

Screening for gestational diabetes mellitus (GDM)

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Abstract

Background: The prevalence of diabetes mellitus in the World is 5.4% and in India, in adults it is found to be 2.4% in rural and 4-11.6% in urban population. It is estimated that 1 out of every 200 pregnancies is complicated by diabetes mellitus and additionally that 5 in every 200 pregnant women will develop gestational diabetes mellitus. It is important to identify a pregnant woman with gestational diabetes mellitus because Gestational Diabetes mellitus (GDM) is associated with significant metabolic alterations, increased perinatal mortality and morbidity, maternal morbidity and exaggerated long term morbidity among the mothers and their off springs. **Objective:** The objective of this study is to find out prevalence of gestational diabetes mellitus and to evaluate and compare the occurrence of GDM with and without risk factors. **Material and Methods:** Prospective study conducted among 450 pregnant women attending the OPD/admitted at a tertiary care hospital in Mysore after the approval from the institutional Ethical committee, were randomly selected according to the inclusion and exclusion criteria. **Results:** In our study 106 (23.56% patients) had positive screening for 50 gms OGCT. Out of 106 patients, 25 (23.58%) patients of screening positive patients had positive OGTT and 68% of GDM patients had risk factors. There were no risk factors noted in 32% of GDM patients and would have been missed if universal screening is not practiced. **Conclusion:** Universal screening for GDM is superior to selective (risk factor based) screening in detecting more cases, facilitating early diagnosis and is associated with improved pregnancy outcome. **Key Words:** Oral glucose challenge test (OGCT); Oral glucose tolerance test (OGTT); Gestational diabetes mellitus (GDM)

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increased perinatal mortality and morbidity, maternal morbidity and exaggerated long term morbidity among the mothers and their off springs.^{2,3} The screening of all pregnant women for GDM should be universal which is also recommended by the second and third international workshops on GDM and the WHO expert committee on diabetes.^{4,5}

MATERIAL AND METHODS

Prospective study conducted among 450 pregnant women attending the OPD / admitted at a tertiary care hospital in Mysore after the approval from the institutional Ethical committee, were randomly selected according to the following inclusion and exclusion criteria, irrespective of risk factors.

Inclusion Criteria: All pregnant women attending antenatal clinic, of gestational age between 24 to 28 weeks.

INTRODUCTION

The prevalence of diabetes mellitus in the World is 5.4%. It is estimated that 1 out of every 200 pregnancies is complicated by diabetes mellitus.¹ It is important to identify a pregnant woman with gestational diabetes mellitus because Gestational Diabetes mellitus (GDM) is associated with significant metabolic alterations,

Exclusion Criteria: Diabetes mellitus diagnosed prior to pregnancy. All the 450 pregnant women subjected to oral glucose challenge test.

- Universal screening done by 50 gm Oral Glucose Challenge Test (OGCT) irrespective of time and meal of the study.
- If venous blood sample ≥ 140 mg/dl, the screening considered positive.

Table 1:

Time tested	Normal	Impaired fasting glucose or Impaired glucose Tolerance	Diabetes
Fasting	<110 mg/dl	110-125 mg/dl	≥ 126 mg/dl
2 hr	<140 mg/dl	140-199 mg/dl	≥ 200 mg/dl

Statistical Methods

- All the statistical methods were carried out through the SPSS for Windows (version 16.0)

Frequencies and percentages Crosstabs Chi-Square Test

RESULTS

Age: Chi-square revealed a significant difference in frequencies of different age groups, majority of cases were in 21-25 yrs age group (54%), followed by age group of more than 25 yrs (38.7%).

Table 2:

Age (yrs)	Total No. of Cases (450)	Percentage
≤ 20	33	7.3%
21-25	243	54.0%
26-30	105	23.4%
>30	69	15.3%
TOTAL	450	100.00%

Chi square (2) = 224.880 P value (P) = .000 It was observed that as age increases the prevalence of GDM increases linearly. Out of 450 pregnant women screened, 192 (42.7%) were with risk factors and 258 (57.3%) were without risk factors. Among GDM cases, age > 25 years (48%) followed by obesity and family history of diabetes mellitus (28%) and past history of abortion were seen. In our study 106 (23.56% patients) had positive screening for 50 gms OGCT. Out of 106 patients, 25 (23.58%) patients of screening positive patients had positive OGTT and 68% of GDM patients had risk factors. There were no risk factors noted in 32% of GDM patients and would have been missed if universal screening is not practiced.

Gravidity: Almost equal number of cases are there in the study population, Primigravida (50.2%) and Multigravida (49.8%), Difference is not statistically significant (P=.925). Higher number of GDM cases are in Multigravida

(64%) as compared to Non-GDM cases (48.9%) is observed in our study.

Table 3:

Gravidity	GDM cases (25)		
	No.	%	No.
Primigravida	9	36%	217
Multigravida	16	64%	208
Total	25	100%	425

CC = 0.069, P = 0.143

OGTT and RISK FACTORS: Out of 450 women studied 25 were diagnosed as GDM as per Carpenter and Coustan’s criteria. Out of 25 cases, 17 cases (68%) are having risk factors and 8 cases (32%) are without risk factors.

Table 4:

OGTT test	Risk factors		Total
	Present	Absent	
Normal (negative)	175 (41.2%)	250 (58.8%)	425 (100%)
Abnormal (positive)	17 (68%)	8 (32%)	25 (100%)
Total	192 (42.7%)	258 (57.3%)	450 (100%)

CC = 0.123, P = .008

Complications in current pregnancy and delivery: Pre-eclampsia is the common complication, 7 cases (28%) in the GDM group followed by 6 cases (24%) of hydramnios compared to Non-GDM cases where 41 cases of pre-eclampsia (9.64%), followed by 14 cases (3.29%) of hydramnios (3.29%) which is a statistically significant difference (p<0.05). Other complications are also more in GDM cases like preterm labour (12%), infections (16%), IUD (8%), still birth (4%) shoulder dystocia (12%), with a statically significant (P<0.05) except for preterm labour, still birth and oligohydraminos, for which the difference is not statistically significant.

Table 5:

Complications	Study population (450)			
	No	%	χ^2	P
Hydramnios	20	4.44%	373.556	0.000
Preterm labour	29	6.44%	341.476	0.000
Preeclampsia	48	10.66%	278.480	0.000
IUD	6	1.33%	426.320	0.000
Infections	9	2%	414.720	0.000
Still birth	4	0.88%	434.142	0.000
Shoulder dystocia	10	2.22%	410.889	0.000
Oligohydraminos	17	3.77%	384.509	0.000

Neonatal Complications in study population: 8 cases (32%) of Macrosomia seen in GDM group compared to 13 cases (3%) in Non-GDM group which is a statistically significant. All other neonatal complications are more in GDM group i.e. Hypoglycemia (12%), RDS (12%),

Congenital anomaly (8%) compared to Non-GDM group with a statistically significant difference ($P < 0.05$) except L.B.W. and Hyperbilirubinemia which is not statistically significant.

Table 6:

Neonatal complication	Study population (450)			
	No	%	χ^2	P
Macrosomia	21	4.66%	369.920	.000
Low birth weight	34	7.55%	324.276	.000
Hyperglycemia	7	1.55%	422.436	.000
Hypocalcemia	0	0%	0	.000
RDS	10	2.22%	410.889	.000
Hyperbilirubinemia	11	2.44%	407.076	.000
Congenital anomaly	5	1.11%	430.222	.000

DISCUSSION

Prevalence of the GDM in our study is 5.5% which is comparable to Kumar *et al.*,⁴ and Vitorattos *et al.*,⁵ studies. Of the 450 screened women, 192 had risk factors, and the commonest risk factor were age > 25 yr (38%), similarly this is the commonest risk factor in Jindal A *et al.*,⁶ and Dixon DRD *et al.*,⁷ Out of 450 women screened with GCT (cut of value ≥ 140 mg/dl) 106 cases (23.56%) found to be screen positive in our study, which is comparable to the Jindal *et al.*,⁶ and Dixon DRD *et al.*,⁷ There were 25 cases diagnosed of GDM in our study. Of them 17 cases (68%) are with one or other risk factors and 8 cases (32%) are without risk factor. If selective screening is done, then these 8 cases (32%) would have been missed as they have no risk factors. the percentage of cases missed if selective screening is used is comparable to other studies as shown in table. Our study support the concept of universal screening.

Table 7:

Studies	Percentage of patients missed in selective screening
Bhattacharya <i>et al.</i> , ⁷	33.3%
Baliutaviciene D <i>et al.</i> , ¹¹	23.13%
Wagaarachchi.T <i>et al.</i> , ¹²	40%
Coustan <i>et al.</i> , ¹⁰	35%
Present study	32%

CONCLUSION

Universal screening for GDM is superior to selective (risk factor based) screening in detecting more cases, facilitating early diagnosis and is associated with improved pregnancy outcome.

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