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A STUDY OF COMPARISON OF DIAGNOSTIC ACCURACY OF NON-FASTING DIPSI WITH FASTING (WHO CRITERIA G D M)

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ABSTRACT

To compare the accuracy of non-fasting DIPSI (Diabetes In Pregnancy Study Group India) with fasting WHO GTT (Glucose Tolerance Test)1999 for diagnosing gestational diabetes mellitus(GDM) among antenatal women. Pregnant women of gesational age 24 to 28 weeks attending antenatal clinic underwent a 2-h 75-gm GCT in non-fasting state (DIPSI). A 2-h75-gm GCT was repeated for all women after 48 h in a fasting state (WHO criteria). Gestational diabetes mellitus was diagnosed if plasma glucose was 140 mg/dl by either test. Results of the 1000 women evaluated, 82 were diagnosed as gestational diabetes mellitus by WHO criteria, 72by DIPSI. The diagnostic accuracy of non fasting DIPSI is 80% and the diagnostic accuracy of fasting WHO criteria is 91%. WHO GTT criteria had high diagnostic accuracy compared to non fasting DIPSI.

INTRODUCTION

Today the major health problem in world is Gestational diabetes mellitus, and the prevalence rates vary according to the population screened and the type of diagnostic method used. During pregnancy early detection and achieving normal blood glucose can prevent complications for both the mother and her baby. Therefore, the need for universal screening is very essential specially in Indian women who have 11-foldhigher risk of developing gestational diabetes mellitus compared to Caucasian women [1]. Without attending any antenatal clinic, many women in developing countries avail antenatal care late in second or third trimester or may approach the health facility during labor. In the last decade, as per the National data, health indicators including utilization of antenatal care services were as poor as 50-60% in rural areas [2], and there is a drop out of nearly one-

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third in the follow-up visits every year in India about 27 million pregnancies occur, and all these women need to be screened for gestational diabetes mellitus. With this, Diabetes in Pregnancy Study group India (DIPSI) recommended 75-gram glucose challenge test in nonfasting state for diagnosis of gestational diabetes mellitus. This one-step procedure is simple, feasible, and economical for diagnosis of gestational diabetes mellitus [3]. Although DIPSI criteria have been recommended by the Ministry of Health [4], Government of India, it is not being followed in many centers all overthe country. Current position of DIPSI remains controversial as few recent studies have reported its poor sensitivity and specificity compared to other tests [5-7].Based on a large retrospective study comparing the IADPSG criteria and the WHO 2009 criteria, it was concluded[8] that WHO 2hPG of >140 mg/dl appears to be sufficient to diagnose gestational diabetes mellitus, as it picks up the majority of gestational diabetes mellitus cases diagnosed by IADPSG criteria as well. Since one blood sample of WHO criteria picks the same number of cases as the three samples of IADPSG criteria, the single WHO cut-point of 2 h PG[140 mg/dl appears to be suitable for large-scale screening for



gestational diabetes mellitus in India and other developing countries. Therefore, the WHO 1999 criteria was chosen as gold standard in this study as gestational diabetes mellitus based on this criteria has been shown to predict adverse pregnancy outcome [9]. The aim of the current study was to compare the diagnostic accuracy of non-fasting tests DIPSI with fasting WHO 1999 criteria for diagnosis of gestational diabetes mellitus.

Materials

This cross-sectional study was conducted in Our hospital, Shri Satya Sai medical college and research institute and Sri Lakshmi narayana Institute of medical sciences, Pondicherry, after obtaining proper ethical clearance and informed consent from all patients. Enrollment and conduct of the study were done in accordance with ICH-GCP guidelines.

Study population

The study population comprised of 400 pregnant women attending antenatal clinic

Sample Size

Sample size was computed as in a diagnostic test study with calibrated outcome. Further assuming prevalence of gestational diabetes mellitus of 10.5% to 15.7% in the screened population [10], we needed to screen at least 1000 pregnant women to diagnose gestational diabetes mellitus. Statistical analysis was performed using version 17 of SPSS Software for Windows. The results were expressed as mean \pm standard deviation and percentage. The diagnostic accuracy of DIPSI and GTT were calculated.

Inclusion criteria.

- 1. Singleton pregnancy
- 2. Period of gestation 24 to 28 weeks
- 3. Women who are willing to participate in the study

Exclusion criteria

- 1. Women with multiple pregnancy
- 2. Already diagnosed cases of diabetes mellitus
- 3. Women who are not willing to participate in the study

Method

After informed consent, women presenting to the antenatalout patient department were recruited and underwent a detailed history and thorough clinical examination. BMI was calculated based on the prepregnancy weight and height. All women were given 75gm glucose load orally in water within 10 min irrespective of their previous meal as recommended by DIPSI. Blood sugar was measured after2 h. All participants were in structed to return after 48 h in a fasting state for WHOGTT. Blood sugar was measured in a fasting state and then2 h after glucose load. Diagnosis of gestational diabetes mellitus was made if 2 h post-glucose blood sugar was C140 mg/dl by either test. All women were asked to come for WHO GTT in fasting state by telephonic call given1 day prior to the test to minimize the loss of cases. The blood sugar samples were analyzed on fully automated clinical chemistry analyzer.

RESULTS

In the present study, mean age was 24 year, while it was 28 years in women with gestational diabetes mellitus. The mean BMI was significantly increased in gestational diabetes mellitus as compared to nongestational diabetes mellitus group. obesity (BMI >25 kg/m2) was significantly more prevalent in the gestational diabetes mellitus women as compared to non-gestational diabetes mellitus. In cases of gestational diabetes mellitus, the mean blood sugar by DIPSI was 170 mg/dl and by WHO criteria was 182mg/dl. Women diagnosed as gestational diabetes mellitus by WHO GTT were 82 and by DIPSI were 72.

Table 1: Risk factors for GESTATIONAL DIABETES MELLITUS

Risk factors	Number	Relative risk
AGE > 25	75	83%
BMI	60	66%
FAMILY HISTORY	31	34%
H/O ABORTION	20	22%
H/O IUD/SB	12	13%

DIAGNOSTIC DISTRIBUTION OF GESTATIOANAL DIABETES MELLITUS PATIENTS BY WHO AND DIPSI



Distribution of risk factors

WHO

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Age≥25yrs-69(84.14%)
BMI≥25-54(65.8%)
FH-27(32.92%)
Abortion-18(21.95%)
SB-11(13.41%)
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DISCUSSION

The prevalence of gestational diabetes mellitus in the present study was 9%. Based on the studies conducted in South India, the prevalence of gestational diabetes mellitus was between 6 and 7% which is lesser than our present study [11,12].Relative risk of BMI > 25 is 66% when compared with the non Gestational diabetes mellitus women and it is evident that the family history diabetes, previous history of abortions, and still births were significantly higher in gestational diabetes mellitus. Reason for previous still birth and abortions in women with gestational diabetes mellitus are varing blood sugar levels, decreased placental blood flow, necrosis of placenta, abnormalities amniotic fluid, congenital and metabolic abnormalities, polycythemia, etc. In this study, 64 were diagnosed as gestational diabetes mellitus by both fasting WHO 1999 criteria and DIPSI. 18 women were picked up as gestational diabetes mellitus only by WHO criteria, similarly 8 women were diagnosed only by DIPSI. Although diagnosing gestational diabetes mellitus with a single sample is practical and economical the accuracy of diagnosing gestational diabetes mellitus is more with WHO criteria when compared to DIPSI.

DIPSI

Age≥25yrs-60(83.33%) BMI≥25-48(66.66%) FH-21(29.16%) Abortion-16(22.23%) SB-10(13.88%)

CONCLUSIONS

Non-fasting DIPSI criteria may be recommended for diagnosis of gestational diabetes mellitus due to its high diagnostic accuracy and agreement with gold standard, WHO 1999.Though this test has several advantages over WHO GTT as this single test, serving both as a screening and diagnostic test, does not require the patient to come in a fasting state and is economical.WHO CRITERIA serves as gold standard test in diagnosing Gestational diabetes mellitus when compared with non-fasting DIPSI.

Conflict of interest

Authors have no conflict of interest in the findings of this study.

Ethical Statement

This study was initiated after approval from the Ethics Committee of Human Research of the Institute. Enrollment and conduct of the study were done in accordance with ICH-GCP guidelines. Human and Animal Rights All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Informed Consent Informed consent was obtained from all individual participants included in the study.

REFERENCES

- 1. Dornhost A, Paterson CM, Nicholls JS, et al. High prevalence of gestational diabetes mellitus in women from ethnic minority groups. Diabetic Med.1992;9:820–2.
- 2. Majrooh MA, Hasnain S, Akram J, et al. Coverage and quality of antenatal care provided at primary health care facilities in the 'Punjab' province of 'Pakistan'. PLoS ONE. 2014;.doi: 10-1371/journal.pone.0113390
- 3. Seshiah V, Balaji V, Balaji MS, et al. One step procedure for screening and diagnosis of gestational diabetes mellitus. J Obstet Gynecol India. 2005;55:525–9.
- 4. Government of India, Ministry of Health and Family Welfare, Nirman Bhavan, New Delhi (DO No. M-12015/93/2011-MCH/2011). Accessed 25 July 2014.
- 5. Vij P, Jha S, Gupta SK, et al. Comparison of DIPSI and IADPSG criteria for diagnosis of GDM: a study in a north Indian tertiarycare center. Int J Diabetes Dev Ctries. 2015;.doi: 10-1007/s 13410-014-0244-5.

- 6. Herath M, Weerarathna TP, Umesha D. Is non fasting glucose challenge test sensitive enough to diagnose gestational diabetes mellitus? Int Arch Med. 2015;8:1–8.
- 7. Mohan V, Mahalakshmi MM, Bhavadharini B, 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.
- Nallaperumal S, Bhavadharini B, Mahalakshmi MM, et al. Comparison of the world health organization and the International association of diabetes and pregnancy study groups criteria in diagnosing gestational diabetes mellitus in South Indians. Indian J Endocrinol Metab. 2013;17:906–9.
- 9. Schmidt MI, Duncan BB, Reichelt AJ, et al. Gestational diabetesmellitus diagnosed with a 2-h 75 gm oral glucose tolerance testand adverse pregnancy outcomes. Diabetes Care.2001;24:1151–511.
- 10. Balaji Bhavadharani, manni Mohanraj Mahalakshmi, Ranjith, et al. Prevalence of gestational Diabetes Mellitus in urban and rural Tamil Nadu using IADPSG and WHO 1999 Criteria.
- 11. Bhvadhrini et al. Clinical Diabetes and Endocrinology (2016) 2:8.
- 12. Sharma K, Wahi P, Gupta A, et al. Single glucose challenge test procedure for diagnosis of gestational diabetes mellitus: a Jammu cohort study. J Assoc Physicians India. 2013;61:558–9.
- Wahi P, Dogra V, Jandial K, et al. Prevalence of gestational diabetes mellitus (GDM) and its outcomes in Jammu region. J Assoc Physicians India. 2011;59:227–30

