The “missing window of opportunity” for preventing diabetes: A mixed method study on postpartum screening for diabetes among women with gestational diabetes mellitus in Kerala, India

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ABSTRACT

Background: The prevalence of gestational diabetes mellitus (GDM) is ranging from 15.9% to 17% in Kerala. Women with GDM and their offspring are at increased risk of developing type 2 diabetes mellitus in their later life. Hence, postpartum screening and follow-up of the women with GDM along with nutritional and lifestyle modification support are extremely important in Kerala. This study revealed the clients’ and providers’ perspective on the postpartum diabetes screening among GDM mothers.

Objectives: The study aimed to assess timely postpartum diabetes screening rate and factors associated with postpartum diabetes screening among women with GDM who had recently delivered at selected hospitals in Malappuram district, Kerala. The study also assessed the clinicians’ perspective on postpartum diabetes screening of women with GDM.

Materials and Methods: A cross-sectional study was done among 200 women with GDM, who had delivered in selected hospitals in Malappuram districts between 9 weeks and 6 months before the survey using a pretested validated interview schedule. In-depth interview was carried out to explore the clinicians’ perspective on postpartum diabetes screening of women with GDM.

Results: Timely postpartum diabetes screening rate among respondents was 29%. The age-adjusted multivariate logistic regression analysis result had a significant P value for the health-care provider’s advice with an adjusted OR of 3.2 (1.4–6.9). About 6% of the women with GDM received appropriate and adequate postpartum follow-up.

Conclusion: There is an urgent need to enforce adherence to national guidelines for postpartum diabetes screening and establishment of registration and follow-up of women with GDM through public health-care delivery system.

Keywords: Gestational diabetes mellitus, Malappuram, mixed method, perspective

Introduction

Globally, gestational diabetes mellitus (GDM) is a common condition associated with pregnancy, which affects between <1% and 28% of all pregnancies. GDM was defined by the American Diabetes Association as the hyperglycemia diagnosed for the first time in pregnancy that is not clearly overt diabetes. Healthy lifestyle interventions and medications during the antenatal and postnatal periods prevent or reduce the risk of development of diabetes in women with GDM.[3]
Early identification of diabetes risk postpartum is very important and can be done through timely postpartum screening of blood sugar.[4] Routine postpartum screening for diabetes among women with GDM is universally recommended[2‑6] at and after 6-week postpartum.[7] However, across the world, in high-income as well as low-income and middle-income countries, the screening rates for postpartum diabetes are very low, ranging from 17% to 24%. This includes data derived from single or multisite studies and national data.[4‑9]

Indian women have a relatively high prevalence of GDM (7.2%)[4] as well as several times higher risk of developing type 2 diabetes within 3–5 years following the pregnancy during which GDM was experienced.[8‑13] While several studies have highlighted the low rates of postpartum screening following a GDM pregnancy, this study examines the reasons why this so. It presents both physician- and patient-related reasons contributing to low prevalence of postpartum diabetes screening in women with GDM and identifies entry points for intervention to substantially improve postpartum management of these women. This paper thus makes an important contribution to program planning for prevention of progress to type 2 diabetes in women experiencing GDM.

The objective of the present study was to assess timely postpartum screening rates for diabetes and its determinants among women with GDM in a district of Kerala. A 2010 study reported that the prevalence of diabetes among women was 17.8% in Kerala,[18] the highest prevalence noted in India. The study also explores clinicians’ perspectives on postpartum screening for diabetes among women with GDM.

Materials and Methods

Ethics
This study received approval from the Institutional Ethics Committee of the Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. Written informed consent was obtained from all the participants in the study with the freedom to opt out of the study at any time during the interview.

Definitions
We defined timely postpartum screening as those who had tested at or >6 weeks and not timely postpartum screening as who had tested the blood sugar before 6 weeks or not ever tested. We relied on self-reports on when postpartum screening was done.

Study design
We used sequential explanatory mixed method strategy. The study had a quantitative phase followed by a qualitative phase. The quantitative phase included a cross-sectional survey using a pretested interview schedule to assess the postpartum screening rate for diabetes and its determinants among the women with a history of GDM. The qualitative study included in-depth interviews conducted among obstetricians to know their perspectives on low postpartum diabetes screening rate among GDM women.

We conducted this study in Malappuram district of Kerala. As per the NFHS-3, Malappuram district has a total fertility rate (2.2/woman respectively) higher than the state average (1.7/woman respectively). In 2015–2016, the proportion of public hospital deliveries was 11% in the district as compared to 19% in Kerala.[21]

We conducted a cross-sectional survey of GDM patients from June to September 2015. We estimated the required sample size as 154 based on the prevalence of GDM of 15.9% from an earlier study in the same district in 2014 (Mohan and Chandrakumar 2015) with 95% confidence and 1% precision. Since we added 25% to adjust for nonresponse, the final sample size was 200.

Using multistage random sampling, we randomly selected four hospitals from a list of 71 hospitals in Malappuram district followed by selection of all women who experienced GDM during their most recent pregnancy and had delivered in the selected hospitals in Malappuram district 9–24 weeks before the survey. Our exclusion criteria were women with GDM who were (a) below 18 years of age at the time of the survey; (b) who were not residing in the district at the time of interview, and (c) who were too ill to participate in the study.

We then conducted eight in-depth interviews with clinicians from a range of specialists in the field of obstetrics, gynecology, and medicine (male = 2 and female = 6) from both private and public hospitals of Malappuram district.

Data collection
The randomly selected study participants were interviewed at their houses using an interview schedule in the local language (Malayalam). The interview schedule had nine sections. It included sociodemographic details of the
respondents, history of diabetes, details on the most recent pregnancy and delivery and health of the newborn, management of GDM in most recent pregnancy, personal barriers to postpartum screening, use of postpartum contraception, risk perceptions, and finally postpartum health.

The principal investigator conducted all the in-depth interviews in this study which aimed to explore the perspectives of obstetricians on postpartum screening for diabetes of women with GDM at their hospitals.

Data analysis
Bivariate and multivariate analyses were performed using timely postpartum screening status as the outcome variable. The variables found to be significantly associated \((P < 0.05)\) with timely postpartum screening status in the bivariate analysis were included in the logistic regression model. All statistical analyses were performed using Statistical Package for Social Sciences for Windows (version 17.0, IBM SPSS, Chicago, IL, USA).

SK served as the primary coder using both \textit{a priori} (predetermined) codes and categories based on the research questions as well as codes that emerged from the data. Our approach was iterative such that data collection and analysis occurred simultaneously and regular team meetings guided the interpretation of the findings; we resolved differences through consensus. To protect the confidentiality of our participants, we have used pseudonyms throughout this article and have removed or masked all personally identifying information about the health-care providers. At eight interviews, we determined data coding saturation had occurred as no new themes were raised in the last few interviews.

Results

Participants’ characteristics
The mean age of the study participants was 31.4 ± 4.2 years. About 97% of the study participants were homemakers. The prevalence of overweight and obesity was 42% and 16%, respectively. Women with gravida <4 were 83.5%, and of those who were diagnosed with GDM during the most recent pregnancy, about 30% were diagnosed in the first trimester. Only 10.8% had received medical advice for further follow-up and screening of diabetes, and half of those who received advice were able to adhere.

Timely postpartum screening
Among the women with GDM who underwent postpartum blood sugar assessment, only 29% reported having postpartum screening for blood sugar on or after 6-week postpartum, i.e., “timely” postpartum screening. About 59% of respondents were not aware of postpartum follow-up and had not received any information on blood testing after delivery. Of those who consulted a doctor following postpartum screening, 79% got reassurance that “there was nothing to worry.”

Women who belonged to the age group 31–35 years, those who had four children or more and had moods of feeling down about their health status in the postpartum period and those who had received instructions about postpartum screening from doctors were more likely to undergo timely postpartum screening [Table 1].

We found that those who were advised by a doctor had three times higher chance of timely postpartum screening compared to those who had been advised by other health workers or others.

Clinician’s awareness of protocols and their perspectives on postpartum screening of women with gestational diabetes mellitus
Of the 8 participating doctors, 6 were women. All had >10 years of experience as clinicians and five belonged to the private sector. We describe findings from our in-depth interviews with them under four major themes [Figure 1].

Table 1: Determinants endowed by gestational diabetes mellitus women on postpartum screening: results of multiple logistic regression analysis

| Variables                                           | Timely postpartum screening, n (%) | Unadjusted OR (95% CI) | Adjusted OR (95% CI) |
|-----------------------------------------------------|-----------------------------------|------------------------|----------------------|
| Past history of GDM                                 |                                    |                        |                      |
| Yes                                                 | 17 (44.7)                          | 2.38 (0.96-1.15)       | 1.74 (0.67-4.53)     |
| No                                                  | 41 (25.3)                           |                        |                      |
| Instructions on timely postpartum screening         |                                    |                        |                      |
| Physician                                          | 32 (52.5)                           | 2.96 (1.43-6.13)       | 3.20 (1.40-6.90)     |
| Others                                              | 19 (27.1)                           |                        |                      |
| Perceived high risk for developing diabetes         |                                    |                        |                      |
| Yes                                                 | 21 (44.7)                           | 2.53 (1.27-5.01)       | 1.81 (0.78-4.2)      |
| No                                                  | 37 (55.3)                           |                        |                      |
| Feeling down                                        |                                    |                        |                      |
| Yes                                                 | 19 (52.8)                           | 3.58 (1.69-7.55)       | 2.17 (0.87-5.36)     |
| No                                                  | 39 (23.8)                           |                        |                      |

*P < 0.05, OR - Odds ratio, CI - Confidence interval, GDM - Gestational diabetes mellitus
Nonimplementation of national guidelines to manage gestational diabetes mellitus

The clinicians reported seeing a significant number of GDM patients—around 4/week. Nevertheless, none of the clinicians followed the national guidelines when managing patients with GDM. Advice and management during pregnancy and labor, as well as in the postpartum period varied even within this small group of doctors. Each doctor had his or her own protocol to manage GDM patients. Four of the eight doctors reported advising diet control after delivery. One doctor said “I advised a GDM woman to follow strict diet control, not giving emphasis to exercise and MNT (medical nutrition therapy)”. Three of the doctors had started with diet control and waited for 2 weeks to control the blood sugar value.

Advice regarding regular exercise postpartum (two of eight) and frequent breastfeeding to prevent hypoglycemia (three of eight) was far less common. None of them routinely prescribed drugs for glycemic control in the postpartum period, and prescription of insulin or oral drugs depended on the status of hyperglycemia of the patient. None of the clinicians advised women on postpartum contraception.

Low awareness of gestational diabetes mellitus women on the importance of postpartum screening and follow-up

According to the clinicians, most of the GDM patients were not aware of the importance of undergoing postpartum screening for diabetes and adopting a healthy lifestyle during the postpartum period. One doctor said, “During the antenatal period, we give importance to a tension-free antenatal period, and telling them about risk of diabetes in future will cause their blood pressure shoot up. So we do not inform them about their future risk to diabetes and how to prevent the diabetes risk.”

Another doctor felt that GDM patients were hesitant to follow the instructions from the physician. There was a perception among a couple of doctors that women did not take the problem of hyperglycemia seriously and hence ignored doctors’ advice for postpartum screening.

Missing regular follow-up and postpartum screening

The doctors also reported that during the postpartum period, women were very busy with child care and did not give importance to follow-up visits. The difficulty in going out with a small baby and the absence of a screening facility in the nearby locality were cited by others as potential barriers. One physician mentioned that mothers feared reduction in quantity of breast milk as a consequence of controlling diet for blood glucose control.

Women’s inability to find time to come for follow-up care because of their workload; lack of decision-making power especially among younger women; and lack of appreciation of the importance of follow-up care by women’s caregiver, usually mothers-in-law, were also cited as reasons for missing the screening and follow-up.

Unique status of gestational diabetes mellitus mother with NRI spouse

Another doctor expressed his view in terms of prioritization as most of the mothers had a lot of family responsibility as their husbands were working abroad. One doctor said, “it is very difficult for a ‘Gulf wife’ to manage household affairs single-handed. For the elder children, she would carry out the responsibilities of both parents. This (screening, hospital visits for follow-up care) is the only thing, she can postpone.”

Discussion

According to the National guidelines for women with GDM, timely postpartum screening for diabetes is at or
after 6-week postpartum. In our study, only 29% have had timely screening for diabetes, a much lower rate when compared to a study carried out in the United States (46%) during 6–12 weeks of postpartum. Screening immediately after delivery may underestimate the proportion with hyperglycemia especially if the patient was under drugs for glycemic control during pregnancy and overestimate the prevalence of prediabetes. Postpartum screening for diabetes done too early by GDM-affected women may be a consequence of inaccurate advice given by their obstetricians/gynecologists at the time of discharge after delivery. Another study substantiates this observation. They found that >40% of both sets of specialists had advised postpartum screening within 6 weeks of delivery.\[5\]

In the present study, doctor’s advice on postpartum screening emerges as the significant factor associated with timely postpartum diabetes screening, which was an important predictor for other studies also.\[10-14\] Physicians considered revealing any information to a pregnant woman regarding her future risk of diabetes as a sensitive issue which may affect the woman adversely by increasing her anxiety. This attitude prevented him/her from routine advice directly to the women and he/she tended to provide information only to the caregivers, usually other members of the family. However, after discharge from hospital, there is not much communication between the caregiver and the patient, and the information does not reach the woman concerned.

GDM is known to increase risk of postpartum blues and even postpartum depression,\[5,10\] and we found that almost a third of the respondents (36%) in our study reported feeling thus and were significantly more likely to have timely postpartum diabetes screening as compared to other GDM mothers (in the bivariate analysis). This association may be because their inability to perform routine day-to-day activities had compelled them to test to find out whether this condition was due to diabetes.

In our study, we found that older women (31–35 years) and women of parity 4 or higher were more likely to have undergone timely postpartum screening. While Tovar et al. similarly reported older age to be a predictor of postpartum screening, their study found null parity and not multiparity to be a predictor.\[20\] In the Indian setting, as age increases the parity also increases. The rise in timely screening status among women of relatively older age and parity may be due to a greater autonomy enjoyed by them after many years of marriage and several children.

From our in-depth interviews with doctors, our observation is that none of them knew the details of the National Guidelines for Diagnosis and Management of GDM, India. It may be that as obstetricians/gynecologists, they are mainly concerned about managing safely the GDM patient’s pregnancy and doing their best to ensure a positive pregnancy outcome. No doctor advised women to repeat the test periodically or to report their GDM history at the time of their antenatal registration in their next pregnancy. Many doctors told this researcher that gestational diabetes is relieved after delivery and only overt diabetes will continue after delivery and did not seem to appreciate the elevated risk of progression to type 2 diabetes mellitus (T2DM) among women with a history of GDM. We wonder if this belief is reflected in their advice to patients and caregivers and gradually disseminated into the society. This could prevent the majority from undergoing postpartum blood glucose testing and from a consultation with the physician following the test.

Postpartum diabetes screening for diabetes among gestational diabetes mellitus women – a case of repeated missed opportunities to prevent type 2 diabetes mellitus

The findings of the study bring out the alarming failure of the health system to use the window of opportunity provided during pregnancy and in the postpartum period, in preventing mothers with GDM from progressing to full-blown T2DM at an early age. Figure 2 illustrates
the tragedy of how out of 200 women with GDM who actually came to the health services and were managed well during pregnancy and delivery, barely 6% or 11 women received appropriate postpartum advice and management that could help prevent future T2DM. The other 94% represent missed opportunities that could be easily avoided through appropriate policies and interventions.

The strengths of the study are that all the interviews were conducted by a single investigator who is a physician and that the respondents were interviewed in their residence, because of which detailed responses could be captured. The limitations of the study are as follows. One, since the sample frame is taken from hospitals, it is not a representative sample of the population. It is a representation of the population who seek institutional delivery in the private sector, a group that may be expected to do better than the average population. Two, since the sample facilities were identified around 6 months before the study, the selection may itself have influenced the practices of providers and hence elevated the postpartum screening rate. Even so, we see that timely postpartum screening for GDM is only around 6%.

Conclusion

Doctor’s advice on postpartum screening is a significant predictor of timely postpartum screening for diabetes among women with GDM. Hence, training of health workers and doctors regarding the implications of GDM and the importance of timely screening and postpartum follow-up must be established in the system. The community also needs to be more aware of the potential risk posed by GDM for developing T2DM in future. Improving awareness on early detection, proper management during pregnancy, timely postpartum screening, mass education programs on future risk of T2DM, and scope for prevention of T2DM are important areas in which interventions are urgently needed to prevent a dramatic increase in T2DM among younger women in the near future.

While establishing health system-oriented programs for effective management of GDM, various barriers faced by GDM affected mothers in accessing services due to their roles as mother, parent, caregiver, and most of the times as a head of the family need to be addressed.

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Conflicts of interest

There are no conflicts of interest.

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