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Original Research Article

Prevalence of gestational diabetes mellitus among pregnant women attending antenatal care services in Diette Koki memorial hospital, Opolo Bayelsa state, Nigeria

Otovwe Agofure[1]*, Stella Odjimogho[2], Oghenenioborue R. A. Okandeji-Barry[1], Imomotimi Glasgow[1]

[1]Department of Public and Community Health, Novena University, Ogume Delta State, Nigeria
[2]Department of Optometry, University of Benin, Benin-City, Edo State, Nigeria

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***Correspondence:**
Dr. Otovwe Agofure,
E-mail: agofureotovwe@yahoo.com

ABSTRACT

Background: Gestational diabetes mellitus is a condition in which women without previously diagnosed diabetes exhibit high blood glucose levels during pregnancy. Gestational diabetes which prevalence is on the increase in Nigeria may have negative consequences on the health of the foetus or mother. This study was designed to determine the prevalence of gestational diabetes mellitus and its complications among pregnant women attending antenatal services in Diette Koki memorial hospital Opolo Bayelsa State from 2014-2016.
Methods: This was a retrospective study carried out at the Diette Koki Memorial Hospital Opolo in Bayelsa State. The study population comprised pregnant women that attended antenatal care services within the period of January 2014-December 2016. A designed proforma was used to collect the data from the hospital record department.
Results: The results of the study showed that the prevalence of gestational diabetes in the year 2014 was 0.023% or 2.33 per 10,000 pregnancies while the prevalence for 2015 was 0.026% or 2.59% per 10000 pregnancies. Furthermore, other complications recorded were hypertension, pre-eclampsia and eclampsia. Similarly, there was a significant correlation between prevalence of gestational diabetes and other complications (r=0.898, p=0.022).
Conclusions: In conclusion, prevalence of gestational diabetes was recorded among pregnant women of Diette Koki memorial hospital Opobo Bayelsa State. Therefore, prompt screening and preventive measures should be enforced by health care professionals to prevent maternal and foetal morbidity and mortality.

Keywords: Eclampsia, Gestational diabetes, Hypertension, Prevalence, Pre-eclampsia

INTRODUCTION

Gestational Diabetes Mellitus (GDM) is a condition in which women without previously diagnosed diabetes exhibit high blood glucose levels during the onset or first recognition of pregnancy.[1] Gestational diabetes is caused due to the malfunctioning of insulin receptors. Gestational diabetes is expected to resolve after delivery.[2] However, some long-term prospective studies have shown that between 40-60% of GDM patients develop Non-Insulin Dependent Diabetes Mellitus in ten to twenty years.[3-5] Globally, it was estimated by International Diabetes Federation (IDF) that 21.3 million or 16.2% of live births to women in 2017 had some form of hyperglycaemia in pregnancy. Furthermore, out of the estimated 131.4 million total live births to women aged 20-49 years in 2017, about 16.20% had hyperglycaemia in pregnancy.[6]

Reported prevalence rate of GDM varies from 1-14%.[7] In Nigeria various studies have reported varying prevalence of GDM. A study in Abakaliki Ebonyi State South-Eastern Nigeria reported prevalence 4.80%, while another study in Port-Harcourt Rivers State South-South Nigeria reported 2.98 per 1000 pregnancies and a study in Ibadan South-West Nigeria reported a prevalence of 4.90% for their prospective study participants and 1.60% for their retrospective study participants.[2,8]

Gestational diabetes mellitus poses risk to both mother and child. The two main risks GDM imposes on the body are growth abnormalities and numerical in-balance after birth. Babies are at risk of having low blood glucose immediately after birth in addition to being larger than normal.

Other serious complications of poorly controlled GDM in the new born can include increased chances of having jaundice, increased risk of respiratory distress syndrome due to incomplete long maturation and higher chances of dying before or after birth.[9] For the mother they have a greater risk of becoming overweight and developing type-2 diabetes later in life.[9]

Furthermore, in Nigeria, like most other developing countries, women are rarely screened for gestational diabetes mellitus. Peradventure were they are screened for urinalysis as part of antenatal care, majority who tested positive to glucose in their urine are not referred for either fasting or random glucose confirmatory tests. For those few that were screened and diagnosed for GDM, they have few options for management of the disease. This observed poor management of GDM is not peculiar to GDM alone, but to diabetes mellitus management in general which has been reported to be poor in Nigeria.[10-11]

Therefore, this retrospective study was designed to access the prevalence of gestational diabetes mellitus and its complications among pregnant women attending antenatal care services in Diette Koki memorial hospital Opobo Bayelsa State.

METHODS

The study employed a retrospective descriptive design in assessing the prevalence of gestational diabetes mellitus among pregnant women in Diette Koki Memorial Hospital Opolo Bayelsa.

The study area is Diette Koki Memorial Hospital Opolo in Bayelsa State. This hospital is a government owned central hospital that serve the health need of Opolo indigenes.

It is one of the highest delivery rate health institutions in Bayelsa State. The unit has a total of 135 beds, with 30 beds in the antenatal ward, 40 beds in the postnatal ward, 40 beds in the unbooked ward, 13 beds in the first stage room, 4 beds in second stage room, and 8 beds in private/semi-private rooms. There are five units and each unit has four consultant obstetricians, five specialist senior registrars and two registrars with many experienced nurses and midwives. It serves both urban and rural population within and outside the state. The target population for this study was all pregnant women that attended antenatal care services within the period of January 2014-December 2016.

Inclusion criteria

- All pregnant women that attended antenatal care services in the study setting within January 2014-December 2016.

According to the records in the registry of the hospital, the total number of pregnant women that attended antenatal care services in the period under review was 23996 and this constituted our sample size.

A structured data extraction tool was developed and used to collect the information from the medical record section of the hospital. On the day of data collection, the researcher and four other assistants went through each of the case files and extracted information relevant to the study. Statistical Package for Social Sciences (SPSS) 20.0 for windows was used in entering and analyzing information generated.

In this study GDM was diagnosed if there was persistent glycosuria in urinalysis and a confirmatory blood sugar results were considered positive on the basis of Fasting Blood Sugar ≥126 mg/dl. Ethical clearance was obtained from the medical director of Diette Koki Memorial Hospital Opolo in Bayelsa State.

RESULTS

According to figure 1 below, more of the respondents 50.0% were between the ages 28-37 years while 35.0% were 18-27 years and 15.0% were 38-47 years (Figure 1).

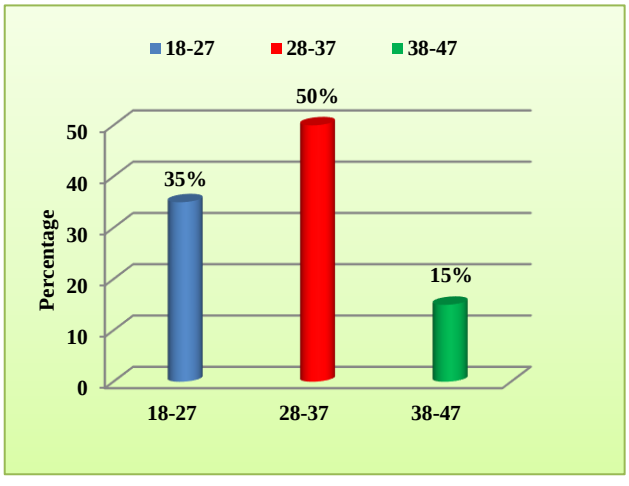

Figure 1: Ages of the women.

Prevalence of gestational diabetes in the year 2014

As shown in Table 1, two cases of gestational diabetes were recorded in the months of August and September giving a prevalence of 0.023%. Furthermore, the total number of women screened for GDM in year 2014 was 8590 with 700 women screened in the month of January, 728 women in the month of February, 882 women in the month of March and 927 women in the month of April.

In addition, 798 women were screened for GDM in the month of May, while 868 women were screened for GDM in the month of June and 713 women were screened for GDM in the month of July.

Also, 654 women were screened for GDM in the month of August, followed by 876 women in the month of September, 624 women in the month of October and 559 women in the month of November.

Table 1: Prevalence of gestational diabetes in the year 2014.

Months of the year	No. of women screened for GDM	No. of women with GDM
January	700	0
February	728	0
March	882	0
April	927	0
May	798	0
June	868	0
July	713	0
August	654	1
September	876	1
October	624	0
November	559	0
December	261	0
Total	8590	2

Prevalence of GDM=0.023%

Prevalence of Gestational Diabetes in the year 2015

Out of the 7703 patients that attended the ANC clinic in the year 2015 only 2 cases of gestational diabetes were recorded in the months of January and November, giving a prevalence of 0.026%.

The number of women screened for GDM in the month of January was 600, February was 520, March was 695, April was 730 and May was 488 women.

Furthermore, 700 women were screened for GDM in the month of June, 675 in the month of July, 692 in the month of August, and 753 in the month of September.

In addition, 550 women were screened for GDM in the month of October, 620 women in the month of November and 680 women in the month of December (Table 2).

Table 2: Prevalence of gestational diabetes in the year 2015.

Months of the year	No. of women screened for GDM	No. of women with GDM
January	600	1
February	520	0
March	695	0
April	730	0
May	488	0
June	700	0
July	675	0
August	692	0
September	753	0
October	550	0
November	620	1
December	680	0
Total	7703	2

Prevalence of GDM=0.026%

Prevalence of gestational diabetes in the year 2016

No cases of gestational diabetes were recorded in the year 2016.

However, the number of women screened for GDM in January was 661, 707 women in February, 730 women in March, 651 women in April and 560 women in May.

In addition, 638 women were screened for GDM in the month of June, 640 women in the month of July, 757 women in the month of August, 589 in the month of September and 590 women in the month of October.

Also, 540 women were screened for GDM in the month of November and 535 women were screened for GDM in the month of December (Table 3).

Table 3: Prevalence of gestational diabetes in the year 2016.

Months of the year	No. of women screened for GDM	No. of women with GDM
January	661	0
February	707	0
March	730	0
April	651	0
May	560	0
June	638	0
July	640	0
August	757	0
September	589	0
October	590	0
November	540	0
December	535	0
Total	7703	0

Prevalence of GDM=0.0%

Other complications

Prevalence of hypertension among the pregnant women

Hypertension was prevalent in all the pregnant women attending ANC in the period under review. Hypertension was higher in the months of September (16) and December (15) in year 2015. Furthermore, cases of hypertension were higher in the months of February (16), July (10) and August (15) 2016 respectively. In the year 2014 hypertension were higher in the months of January (10), March (14), June (12) and October (11) (Figure 2).

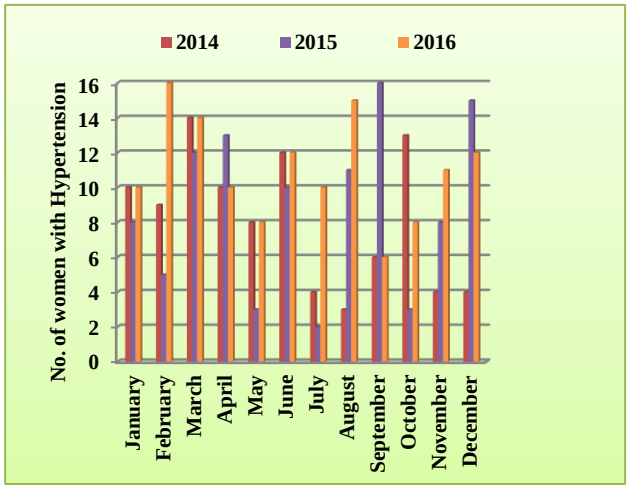

Figure 2: Number of the pregnant women with hypertension.

Pre-eclampsia

Cases of pre-eclampsia were also recorded throughout the period under review. Cases of pre-eclampsia were recorded more in 2014 in the months of January (10), February (10), May (6), June (9), July (9), August (9), October (7) respectively.

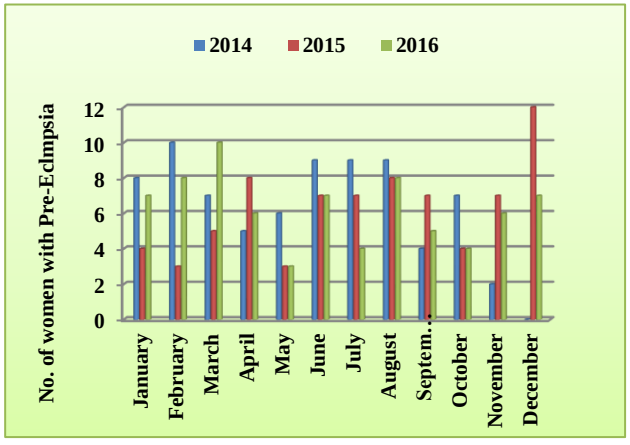

Figure 3: Number of pregnant women with pre-eclampsia.

In the year 2015 cases of pre-eclampsia were higher in the months of April (8), September (7), November (7) and December (12) respectively. In the year 2016 in the months of January (7), February (8), March (10) and August (8) (Figure 3).

Eclampsia

According to figure 4 below, cases of pre-eclampsia were higher in 2014 in the months of March (4), May (4), and December (4). In the year 2015, the caases of pre-eclampsia were higher in the months of January (4), February (3), April (3), June (3), August (5), and November (7) respectively. Similarly, in the year 2016 cases of pre-eclampsia were higher in the months of January (4), July (4), September (5) and October (4) respectively.

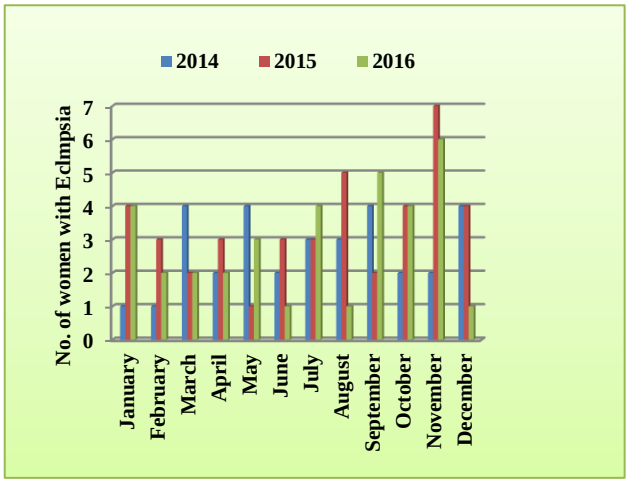

Figure 4: Number of pregnant women with eclampsia.

Hypotheses

Hypothesis One: There is no significant relationship between the number of pregnant women screened in 2014 and the prevalence of GDM in 2014.

According to Table 4, the relationship between the number of women screened for GDM and number of women with GDM showed strong correlation, but no significant difference P>0.05.

Table 4: Relationship between the number of pregnant women screened in 2014 and the prevalence of GDM in 2014.

	Pearson correlation	P-Value
Number of women screened for GDM	0.699	0.125
Number of women with GDM		

Hypothesis Two: There is no significant relationship between the number of pregnant women screened in 2015 and the prevalence of GDM in 2015.

As shown in Table 5, the relationship showed a negative correlation with no significant difference between the number of pregnant women screened in 2015 and number of women with GDM.

Table 5: Relationship between the number of pregnant women screened in 2015 and the prevalence of GDM in 2015.

	Pearson correlation	P-Value
Number of women screened for GDM	-0.588	0.174
Number of women with GDM		

Hypothesis Three: There is no significant relationship between the other complications presented by the pregnant women and the prevalence of GDM.

The results of Table 6 below showed only pre-eclampsia showed a strong positive correlation with prevalence of GDM and the relationship was also significant at P<0.05.

Table 6: Relationship between the other complications presented by the pregnant women and the prevalence of GDM.

	Pearson correlation	P-Value
Number of women with GDM		
Hypertension	-0.308	0.067
Pre-eclampsia	0.898	0.022
Eclampsia	0.193	0.260

DISCUSSION

The findings of the study showed prevalence of gestational diabetes mellitus in Diette Koki Memorial hospital. According to the results more women attended antenatal care in the year 2014 and 2015 than 2016. The total number of antenatal patients seen during this period was 23996 patients. This figure was higher than the number of patients seen from previous studies in Port-Harcourt and Abakaliki metropolis.[2,12] This shows the increasing awareness of the importance of ANC among pregnant women in the South-South region. The public health implication is improved maternal and foetal outcome as booked ANC has been shown to improve both maternal and foetal outcome.[13-16] In addition, it would afford opportunity for more women to be screened for GDM and implement appropriate follow-up and monitoring for women with severe cases so as to improve both maternal and foetal outcomes.

The prevalence of GDM in the year 2014 was 0.023% or 2.33 per 10000. This finding was lower than the findings of the study in Port-Harcourt which gave a prevalence of 0.298% or 2.98 per 10000 pregnancies.[12] This prevalence was also lower than the study in Abakaliki metropolis which showed a prevalence of 4.8%.[2] The observed prevalence in the study was also lower than that of a study in western Rajasthan India.[17] This shows the variability of GDM in various locations both within Nigeria and outside Nigeria.

The prevalence of GDM in 2015 was 0.026% or 2.59 per 10000 pregnancies. This prevalence was higher than that of year 2014. This difference could be attributed to the higher population that attended antenatal in the year 2014. The finding was different from the study in Jos Nigeria which showed a prevalence of 8.3%.[18] The finding was also different from the findings of previous studies both in Nigeria and outside Nigeria.[2,12,17] Although, the prevalence of the study seems to be lower than those of previous studies sometimes the process of diagnosis for each study might be different. For the current study the researcher only focused on patients with confirmatory blood fasting sugar test, as patients tested positive for glucose in their urine without confirmatory sugar test were not included in the study. However, this set of patients needs to be followed-up to ensure they do not have GDM which would have some consequences for both the mother and baby before and after delivery.

The findings of the study showed that hypertension was prevalent in all the pregnant women attending antenatal in the period under review. This finding was similar to the study in India which showed the prevalence of hypertension among pregnant women.[17] The finding was similar to previous studies in Nigeria.[18] Furthermore, the results showed cases of eclampsia and pre-eclampsia were also recorded during the period under review. This finding was also similar to the study in Northern Nigeria.[18] In addition, pre-eclampsia showed a positive strong correlation with prevalence of GDM. This finding was similar to the study in Maiduguri which showed a relationship between hypertensive disorders such as pre-eclampsia and gestational diabetes.[19]

CONCLUSION

In conclusion the study showed the prevalence of gestational diabetes mellitus among the pregnant women attending antenatal care in Diete Koki Memorial Hospital Yenagoa. Furthermore, other complications such as pre-eclampsia, eclampsia and hypertension were recorded among the pregnant women attending the hospital.

Recommendations

Based on the findings of the study the following recommendations were suggested:

- There should be prenatal counseling for all intending pregnant women to ensure that they receive proper counseling from medical experts on how to go

through the gestational period successfully with low or minimal complications.

- All pregnant women coming for antenatal care should be screened for gestational diabetes as this would help to enhance early detection and avoid long-term complications.
- Pregnant women should be encouraged to engage in exercise activities as this would help to prevent diseases and assist during delivery. Exercise goes a long way in preventing and controlling gestational diabetes.
- Pregnant women should also be encouraged to eat balanced diet as this would help to prevent and control gestational diabetes.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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