

Preferences of participating in diabetes screening programs for postpartum women with gestational diabetes mellitus in a university hospital in Turkey

Azime Karakoc Kumsar
Biruni University, Istanbul, Turkey, and
Feride Taskin Yilmaz and Gulbahtiyar Demirel
Cumhuriyet University, Sivas, Turkey

Abstract

Purpose – The aim of this study is to determine the preferences to participate in diabetes screening program of women with gestational diabetes mellitus (GDM) in postpartum period.

Design/methodology/approach – The data of retrospective and descriptive study were collected using “Individual Identification Form” and “Information Form for the Screening of Diabetes in the Postpartum Period” from 151 women in referred to obstetrics and gynecology clinic of a university hospital in Turkey.

Findings – Only 21.9% of women had diabetes screening in postpartum period and 21.2% of the participants were diagnosed with type 2 diabetes. It was determined that the participants mostly participated in screening because of the diabetes history in their family (30.3%). Women who had diabetes screening in postpartum period had lower level of education than those who did not and their level of knowledge about the screening in postpartum and the history of abortion were higher ($p < 0.01$).

Originality/value – The rate of participation in the screening for diabetes in the postpartum period is very low in pregnant women diagnosed with GDM. It was determined that the educational status, history of previous abortion and knowledge level of the women were factors that prevented participation in diabetes screening. This research is original because there are inadequacy of studies examining determining the participation status of pregnant women with GDM to diabetes screening in the literature. This study will contribute to health professionals in order to improve preventive factors and increase the participation of pregnant women with GDM in diabetes screening in the postpartum period.

Keywords Gestational diabetes mellitus, Postpartum period, Screening, Turkey

Paper type Research paper

Introduction

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy [1]. GDM, which is a metabolic disease of pregnancy, is seen at different rates in different populations, but it is usually 3-5% on average [2, 3].

There is a risk of developing type 2 diabetes from GDM during and after the postpartum period. In the literature, it has been reported that approximately one-third of women diagnosed with GDM develop type 2 diabetes in the postpartum period [4], and more than half



of them who are diagnosed with GDM develop type 2 diabetes in five years [3]. Women with a history of GDM may prevent or delay the risk of developing type 2 diabetes through healthy lifestyle changes, such as a healthy diet, reaching an ideal weight and maintaining it, engaging in regular physical activity and quitting smoking in the postpartum period [5]. In addition, women with a history of GDM are recommended to have the oral glucose tolerance test (OGTT), which is an effective method for determining hyperglycemia, performed between the 6th and 8th weeks postpartum [6, 7]. However, studies showed that the rate of participation in the screening for diabetes in the postpartum period was very low in pregnant women diagnosed with GDM [6, 8, 9]. In the postpartum period, the reasons for women not participating in diabetes screening were determined as lack of time, forgetting about the test or the time for taking the test, not wanting to take medication, feeling unwell, being busy with the baby and insensibility [3, 10].

This study was carried out because of lack of data in the literature determining the participation status of pregnant women with GDM to diabetes screening and the affecting factors. We believe that this study will help health professionals to improve preventive factors to increase the participation of pregnant women with GDM in diabetes screening in the postpartum period. This study was carried out to determine the participation status of pregnant women diagnosed with GDM in diabetes screening programs during the postpartum period and the affecting factors in Turkey.

Methodology

Design

A retrospective and descriptive research model was used in our study.

Participants

The population of the study consisted of 193 pregnant women diagnosed with GDM and referred to the obstetrics and gynecology clinic of a university research and practice hospital in Turkey, between January 01, 2017 and June 01, 2019. The contact information of these pregnant women was obtained as a result of archive scanning after obtaining written permission from the relevant institution. Data were collected by using a face-to-face interview technique after women were called to the institution via the phone numbers obtained from the patient files in the postpartum period. The study included 151 women in the postpartum period who did not have a diagnosis of type 1 or type 2 diabetes, who did not have multiple pregnancies, had no liver, kidney and endocrinopathic diseases, and who agreed to participate in our study, and 42 women were excluded from the study because 21 women did not answer their phone, 13 women did not come to the institution and 8 women refused to take part in our study.

The OGTT was performed for GDM screening in the research institution. In this institution, OGTT was performed on women who were between 24 and 28 weeks of pregnancy by drinking 75 g of oral glucose solution after the measurement of fasting plasma glucose level, and then plasma glucose measurement was done in the first and second hours. For OGTT, fasting ≥ 92 mg/dl, 1st hour: ≥ 180 mg/dl, and 2nd hour: ≥ 153 mg/dl were considered diagnostic for gestational diabetes [11]. According to the results of the OGTT, the presence or absence of gestational diabetes was expressed by the physician.

Data collection

The data were collected using an "individual identification form" and an "information form for the screening of diabetes in the postpartum period" prepared by the researchers after the literature review. The individual identification form included personal information

(age, educational status, working status, family type, presence of chronic disease, etc.), obstetric information (weight gain during pregnancy, number of pregnancies, gestational week, mode of delivery, developing health problem during delivery, etc.) and GDM related information (GDM diagnosis, having GDM related training, etc.). The information form for the screening of diabetes in the postpartum period included the information about diabetes screening in the postpartum period (performing oral glucose tolerance test after birth, factors that facilitate and prevent diabetes screening, etc.) [3, 8–10, 12, 13].

Content validity was used to ensure the validity of the questionnaire, in which the opinions of one endocrinologist, one specialist in internal medicine and three nurse academicians were sought with regards to content validity. The validity and comprehensibility of the questionnaire were tested in a pilot study with a sample group of 20 women. During the pilot study, the content validity of the form was investigated, and similar questions were excluded. The questionnaire was administered to the women three weeks later, and the test-retest reliability of the measure was checked. All ambiguities were corrected before the administration of the questionnaire to the final sample. The evaluation of their results indicated no problems in terms of the clarity and the implementation of the form.

The data were collected by researchers using the face-to-face interview method in the Turkish language in a comfortable room. It took approximately 20–25 minutes to complete each interview.

Data analysis

The data were analyzed with the Statistical Product and Service Solutions (SPSS) 22.0 package program. Mean, standard deviation and percentage distribution were used in the distribution of personal and obstetric characteristics of women and in the evaluation of the features that facilitate and prevent the screening of diabetes in the postpartum period. Student t-test, chi-square test and Fisher's exact test were used for the association of personal and obstetric characteristics of women who did and did not have diabetes screening in the postpartum period. The statistical significance was evaluated as $p < 0.05$.

Ethical considerations

Written consent was obtained from the ethics committee of a university (Decision no: 2018-01/28) and the institution where the research was conducted before collecting the data.

Results

When the OGTT results of women who had no disease other than gestational diabetes were examined, their blood glucose levels were found to be between 153-169 mg/dl in 29.8% of them, 170–199 mg/dl in 47% and 200 mg/dl and above in 23.2% of them. 27.2% of women applied insulin and diet therapy in GDM treatment. In total, 13.9% of the participants stated that GDM developed in their previous pregnancies and 1.3% of them stated that another medical problem developed as well as GDM during their pregnancy.

When women who did and did not undergo diabetes screening were compared with their personal and obstetric characteristics, no statistical difference was found between age, working status, number of pregnancies, weight gained during pregnancy, therapy type for gestational diabetes, developing GDM in previous pregnancies, family history of diabetes mellitus in first degree relatives, birth time and having diabetes screening ($p > 0.05$). The rate of women with higher education levels (secondary and higher education) who had a screening for diabetes in the postpartum period was lower ($\chi^2 = 14.194$; $p < 0.01$). The rates of having diabetes screening of women who had a history of abortion were significantly higher than those who did not in the postpartum period ($\chi^2 = 16.835$; $p < 0.01$). Diabetes screening rates of

women who received information about OGTT in the postpartum period were lower than those who did not ($X^2 = 14.654; p < 0.01$) (Table 1).

Only 30.5% of women stated that they received information from health professionals on the screening of diabetes between the 6th and 8th weeks in postpartum. Only 21.9% of the women had OGTT in the postpartum period and 21.2% of the participants were diagnosed

Characteristics	Postpartum period		<i>p</i>
	Having-diabetes screening group <i>n</i> = 33(%21.9)	Not having-diabetes screening group <i>n</i> = 118(%78.1)	
Age (years) (mean ± SD)	33.12 ± 6.58	33.61 ± 6.69	$t = -0.379; p = 0.705$
<i>Educational status</i>			
Illiterate	2(100)	0(0.0)	$X^2 = 14.194; p = 0.003^{**}$
Primary school	2(6.2)	30(93.8)	
Secondary school	20(22.0)	71(78.0)	
Higher education	9(34.6)	17(65.4)	
<i>Working status</i>			
Yes	11(26.2)	31(73.8)	$X^2 = 0.641; p = 0.424$
No	22(20.2)	87(79.8)	
<i>Number of pregnancies</i>			
1-2	20(27.4)	53(72.6)	$X^2 = 2.542; p = 0.081$
3 and above	13(16.7)	65(83.3)	
<i>History of abortion</i>			
Yes	21(41.2)	30(58.8)	$X^2 = 16.835; p = 0.000^{**}$
No	12(12.0)	88(88.0)	
<i>Gained weight during pregnancy</i>			
Less than enough	6(25.0)	18(75.0)	$X^2 = 0.231; p = 0.891$
Normal	11(22.4)	38(77.6)	
More than enough	16(20.5)	62(79.5)	
<i>Treatment specific to gestational diabetes mellitus</i>			
Only diet therapy	24(21.8)	86(78.2)	$X^2 = 0.000; p = 0.986$
Insulin and diet therapy	9(22.0)	32(78.0)	
<i>Developing gestational diabetes mellitus in previous pregnancies</i>			
Yes	5(23.8)	16(76.2)	$X^2 = 0.055; p = 0.815$
No	28(21.5)	102(78.5)	
<i>Diabetes history in first degree relatives</i>			
Yes	21(20.0)	84(80.0)	$X^2 = 0.694; p = 0.265$
No	12(26.1)	34(73.9)	
<i>Birth time</i>			
Preterm	9(18.4)	40(81.6)	$X^2 = 0.516; p = 0.534$
Born mature	24(23.5)	78(76.5)	
<i>Having information about performing OGTT in postpartum</i>			
Yes	19(41.3)	27(58.7)	$X^2 = 14.654; p = 0.000^{**}$
No	14(13.3)	91(86.7)	

Note(s): * $p < 0.05$; ** $p < 0.01$

Table 1.
Distribution of some sociodemographic and obstetric characteristics of women regarding diabetes screening in the postpartum period ($N = 151$)

with type 2 diabetes by the physician. Among the factors facilitating the inclusion of women undergoing diabetes screening in the postpartum period, women who had a family history of diabetes were at the highest rate (30.3%). It was determined that women could not participate in screening because they were busy with their babies and other jobs (31.3%) (Table 2).

Discussion

Gestational diabetes mellitus is an important metabolic problem affecting the health of the mother and the fetus. In women with a history of GDM, the risk of developing type 2 diabetes increases significantly in the postpartum period [14]. It is important for women diagnosed with GDM to have diabetes screening in the postpartum period because it is preventable and controllable for the development of type 2 diabetes.

It is known that advanced maternal age is an important risk factor for the development of gestational diabetes and the number of individuals with type 2 diabetes increases with age [15–18]. The mean age of women was 33.12 ± 6.58 in this study. Nowadays, considering that the marriage age and the gestational age of women have increased, it should be taken into

Characteristics	<i>n</i>	%
<i>Having information from health professionals about having OGTT in the postpartum period</i>		
Yes	46	30.5
No	105	69.5
<i>Details of who provided the training*</i>		
Physician	23	50.0
Midwife	12	26.1
Nurse	11	23.9
<i>Having OGTT in the postpartum period</i>		
Yes	33	21.9
No	118	78.1
<i>Diabetes screening result in postpartum period*</i>		
No problem was found by physician	13	39.4
Regular follow-up was recommended by physician	13	39.4
Physician diagnosed type 2 diabetes	7	21.2
<i>Facilitating factors to go for diabetes screening (n = 33)</i>		
I'm conscious of my family being a patient with diabetes	10	30.3
I am aware of the necessity of diabetes screening	9	27.2
I know that type 2 diabetes may develop after gestational diabetes	8	24.2
I wanted to know if I had diabetes	6	18.3
<i>Preventive factors from participating in diabetes screening (n = 118)</i>		
I was very busy with the baby and other jobs	37	31.3
I did not know that I should have performed screening	18	15.3
I forgot the time of the OGTT	18	15.3
I had a transportation problem	16	13.6
I was not aware of the necessity of diabetes screening	12	10.1
I did not have diabetes symptoms	5	4.2
I do not think that I have diabetes	4	3.4
My blood sugar level was normal when I checked at home	3	2.6
Long waiting period in hospital	5	4.2

Table 2. Distribution of the characteristics of women for diabetes screening in the postpartum period (N = 151)

Note(s): OGTT: Oral glucose tolerance test
**n* number has changed

consideration in diabetes screenings that gestational age is an independent risk factor for GDM and the development of diabetes postpartum.

Prevention of negative obstetric results in diagnosis and treatment of gestational diabetes mellitus is among the most important objectives [1, 6]. It is also important to determine the group at risk of developing diabetes in women diagnosed with GDM [6, 9, 14]. Moreover, most women who are diagnosed with GDM are candidates for type 2 diabetes within the first five years after birth, regardless of other risk factors [9, 10]. In our study, one-fifth of the women who participated in the screening in the postpartum phase was diagnosed with type 2 diabetes by the physician. In a similar study, 78 women had an OGTT between the 6th and 12th months postpartum, and according to the screening results, 34.6% of women were found to have type 2 diabetes and 35.9% were found to have impaired glucose tolerance or impaired fasting glucose [4]. In other studies, the prevalence of type 2 diabetes was reported between 4.5% and 30%, according to the results of postpartum screening among women who were diagnosed with GDM during pregnancy [7, 15, 18–21]. Although the differences in follow-up periods and changes in diagnostic criteria are different, women diagnosed with GDM have a high prevalence of diabetes or prediabetes in the postpartum period. These planned screenings contribute to the early and effective treatment of women diagnosed with diabetes, thus preventing possible adverse health problems or complications. In our study, since the number of cases was insufficient, we considered the two-year period. As it is a retrospective study and to keep our number of cases high, we included all women who met the inclusion criteria of the study within two years and agreed to participate in the study. In calculating the sample size, we would have very few cases in one year, so we thought the reliability of the study would decrease.

Diabetes screening in the postpartum period for women who had a diagnosis of gestational diabetes mellitus provides a valuable opportunity for early identification of type 2 diabetes and the prediction of the risk of type 2 diabetes [9]. The studies [22, 23] indicate that the recommendations for postpartum diabetes screening have complied at very low levels. In literature [24, 25], it is stated that education is an effective method in the management of diabetes and in this process. In our study, only one-fifth of women were referred to the institution for diabetes screening in postpartum and had OGTT, and only 30.5% stated that they received information from health professionals about diabetes screening postpartum. In a similar study [7], 38.7% of women reported that they went to postpartum diabetes screening and 57.7% received training on diabetes screening in the postpartum period. Sterne *et al.* [3] found that 53.4% of women had diabetes screening during the postpartum period. In our study, the rate of undergoing diabetes screening in the postpartum period was low compared to other study results. Likewise, the rate of having training on this issue was quite low. On the other hand, the rate of having diabetes screening of women who received information about OGTT in postpartum was low compared to those who did not. In the study of Clark *et al.* [6], it was found that calling on women to the institution by reminding them to perform screening increased the screening rates in women diagnosed with GDM. In this context, it should be noted that health professionals should take responsibility by using their authority to encourage diabetes screening during the postpartum period and to raise awareness of its importance among women.

The level of education is one of the most important components affecting participation in screenings [26]. In our study, the rate of having a high education level was found to be lower in women who had diabetes screening in the postpartum period. However, in another study [7], as women's level of education increased, their rate of participating in diabetes screening during the postpartum period was found to increase. In a study conducted with the participation of 19,351 women in Germany [27], no statistically significant difference was found between women's participation in the screening program and their educational level. Although the findings of the research are contradictory, it is necessary to carry out similar studies with more sample groups.

The abortion rate, which is the most frequent complication of pregnancy, shows a significant increase in the presence of uncontrolled diabetes [28]. In our study, women who had a history of abortion had higher rates of diabetes screening in the postpartum period than those who did not. In another study [3], with the increase in the number of gravida and partus, the rate of going to diabetes screening during the postpartum period was found to increase. This shows that the mother who is worried about her next pregnancy and her baby is more sensitive.

Individuals with a family history of diabetes, especially in first-degree relatives, are considered high-risk individuals for diabetes [1, 16–18]. In our study, it was determined that women mostly participated in screening because of having a history of diabetes in their families. Although the rate of women with diabetes in the family was high, the rate of screening was low. This result reiterates the need for more effective and continuous primary protection initiatives carried out by health professionals.

In our study, it was determined that women could not participate in the screening because they were mostly busy with their babies and other responsibilities. When similar studies were examined, the reasons that prevent the screening were found to be lack of knowledge or lack of information [3, 7, 8], believing that GDM would disappear after birth [8], being too busy with the baby and with other responsibilities [3, 7, 8] and not being aware of the necessity of the test [7]. The study shows that the woman could not participate in this short screening program due to many factors in the postpartum period. This finding may be due to the lack of knowledge of women on the development of diabetes.

Conclusion

Our study of women living in Turkey's Central Anatolia, and the rate of participation in postpartum diabetes screening was found to be very low in women diagnosed with GDM. It was determined that educational status, history of previous abortion and knowledge level affected the participation in diabetes screening in the postpartum period. In addition, being busy with their babies and other responsibilities prevented women from participating in the screening. In Turkey, numerous studies are carried out at the national level to improve women's health, especially maternal and child health in the postpartum period. However, some women do not understand the importance of health-enhancing activities due to the cultural characteristics of the region. In this context, it has been recommended that women who were diagnosed with GDM should be educated on lifestyle and especially on diabetes screening in the postpartum period, that every woman should be screened at the health institution postpartum by forming patient charts and that women with a serious illness or handicap should perform diabetes screening through the home by home care services.

Conflict of Interest: None

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Corresponding author

Gulbahtiyar Demirel can be contacted at: gulbahtiyar_doganer@hotmail.com