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A STUDY ON FETOMATERNAL OUTCOMES OF IADPSG VERSUS WHO DIAGNOSTIC CRITERIA OF GESTATINAL DIABETES MELLITUS

Gynaecology

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ABSTRACT

Gestational diabetes mellitus (GDM) is a disorder of carbohydrate metabolism, that develops due to inability to compensate for physiological increase in insulin resistance in pregnancy and is associated with adverse maternal and perinatal outcomes.

To measure the maternal and neonatal outcomes of Gestations diabetes Mellitus (GDM) using World Health Organization (WHO) versus International Association of Diabetes in Pregnancy Study Group (IADPSG) criteria among pregnant mother.

The current study had been conducted in the department of obstetrics &gynaecology in COMJNMH HOSPITAL, KALYANI, West Bengal during. 500 women were screened for eligibility. Among them 200women were diagnosed GDM of whom 155 women fulfilled IADPSG criteria and45women were selected on the basis of WHO criteria.

Prevalence of Gestational diabetes was 31% and 9% respectively using IADPSG and WHO (1999) criteria. The current study revealed that there was no statistically significant difference between both the groups in relation to pre-eclampsia and mode of delivery. But lower segment caesarean section (LSCS) increased in both groups. Birth weight of neonates were between 2.7-2.8 kgs. in majority of neonates of women of both groups. The mean birth weight was significantly higher in the neonates of diagnosed by WHO criteria than those women diagnosed by IADPSG criteria (mean 2.8kgs vs 2.5 kgs in respectively WHO & IADPSG, p=0.015). In our study, neonatal hypoglycemia & neonatal hypocalcemia was infrequent in either group. Neonatal hypoglycemia detected 6.5% and 8.9% and neonatal hypocalcemia detected 1.9% and 4.4% in respectively IADPSG and WHO group. Although, there was no significant difference statistically among the two groups, both hypoglycaemia and hypocalcaemia was more evident in the newborns of mothers detected by WHO critera.

It can be concluded that, overall, maternal outcome did not show any major benefit in IADPSG group. Neonatal outcome parameters were marginally better in the IADPSG group.

KEYWORDS

Gestatinal Diabetes Mellitus, Who, IADPSG, Fetomaternal Outcomes

INTRODUCTION

Diabetes complicates two to five percent of pregnancies, of which 90% is contributed by gestational diabetes mellitus.[1-2] GDM has been defined as any degree of glucose intolerance with onset of first recognition during pregnancy and does not exclude the possibility that unrecognized glucose intolerance may have antedated or begun concomitantly with pregnancy.[3-8]

There is lack of uniformity in screening and diagnostic criteria of GDM globally. The initial criteria used for diagnosis of GDM was established in 1964[9]. The World Health Organization (WHO,1999), used the same criteria for impaired glucose tolerance in pregnancy as in non-pregnant subjects(FBG≥125mg/dl, 2 hr after 75 gmOGTT, plasma glucose ≥140mg/dl)[10]. A two step approach(50 gm glucose screening test and 3 hour 100 gm GTT) ,Fasting blood glucose, Random blood glucose, HbA_1C,serum fructosamide has all been proposed as screening /diagnostic tests for GDM. American Diabetes Association (ADA) , ACOG, NICE also recommended different diagnostic criteria[11,12,13].

Recently, The hyperglycemia and adverse pregnancy outcomes study (HAPO) involving 25,505 pregnant women was conducted to determine the level of glucose intolerance in pregnancy that is associated with adverse outcomes. The study showed linear relationship between maternal hyperglycemia and increased frequency of primary and secondary outcomes which included birth weight above the 90th percentile, primary cesarean delivery, premature delivery, shoulder dystocia and pre-eclampsia [14].In 2010,based on HAPO study, International association of Diabetes and Pregnancy Study Group (IADPSG),an international collaborative group, recommended new terminology and diagnostic cut off for GDM (FBG≥92mg/dl, 75 gm GTT 1 hr plasma glucose ≥180mg/dl, 2 hr≥153 mg/dl)[15].

There is still lack of consensus regarding the best diagnostic approach as studies shows conflicting evidences regarding WHO (1999) and IADPSG criteria . A systematic review by Wendland et al.[16]after the criteria proposed by the IADPSG was published showed both the WHO and the IADPSG criteria had similar increase in adverse pregnancy outcomes in terms of large for gestational age babies, cesarean delivery and pre-eclampsia . The Atlantis Diabetes in Pregnancy Program conducted in Ireland revealed that the prevalence of GDM in a European population increased to 12.4% when using the IADPSG criteria as compared to 9.4% when using the WHO criteria. There were statistically significant adverse pregnancy outcomes in the IADPSG group as compared to the WHO group [17-18].

However, similar studies in India are few. Therefore, study needed to be done in India, the country with a very high incidence of GDM, to find out the association of maternal and fetal outcome in relation to lowering the cut off values in IADPSG criteria versus the older WHO criteria. In this background, the present study was conducted to compare WHO and IADPSG diagnostic criteria in diagnosing GDM with reference to feto maternal outcome.

To measure the maternal and neonatal outcomes of Gestations diabetes Mellitus (GDM) using World Health Organization (WHO) versus International Association of Diabetes in Pregnancy Study Group (IADPSG) criteria among pregnant mother.

MATERIALS AND METHODS

We found in our study initially screened 500 women , 65 of them had overt diabetes and were excluded ;35 of them did not give concent;155 did not meet the inclusion criteria;45 women failed to comply with the necessary investigations. Thus, 200 women were included in the study. Among them GDM was diagnosed by IADPSG criteria in 155 women and by WHO criteria in 45 women. Hence, prevalence of Gestational diabetes was 31% and 9% respectively using IADPSG and WHO (1999) criteria.

200 women diagnosed using Gestations diabetes Mellitus (GDM) using World Health Organization (WHO) versus International Association of Diabetes in Pregnancy Study Group (IADPSG) criteria among pregnant mother. The study was conducted in the department of obstetrics and Gynaecology of COMJNMH HOSPITAL, KALYANI.

Statistical Analysis:
For statistical analysis data were entered into a Microsoft excel spreadsheet and then analyzed by SPSS 24.0. and GraphPad Prism version 5. Unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate. p-value ≤ 0.05 was considered for statistically significant.

RESULT AND ANALYSIS

Out study showed that when age distribution of patients was analysed, maximum number of patients were 24-29 years of age followed by 18-23 years, 30-35 years. There was no significant difference between the groups in relation to age (p=.0.38). Majority of women in both the groups were primigravidae (nulliparous). There was no significant difference between the groups in relation to parity (p=0.52). Family history of Diabetes Mellitus were present in 53 cases(34.2%) and 21 cases (46.7%) in IADPSG and WHO groups respectively. There was nosignificant difference between the groups in relation to family history of Diabetes mellitus (p=0.17).

We showed that majority of the cases in both groups had no Previous history of GDM. There was no significant difference between the groups in relation to previous history of GDM(p=0.93). When BMI distribution of patients were analysed, most of the cases in both groups belonged to 18.5-24.9.Therewas no significant difference between the groups in relation to BMI(P=1.56). Most of the women GDM in both groups were diagnosed by 25-28 weeks of POG. There was no significant difference between the groups in relation togestational age at Diagnosis(p=0.34). During diagnosis of GDM by IADPSG criteria, Fasting Blood Sugar (FBS) were in range of 92-125 mg/dl (mean 101mg/dl) whereas, most of the cases diagnosed by WHO criteria were in the range 126- 160 mg/dl (mean 132mg/dl) and this difference was statistically significant. P-value significant(P<0.05).

Our study showed that most of the cases in both groups had HbA1C in the range 5.4-6.4%. There was no significant difference between the groups in relation to HbA1C(p=0.83). Preeclampsia were present in respectively in IADPSG and WHO groups. There was no significant difference between the groups in relation to preeclampsia (p=0.87). 13.3% women diagnosed by WHO criteria had one or more episodes of UTI during antenatal period compared to 2.65% of women diagnosed by IADPSG criteria and this difference was statistically significant (p=0.01).

We found most of the cases in both groups were delivered at 37-38 weeks of POG followed by at 39-40 weeks of POG and at 30-36 weeks of POG, there were only 5 cases of preterm delivery. There was no significant difference between the groups in relation to gestational age at delivery (p=0.39). Incidence of caesarean section was high in both the groups(54% and 60% in IADPSG and WHO respectively). There was no significant difference between the groups in relation to mode of delivery (p=0.65).

In our study we showed that birth trauma was rare during the delivery in either group. There was no significant difference between the groups in relation to birth trauma during delivery(p=0.50). Incidence of sepsis(puerperal,UTI, wound infection) was very low in both groups. There was no significant difference between the groups in relation to sepsis in postnatal periods(p=0.44). When APGAR score at 5 minutes, were analysed, mean APGAR score in neonate of women diagnosed by IADPSG was higher (mean 8.5) than those diagnosed by WHO(mean 8.04) and it was statistically significant(p=0.002).

We showed that the birth weight of neonates were between 2.7-2.8kgs in majority of neonates of women of both groups. There were no macrosomic baby in either group. The mean birth weight was significantly higher in the neonates of women diagnosed by WHO criteria than those of women diagnosed by IADPSG criteria (2.8 kg vs 2.5 kg, p=0.015). 7.7% and 11.1% neonates of the women of IADPSG and WHO groups required NICU admissions and the difference was not significant statistically. Hypoglycaemia was infrequent in either group (6.5% and 8.9%in IADPSG and WHO). There was no significant difference between the groups in relation to neonatal hypoglycaemia(p=0.82). Neonatal hypocalcaemia was also rare in either group. There was no significant difference between the groups in relation to neonatal hypocalcaemia(p=0.68).

DISCUSSION

The observation revealed that prevalence rate of GDM were higher when IADPSG criteria was used (31%) compared with WHO criteria (9%).

Prevalence of GDM, in study done by **ImohLC et al**[19] , was 21.5% and 16.2% in respectively of IADPSG and WHO groups, which was similar to our study. Similar results were found in study done by **Sagil H et al**[20]and where prevalence rate was higher in IADPSG group than WHO group.

In our study, there was no statistically significant difference between the two groups in relation to family history of diabetes and previous history of GDM. Study conducted by **Nair VG et al**[21]mentioned that previous history of GDM was found to be most significant high-risk factor associated with GDM followed by family history of diabetes.

During diagnosis of GDM in our study, the range of FBS was 92-125 mg /dl(mean 110 mg/dl) in IADPSG group and the same was 126-160 mg/dl(mean 132 mg/dl) in the WHO group and it was statistically significant(p=<0.0001).Study conducted **by Sagil H etal**[20] found that fasting plasma glucose level was very significant in evaluating the prognosis . So, a better feto maternal outcome in IADPSG group with a lower mean FBS in our study, supported the opinion of the mentioned study.

In our study, majority of patients in the both groups, GDM was diagnosed by OGTT with 75 g glucose at 25-28 weeks of gestation. The study conducted by **Sagil H etal**[20]**,** revealed that more than 24 weeks of gestation was ideal periods for diagnosis of GDM and it was similar to pur study.

The current study revealed that there was no statistically significant difference between both the groups in relation to pre-eclampsia and mode of delivery. But lower segment caesarean section (LSCS) increased in both groups. Increased rate of cesarean delivery was also observed by **Sagil H et al**[20] in their studies. GDM, being a high risk factor for both fetus and mother, increased the rate of induction of labour, and subsequent LSCS. **Sagil H et al**[20]also mentioned that prevalence of GDM was higher when diagnosed by IADPSG criteria and was associated with more LSCS which was similar to our observation.

Birth weight of neonates were between 2.7-2.8 kgs. in majority of neonates of women of both groups. There was no macrosomia baby in either group in our study. The mean birth weight was significantly higher in the neonates of diagnosed by WHO criteria than those women diagnosed by IADPSG criteria (mean 2.8kgs vs 2.5 kgs in respectively WHO & IADPSG, p=0.015). Similar to our observation, **Imol LC et al**[19]found that birth weight was significantly higher in WHO group than IADPSG group.

In our study, neonatal hypoglycemia & neonatal hypocalcemia was infrequent in either group. Neonatal hypoglycemia detected 6.5% and 8.9% and neonatal hypocalcemia detected 1.9% and 4.4% in respectively IADPSG and WHO group. Although, there was no significant difference statistically among the two groups, both hypoglycaemia and hypocalcaemia was more evident in the newborns of mothers detected by WHO critera.

CONCLUSION

We found that Rate of Cesarean delivery was high in both the groups without any statistical difference. Birth weight was significantly higher in newborns of women diagnosed by WHO criteria compared with those diagnosed by IADPSG criteria. Frequency of admission to NICU, Incidence of Neonatal hypogycaemuia and hypocalcaemia , although was higher in the newborns of WHO group compared with IADPSG group, the difference failed to reach statistical significance. It can be concluded that, Overall, maternal outcome did not show any major benefit in IADPSG group. Neonatal outcome parameters were marginally better in the IADPSG group.

Table 1: Association of all parameters in two groups in two Groups.

		IADPSG N=155	WHO N=45	P-Value (Chi-square test)
Preeclampsia	**NO**	140	41	0.87
	YES	15	4	

Infection (UTI)	**NO**	151	39	0.011
	YES	4	6	
Birth Trauma	**NO**	155	44	0.50
	YES	0	1	
Fever	**Yes**	2	0	0.44
	NO	153	45	
NICU Adm.	**NO**	143	40	0.68
	YES	12	5	
HYPOGLYCEMIA	**NO**	145	41	0.82
	YES	10	4	
HYPOCALCEMIA	**NO**	152	43	0.68
	YES	3	2	

Table 2: Association of APGAR score , Birth weight in two Groups,

		IADPSG N=155	**WHO N=45**	**P- Value (t- Test)**
APGAR score at 5 mins	**Mean ± SD**	8.51 ±.68	8.04±.85	**0.002**
	7-8	61 (39.4%)	31(68.9%)	
	9-10	94 (60.6%)	14(31.1%)	
Birth weight(kgs)	**Mean ± SD**	2.57±.32	2.85±.42	**0.015**
	2.5-2.6	60 (38.7%)	8(17.8%)	
	2.7-2.8	95 (61.35%)	37 (82.2%)	

REFERENCES:

1. "Diabetes Blue Circle Symbol". International Diabetes Federation. 17 March 2006. Archived from the original on 5 August 2007.
2. "Gestational Diabetes". NIDDK. September 2014. Archived from the original on 16 August 2016. Retrieved 31 July 2016.
3. Donovan, Peter J; McIntyre, H David (1 October 2010). "Drugs for gestational diabetes". Australian Prescriber. 33 (5): 141–144. doi:10.18773/austprescr.2010.066. Archived from the original on 17 August 2016.
4. Metzger, B. E.; Coustan D. R. (1998). "Summary and recommendations of the Fourth International Workshop-Conference on Gestational Diabetes Mellitus. The Organizing Committee". Diabetes Care. 21 Suppl 2: B161–B167. PMID 9704245. And the rest of the issue B1–B167.
5. American Diabetes, A. (2004). "Gestational diabetes mellitus". Diabetes Care. 27 Suppl 1 (Supplement 1): S88–S90. doi:10.2337/diacare.27.2007.88. PMID 14693936.
6. White, P. (1949). "Pregnancy complicating diabetes". The American Journal of Medicine. 7 (5): 609–616. doi:10.1016/0002-9343(49)90382-4. PMID 15396063.
7. "Archived copy". Archived from the original on 2017-03-02. Retrieved 2017-02-20.
8. Gabbe S.G., Niebyl J.R., Simpson J.L. OBSTETRICS: Normal and Problem Pregnancies. Fourth edition. Churchill Livingstone, New York, 2002. ISBN 0-443-06572-1
9. Carpenter, Marshall W.; Coustan, Donald R. (December 1982). "Criteria for screening tests for gestational diabetes". American Journal of Obstetrics and Gynecology. 144 (7): 768–773. doi:10.1016/0002-9378(82)90349-0. ISSN 0002-9378.
10. Ross, G. (2006). "Gestational diabetes". Australian family physician. 35 (6): 392–396. PMID 16751853.
11. Chu, S. Y.; Callaghan, W. M.; Kim, S. Y.; Schmid, C. H.; Lau, J.; England, L. J.; Dietz, P. M. (2007). "Maternal Obesity and Risk of Gestational Diabetes Mellitus". Diabetes Care. 30 (8): 2070–2076. doi:10.2337/dc06-2559a. PMID 17416786.
12. Zhang, C.; Bao, W.; Rong, Y.; Yang, H.; Bowers, K.; Yeung, E.; Kiely, M. (2013). "Genetic variants and the risk of gestational diabetes mellitus: A systematic review". Human Reproduction Update. 19 (4): 376–90. doi:10.1093/humupd/dmt013. PMC 3682671. PMID 23690305.
13. Bjorge, T.; Tretli, S.; Engeland, A.; Soule, L. M.; Schisterman, E. F.; Yu, K. F.; Catalano, P. M. (2004). "Relation of Height and Body Mass Index to Renal Cell Carcinoma in Two Million Norwegian Men and Women". American Journal of Epidemiology. 160 (12): 1168–1176.
14. Toulis, K. A.; Goulis, D. G.; Kolibianakis, E. M.; Venetis, C. A.; Tarlatzis, B. C.; Papadimas, I. (2009). "Risk of gestational diabetes mellitus in women with polycystic ovary syndrome: A systematic review and a meta-analysis". Fertility and Sterility. 92 (2): 667–677.
15. Ma, R. M.; Lao, T. T.; Ma, C. L.; Liao, S. J.; Lu, Y. F.; Du, M. Y.; Xiao, H.; Zhang, L.; Yang, M. H.; Xiao, X. (2007). "Relationship Between Leg Length and Gestational Diabetes Mellitus in Chinese Pregnant Women". Diabetes Care. 30 (11): 2960–2961.
16. ACOG. Precis V. An Update on Obstetrics and Gynecology. ACOG (1994). p. 170.
17. Carr DB, Gabbe S (1998). "Gestational Diabetes: Detection, Management, and Implications". Clin Diabetes. 16 (1): 4. Archived from the original on 2007-10-10.
18. Gabbe, Steven G. (2012). Obstetrics normal and problem pregnancies (6th ed.). Philadelphia: Elsevier/Saunders. p. 890.
19. Imoh LC, Ogunkeye OO, Isichei CO, Gadzama AA, Ekwempu CC. Combining the IADPSG criteria with the WHO diagnostic criteria for gestational diabetes mellitus optimizes predictability of adverse pregnancy outcome. Tropical Journal of Obstetrics and Gynaecology. 2016;33(2):185-9.
20. Sagili H, Kamalanathan S, Sahoo J, Lakshminarayanan S, Rani R, Jayalakshmi D, Kumar KH. Comparison of different criteria for diagnosis of gestational diabetes mellitus. Indian journal of endocrinology and metabolism. 2015 Nov;19(6):824.
21. Nair VG, Sandhu GS, Biswas M, Bhalla R. Evaluation of the incidence and outcome of gestational diabetes mellitus using the current international consensus guidelines for diagnosing hyperglycaemia in pregnancy. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2016 Dec 15;5(10):3361-6.