Evaluation of the Knowledge of Diabetes Mellitus among pregnant women attending General Hospitals in Lagos, Nigeria

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Abstract

Diabetes mellitus in pregnancy is an increasing epidemiological health issue. Good knowledge about the disease condition could prevent the onset of the disease in some cases as well as prevent its associated complications in most cases. The objectives of the study are to assess the knowledge of Diabetes mellitus in pregnancy and identify areas of deficient knowledge among diabetic pregnant women attending antenatal clinics of Island maternity and Onikan general hospitals in Lagos Island, Lagos, Nigeria. A quantitative cross-sectional approach was adopted in this study. Total enumeration method of sample size and purposive sampling techniques were also used while number of participants was seventy-five (75). The instrument included demographic information and test question on DM in pregnancy. Cronbach's alpha value for self-reliability index of the instrument was 0.86. Ethical approval and consent were received from Babcock University Health Research Ethical committee (BUHREC) and Lagos State Heath Service Commission respectively. All the respondents were married (100%). There were more respondents (57.3%) with a family history of diabetes. Overall knowledge mean score on DM in pregnancy was poor (11.87 ± 0.42). Knowledge mean score on meaning of DM in pregnancy was good (0.91), however, knowledge means score was poor on the causes of DM in pregnancy (0.92 ± 0.06); risk factors (1.91 ± 0.04); Types (1.92 ± 0.10); signs and symptoms (2.48 ± 0.10). Based on these findings, education intervention for the improvement of knowledge of diabetic pregnant women on DM in pregnancy is required to stem its increasing prevalence.

Keywords: *Diabetes, Knowledge, Pregnant, Gestational, Women.*

Introduction

Diabetes Mellitus (DM) in pregnancy has become of great concern to medical practice globally. Its complications on mother and fetus/baby are leading factors of maternal and perinatal mortality (Babah, Owie, Ohazurike and Akinajo, 2018). It poses serious effect on the patient as well as immediate family members and in fact, the entire community.

DM in pregnancy can be defined as any degree of glucose intolerance with onset or first recognition before or during pregnancy (Macaulay, Dunger & Norris, 2014). This includes DM that predates pregnancy or Gestational Diabetes Mellitus (GDM). "GDM can be defined as any degree of glucose intolerance with onset or first recognition during pregnancy" (Law & Zhang, 2017). DM diagnosed in a pregnant mother prior to conception is regarded as Pre-Gestational Diabetes Mellitus (PGDM). It is important to diagnose and properly manage diabetes mellitus during pregnancy because a mild diabetes can raise the risk of maternal and perinatal morbidity and mortality. (Alharthi, Althobaiti & Alswat, 2018; Egbe, Tsaku, Tchounzou & Ngowe, 2018).

It has been reported that the prevalence of DM especially during pregnancy is increasing worldwide, hence, current data shows that prevalence of DM in pregnancy is 15% (Donazar-Ezcurra, López-del, & Bes-Rastrollo. 2017). A recent review of existing literature on prevalence of diabetes in pregnancy conducted by Muche, Olayemi and Gete, (2019) revealed that occurrence of DM in pregnancy in sub-Saharan region of Africa was 14%. In Nigeria, prevalence of DM in pregnancy was 13.6% (Macaulay, Dunger & Norris, 2014). However, a general observation on the literatures dealing with

prevalence of DM in pregnancy within Nigeria is that results are not consistent (Onyenekwe et al., 2019). Secondly, existing data within Nigeria revealed that Lagos has the highest prevalence of DM in pregnancy (23.2%; Ajayi, Adegbola & Oseni, 2015).

"Pregnant women diagnosed to have diabetes mellitus are exposed to high risk of pregnancy complications such as preeclampsia, pre-term birth and macrosomia" (Kanguru, Bezawada, Hussein & Bell, 2014), post-partum complications which includes higher risk of DM in future pregnancies as well as possible development of type II diabetes at a period of up to 25 years after the childbirth (Poomalar, 2015). Other effects of serious concern are the profound consequence of DM in pregnancy on the child/neonate who is at a higher risk of health defects (Xu *et al*., 2017). These health challenges are transmitted to later generations leading to a perpetuated vicious cycle of metabolic diseases.

Consequent on the foregoing, it is important to step up intervention efforts aimed at enhancing the knowledge of DM among pregnant women in Lagos, Nigeria. Good knowledge about DM in pregnancy could assist diabetic pregnant women in coping and adjusting well to their medical condition (Alharthi, Althobait & Alswat, 2018). Although high prevalence of DM in pregnancy has been reported in Nigeria (especially South-Western Nigeria), Nigeria is short of data on the level of knowledge about DM in pregnancy among diabetic pregnant women (Ogu et al., 2018). The main objective of this study is to assess the level of knowledge of DM in pregnancy as well as identify areas of knowledge deficits among pregnant women attending Lagos Island Maternity and Onikan general hospitals in Lagos Island, Lagos State, Nigeria.

Methodology

A quantitative cross-sectional study was conducted in February, 2020 among diabetic pregnant women attending two hospitals owned by Lagos State government in Lagos Island, Lagos State, Nigeria.

Selection of the area

The choice of Lagos as the study area is based on initial report that Lagos has the highest prevalence of DM in pregnancy in Nigeria (Ajayi, Adegbola & Oseni, 2015). The study however concentrated on Lagos Island, which has the highest population among the five divisions. There are four general hospitals in Lagos Island, however, only two (Island Maternity Hospital and Onikan General Hospital) have Obstetrics and Gynecology facilities. These two were therefore used in this study.

Sample size determination

Target population which was the number of pregnant women diagnosed with DM in the two hospitals was 83. Sample size was calculated based on Cochran's formula stated as follows:

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{N}} \quad (1)$$

Where

$$n_0 = \frac{Z^2 pq}{e^2} \quad (2)$$

n = sample size;

N = population size;

e = error margin;

$q = 1 - p$;

p = estimated population proportion

z = standard error

The value of p used in this study was 23.2% (Ajayi, Adegbola & Oseni, 2015) and z was standard error corresponding to 95% confidence interval (1.96). The sample size computed based on this formula was 63.78 (approximately 64). The study eventually adopted the total enumeration method of sample size determination since the target population was finite, the number was close to the sample size and the entire data could be effectively analyzed.

Sampling technique

The purposive sampling techniques were used in this study because it targeted only diabetic pregnant women.

Data collection

A total number of 81 participants started the study while 75 participants (30 from Onikan general hospital and 45 from Island maternity) completed the study. The instrument used for data collection consisted of participants' demographic data (which consists of seven questions) and test paper on knowledge of diabetic pregnant women on diabetes mellitus in pregnancy consisting of 42 questions. It was close ended with Yes or No answer. The instrument's reliability test carried out at Lagos Island Maternity yielded Cronbach's Alpha 0.86.

Data analysis

All demographic data with options from "a" to "e" were coded as 1 to 5. On the test for knowledge of participants on diabetes mellitus in pregnancy, every question answered correctly was coded as "1" while every question answered wrongly was coded "0". SPSS version 25 was used in analyzing the participants' response. Descriptive statistics in the form of frequencies, percentages and means were used to present the results. Babcock University Research and Ethical committee (BUREC) provided ethical approval for this study. Consent was obtained from Lagos State Health Service Commission while informed consent was obtained from each respondent before administration of instrument.

Result presentation

The socio-demographic information of the participants is as presented in Table 1. The results revealed that the study was dominated by participants who were between the ages of 21 to 45 (88%); while 12 percent were between the ages of 46 to 65. All the respondents were married (100%). Majority had tertiary education (70.7%), while 29.3 percent may not. In terms of religion, participants who belong to the Islamic religion (49.3%) and Christianity (50.7%) were almost equally represented in the study. More respondents (57.3%) might have had genetic predisposition to diabetes; this is because many of them indicated their mothers (25.3%), fathers (21.3%) brothers (6.7%) and sisters (4.0%) had history of diabetes.

Presented in Table 2 and Table 3 are the knowledge mean score of participants on the various variables considered in this study. In Table 2, participants' knowledge mean score on the main construct of this study (knowledge of DM in pregnancy) was 11.87 ± 0.42 in a maximum scale of 42. Knowledge mean score was 0.91 ± 0.03 in a maximum scale of 1 on meaning of DM in pregnancy; other results are causes of DM in pregnancy (0.92 ± 0.06 in a maximum scale of 5); risk factors (1.91 ± 0.04 in a maximum scale of 7); Types (1.92 ± 0.10 in a maximum scale of 6); signs and symptoms (2.48 ± 0.10 in a maximum scale of 9); methods of diagnoses (2.55 ± 0.10 in a maximum scale of 10) and criteria for diagnoses (1.19 ± 0.12 in a maximum scale of 4). Further breakdown of the results to knowledge mean score on each question and knowledge mean score for each variable are presented in Tables 3. Knowledge mean score on each question are presented along with the standard deviation. Standard Deviation (SD) results provide information about how much each response deviated from the mean.

Table 1. Demographic Characteristics of Respondents

Variable		Frequency (n)	Percentage (%)
Age	21-35	35	46.7
	36-45	31	41.3
	46-65	9	12.0
	Total	**75**	**100**
Marital Status	**Married**	75	100.0
Educational Qualification	Secondary Education	22	29.3
	Tertiary Education	53	70.7
	Total	**75**	**100**
Religion	Christianity	38	50.7
	Islam	37	49.3
	Total	**75**	**100**
Record of Family with history of diabetes	Father	16	21.3
	Mother	19	25.3
	Brother(s)	5	6.7
	Sister(s)	3	4.0
	None	32	42.7
	Total	**75**	**100**
Number of Children	None	11	14.7

	One	20	26.7
	Two	31	41.3
	Three or more	13	17.3
	Total	**75**	**100**
Previous History of High Blood Glucose in pregnancy	No	47	62.7
	Yes	28	37.3
	Total	**75**	**100**

Source: Field survey, 2020

Table 2. Knowledge of DM in pregnancy

Variables	Max Scale Point	Items on scale	Pre-Intervention $\bar{x}$ (SE) ±SD
Knowledge of diabetes mellitus in pregnancy **(Main Construct)**	**42**	**42**	11.87(0.42)3.63
Meaning	**1**	**1**	0.91(0.03)0.29
Causes	**5**	**5**	0.92(0.06)0.13
Risk factors	**7**	**7**	1.91(0.04)0.11
Types	**6**	**6**	1.92(0.10)0.24
Signs and Symptoms	**9**	**9**	2.48(0.10)0.31
Methods of diagnoses	**10**	**10**	2.55(0.10)0.31
Criteria for diabetes diagnoses	**4**	**4**	1.19(0.12)0.16

Source: Field Survey, (2020)

Table 3. Knowledge of Diabetes Mellitus in Pregnancy

Items	Mean ($\bar{x}$)	SD	Average Mean
Meaning of DM in pregnancy			
When a pregnant woman is detected for the first time with high blood glucose before or during pregnancy	0.91	0.29	
The causes of diabetes mellitus in pregnancy			
Hormone disorder	0.08	0.27	
Problem with pancreas	0.44	0.50	
**Reduced weight gain during pregnancy	0.67	0.25	0.18
Inability of the body cells to properly absorb sugar	0.16	0.37	
**Effective body response to insulin	0.17	0.38	
Risk factors for diabetes mellitus in pregnancy			
**Involvement in physical activity	0.17	0.38	
Family member with history of diabetes mellitus	0.48	0.50	
High fat diet	0.20	0.40	
**Low alcohol intake	0.33	0.48	0.27
High blood pressure	0.29	0.46	
**Low Carbohydrate	0.28	0.45	
Increased weight gain before or during pregnancy	0.15	0.36	
The types of diabetes mellitus in pregnancy			
Diabetes mellitus diagnosed first at 24-28weeks of pregnancy	0.36	0.48	
Diabetes mellitus diagnosed first before booking at the ante-Natal clinic	**0.15**	0.36	
Diabetes mellitus diagnosed first at 20weeks of pregnancy	0.04	0.20	0.32
Diabetes mellitus diagnosed first before pregnancy	0.48	0.50	
Diabetes mellitus diagnosed first during pregnancy	0.73	0.45	

The signs and symptoms of diabetes mellitus in pregnancy			
Frequent urination	0.73	0.45	
Headache	0.01	0.12	
Blurred vision	0.05	0.23	
Unusual thirst	0.05	0.23	
Increased weight gain during pregnancy	0.21	0.41	0.28
Glucose in urine	0.88	0.33	
Mother having enough strength	0.40	0.49	
Feeling like vomiting	0.07	0.25	
Frequent vaginal, bladder and skin infections	0.07	0.25	
The methods used in diagnoses of diabetes in Pregnancy			
Fasting blood glucose test	0.92	0.27	
Urine test	0.81	0.39	
Frequent vaginal infections	0.04	0.20	
Frequent urination	0.08	0.27	
2 hours after meal glucose test	0.12	0.33	0.25
Random blood glucose test	0.20	0.40	
Eye test	0.09	0.29	
Oral glucose tolerance test	0.15	0.36	
Initial glucose test	0.07	0.25	
Follow up glucose test	0.07	0.25	
Criteria for the diagnosis of diabetes mellitus			
Fasting blood glucose of 92mg/dl -126mg/dl	0.73	0.45	
2hour blood glucose of 153-199mg/dl following a 75g oral glucose load	0.13	0.34	0.30
2hour blood glucose ≥ 200mg/dl following a 75g oral glucose load	0.09	0.29	
Random blood glucose ≥ 200mg/dl with diabetes symptoms	0.23	0.42	

NOTE = Yes Coded 1; No Coded 0; ** Items were reverse coded

Source: Field survey, (2020)

From Table 3 above, participants' knowledge of DM in pregnancy was generally below average. Knowledge mean score about the meaning of diabetes mellitus was 0.91. Participants' knowledge mean about the causes of diabetes mellitus was 0.18; it was 0.27 for risk factors, the value was 0.32 for knowledge about types of diabetes in pregnancy and 0.28 for knowledge on signs and symptoms of DM in pregnancy. The results equally revealed that knowledge mean score on the methods used in diagnosis of DM in pregnancy was 0.25 and results on criteria for diagnosis was 0.30.

These findings showed that participants' knowledge mean score on DM in pregnancy was poor. Results on knowledge of diabetes mellitus in pregnancy revealed that participants had good knowledge about the meaning of diabetes mellitus in pregnancy ($\bar{x}$ = 0.91). Having a good understanding of the meaning of DM in pregnancy could assist a pregnant woman to seek prompt assistance from healthcare provider. Knowledge on causes of DM in pregnancy was poor although, participants have good knowledge that increased weight gain can lead to diabetes. Poor knowledge about causes of DM in pregnancy could lead to increased prevalence which contributes to increased health burden. The results also revealed poor knowledge about risk factors of DM in pregnancy. Participants' knowledge was below average on all questions relating to risk factors. Knowledge about types of DM in pregnancy was equally poor, however, knowledge mean score on this variable was highest. The results suggested that participants' knowledge was high on diabetes diagnosed first during pregnancy (GDM). Their understanding of other types of DM in pregnancy was poor. This could be associated with the previous studies suggesting that cases of GDM in DM in pregnancy was about 84% (Wang &Yang, 2016). Participants' knowledge of signs and symptoms

was equally poor. Results revealed that participants understood that frequent urination and glucose in urine as signs and symptoms of DM in pregnancy. Their knowledge of other signs and symptoms were poor. On the methods of diagnoses, participants' knowledge was low. Lack of knowledge about methods of diagnoses could result in inadequate information from patient to caregiver and could results to delayed diagnosis. Results also revealed that participants' knowledge of criteria for diagnoses was poor. In general, participants' low knowledge on DM in pregnancy. Low knowledge of causes, risk factors, types and symptoms of DM in pregnancy could contribute to failure of diabetic pregnant women in seeking early medical assistance which could lead to complications. This result was supported by Monir, Zeba and Rahman (2018) in a study carried out in Bangladesh as well as that of Khiyali, Manoochri, Khani, Babaei, and Mobasheri, (2017) carried out in Fasa city, southern Iran, where it was reported that pregnant women's knowledge about DM in pregnancy was low.

Conclusion

Good knowledge about DM in pregnancy could prevent the onset of DM in pregnancy. It could also aid quick intervention that could prevent complications. The results of this study revealed that knowledge of pregnant women attending antenatal clinics of Island maternity and Onikan general hospitals about DM in pregnancy was poor. Therefore, educational intervention for the improvement of knowledge of diabetic pregnant women on DM in pregnancy is very important as one way of stemming the increasing prevalence of DM in pregnancy.

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