Prevalence of Diabetes Mellitus amongst Antenatal Clinic Attendees at Booking in a Teaching Hospital in Rivers State, Nigeria

Eli S[1], Nonye-Enyidah E[2], Okagua KE[2], Kua P[2], Owhonda G[3], Tee GP[2], Emeghara GI[2], Iwo-Amah R[2], Nnoka VN[4],
Onwuegbule C[5], Nnadi NO[6]
Mother, Baby and Adolescent Care Global Foundation.[1]
Department of Obstetrics and Gynaecology, Rivers State University Teaching Hospital.[2]
Department of Community Medicine, Rivers State University.[3]
Department of Human Physiology, Rivers State University.[5]
Department of Pharmacology, Rivers State University.[4]
First Rivers Hospital, Port Harcourt, Rivers State.[5]
Department of Family Medicine, Rivers State University Teaching Hospital.[6]
Correspondence: Dr Okagua KE MBBS, FWACS, FICS

Abstract:-
Background: Diabetes mellitus (DM) both in gravid and non-gravid persons is a common endocrine pathology globally. The prevalence of DM has tripled from 1980 till date and this has negative effects to the fetus and mother.

Aim: The aim was to determine the prevalence of DM amongst antenatal clinic (ANC) attendees at booking at the Rivers State University Teaching Hospital (RSUTH).

Methods: This was a cross sectional study of ANC attendees at the RSUTH. A structured questionnaire was used and the information was obtained by self-reporting. Approval for the study was granted by the ethical committee of the Rivers State Hospital Management Board . The cut-off   for DM was FBS of 7.0 mmol/L. The information was analyzed using SPSS version 25.

Result: Two hundred and fifty subjects were recruited for the study. The mean age was 32 years. The modal parity was 1.0. The mean gestational age was 19 weeks. The number of ANC attendees with weight equal to or greater than 90 kg was 53 (21.2%). The number with weight greater than or equal to 90 kg with glycosuria was 25 (10%) of the subjects. Eight (3.2%) of the subjects were known diabetic whereas 30 (12%) had family history of DM.

Conclusion: The study revealed that 3% of ANC attendees with weight equal to or greater than 90 kg were diabetic. In addition, ANC attendees who had family history of DM were 12.3%. There is need for screening for pregnant women with risk factors for DM for early detection and for prevention of adverse effect of DM to the mothers and their unborn babies.

Keywords:- cut-off, weight, prevalence, diabetes mellitus, ante natal, RSUTH.

I. INTRODUCTION

Diabetes mellitus in pregnancy is a common endocrine pathology globally.[1] The cut-off gestational age for pregestational diabetes or Diabetes Mellitus (DM) in pregnancy is gestational age less than 24 weeks, however some researchers consider less than 20 weeks with pregnant women presenting with glycaemic range of DM.[1-4] Researchers have shown that 1 in 7 pregnancies is affected by gestational diabetes mellitus (GDM).[1-2] Those with GDM are at risks of type 2 diabetes (T2D) in later life .[1] In addition worldwide women with a history of GDM were about 7 – 9 times as likely to develop T2D compared with GDM in a meta-analysis. [4,-6]

Furthermore, hyperglycaemia and adverse pregnancy outcome (HAPO) study from which the recent International Association of Diabetes and Pregnancy Study Groups (IADPSG) GDM diagnostic criteria were derived revealed that less severe maternal hyperglycaemia were also associated with higher risk of adverse pregnancy outcome;[1,4] and development of T2D or prediabetic at a median age of 11.4 years.[1,3]

Prevention or a delay in the onset of T2D has been proven to be associated with the patients education, lifestyle intervention and regular screening for pre – diabetes after a pregnancy complicated by GDM.[1,4-8]

Studies have shown that the weight in pre- pregnancy and during pregnancy appears to be an important prognostic factor and mediator in the development of T2D following a GDM pregnancy.[4,9-10]

Earlier meta – analysis comprising of studies in Europe and north American population with maternal overweight/obesity are at risk of GDM.[1,4-10] In a study amongst the Chinese women with history of GDM, Pre – pregnancy obesity and substantial post – delivery weight gain increases the risk of developing GDM.[1,4,11-14] An intensive lifestyle intervention, with weight loss being a critical element, in women with a history of GDM reduced the occurrence of T2D within 3 years of delivery by 50%.[10]

In a study by Eli et al there was an association between weight gain and the development of DM.[6]

II. AIM

The aim was to determine the prevalence of DM amongst antenatal clinic (ANC) at booking at the Rivers State University Teaching Hospital (RSUTH).

III. METHODS

This was a cross sectional study of ANC attendees at the RSUTH. A structured questionnaire was used and the information was obtained by self-reporting. Approval for the study was granted by the ethical committee of the Rivers State Hospital Management Board . The **cut-off** for DM was FBS of 7.0 mmol/L. The information was analyzed using SPSS version 25.

IV. STUDY POPULATION

This study was conducted in the Rivers State University Teaching Hospital. It is **a** 370 bed hospital located at Harley Street Port Harcourt Local Government Area of Rivers State, South South Nigeria. It is a tertiary health institution that provides all levels of health care services to Rivers, Bayelsa, Delta, Imo, Abia and Akwa-Ibom States. The Obstetrics and Gynaecology department is one of the clinical departments of the hospital with twelve (12) Consultant Staff.

V. SAMPLE SIZE ESTIMATION

The sample size of 250 was calculated using the Kish Leslie formula for cross-sectional studies calculated, based on 20% prevalence of Gestational and Pre-gestational Diabetes Mellitus from study by Egan AM et al [2] and a confidence level of 95%. $n= Z^2Pq/d^2$ Where n is the desired sample size Z is the standard normal deviate usually set at 1.96, which corresponds to the confidence interval P is the proportion of pregnant women with diabetes mellitus which in this case is 20% q is complementary proportion equivalent to one (1), that is 1- 0.2% equal to 0.8% d is the degree of accuracy desired which is 5.0% (0.05%) $n= 1.96^2$ x 0.2 (1- 0.2)/0.05^2 = 245 This was rounded up to the nearest whole number, the reason for using 250 as the sample size.

VI. RESULT

Two hundred and fifty subjects were recruited for the study. The mean age was 32 years. The modal parity was 1.0. The mean gestational age was 19 weeks. The number of ANC attendees with weight equal to or greater than 90 kg was 53 (21.2%). The number with weight greater than or ≥equal to 90 kg with glycosuria in 25 (10%) of the subjects. Eight (3.2%) of the subjects were known diabetic whereas 30 (12%) had family history of DM.

Mean age	32 years
Modal parity	**1**
Mean gestational age at booking	**19 weeks**

Table 1: Showing the mean age, modal parity and mean gestational age

	Number	Percentage (%)
Prevalence of DM	8	3.2
Prevalence of Glycosuria	25	10
Prevalence of family history of DM	30	12

Table 2: Prevalence of Diabetes Mellitus (DM), Glycosuria and Family history of DM Amongst ANC Attendees at the Rivers State University Teaching Hospital (RSUTH)

VII. DISCUSSION

Our study revealed that 3% of ante natal clinic attendees had pregestational diabetes, 12% had family history of DM and 10% had glycosuria at booking. The prevalence was lower in the Ethiopian study with a prevalence ranging from between 4 to 13%.[1,2] However, with a family history prevalence of DM of 12% indicates that this was in agreement with the results obtained from researchers in studies outside Africa.[1-4] With glycosuria of 10 percent amongst the subjects is a pointer that the prevalence of GDM may be higher than the prevalence of 3.2% for DM. This is in agreement with a study by Eghan AM et al.[1-2] Furthermore, glycosuria in the urine of ante natal women is for screening and not a confirmatory diagnosis for DM or GDM.[1-6]

Researchers have shown that about 4% of all pregnancies with GDM have an estimated 7 fold chances of developing type 2 diabetes in the future as well as their children and subsequent generations. [1-4]

The burden of DM is rising in low and middle income countries with some 90% of the cases occurring in developed countries.[2-4] The effects of DM to the mother is myriad, affecting both the mother and the baby. [1-5] Some of these effects include increased risk of preeclampsia in mothers, increased risk of macrosomia, hypoglycaemia, jaundice, respiratory failure, polycythemia and hypocalcaemia in new born babies. [11-13]

The mean gestational age from our study was 19 weeks at booking. This means that ante natal mothers presenting with fasting blood sugar of diabetic range were considered to have pre-gestational diabetic or diabetes

predating the pregnancy.[1-2] This is because majority of researchers use 20 weeks of gestation as the cut-off range for DM or GDM.[1-4] However, some other Scholars use 24 weeks as cut-off gestation for either DM or GDM.[2-3] Which ever school of thought at a gestational age of 19 weeks with glycaemic level of the diabetic range is DM or pre-gestational diabetes.[1-4,10-13]

VIII. CONCLUSION

The study revealed that 3% of ANC attendees were diabetic. In addition, ANC attendees who had family history of DM were 12.3%. There is need for screening for pregnant women with risk factors for DM for early detection and for prevention of adverse effect of DM to the mothers and their unborn babies.

REFERENCES

[1.] Egan AM. Epidemiology of Gestational and Pre-gestational Diabetes Mellitus. Https://www. Kanger.com> Abstract (accessed 26/3/2022)

[2.] Egan A, Dinneen S. What is Diabetes? Medicine 2014: 42: 679 – 681

[3.] Laribo YM. Prevalence and Risk Factors of Gestational Diabetes mellitus among women attending care in Hadiyu zone public Hospitals Southern Nation Nationality People Region. Https://doi.org/10.1155/2v21/5564668 (accessed 26/3/2022)

[4.] Lapoila A, Metzger BE. Gestational Diabetes: A Decade after the HAPO study, front Diabetes, Basei, Karger 2020; 28: 1-10.

[5.] Chen LW. anahwi edu analysis of gestational diabetes and maternal weight store from pre – pregnancy through post delivery in future development of type 2 diabetes. Sci Rep 2021; 11: 5021

[6.] Eli S et al. Prevalence of Diabetes mellitus in pregnancy amongst Antenatal Clinic Attendees at Booking at the Rivers State University Teaching Hospital. Journal of Advances in Medicine and Medical Research. Doi: 10.9734/jammr/2020/v32i1630621 (accessed 21/3/2022)

[7.] Iinternational Diabetes Federation. IDF Diabetes At las, 9th edn. Brussels, Belgium. Https: //www.diabetes atlas. org (accessed 21/3/2022)

[8.] Bellamy L, Casas JP, Hingorani AD, Williams D. Type 2 diabetes mellitus after gestational diabetes. A systematic review and meta – analysis. Lancet 2009; 373: 1773 – 1779

[9.] ChusSY et al. maternal obesity and risk of gestational diabetes mellitus. Diabetes Care 2007; 30: 2070 – 2076

[10.] Scantos S et al. impact of maternal body mass index and gestational weight gain in pregnancy complications. An individual participant data meta – analysis of European,

[11.] North American and Australian cohorts. BJO G an Int. J Obstet. Gynaecol. 2019; 126: 984 – 995

[12.] Lin H et al. Pregnancy body mass index and weight change on post partum diabetes risk among gestational diabetes in women. Obesity 2014; 22: 1560 – 1567

[13.] Hedderson MM, Gunderson EP, Ferrara A. Gestational weight gain and risk of gestational diabetes mellitus. Obstet. Gynecol 2010; 115: 597 – 604

[14.] Carrew CA et al. Excessive early gestational weight gain and risk of gestational diabetes mellitus in nulliparous women. Obstet. Gynecol 2012: 119; 1227 – 1233

[15.] Moon JH et al. Weight gain and progression to type 2 diabetes in women with a history of gestational diabetes mellitus. J chin. Endocririol. Metab 2015; 100: 3548 – 3555.