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ASSESSMENT OF AWARENESS ABOUT GESTATIONAL DIABETES MELLITUS AMONG RURAL ANTENATAL POPULATION OF PUNJAB, PAKISTAN

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Abstract:
Introduction: *Gestational diabetes mellitus (GDM) is the most frequent medical complication of pregnancy. GDM is a severe threat to maternal and child health in a resource constraint country like Pakistan. Awareness of the condition among antenatal women will translate into prevention and early diagnosis of the disease.*
Material and Methods: *This cross-sectional study was conducted during October to December 2020. Data collection was done using a questionnaire through convenient sampling. Antenatal women were interviewed during routine antenatal visits. SPSS-26 was used for data analysis.*
Results: *263 participants were included in this study. Majority (53.2%) of the participants did not know that blood sugar level only increases during gestational diabetes mellitus. Only 31.9% knew that 100mg/dl is the cut-off fasting blood sugar value for diagnosis of GDM. Regarding risk factors, 177 (67.3%), 148 (56.3%), 178 (67.7%) and 160 (60.8%) participants were aware that risk of GDM increases with age, history of diabetes in first degree relative, past history of GDM and obesity simultaneously. 37.6% knew that gestational diabetes rarely persists as chronic diabetes following delivery. 55.5% answered that insulin is used if blood sugar level remains uncontrolled. 46.64%, 51.3% and 43.7% of the study population knew that risk of neonatal hypoglycemia, respiratory distress and structural cardiac defects in newborn increases, respectively, in case of gestational diabetes.*
Discussion: *Majority of the study population had good knowledge about risk factors. Awareness about management and neonatal complications of gestational diabetes needs to be improved. Healthcare providers should actively educate the public to decrease the disease burden.*
Keywords: *Gestational diabetes, awareness, risk factors, neonatal complications, management.*

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INTRODUCTION:

Gestational diabetes Mellitus (GDM) is defined as a glucose intolerance resulting in high blood glucose levels of variable severity with onset during pregnancy. [1] Gestational diabetes mellitus is the most frequent medical complication of pregnancy. [2] Despite the increasing epidemic of diabetes mellitus affecting populations at different life stages, the global burden of gestational diabetes is not well assessed. [3] In a study conducted in Pakistan, frequency of gestational diabetes mellitus (GDM) was found to be 11.8% in all trimesters of pregnancy. [4] Gestational diabetes mellitus (GDM) is associated with adverse maternal and foetal outcome. [4] Obesity and family history of diabetes are the high-risk factors for gestational diabetes, along with advancing age and previous history of gestational diabetes. [4]

GDM is a severe threat to maternal and child health in a resource constraint country like Pakistan. [4] Women with gestational diabetes are at 7 times greater risk of developing type 2 diabetes than are women without gestational diabetes. [5] Patients with GDM are more often hospitalized and are more likely to have premature birth. [6] GDM is an independent risk factor for future longer-term risk of type 2 diabetes mellitus, metabolic syndrome, cardiovascular morbidity, malignancies, ophthalmic, psychiatric, and renal disease in the mother. [7]

Maternal Diabetes Mellitus, including GDM, is associated with an increased risk of neonatal respiratory distress syndrome. [8] The risk of malformations increases in new-borns of mothers with GDM compared to the general population. [9] Routine screening for neonatal hypoglycaemia following pregnancies complicated by GDM reveals high incidence of both mild and severe hypoglycaemia. [10] Offsprings born to mothers with gestational diabetes are at increased risk of long-term adverse health outcomes, including Type 2 diabetes mellitus , subsequent obesity, impacted neurodevelopmental outcome, increased neuropsychiatric morbidity, and ophthalmic disease. [7]

Gestational diabetes mellitus (GDM) is a perfect window of opportunity for the prevention of diabetes mellitus in two generations. [11] Awareness of the condition among antenatal women will result in prevention and early diagnosis of the disease. [11]

Objective:

Objective of this study was to assess the awareness regarding gestational diabetes mellitus among rural population of Punjab, Pakistan.

MATERIAL AND METHODS:

This study was a cross-sectional study conducted during October to December 2020 in rural areas of District Chakwal, Gujranwala and Sialkot. Data collection was done through convenient sampling. A questionnaire was used to collect data. Questions were divided into five parts. First Part consisted of age, educational and gravida status. Rest of the four parts consisted of close ended questions. In second, third, fourth and last part, questions were related to screening, risk factors, management and neonatal complications of gestational diabetes mellitus (GDM) simultaneously. Antenatal women were interviewed by trained lady health visitors, lady health workers and medical officers during antenatal visits. SPSS 26 was used for data entry. Data was analyzed as frequencies and percentage.

Any questionnaire with one or more missing answers was excluded.

RESULTS:

310 antenatal women were interviewed during antenatal visits. 47 were excluded.

Table 1			
Gravida Status	**Frequency**	**Percent**	**Cumulative Percent**
Primigravida	43	16.3	16.3
G2	63	24.0	40.3
G3	59	22.4	62.7
G4	47	17.9	80.6
G5	20	7.6	88.2
G6	15	5.7	93.9
G7	10	3.8	97.7
G8	3	1.1	98.9
G9	3	1.1	100.0
Total	263	100.0	

263 were included in this study. Their mean age was 29.20 with standard deviation of 5.597. Almost one-third of the participants (32.7%) were of the age between 26-30 years. The youngest and oldest participants were of the age of 18 years and 43 years simultaneously. Gravida status of majority, 212 (80.6%) of the participants, was 4 or less than 4. Almost one sixth (16.3%) of the participants were primigravida while 3 women (1.1%) had conceived for 9th time, highest among study population. 36 (13.7%) participants were uneducated.

It was noted that 62.3% had school education till matric or less than that. While 24% participants had qualification higher than matric.

Table 2		
Education	**Frequency**	**Percent**
Uneducated	36	13.7
Primary	45	17.1
Middle	38	14.4
Matric	81	30.8
Intermediate	33	12.5
Graduation	21	8.0
Post-Graduation	9	3.4
Total	263	100.0

Table 3			
Questions	**Yes**	**No**	**Don't know**
Have you ever heard of gestational diabetes mellitus?	189 (71.9%)	74 (28.1%)	-
Should screening for blood sugar be done during antenatal period?	216 (82.1%)	23 (8.7%)	24(9.1%)
Increasing age is a risk factor for gestational. diabetes mellitus.	177 (67.3%)	28 (10.6%)	58 (22.1%)
Diabetes in first degree relative is risk factor for gestational diabetes mellitus.	148 (56.3%)	63 (24%)	52 (19.8%)
Past history of GDM is a risk factor for gestational diabetes mellitus.	178 (67.7%)	34 (12.9%)	51 (19.4%)
Obesity is a risk factor for gestational diabetes mellitus.	160 (60.8%)	48 (18.3%)	55 (20.9%)
Risk of neonatal hypoglycemia is more in neonates born to mothers with GDM.	122 (46.64%)	44 (16.7%)	97 (36.9%)
Risk of respiratory distress is more in neonates born to mothers with GDM.	135 (51.3%)	52 (19.8%)	76 (28.9%)
Risk of cardiac malformations is more in neonates born to mothers with GDM.	115 (43.7%)	49 (18.6%)	99 (37.6%)

Table 3 shows that 189 (71.9%) participants had heard of diabetes and 82.1% of the participants knew that antenatal women should be screened for diabetes. Regarding risk factors, 177 (67.3%), 148 (56.3%), 178 (67.7%) and 160 (60.8%) participants were aware that risk of GDM increases with age, history of diabetes in first degree relative, past history of GDM and obesity simultaneously. 46.64% of the participants knew that risk of neonatal hypoglycemia is more in children born to mothers with gestational diabetes. 51.3% of the study population knew that infants of diabetic mother are at increased risk of respiratory distress and 43.7% knew that risk of structural cardiac defects in newborn increases in case of gestational diabetes.

Table 4 shows that 46.8% participants knew that blood sugar level increases during GDM. Only 31.9% knew that 100 mg/dl is the cut-off fasting blood sugar value for diagnosis of GDM. 37.6% knew that gestational diabetes rarely persists as chronic diabetes following delivery. 60.5% knew that blood sugar level should be followed during post-natal period in all cases of gestational diabetes.

Table 4		
Questions	**Frequency**	**Percentage**
Blood Sugar level in case of GDM is		
a) Higher than normal	123	46.8%
b) Higher or lower than normal	100	38%
c) Lower than normal	40	15.2%
Cut-off fasting blood sugar level for diagnosis of GDM is		
a) 100 or above	84	31.9%
b) 110 or above	96	36.5%
c) 126 or above	42	16%
d) 140 or above	41	15.6%
Following Delivery, how often GDM persists as Diabetes Mellitus		
a) Never	67	25.5%
b) Always	36	13.7%
c) Often	61	23.2%
d) Rarely	99	37.6%
Post-natal follow-up blood sugar test should be done in case of GDM		
a) If BSR during pregnancy goes above 400 mg/dl	51	19.4%
b) If BSR during pregnancy goes above 300 mg/dl	36	13.7%
c) If BSR during pregnancy goes above 350 mg/dl	17	6.5%
d) All cases	159	60.5%
Which of the following is used to control blood sugar level in case of GDM?		
a) Diet alone	60	22.8%
b) Oral hypoglycemics	65	24.7%
c) Exercise alone	41	15.6%
d) Insulin	46	17.5%
e) All of these	51	19.4%
Insulin is used in GDM		
a) Always	38	14.4%
b) If blood sugar is uncontrolled	146	55.5%
c) Contraindicated in pregnancy	79	30%

Regarding management to control blood sugar level in case of gestational diabetes, 22.8% of the participants said that dietary control alone is sufficient. 24.7% were of the view that oral hypoglycemics are the only option to control blood sugar level. 15.6% considered that exercise alone is sufficient and 17.5% thought insulin to be the only treatment option. Only 19.4% knew that all of these can be used to control blood sugar level in case of gestational diabetes.

Regarding use of insulin in GDM, 55.5% answered that insulin is used if blood sugar level remains uncontrolled.

DISCUSSION:

Objective of this study was to find out awareness about gestational diabetes in rural population of Punjab. In this study, majority of the 82% women responded that antenatal blood sugar level testing should be done and majority (60.4%) of the participants were aware that postnatal follow-up blood sugar test should be done in all cases of gestational diabetes. This emphasizes that majority of the population knew about importance of screening for diabetes but knowledge regarding importance of postpartum screening is low as compared to antenatal screening within same population. Postpartum screening is suboptimal globally [12-13] and awareness in this regard needs be enhanced.

Although 72% of the study population knew that diabetes can occur during pregnancy, which is less than a study done in Rawalpindi [14] and comparable to a study done in rural areas of India [15], only 46.8% knew that blood glucose level rises in case of diabetes and only 32% of the study population knew about diagnostic blood sugar level. This difference is consistent with a similar study done in an urban area of the same province [14] and reflects that although most of the women have heard of gestational diabetes but depth of knowledge regarding diabetes is low. Majority (53.2%) of the participants did not even know that blood sugar level increases during gestational diabetes mellitus.

Most of the participants had good knowledge about risk factors. More than 60% of the study population knew that risk of gestational diabetes increases with age, obesity and previous history of GDM, which is better as compared to regional and global studies done at primary healthcare centers. [16-18]. 56% of the study population knew that family history of diabetes is a risk factor for development of gestational diabetes.

Perception regarding persistence of diabetes was low. More than one-third of the respondents had poor knowledge in this regard, as they believed that gestational diabetes either never or always persists as chronic diabetes following delivery. 23.2% were of the opinion that GDM often persists as chronic diabetes. Although future risk of chronic diabetes increases in case of gestational diabetes, [19-21] gestational diabetes normally goes away after birth.[22] Only 37.6% knew that GDM rarely persists as chronic diabetes.

Regarding treatment, 24.7% ,22.8%, 17.5% and 15.6% considered oral hypoglycemics, dietary control only, insulin and exercise alone respectively to be effective enough to control blood sugar level. Only 19.4% knew that all of these can be used to manage gestational diabetes. Although majority (55.5%) of the participants knew that insulin is used in case of uncontrolled blood sugar level, a significant proportion (44.5%) of the study population was unaware of proper use of insulin in the management of gestational diabetes. 30% considered it to be contraindicated during pregnancy while 14.4% responded that insulin is used in all cases of GDM. This shows that awareness regarding management of diabetes is low among study population.

Awareness regarding neonatal complications of gestational diabetes was average. Majority of the study population did not know that infants of the diabetic mothers have increased risk to suffer from neonatal hypoglycemia and cardiac anomalies and almost half of the study population was unaware that infants born to diabetic mother have increased risk of respiratory distress syndrome. Awareness regarding neonatal complications in case of uncontrolled blood sugar will help in better management of gestational diabetes to avoid adverse fetal outcome.

CONCLUSION:

Awareness among antenatal women regarding gestational diabetes needs to be improved.

Antenatal women had good knowledge regarding risk factors of gestational diabetes. Healthcare providers should actively educate the public to decrease the disease burden.

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