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Current Practices in the Management of Gestational Diabetes Mellitus: A Survey among Health Care Professionals

Short running title: Management of gestational diabetes mellitus among health care professionals

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Abstract:

Aim: To elicit information on the perception of doctors, allied health care professionals (HCPs) and other associated staff about GDM and the management strategies for GDM followed by them.

Methods: A survey was conducted among doctors, allied HCPs and other associated staff working in hospitals and other private clinics using the purposive sampling criterion. A validated questionnaire was used to understand the perception about managing GDM, screening, assessment, diagnosis, intervention and follow-up of GDM women. Descriptive statistics were reported as the frequency of the total number of responses for each question.

Results: Although greater than half of the respondents stated routine screening of all pregnant women for GDM at their first visit, the screening lacked to identify those at risk of developing GDM. No specific tool for GDM risk identification was found to be used in any of the surveyed hospitals. The perception of doctors and allied HCPs showed significant difference towards achieving normoglycaemia in GDM through MNT and exercise. Difference was also seen in the preferred drug of choice for GDM among obstetricians and diabetologists.

Conclusion: The survey strongly recommends GDM risk screening for all pregnant women and to initiate early lifestyle interventions thereby delaying or preventing the onset of GDM.

Keywords: Perception, Health Care Professionals, Gestational Diabetes Mellitus, Guidelines

INTRODUCTION

Gestational Diabetes mellitus (GDM), characterised by impaired glucose tolerance in pregnancy, is one of the major problems affecting maternal and foetal health. In 1964, O'Sullivan and Mahan gave the first diagnostic criteria for GDM.[1] Over the years; several other guidelines have been put forward based on the newer data that became available. However, no uniform consensus emerged on whether one particular approach should be followed over the others. One of the most extensive epidemiological study, the Hyperglycaemia and Adverse Pregnancy Outcome (HAPO) study,[2] reported conclusive evidence on the association of high values in OGTT and the likelihood of maternal and foetal outcome-related problems such as large for gestational age, cesarean section, foetal insulin levels and neonatal fat content.

The HAPO study, in consensus with the International Association of Diabetes in Pregnancy Study Groups (IADPSG) and various associations worldwide, was also instrumental in proposing the diagnostic criteria for gestational diabetes mellitus.[2] A survey conducted among healthcare practitioners involved in managing GDM from 173 countries reported countries using a variety of screening approaches. Many also did not conduct systematic screening for GDM, and their practices frequently diverged from guidelines.[3] In India, there is no consensus on systematic management for GDM.[4] The Women in India with Gestational Diabetes Mellitus Strategy (WINGS-5) exhibited diversity in the screening and diagnostic criteria used for GDM among health care practitioners in India, with a majority using it incorrectly, increasing chances of over and under-diagnosis of GDM. The study also reported inconsistencies in the postpartum follow-up of GDM women.[5]

The present study aimed to obtain information on the current practices followed in the management of GDM among healthcare professionals (gynaecologists or obstetricians, diabetologists or endocrinologists, dietitians, diabetic educators, nurses, physiotherapists, clinical psychologists, biochemists and quality control managers).

METHODS

A survey was conducted from March 2019 to January 2021 among healthcare professionals (grouped as (i) Doctors: 35 gynaecologists or obstetricians, 14 diabetologists or endocrinologists, 21 neonatologists or paediatricians, (ii) Allied health care professionals: 55 dietitians, 7 diabetes educators, 36 nurses, 14 physiotherapists and (iii) Others: 5 clinical psychologists, 7 biochemists, 7 quality control managers) employed in hospitals or private clinics in Kochi, Kerala state, India using the purposive sampling criterion. Consenting health care professionals willing to fill and submit a questionnaire participated in the study. The questionnaire was handed over or mailed to them according to their preference. Ethical approval for the study (AUW/IHEC/FSMD-19-

20/XPD-26) was obtained from the Institutional Human Ethics Committee, Avinashilingam Deemed University, Coimbatore, Tamil Nadu on 3rd December 2020. The questionnaire was designed based on the structured survey tools used in Women in India with Gestational Diabetes Mellitus Strategy (WINGS-5) project[5] and the Gestational Diabetes Dietetic Practice Survey developed by Morrison et al.[6] Additional questions were incorporated based on the Diagnosis and Management of Gestational Diabetes Mellitus: Technical and Operating Guidelines set by the Ministry of Health and Family Welfare, Government of India.[7] The 46-item questionnaire included both multiple-choice and open-ended questions. Open-ended questions were used to record demographic details (3 questions), screening and diagnosis (6 questions), intervention and guidelines (9 questions), follow-up and evaluation practices (10 questions). Likert scale responses were used to report perception of GDM (8 questions) and the need for protocol-based management strategies and interventions (8 questions). The developed questionnaire was pilot tested by two dietitians, two obstetricians, two academicians and one statistician and then used as the survey tool. Questions asked among health care professionals were based on relevance to their respective fields. Statistical analysis was done using SPSS version 21. Descriptive statistics were expressed as the frequency of the total number of responses for each question in the questionnaire (%).

RESULTS

Demographic details

A total of 201 health care professionals participated in the survey, out of which 73.1% worked in multispeciality hospitals and the mean ages of doctors were 43.73±8.56, allied health care professionals 33.47±7.95 and others 39.89 ± 5.43. Table 1 shows the demographic details of the participants.

Screening and diagnosis of GDM

Monthly, more than 500 pregnant women were reported to be seen by 68.6% of the total 35 gynaecologists/obstetricians in their respective hospitals. Thirty-one per cent of them also confirmed seeing more than 15 GDM women on an average per month. Around 37% of the gynaecologists/obstetricians also recommended routine screening for GDM between 20-24 weeks of gestation. Of the total 201 respondents, 65% of health care professionals reported that screening of GDM was done for all pregnant women during their first visit to the hospital. Whereas 24% confirmed screening as not being done, and 11% expressed that they do not know if it is done at their respective hospitals. Of the 49 surveyed gynaecologists/obstetricians and diabetologists/endocrinologists, 53% used the diagnostic criteria of the International Association of Diabetes and Pregnancy Study Groups (IADPSG)[8] or American Diabetic Association (ADA)[9] to detect GDM. However, only 23 (47%) could correctly answer the threshold values (FPG>92mg/dl, 1hr Plasma Glucose >180mg/dl, 2hr Plasma Glucose > 153mg/dl) taken as the

cut-off for the diagnosis of GDM. It was found that the existing screening procedures for GDM employed in the surveyed hospitals lacked to identify pregnant women at risk of developing GDM. There was no pregnancy specific screening tool also found to be used in any of the hospitals.

Guidelines and Interventions for GDM

When all the respondents were enquired if they used any operating guidelines for the management of GDM, 51% confirmed using one, but 84% could not specify the operational guideline used in their hospital, indicating the low usage of specific reference guidelines. Of the 49 surveyed gynaecologists/obstetricians and diabetologists/endocrinologists, 41% suggested MNT alone, whereas nearly half (49%) recommended MNT with exercise as their first treatment strategy for GDM management. Out of the total 35 gynaecologists/obstetricians, only 63% immediately suggested a dietitian consultation and 66% indicated a diabetologist consultation to their patients upon detection of GDM. However, 25 of 35 (71%) gynaecologists/obstetricians also said that they never gave referrals to physiotherapists; instead suggested walking to their patients. Out of the seven surveyed hospitals, only three hospitals had an antenatal yoga programme conducted for pregnant women visiting their facility. Fisher's exact test on the preferred drug of choice for GDM among gynaecologists/obstetricians and diabetologists/endocrinologists showed a significant difference between both groups (Table 2). Gynaecologists/obstetricians chose to begin with oral hypoglycaemic agents and initiate insulin only when target glycaemic goals are not achieved. In contrast, diabetologists/endocrinologists preferred starting with insulin. Information given by the surveyed doctors on planning and implementation of treatment strategies for GDM varied among doctors working in the surveyed hospitals, indicating a lack of protocol and evidence-based treatment strategies. There were differences in the initial blood tests ordered, the interdepartmental referrals given, the type of drugs prescribed, the glucose monitoring methods suggested, and the target blood glucose values recommended for glycaemic control. Fifty-seven (28%) of 201 respondents described obstetricians, diabetologists and dietitians as the significant healthcare workers directly involved in managing GDM women. The responses exhibit inconsistent multidisciplinary teams in the surveyed hospitals.

Outcomes, Follow up and Evaluation for GDM

Of the 182 doctors and allied health care practitioners, 79% stated assisted labour, 71% polyhydramnios or oligohydramnios, 59% miscarriage or stillbirth and 54% prolonged labour as the commonly seen maternal problems in GDM. The foetal problems reported by the majority (91%) of the respondents were excessive weight gain followed by neonatal hypoglycaemia (79%) and spontaneous abortion (59%). Obesity was described as the major future risk for children born to GDM mothers by 130 of 201 (64.7%) participants. The other prominent risks

suggested by the respondents were type 2 diabetes mellitus in childhood or adolescence and glucose intolerance.

The precautionary treatment strategies employed for GDM women, as suggested by 42% of gynaecologists/obstetricians, were administering Betnesol for lung maturity, regular CTG monitoring, induction of labour after 38 weeks of gestation and early artificial rupture of membrane. As described by 26% of gynaecologists/obstetricians, the preliminary procedures before delivery included stopping insulin or OHA on the proposed day of delivery and periodic monitoring of blood glucose of the GDM woman.

More than half (54%) of gynaecologists/obstetricians confirmed conducting deliveries of GDM women after 38 weeks of gestation. Although all gynaecologists/obstetricians reported seeing their GDM patients post-delivery, and 60% suggested postnatal appointment after six weeks, postnatal OGTT was recommended only by 57% of obstetricians. Of the total 35 gynaecologists/obstetricians, 54% felt follow-up for GDM women be done every year.

Perception about GDM

A 5-point Likert scale on the perception of doctors, allied HCPs and others about GDM resulted in 57% agreeing that GDM is on the rise and 46% responding to the prevalence being more in urban than rural areas. Even when three-fourths (78%) of the total respondents considered family history of Type 2 Diabetes Mellitus as the risk factor for GDM, a Chi-square test conducted on the perception of doctors and allied HCPs showed a significant difference in high maternal age, obesity and GDM diagnosed in previous pregnancy as the risk factors for GDM (Table 3). Forty-six per cent of the respondents also agreed on GDM as a risk factor for future Type 2 diabetes mellitus in expectant mothers. The Chi-square test on the perception of doctors and allied HCPs also showed significant differences when asked if normoglycaemia can be achieved through MNT and exercise alone for GDM (Table 4).

Perception about Guideline-based Management Strategies for GDM

There was strong agreement among respondents regarding their perception of guideline-based management strategies like proper documentation (65%), multidisciplinary approach (60%), continuous training of healthcare professionals (56%), use of evidence-based guidelines (51%), development of standard operating protocols (47%) and interdisciplinary rounds and clinical audits (39%) conforming to set quality standards. Out of the total participants, 81% suggested health and nutrition education, 71 % early diagnosis and detection of GDM, 68 % regular follow-up with evaluation and 48% evidence-based treatment strategies as preventive measures to reduce the incidence of GDM at a national level. Out of 35 gynaecologists/obstetricians and 14 diabetologists/endocrinologists, 45% demonstrated their agreement when asked whether a protocol-based flow chart for insulin dosing be useful for GDM.

DISCUSSION

The survey attempted to understand the existing practices in the management of GDM among doctors, allied HCPs and others. The results on perception of GDM revealed that more than half of the respondents agreed that GDM is on the rise and that the prevalence is more in urban than rural areas. The Women in India with GDM Strategy (WINGS) project described results contrary to the perception that GDM is more in urban areas. The WINGS project showed no difference in the prevalence of GDM in urban or rural areas and projected the prevalence rates in rural areas to be increasing.[10]This indicates the need for bringing systematic and structured management strategies for GDM both in urban and rural areas.

The survey showed that nearly 80% of the respondents considered family history of Type 2 Diabetes Mellitus as a risk factor for GDM. Apart from family history of diabetes, earlier studies have highlighted maternal age, obesity, previous history of GDM, and previous history of macrosomia also as major risk factors for GDM [11-15]. However, in this survey, the perception of doctors and allied HCPs showed significant differences in high maternal age, obesity and GDM diagnosed in previous pregnancy as the risk factors for GDM. There was also a significant difference among doctors and allied HCPs when asked if normoglycaemia can be achieved through MNT and exercise alone for GDM.

The survey also helped to understand the inconsistencies in the management of GDM across the surveyed hospitals. There was a lack in the use of screening tools to identify risk for GDM among pregnant women, insufficiency of a multidisciplinary team approach in managing GDM, differences in screening, diagnostic criteria, type of drugs and operating guidelines used in the management of GDM. One-fourth of the participants were unsure if all pregnant women coming to their hospitals underwent screening for GDM during their first visit. A majority (84%) of the surveyed HCPs also could not specify the operating guidelines used in their hospitals, suggesting a lack of awareness. Such inconsistencies in the management of GDM have been reported in many countries, including India.[5,16] More than half of the gynaecologists/obstetricians confirmed referring their patients to a dietitian and or diabetologist upon detection of GDM. Twenty-five (71%) of 35 gynaecologists/obstetricians reported not recommending any physiotherapist referrals.

Based on the responses given by the study participants, the commonly seen maternal problems were assisted labour and polyhydramnios or oligohydramnios. The foetal problems commonly seen were macrosomia and neonatal hypoglycaemia.

Less than half of the total gynaecologists/obstetricians could explain the precautionary treatment strategies and the pre-delivery procedures for GDM women.

More than half of the total 201 participants agreed with guideline-based management strategies like proper documentation, multidisciplinary team approach, continuous training of healthcare

professionals and evidence-based guidelines for managing GDM. They also considered health and nutrition education, early diagnosis and detection of GDM, regular follow-up and evaluation as preventive measures to reduce the incidence of GDM at a national level.

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Table 1: Demographic details of the survey participants

	Doctors (n=70)	Allied HCPs* (n=112)	Others (n=19)
Education			
Graduate	0	27 (24.1%)	1(5.3%)
MBBS with Diploma/Diploma	16 (22.9%)	24(21.4%)	0
Post Graduate	54(77.1%)	61(54.5%)	18(94.7%)
Age group			
< 40 years	26(37.1%)	89(79.5%)	10(52.6%)
40-50years	29(41.4%)	17(15.2%)	9(47.4%)
>50 years	15(21.4%)	6(5.4%)	0
Years of Clinical experience			
<10years	21 (30%)	83(74.1%)	8(42.1%)
10-20 years	36(51.4%)	24(22.3%)	11(57.9%)
>20 years	13(18.6%)	4(3.6%)	0
Type of Institution			
Private Obstetrics /Gynaecology Clinic	20(28.5%)	23(20.5%)	5(26.3%)
Private Multi speciality Hospital	46(65.7%)	87(77.7%)	14(73.7%)
Government Hospital	4(5.7%)	2(1.8%)	0

*Health Care Professionals

Table 2: Preferred drugs of choice in the treatment of GDM among Obstetricians and Diabetologists

Type of Professional	**Preferred drugs of choice in the treatment of GDM**		
	Insulin	**Metformin**	**Initiate Metformin, followed by Insulin**
Gynaecologist/Obstetrician (n=35)	5(14.3%)	10 (28.6%)	20 (57.1%)
Diabetologist/ Endocrinologist (n=14)	9 (64.3%)	5 (35.7%)	0
Fisher's exact value	18.310		
P value	<.001*		

* indicates significant at 5% level of significance ($P < 0.05$)

Table 3: Perception of doctors and allied HCPs on associated risk factors of GDM

Type of Professional	**GDM in Previous Pregnancy**		**Obesity**		**High Maternal age**	
	No	**Yes**	**No**	**Yes**	**No**	**Yes**
Doctors (n=70)	8 (11.4%)	62 (88.6%)	6 (8.6%)	64 (91.4%)	21 (30%)	49 (70%)
Allied HCPs (n=112)	39 (34.8%)	73 (65.2%)	28 (25%)	84 (75%)	56 (50%)	56 (50%)
χ^2 value	12.306		7.653		7.059	
P value	<.001*		.006*		.008*	

* indicates significant at 5% level of significance ($P < 0.05$)

Table 4: Perception of doctors and allied HCPs on achieving normoglycaemia through MNT and Exercise for GDM

Type of Professional	**Normoglycaemia through MNT and Exercise for GDM**			
	Disagree	**Neutral**	**Agree**	**Strongly Agree**
Doctors (n=70)	14 (20%)	10 (14.3%)	34 (48.6%)	12(17.1%)
Allied HCPs (n=112)	2(1.8%)	20(17.9%)	58(51.8%)	32(28.6%)
χ^2 value	19.005			
P value	<.001*			

* indicates significant at 5% level of significance ($P < 0.05$)