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Original Article

Health Care Professionals Perspective Regarding Gestational Diabetes Mellitus in Pakistan: Are Clinicians on the Right Track?

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Abstract

Objective: To study health care professionals' perspective working at tertiary care settings regarding gestational diabetes mellitus (GDM) and to recognize differences in the practice and approach amongst them.
Study type, settings and duration: A cross-sectional survey was carried out at several tertiary care hospitals of all four provinces (Punjab, Sindh, Baluchistan and Khyber Pakhtunkhwa) from January 2017 to December 2018.
Methodology: A Nationwide cross-sectional survey on the practice patterns with respect to screening, diagnosis, management and follow-up of Gestational Diabetes Mellitus was carried out at several tertiary care hospitals of Pakistan covering physicians/ diabetologists/ endocrinologists and Obstetrician/ gynecologists. Health care professionals from public and private sectors were invited to participate. Total 300 health care professionals (HCPs) participated in this survey
Results: Among the survey participants 49.8% were general physicians, 37.8% were gynecologist/obstetrician while 12.4% were diabetologist/ endocrinologist. Regarding screening methods used by HCPs, 75gm oral glucose tolerance test (OGTT) was used by 20.4%, 50-gram glucose challenge test (GCT) by 18%, and 100-gram OGTT by 1% . A large proportion of study participants (40.4%) were using fasting blood glucose/random blood glucose for the diagnosis of GDM while 75gm OGTT for the diagnosis of GDM were practiced by only 25.1%, followed by 50gm GCT by 20%, urine glucose by 8%, HbA1c by 5.2% and 100 gm OGTT by 1.3%. While 97% advised self-monitoring of blood glucose level. Out of them 55.8% advised self-monitoring of blood glucose daily, 24.6% weekly while 19.6% monthly. Most common regimen prescribed by HCPs for management of GDM included life style modification (LSM) plus metformin plus insulin in 38.8% study participants. Post-partum screening for persistence of diabetes was advised by 80.4% HCPs. Investigations done for follow up of GDM through FBS/RBS by 50%, HbA1c by 25.3%, OGTT by 19.5% and multiple tests used by 5.2%.
Conclusion: The present study reveals that there are major differences amongst health care professionals regarding various aspects of GDM management.
Key words: Health care professionals, GDM, tertiary care settings.

Introduction

Gestational diabetes mellitus (GDM) is characterized by glucose intolerance with new onset or first recognition during pregnancy.[1,2] The rate of GDM parallels the occurrence of impaired glucose tolerance (IGT), type 2 diabetes mellitus (T2DM) and obesity in a specified population and these are rising universally.[2]

According to the estimate of International Diabetes Federation (IDF) one in every six live births (16.8%) are affected by some kind of hyperglycemia during pregnancy. While 16% of these cases may be due to diabetes in pregnancy (either earlier diabetes type 1, type 2 which antedates pregnancy or is first recognized in the index pregnancy), the majority (84%) is due to GDM.[3] GDM affects 7% of all pregnancies as per estimates of American Diabetes Association guidelines,[4] however, this prevalence has reached to 25% in south East Asian region according to the data of IDF.[5]

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SA, MR & AB conceptualized the project along with drafting, revision and writing of manuscript. Literature search & statistical analysis were done by SA & MR. SA also did the data collection.

Nevertheless, approximating the prevalence of gestational diabetes is made difficult by a lack of consensus on diagnostic criteria, a reason which also hinders its reliable diagnosis and management in clinical practice.[6]

In spite of decades of various researches, studies, and international consensus conferences, many features of hyperglycemia during pregnancy mainly related to classification and diagnosis of GDM remains to be a matter of debate.[7]

GDM is associated with higher risk of fetal and maternal complications during gestation and delivery.[8] Among those complications are shoulder dystocia and birth injuries including bone fractures & nerve palsies, fetal macrosomia, polyhydramnios, intra uterine growth restriction, low birth weight, neonatal hyperbilirubinemia, hypoglycemia, respiratory distress syndrome & pre-eclampsia, which may lead to caesarean section. Evidence from numerous epidemiological studies concluded that women with GDM have significantly increased risk of developing T2DM in their later life.[9,10]

Maternal and fetal complications related to GDM are mostly avoidable by timely diagnosis and appropriate management.[11] Lower to middle income countries such as Pakistan, have increased maternal and neonatal morbidity and mortality associated with GDM, emphasizes the significance of early diagnosis and proper management.[12]

Various protocols e.g. American Diabetes Association guidelines (ADA),[4] International Association of Diabetes and Pregnancy Study Group(IADPSG),[13] World Health Organization (WHO),[14] International Federation of Gynecologist & Obstetricians (FIGO),[2] South Asian Federation of Endocrine Societies (SAFES),[15] & Diabetes in Pregnancy Study Group India (DIPSI)[16] are in regular practice transnationally, each with its own recommendations as to which pregnant women need to be screened for biochemical testing.[17]

The objective of this study is to explore health care professionals' perspective regarding various aspects of GDM screening and management working at tertiary care settings and to recognize differences in the practice and approach between gynecologists and physicians.

Methodology

A nationwide cross-sectional survey on the practice patterns with respect to screening, diagnosis, management and follow-up of GDM was carried out at several tertiary care hospitals of all four provinces (Punjab, Sindh, Baluchistan and Khyber Pakhtunkhwa) of Pakistan covering physicians/ diabetologists/ endocrinologists and Obstetrician/ Gynecologists. Health care professionals from public and private both sectors were invited to participate. The sample for this study was calculated by using a single population proportion formula, with finite population correction with 95% confidence interval, 5% relative precision and a proportion of GDM knowledge and attitude of 50%, since there is no previous study done in the same population and 8% nonresponse rate. Hence, the total sample size was 300. Non probability convenient sampling technique was used. A verbal informed consent was taken from participants before the collection of data and the confidentiality of the information collected from the individuals was maintained. The self-structured questionnaire was developed by panel of experts taking into account various past published studies.

The questionnaire had 5 sections. First section contained demographic profile of participants including gender, year of graduation, qualification, number of years of practice, specialty, designation, working in private or public hospital. The Second section of questionnaire included questions regarding screening practices which constitutes universal or selective screening, risk factors which are taken into consideration, at which trimester it is advised, & which screening method is opted. Section three was about the diagnostic method used by the practioners. The fourth section addressed different management techniques employed, education regarding life style modifications, physical activity, whether SMBGs were advised and how often, glycemic targets, and pharmacotherapy options including oral and/or insulin. The final section comprised of postpartum follow-up practices including time of screening post-delivery, method of screening, counseling regarding future risk of developing T2DM and significance of healthy life style to prevent diabetes.

Knowledge regarding existing guidelines of GDM and their opinion about the need to develop local guidelines were also assessed.

This self-reported multiple response questionnaire was completed directly or e-mailed to health care professionals dealing with GDM women to be filled and returned. Data was analyzed using IBM Statistical Package for Social Science, version 20 to compute mean, standard deviation and percentages. Chi squared test and z score test for two population proportions were applied.

Ethical approval for the study was taken by Institutional Review Board of Baqai Institute of Diabetology and Endocrinology, Karachi.

Results

Total 300 health care professionals participated in this survey. Out of them 43.3% were

males while 56.7% were females. Majority of the participants 77.9% have post graduate degree/diploma in their respective fields. 25.7% had <5 years of experience, 42.3% had 5 to 10 years of experience and 32 had >10 years of experience. Among survey participants 49.8%, were general physicians, 37.8%, were gynecologists/obstetricians while12.4%, were diabetologists/ endocrinologists. Health care professionals from public and private both sectors were invited to participate.

In screening section, Almost 95.3% Health Care Physicians screen for GDM, out of which 52.9% were practicing universal screening while 47.1% of them were in favor to screen selectively. Among those participants who were doing selective screening, majority 34.5% of them considered risk factors, family history, past history of GDM and macrosomia. 13.7% additionally considered obesity, dyslipidemia and hypertension as risk factors for GDM while only 12.4% considered all risk factors (Figure-1).

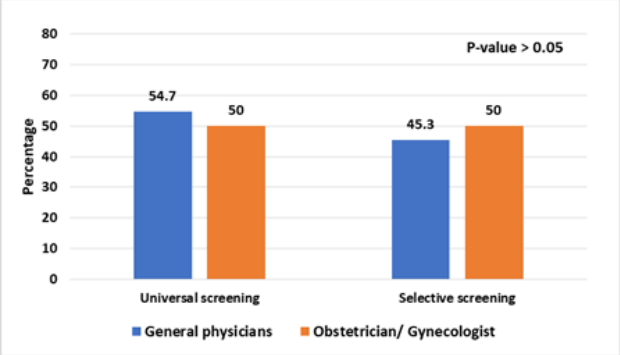

Figure 1: Screening for GDM.

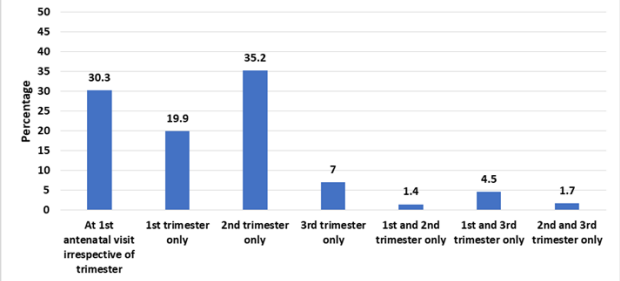

Figure 2: Trimesters wise screening preferences by health care professionals.

Out of all, (30%) participants screened pregnant women at 1st antenatal visit irrespective of trimester. Trimester wise screening is shown in Figure-2. Among screening methods used by HCP, 75gm oral glucose tolerance test (OGTT) was used by 20.4% (n=59), venous random blood glucose was being used by 16.6% (n=48) and venous fasting blood glucose by 18.6% (n=54). Other screening tests being used included: HbA1c by 4.6% (n=13), urine glucose by 3.8% (n=11), both RBS/FBS by 12.2% (n=28).

In questions related to diagnosis, a large proportion of study participants 40.4% (n=117) were using FBS/RBS to diagnose GDM while 75gm OGTT was practiced by only 25.1% (n=73), as shown in Figure-3.

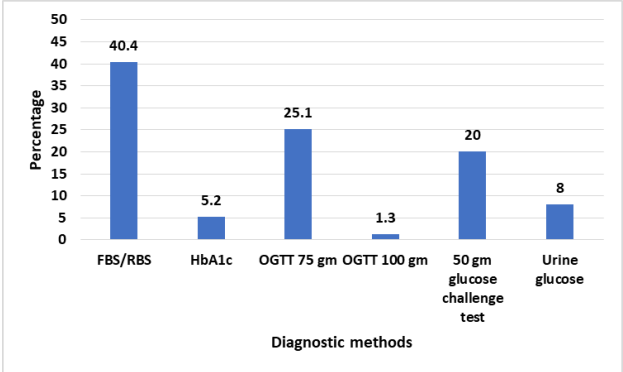

Figure 3: Percentage of different diagnostic tests ordered by HCP for diagnosis of GDM.

Majority of the HCP (39.6% (n=113) were using WHO guidelines to diagnose GDM. Other guidelines being followed are ADA guidelines by 38.2% (n=109), IADPSG (International Association of Diabetes and Pregnancy Study Groups) by 3.9% (n=11), FIGO by 3.1% (n=9) and DIPSI by1% (n=3).A total of 41 (14.2%) participants were not certain about the criteria they were using to diagnose GDM (Figure-4).

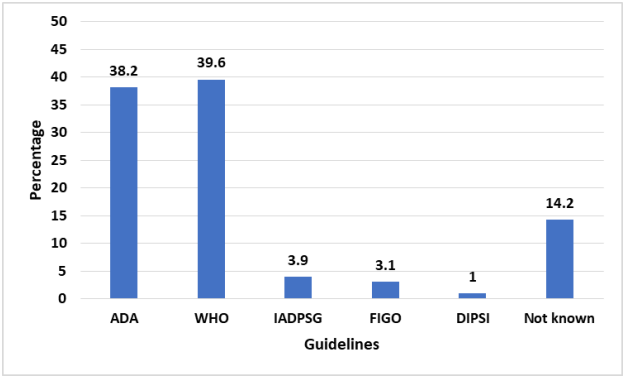

Figure 4: GDM Guidelines practiced by study participants.

Regarding management practices, One hundred and fifty participants (97.4%) advised self-monitoring of blood glucose level. Out of them 55.8% (n=86) advised SMBG daily, 24.6% (n=38)

weekly while 19.6% (n=30) monthly. Target fasting blood glucose values and random blood glucose levels were properly advised by only 44.8% (n=69) and 40.2% (n=62) respectively. Seventy seven percent (n=197) preferred human insulin while insulin analogues were preferred by 21.4% (n=55) and both by 1.9% (n=5). Majority of participants 47.5% (n=123) used free mixing of insulin followed by pre-mixed insulin being used by 22% (n=57), basal insulin was used only by 13.9% (n=36), short acting insulin only by 14.2% (n=37) and multiple combination by 2.4% (n=6).

Most common regimen prescribed by obstetricians/gynecologists for management of GDM included life style modification (LSM) plus metformin plus insulin 52.8% (n=56), LSM plus insulin by 19.8% (n=21), while physicians 29.2% (n=45), recommended LSM plus metformin plus insulin followed by LSM plus insulin 26.6% (n=41), insulin plus metformin 16.2% (n=25), and insulin only by 16.2% (n=25), as shown in Table-1.

In postpartum follow up practices, a large number of HCPs 79.5% (n=233) advised postpartum follow up of GDM. Tests used for follow up of GDM included FBS/RBS by 50% (n=77), HbA1c by 25.3% (n=39), OGTT by 19.5% (n=30) and multiple tests used by 5.2% (n=8).

In case of normal test post-partum, yearly screening was advised by 80.4% (n=230), other time periods by 14% (n=40) while 5.6% (n=16) were not given any advice on screening to the GDM women for type 2 diabetes at all.

Around 77.9% (n=120) HCPs counseled GDM women regarding increased risk of T2DM in their later lives and 3.4% (n=241) counseled them about the significance and importance of healthy life style including diet and exercise to prevent/delay diabetes as shown in Table-2.

Discussion

The present study explored health care professionals' perspective regarding diagnosis and management of GDM and recognized many differences in the practices and approach amongst them.

In our study, majority of the participants 77.9% had post graduate degree/ diploma in their respective fields and most of them 42.3% had 5 to 10 years of relevant experience as well. Recent guidelines have recommended universal screening for GDM in our part of world[15] but only 52.9% study participants were practicing universal screening for GDM. This has been observed in many studies that universal screening is still not adopted by many doctors.[12,18,19]

Forty-seven percent participants do selective screening on the basis of risk factors including family history of DM, past history of GDM/ macrosomia, obesity, dyslipidemia and hypertension. This may be partially affected by certain guidelines including American Diabetes Association which is still in favor of risk based screening.[20] HCPs advising screening merely

Table 1: Management of GDM.

	General physicians n (%)	*Obstetrician/ Gynecologist n (%)*	*p-value*	*Overall n (%)*
N	190	110	-	300
How do you manage women with GDM				
LSM	7 (4.5)	5 (4.7)	0.939	12 (4.6)
Metformin	3 (1.9)	2 (1.9)	0.999	5 (1.9)
Insulin	25 (16.2)	8 (7.5)	0.039	33 (12.7)
Metformin plus insulin	25 (16.2)	5 (4.7)	0.004	30 (11.5)
LSM and metformin	1 (0.6)	5 (4.7)	0.004	6 (2.3)
LSM and glibenclamide	1 (0.6)	0 (0)	0.425	1 (0.4)
LSM and Insulin	41 (26.6)	21 (19.8)	0.207	62 (23.8)
LSM, Metformin and insulin	45 (29.2)	56 (52.8)	0.0001	101 (38.8)
Sulfonylurea only	2 (1.3)	1 (0.9)	0.765	3 (1.2)
LSM, Metformin and glibenclamide	0 (0)	2 (1.9)	0.087	2 (0.8)
LSM, glibenclamide and insulin	3 (1.9)	1 (0.9)	0.514	4 (1.5)
LSM, Metformin, glibenclamide, and insulin	1 (0.6)	0 (0)	0.425	1 (0.4)
Which insulin do you prefer for GDM				
Human insulin	115 (74.7)	82 (79.6)		197 (76.7)
Analogues	35 (22.7)	20 (19.4)	0.509	55 (21.4)
Both	4 (2.6%)	1 (1)		5 (1.9)
Which insulin combination do you use				
Free mixing	62 (40.3)	61 (58.1)	0.005	123 (47.5)
Pre-mixed insulin	36 (23.4)	21 (20)	0.516	57 (22)
Basal only	20 (13)	16 (15.2)	0.104	36 (13.9)
Short acting insulin only	30 (19.5)	7 (6.7)	0.004	37 (14.3)
Multiple	6 (3.9)	0 (0)	0.041	6 (2.3)

Table 2: Postpartum follow-up of GDM.

	General Physicians N (%)	Obstetrician/ Gynecologist N (%)	p-value	Overall N (%)
N	190	110	-	300
Do you advise any follow-up for GDM women after delivery				
Always	142 (77.2)	91 (83.5)	0.196	233 (79.5)
Sometimes	42 (22.8)	18 (16.5)		60 (20.5)
If yes, then how many weeks after delivery				
4 weeks	43 (40.6)	20 (41.7)	0.351	63 (40.9)
6 Weeks	48 (45.3)	25 (52.1)		73 (47.4)
any other	15 (14.2)	3 (6.2)		18 (11.7)
What test do you do on follow-up				
FBS/RBS	55 (51.9)	22 (45.8)	0.154	77 (50)
HbA1c	24 (22.6)	15 (31.2)		39 (25.3)
OGTT	19 (17.9)	11 (22.9)		30 (19.5)
Multiple	8 (7.5)	0 (0)		8 (5.2)
If woman postpartum has impaired sugars or GTT but not reaching diabetic level what follow up do you recommend				
Yearly	157 (87.2)	73 (68.9%)	0.0004	230 (80.4)
None	10 (5.6)	6 (5.7)	0.972	16 (5.6)
Other	13 (7.2)	27 (25.5)	<0.0001	40 (14)
Do you counsel women with GDM about their increased risk of developing overt diabetes in future				
yes	85 (80.2)	35 (72.9)	0.314	120 (77.9)
No	21 (19.8)	13 (27.1)		34 (22.1)
Beside tests, do you counsel GDM women about their health (diet, exercise)				
Yes	150 (82.9)	91 (84.3)	0.759	241 (83.4)
No	31 (17.1)	17 (15.7)		48 (16.6)

on the basis of risk factor/s might result in undiagnosed (around 30%) GDM cases predisposing such patients to poor obstetric outcomes.[21]

Various criteria are employed for screening and diagnosis of GDM across the globe. Both the cut-off values for diagnosing and blood glucose targets practiced by HCPs were not uniform in most of the research studies.[22] In our study only one-fourth HCPs were advising 75gm OGTT for screening purposes while RBS by 16.6%, and FBS by 18.6% which is similar to some previous studies.[18,23] Another study concluded that the GCT/OGTT (75 gm) screening test was the most commonly prescribed test in a tertiary care hospital.[24] Same finding was noted in prospective study of Randhawa et al,[25] compared to our study only one fifth of HCPs used OGTT. Moreover, a KAP study found that 96% doctors were using OGTT to screen but only 42% of them exactly knew the cut off standards for the diagnosis of GDM.[26] In contrast to these studies, a study by Gupta et al revealed that a very small number of HCPs relied on OGTT for screening whereas a vast majority of them banked on fasting blood glucose for screening and diagnosing GDM.[27]

Timing of screening is very crucial particularly in those patients having greater risk of preexisting DM. A large number of HCPs advised screening in 2nd trimester which is the largely adopted timing for screening worldwide,[21] though 30.3% participants would do screening at 1st antenatal visit irrespective of trimester. A study by Divakar et al.,reported that screening of GDM was done at first antenatal visit by 65% HCPs.[28] Similarly a local study showed 39% doctors screened women for GDM during first antenatal checkup irrespective of timing of visit.[12]

Majority of our study participants were aware of international guidelines regarding GDM. Most of the HCP 39.6% were using WHO guidelines to diagnose GDM. Other guidelines being employed were ADA guidelines by 38.2 %, IADPSG by 3.9%, FIGO by 3.1% and DIPSI by 1% while 14.2% participants were not certain about the criteria they were using

In this study 97% study participants advised SMBG. This is contrary to Gabbe et al., study in which only 60% of GDM women were following self-monitoring of blood glucose level.[28] Moreover, 55.8% HCPs advised SMBG daily, 24.6% weekly while 19.6% monthly. In contrast to Divakar et al., study that showed 41% HCPs preferred venous blood glucose levels to be monitored at the interval of two weeks and did not recommend glucose monitoring at home with glucometer.[21] Target fasting blood glucose values and random blood glucose levels were correctly advised by only 44.8% and 40.2% respectively. One study revealed that insulin was the 1st line of treatment by 79% of doctors.[27]

In our study 76.7% prefer human insulin because of the cost while insulin analogues were preferred by 21.4%. Majority of participants 47.5% used free mixing of insulin followed by pre-mixed insulin by 22%, basal only by 13.9%, short acting

insulin only by 14.2% and multiple combination by 2.4%. According to ADA Insulin is the gold standard for GDM management in the U.S and metformin is next alternative.[23] In GDM management, various studies have reported favorable effects of metformin and glyburide.[29,30] Moreover metformin has been shown to have a very beneficial role in obtaining good glycemic control with optimum safety and even improved outcomes are expected when metformin is added to insulin as presented by a review article.[31] Furthermore Gabbe et al., reported, OHA were being used by approximately 13% of obstetrician.[32] In contrary to these studies Akincia et al., study showed that substantial number of doctors used Oral antidiabetic drugs, however these drugs have not been proven to be safely used during pregnancy.[33] One local study showed that practitioners are hesitant to use metformin as an alternative option to insulin which reflects an obvious gap in updated knowledge in regard to GDM management.[12] In our study most practiced regimen prescribed by HCPs for GDM management included life style modification (LSM) plus metformin plus insulin 38.8%, LSM plus insulin by 23.7%, insulin only by 12.7%, metformin plus insulin by 11.6%, LSM by only 4.6%, LSM plus metformin by 2.3%, metformin by only 1.9% , glibenclamide plus insulin by 1.6% , sulfonylurea only 1.2% , LSM plus metformin plus glibenclamide by 0.8%, LSM plus glibenclamide by 0.4% and LSM plus metformin plus glibenclamide plus insulin was used by 0.4%.

Although a large number of HCPs advice postpartum follow up, OGTT was only advised by 19.5% and majority of HCPs were ordering FBS/RBS to rule out persistent diabetes. According to ADA's recommendation, post-partum follow up test should be done with either fasting venous blood glucose or 75 gm OGTT at 6-12 weeks.[34] In our study, only 47.4% HCPs advised follow up after six weeks of delivery while a regional study in India revealed that up to 85% doctors recommends follow up at 6 weeks.[26] In post-partum period if women has impaired blood glucose level 80.4% advised yearly screening, rest of the participants either used other time period for screening or did not screened patients for T2DM at all. Similarly, 77.9% counseled GDM women regarding increased risk of T2DM in their future lives and 83.4% counseled them about the significance of healthy life style including diet and exercise to prevent diabetes but the remaining participants did not give any relevant education to GDM patients. These practice patterns showed a major gap in upto date management awareness and knowledge among the HCP as recommended by ADA, that life style modifications are mandatory and if post-partum early screening test showed impaired blood glucose levels or OGTT then annual screening should be done and if post-partum screening is found to be negative then the test should be repeated within three years.[34]

This study was conducted by self-reported questionnaire so there may be a chance of recall bias.

The current study reveals major differences regarding various aspects of screening, diagnosis and management practices amongst health care professionals regarding GDM management. To fill these gaps education strategy is urgently needed to update their knowledge. Great attention should be given to postpartum follow up and encouragement to adopt healthy lifestyle.

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Conflict of interest: None declared.

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