

Determine the Diagnostic Accuracy of (Dipsi Criteria) Non-Fasting Oral Glucose Tolerance Test for Diagnosing Gestational Diabetes Mellitus in Mirpur Azad Jamu Kashmir

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ABSTRACT

Aim: To determine accuracy of 75gm glucose challenge in non-fasting state in gestational diabetes detection (GD) using DIPSI criteria (diabetes in pregnancy study group India).

Study place and design: Cross Sectional Descriptive study conducted at DHQ Teaching Hospital Mirpur, AJK

Duration of Study: 1st November 2016 to 1st November 2018.

Methodology: All pregnant ladies in second and third trimester who were willing for this study after excluding patient with known case of diabetes, multiple pregnancy and active and chronic liver diseases. Total 220 cases were taken 20 cases dropped from study due to vomiting after glucose ingestion. 75gm glucose was given irrespective of last meal after two hours both capillary and venous blood glucose was checked using DIPSI criteria blood sugar more than 140mg were diagnose as gestational diabetes.

Result: Out of 200 cases 61 patient has blood sugar (30.5%) more than 140mg and 139 has BSL less than 140mg and were consider negative (69%). 41 turned out to be having GDM (true positive 20%) and required treatment. 20 patients has false positive result (10%). Seven patients having false negative 3.5% and 132 (66%) were true negative. There is no significant difference between plasma and capillary blood glucose. Sensitivity is 85.42% and specificity is 86.84% with positive predictive value of 67.21%. Diagnostic accuracy is 81.5%.

Conclusion: Although non fasting OGTT is simple and sensitive procedure so large multicenter trial studies should be encourage on large sample size before recommended as a standard diagnostic test in A Jamu Kashmir.

Keywords: Non fasting OGTT, Gestational Diabetes Mellitus, Blood Sugar Level, DIPSI.

INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance diagnosed first time in pregnancy irrespective of treatment with diet.¹ Prevalence range from 1 to 20% and it depends on diagnostic criteria and population sample². It is associated with bad obstetrical outcome. Its prevalence is on rising trend. It has been reported that in Asian population its prevalence is raising³.

There are various recommendation for its diagnosis but no uniform standard has yet been established. Although fasting plasma glucose is a practical approach in countries where standard OGTT not applicable but its reliability in Asian population is question mark because of rising trend of GDM second issue is its low sensitivity in Asian women⁴ hence only fasting BSL may not be reliable.⁵ ACOG recommend two step procedure 1st GCT and if it is more than 140 then OGTT advised. Two steps procedure has its own advantages and disadvantages⁶. WHO also recommend two steps with positive OGCT 2 hour, glucose tolerance with 75gm glucose is recommended.

In developing and resource poor countries practically not feasible for pt. to come in hospital in fasting state especially from far hilly areas of AJK so alternative like DIPSI should be considered in our set up.⁷ One school of thought that in patient with impair insulin response behave abnormal first with meal and then with 75gm glucose whereas normal glucose level with normal insulin response. So false positive result was less⁷. Lost to follow up is a big issue but this lost is less in DIPSI group⁸. It has been well documented in literature⁹.

This one step procedure is very suitable in our areas

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where due to difficult geographical distribution pt. never come back in fasting state most of the time. Studies have been done to see if capillary glucose sampling is far similar and easier can replace venous sample¹⁰.

We aimed to determine the diagnostic accuracy of non-fasting OGTT level using the DIPSI criteria by comparing its results with standard OGTT using WHO in cross sectional sample of Mirpur AJK women.

RESULTS

Out of 200 cases (using DIPSI criteria that is 2 hours BSL after 75gm glucose irrespective of last meal) more than 61 patients have blood sugar more than 140mg (30%) while 139 cases having blood sugar level less than 140mg/dl (69%) when comparing these values to WHO criteria after gold standard fasting OGTT out of these positive 61 cases 41 turn out to true positive (20%) and 20 were false positive (10%). Out of 139 negative cases by DIPSI, 7 patients have false negative (3.5%). Its mean total 48 cases (24%) turned out to be positive. This is a high prevalence rate in our community. Sensitivity of this test was 85.4%, specificity is 86.8%, positive predictive value is 67.21% negative predictive value is 94.9% and diagnostic accuracy is 81.5% (Table 1)

Table Diagnostic accuracy of non-fasting OGTT When Compared with WHO Gold Standard OGTT (n =200)

			Total
Positive	41 TP	20 FP	61
Negative	7 FN	132 TN	139

TP = True Positive, FP = False Positive, FN = False Negative, TN= True Negative. Sensitivity 85.41%

Specificity 86.84%, Positive Predictive value 67.21%

Negative Predictive value 94.96%, Diagnostic accuracy 81.5%

DISCUSSION

Women with GDM are at increased risk of developing type 2 diabetes mellitus in later half of age. Their children are also at increased risk of diabetes.¹¹ Pregnancy with GDM is considered as a high risk pregnancy with risk of so many maternal and fetal complication hence its diagnosis and treatment is very important for better pregnancy outcome. Earlier two steps approach was used that is GCT and if more than 140. OGTT was planned. The Hapo study 12 and IADPSG criteria 13 recommended universal use of OGTT for diagnosis of DM. Practically it is difficult to implement in developing countries like Pakistan that we offered OGTT each and every women and they comply. DIPSI address this issue and recommended that 2 hours BSL more than 140mg after 75gm glucose irrespective of last meal is acceptable option for developing countries as simple and economically cheap.

In this study 75gm glucose load was given and DIPSI criteria used when compared these result with WHO OGTT results sensitivity of this test was 85% which is quite reasonable but risk of missing 15% was still there. Another study conducted by Reva et al¹⁴ showed sensitivity of 65% that is low as compare to my study. In our study sample size is small because for study purpose most of women refused to become part of this study. As GDM associated with maternal and fetal complication so patients may suffer with these complication if not diagnosed properly.

There were number of women 61 (30%) who were positive but 20 patients, (10%) turned out to be negative so positive predictive value is 67.2%. So over diagnosis is another problem with this test. Patients have to face stress and unnecessary induction and laboratory test increase financial burden on patients.

All the patients who turned out to be negative 139.7 turn out to be positive but negative predictive value is high (94.9%) its mean that if value does' meet the defined value patient is unlikely to be case of DM. Negative predictive value is also high (97.7%) in other studies conductive by Reva et al¹⁴.

100% sensitivity 100% specificity of DIPSI by Anjalakshi et al¹⁵ when comparing with WHO criteria. In this study sensitivity is 85 and specificity is 86% and prevalence is 24%. Another study on Indian population and showed similar results¹⁶. However Mohan et al¹⁷ showed very less sensitive of non-fasting OGTT. Sensitivity is 27.7% and specificity 97.7%. In other study GDM was reported in 6.52% and this low prevalence might to be less sensitivity of DIPSI criteria¹⁸.

In our study 3.5% were not diagnosed by this DIPSI test. Another study on small number that 22.36% person were not diagnosed by DIPSI¹⁹ because of my small sample size may contribute this low value of false negative. Sri Lankan study showed low sensitivity on 274 cases as sample size is also small in my study but high prevalence in Sri Lankan women, result should be considered significant.²⁰ However Magon et al²¹ had recommended the DIPSI test for universal use in India.

CONCLUSION

Use of this test as a diagnostic tool need to be further evaluated in large, multicenter studies before utilizing for universal implementation in Pakistan/AJK.

REFERENCE

1. Buchanan TA, Xiang A, Kjos SL, Watanabe R. What is gestational diabetes? *Diabetes Care*. 2007;30:S105–S111.

2. International Diabetes Federation. *IDF Diabetes Atlas*, 6th ed. Brussels, Belgium: International Diabetes Federation, 2013.
3. Ferrara A. Increasing prevalence of gestational diabetes mellitus: a public health perspective. *Diabetes Care*. 2007;30(Suppl 2):S141–S146.
4. Mohan V, Mahalakshmi MM, Bhavadharini B, Maheswari K, Kalaiyarasi G, Anjana RM, et al. Comparison of screening for gestational diabetes mellitus by oral glucose tolerance tests done in the non-fasting (random) and fasting states. *Acta Diabetol*. 2014;51:1007–13.
5. Junnare KK, Adhau SR, Hegde MV, Naphade PR. Screening of gestational diabetes mellitus in antenatal women using DIPSI guidelines. *Int J Res Med Sci*. 2016;4:446–9.
6. Practice Bulletin No. 137. Gestational diabetes mellitus. *Obstet Gynecol*. 2013;122(2 Pt 1):406–416.
7. Anjalakshi C, Balaji V, Balaji MS. A single test procedure to diagnose gestational diabetes mellitus. *Acta Diabetol*. 2009;46(1):51–54.
8. Sievenpiper JL, McDonald SD, Grey V, Don-Wauchope AC. Missed follow-up opportunities using a two-step screening approach for gestational diabetes. *Diabetes Res Clin Pract*. 2012;96(2):e43–e46.
9. Balaji V, Balaji M, Anjalakshi C. Diagnosis of gestational diabetes mellitus in Asian-Indian women. *Indian J Endocrinol Metab*. 2011;15(3):187–190.
10. Balaji V, Madhuri BS, Paneerselvam A. Comparison of venous plasma glucose and capillary whole blood glucose in the diagnosis of gestational diabetes mellitus: a community-based study. *Diabetes Technol Ther*. 2012;14(2):131–134.
11. American Diabetes Association. Gestational diabetes mellitus (position statement) *Diabetes Care*. 2002;25(Suppl 1):S94–6.
12. Metzger BE, Lowe LP, Dyer AR, Trimble ER, Chaovarindr U, Coustan DR, et al. HAPO Study Cooperative Research Group. Hyperglycemia and adverse pregnancy outcomes. *N Engl J Med*. 2008;358:1991–2002.
13. Metzger BE, Gabbe SG, Persson B, Buchana TA, Catalano PA. IADPSG recommendation on the diagnosis and classification of hypoglycemia in pregnancy. *Diabetes Care*. 2010;33:676–82.
14. Reva T, Divya V, Vinod KG, Shakun T, Kalaivani M, Siddarth R, Mala YM. Evaluation of 75g glucose load in non-fasting state [Diabetes in Pregnancy Study group of India (DIPSI) criteria] as a diagnostic test for gestational diabetes mellitus. *Indian J Med Res*. 2017;145(2): 209–214.
15. Anjalakshi C, Balaji V, Balaji MS, Ashalata S, Suganthi S, Arthi T. A single test procedure to diagnose gestational diabetes mellitus. *Acta Diabetol*. 2009;46:51–4.
16. Sharma K, Wahi P, Gupta A, Jandial K, Bhagat R, Gupta R. Single glucose challenge test procedure for diagnosis of gestational diabetes mellitus: a Jammu cohort study. *J Assoc Physicians India*. 2013;61:558–9.
17. Mohan V, Mahalakshmi MM, Bhavadharini B, Maheswari K, Kalaiyarasi G, Anjana RM. Comparison of screening for gestational diabetes mellitus by oral glucose tolerance tests done in the non-fasting (random) and fasting states. *Acta Diabetol*. 2014;51:1007–13.
18. Junnare KK, Adhau SR, Hegde MV, Naphade PR. Screening of gestational diabetes mellitus in antenatal women using DIPSI guidelines. *Int J Res Med Sci*. 2016;4:446–9.
19. Vij P, Jha S, Gupta SK, Aneja A, Mathur R, Waghdhare S, et al. Comparison of DIPSI and IADPSG criteria for diagnosis of GDM: A study in a North Indian tertiary care center. *Int J Diabetes Dev Ctries*. 2015;35:1–2.
20. Herath M, Weeraratna TP, Umesha D. Is non fasting glucose challenge test sensitive enough to diagnose gestational diabetes mellitus? *Int Arch Med*. 2015;8(93):215.
21. Magon N, Chauhan M. Diagnosing GDM: Role of simple, cost effective and sensitive DIPSI test. *J Obstet Gynaecol India*. 2014;64:299–300

