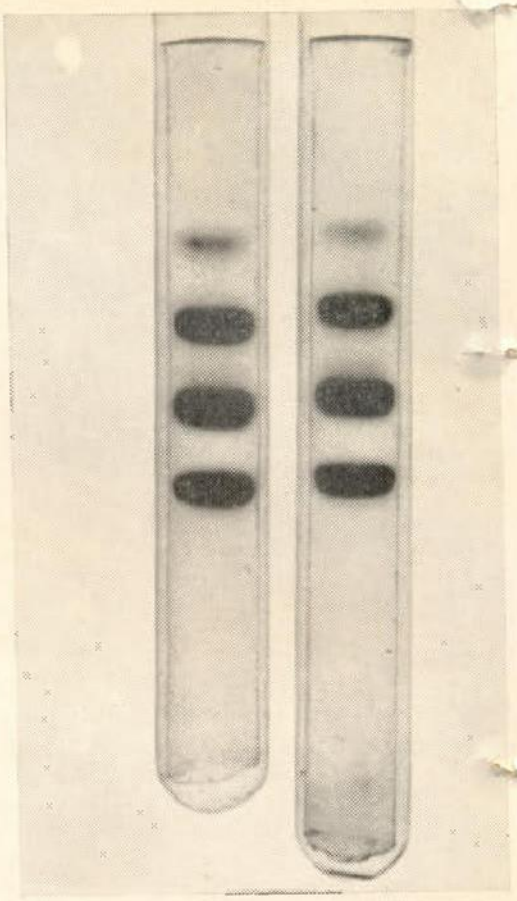
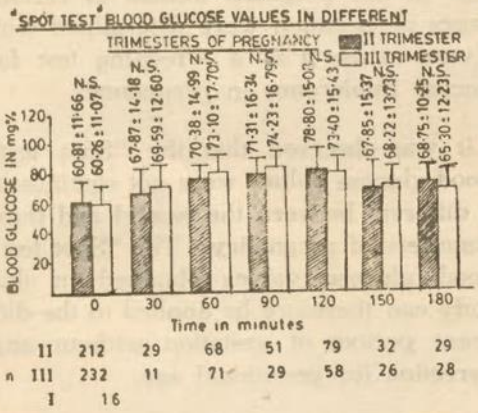


Fig. 2
LDH—4 & 5 were observed only during 12-24 weeks of gestation.

"Spot Test" Blood Glucose Values in Different Trimesters of Pregnancy

Among the 971 pregnant women studied, 16 were in first trimester, 500 in second trimester and 455 in third trimester of pregnancy. The number of women in first trimester of pregnancy was too small to be analysed. It may be mentioned that pregnant women in this country rarely attend antenatal clinic before second trimester of pregnancy. An analysis of the "Spot Test" blood glucose results between those in second trimester and those in third trimester of pregnancy did not reveal any significant difference at any of the time point from last meal (Fig. 2). Therefore the "Spot Test"

FIG. 2

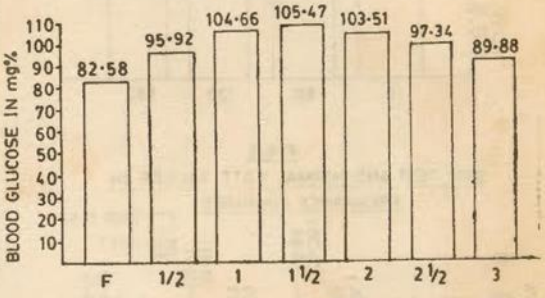


blood glucose values obtained in this study can be applied to the different periods of gestation without any correction for gestational age.

Fig. 3 shows the 95 per centile values for the "Spot Test" results, and when corrected to the nearest 5 mg they are 85, 95, 105, 105, 105, 100 and 90 mg% at 0, 30, 60, 90, 120, 150 and 180 minutes, respectively (Table II).

FIG. 3

+2SD FIGURES FOR THE SPOT TEST BLOOD GLUCOSE VALUES IN PREGNANCY (n = 971)



An ideal thing would have been to carry out OGTT in all the subjects to confirm their glucose tolerance, but, as a test measure. 100 randomly selected women from among the study group were subjected to OGTT. Their OGTT values are shown in Fig. 4. On a comparative analysis of the 95 per centile values obtained on Spot Test and OGTT with the O'Sullivan and Mahan's (1964) diagnostic criteria, it is ound that though the OGTT values are significantly higher than the spot test values (Fig. 5), they are still significantly lower than the O'Sullivan diagnostic criteria (Fig. 6). It is therefore evident that pregnant women whose spot test results are within the +2SD figures quoted above (Table II) would in fact have normal glucose tolerance on a formal glucose challenge.

TABLE II

+ 2SD Figures of Spot Test Blood Glucose Values
(corrected to nearest 5 mg)

Time in Minutes	0	30	60	90	120	150	180
+ 2SD Blood Glucose in mg%	85	95	105	105	105	95	90

FIG. 4

OGTT VALUES IN 100 PREGNANT WOMEN

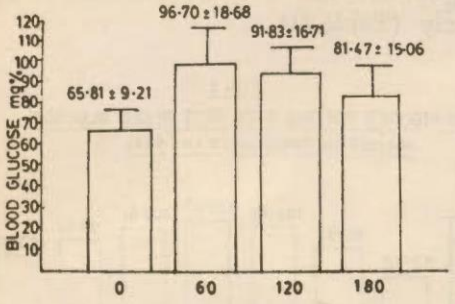


FIG. 5

SPOT TEST AND NORMAL OGTT VALUES IN PREGNANCY COMPARED

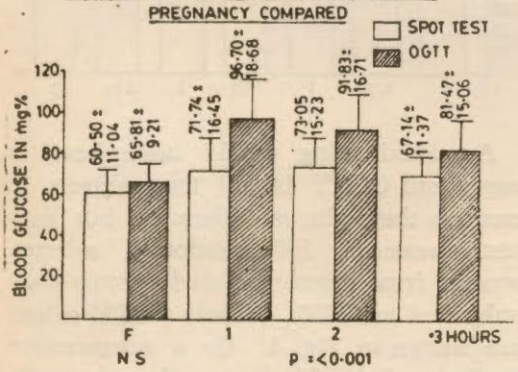
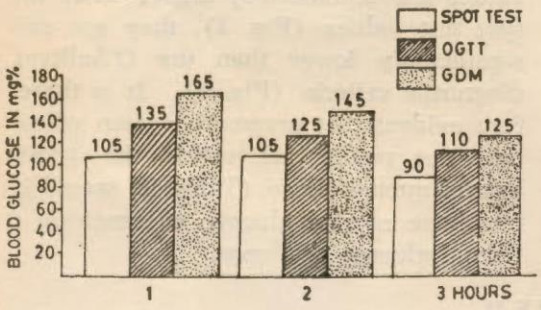


FIG. 6

+2 SD VALUES ON SPOT TEST AND OGTT COMPARED WITH GDM DIAGNOSTIC CRITERIA



Discussion

Glucosuria during pregnancy is non-selective and unreliable as a screening test for the recognition of glucose intolerance during pregnancy. The blood glucose levels are normally lower during pregnancy and hence the non-pregnant blood glucose values cannot be extrapolated to pregnant women to detect abnormal glucose tolerance during pregnancy. Therefore, glucosurea and the non-pregnant blood glucose values cannot be used for the screening of glucose intolerance during pregnancy. That it is impractical to carry out OGTT in all pregnant women during all 3 trimesters in a country with high birth rate has already been stressed (vide supra). The role of glycosylated haemoglobin in the recognition of glucose intolerance during pregnancy has not been fully evaluated. Therefore, in this study, the normal blood glucose levels in pregnancy on a "Spot test" in 971 pregnant women at various stages of gestation were determined with a view to use it as a screening test for glucose intolerance in pregnancy.

It was observed that the "Spot test" blood glucose values were not significantly different between the second and third trimesters of pregnancy. The "Spot test" blood glucose values obtained in this study can therefore be applied to the different periods of gestation without any correction for gestational age.

OGTT performed in 100 randomly selected subjects from among the study group and a comparative analysis of these results and the "Spot test" results with the O'Sullivan and Mahan's (1964) diagnostic criteria, indicate that pregnant women whose "Sport Test" results are within the 95 percentile values would in fact have normal glucose tolerance. Hence, pregnant women with "Spot Test" Blood Glucose levels that meet or exceed 95 percentile values obtained in this study, would require an OGTT.

Credit Vseshiah, 1982

Conclusion

Normal venous whole blood glucose levels on a "Spot Test" in pregnancy are reported. Any pregnant woman who meets or exceeds the following 95 per centile blood glucose values (corrected to the nearest 5 mg%) on a "Spot Test" should be subjected to an OGTT.

"Spot Test" for blood glucose is thus a convenient screening test for the detection of glucose intolerance during pregnancy.

Time in minutes	0	30	60	90	120	150	180
Blood glucose in mg%	85	95	105	105	105	95	90

Reference

1. O'Sullivan, J. B., Mahan, C. M.: Diabetes 13: 278, 1964.

Discussion

Glucosuria during pregnancy is nonselective and unreliable as a screening test for the recognition of glucose intolerance during pregnancy. The blood glucose levels are normally lower during pregnancy and hence the non-pregnant blood glucose values cannot be extrapolated to pregnant women to detect abnormal glucose tolerance during pregnancy. Therefore, glucosuria and the non-pregnant blood glucose values cannot be used for the screening of glucose intolerance during pregnancy. That it is impractical to carry out OGIT in all pregnant women during all 3 trimesters in a country with high birth rate has already been stressed (vide supra). The role of glycosylated haemoglobin in the recognition of glucose intolerance during pregnancy has been fully evaluated and not reliable during in did rent trimesters. Therefore, in this study, the normal blood glucose levels in pregnancy on a "Spot test" in 971 pregnant women at various stages of gestation were determined with a view to use it as a screening test for glucose intolerance in pregnancy. It was observed that the "Spot test" blood glucose values were not significantly different between the second and third trimesters of pregnancy. The "Spot test" blood glucose values obtained in this study can therefore be applied to the different periods of gestation without any correction for gestational age.
OGTT performed in 100 randomly selected subjects from among the study group and a comparative analysis of these results and the "Spot test" results with the O'Sullivan and Mahan's (1964) diagnostic criteria, indicate that pregnant women whose "Sport Test" results are within the 95 percentile values would in fact have normal glucose tolerance. Hence, pregnant women with "Spot Test" Blood Glucose levels that meet or exceed 95 percentile values obtained in this study, would require an OGTT [2].

Glucometers that utilize capillary blood from a finger prick tend to produce glucose readings that are consistently higher than those obtained from lab-based tests using the glucose oxidase (GOD) method on venous blood samples. This difference underscores the importance of understanding the variances in testing methods when managing blood sugar levels effectively [3].

Conclusion

Normal venous whole blood glucose levels on a "Spot Test" in pregnancy are reported. Any pregnant woman who meets or exceeds the following 95 per centile blood glucose values (corrected to the nearest 5 mg%) on a "Spot Test" should be subjected to an OGTT. "Spot Test" for blood glucose is thus a convenient screening test for the detection of glucose intolerance during pregnancy.

Venous Whole blood Glucose value of 105 done by venous sample, lab based (Post Prandial Blood Glucose after 2 hour) will translate into around 110 mg/dl value if test is done by Glucometer which are plasma calibrated metres [3]

1. O'Sullivan, J. B., Mahan, C. M.: Diabetes 13: 278, 1964.
2. Seshiah V et al., Spot test for blood glucose in pregnancy. Journal of obst gynaec. 35(2): 287-291,1986.
3. Kumar G, Sng BL, Kumar S. Correlation of capillary and venous blood glucometry with laboratory determination. Prehosp Emerg Care. 2004 Oct-Dec;8(4):378-83. doi: 10.1016/j.prehos.2004.06.010

- **Informed Consent**

  N/A
- **Conflict of Interest Statement**

  All the authors declared “No Conflict of Interest” with this publication.
- **Additional Information**

- **DOI:** https://doi.org/10.62996/daj.50042025

Cite this Article: VeerasamySeshiah[1], Rajesh Jain[2]. Review of spot Test and significance of Post Prandial Blood Glucose (PPBG) ≥110 mg/dl in 8-10 weeks of Pregnancy. Diabetes Asia Journal;2(1):1-08. https://doi.org/10.62996/daj.50042025