

Perinatal Outcomes of Gestational Diabetes: A Hospital-Based Investigation in Yaounde, Cameroon

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ABSTRACT

Gestational diabetes (GDM) can be considered as glucose intolerance, diagnosed for the first time during pregnancy. It is a global issue with maternal, obstetrical and neonatal implications. We aimed to investigate and describe perinatal outcomes of GDM among a group of affected Cameroonian women. We carried out an observational study with cross-sectional design at the Yaounde Central Hospital (YCH) and the Yaounde Gynaeco-Obstetric and Pediatric Hospital (YGOPH). This was a seven-month investigation from files of all women admitted with GDM from January 2018 to January 2020. Data were analyzed using SPSS software (Statistical package for the Social Sciences) version 20. Our study sample comprised 34 pregnant women diagnosed with GDM out of 652 women admitted in the service during the same period (5.2%). Their average age was 31.8±4.4 years. Most women were multiparous (15: 44.0%) and being followed by both gynecologist and endocrinologist (21: 61.6%). The mean Gestational age (GA) at first antenatal consultation (ANC) was 12±2.5 weeks. The mean GA at delivery was 37.7 ±1.8. Most women were symptomatic with cardinal syndrome comprising polyuria (32: 94.2%), polydipsia (22: 64.1%) and polyphagia (21: 61.6%). The main stay of the management was insulin therapy (25: 73.3%). The rate of caesarean delivery was (22: 64.1%) and most was term (20: 58.3%) live births (30: 88.4%). Nevertheless, 14: 41.7% was born premature. The majority of neonates were macrosomes (13:38.4%) and big babies (9: 26.7%) with main complications being hypoglycemia (13: 38.4%) and neonatal infection (8: 23.52%).

From these results, we observed that GDM is a major issue in pregnancy in our context, with potential of severe perinatal implications in both newly delivered women and babies. Adequate management includes prompt diagnosis and multidisciplinary follow-up until after delivery.

Key words: Gestational diabetes, Perinatal outcome, Cameroon

INTRODUCTION

The prevalence of GDM in Africa is estimated to be around 13.6% with remarkable predominance in Central Africa which accounts for more than 20.4% of the total prevalence [1]. In Cameroon, this frequency is thought to fluctuate between 5 to 17% [2]. GDM is known to be associated with increased maternal and fetal morbidity, among which: pregnancy induced hypertension, preeclampsia, premature rupture of membranes, postpartum hemorrhage, increased risk of caesarean delivery and related complications have been described [2-6]. Furthermore, perinatal mortality rates are as well increased among women with GDM [7].

Meanwhile fetal and neonatal involvement have been found to increase the rate of admissions to the neonatal intensive care unit in babies from such pregnancies [8, 9]. However, it is well recognized that women diagnosed early in pregnancy regularly followed-up develop less complications during the course of pregnancy, and hence less adverse perinatal outcomes [10].

METHODOLOGY

We carried out an observational study with cross-sectional design at the Yaounde Central Hospital and Yaounde Gynaeco-Obstetric and Pediatric Hospital, which are two referral and

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university teaching hospitals in Yeounde, Cameroon. This was a seven-month investigation from files of all women admitted with GDM from January 2018 to January 2020. Data on sociodemographic, clinical and therapeutic characteristics were collected using a collection sheet. Data was then registered and analyzed using the Statistical Package for the Social Sciences (SPSS) software version 20.

RESULTS

A total of 34 pregnant women with gestational diabetes were identified in both hospitals, out of 652 women admitted in the service during the same period. This corresponded to a prevalence of 5.2%. The ages of the recruits ranged from 24-40 years with an average of 31.8±4.4 years. The region of origin of most women was the Centre region (18: 52.5%), followed by women from the West region (8: 23.5%). The majority of these women (21: 61.9%) were married. Secondary level of school education was the most common (20: 58.3%). The most represented profession was self-employment (9: 41.2%).

The mean Gestational Age (GA) at 1st Antenatal Consultation (ANC) was 12±2.5 weeks. The average GA at delivery was 37.7 ±1.8. A great percentage (27: 79.2%) of women with GDM conducted their Antenatal consultations at a 1st category hospital, and were being followed by both gynecologist and endocrinologist (21: 61.6%). Other parameters of pregnancy follow-up are shown in table I.

Table 1. Pregnancy follow-up

	Women who had GDM (N = 34)	
	n	%
Health Care facility where ANC was conducted		
Category 1 hospital	27	79.2
Category 2 Hospital	4	11.6
Category 3 Hospital	3	8.2
Was OGGT test done at 24-28 weeks		
Yes	34	100
No	0	0.0
Glycosuria on diagnosis		
Yes	33	97.6
No	1	2.4
Who followed up the pregnancy		
Gynecologist	12	35.0
Both (Endocrinologist and gynecologist)	21	61.6

	Nurse	1	2.4
Abnormal Bleeding			
	Menometrorrhagia	1	2.4
	None	33	97.6
Pathology in pregnancy			
	Malaria	17	50.0
	UTI	5	14.1
	None	9	26.7
	Others	3	8.2

The Clinical characteristics showed 33 (88.3 %) women with GDM were symptomatic with cardinal syndrome comprising polyphagia (21: 61.6%), polydipsia (22: 64.1%), and polyuria (32: 94.2%) being the most frequent. The majority of the women 25(73.3%) were managed using insulin as an antidiabetic drug.

The rate of caesarean delivery was (22: 64.1%) and most was term (20: 58.3%) live births (20: 88.4%). Nevertheless, 14: 41.7% was born premature. The majority of neonates were macrosomes (13: 38.4%) and big babies (9: 26.7%) with main complications being hypoglycemia (13: 38.4%) and neonatal infection (8: 23.52%). Perinatal characteristics are shown in table II.

Table 2. Perinatal characteristics

Variables	Women who had GDM (N = 34)	
	N	%
Route of Delivery		
Normal Vaginal Delivery	12	35.9
Caesarean Section	22	64.1
Indications of Caesarean Section		
Suspected Macrosomia	11	32.5
Fetal distress	8	23.3
Cephalo-Pelvic Disproportion	6	17.5
Preeclampsia	8	23.3
Inadequate pelvis	1	2.4
Gestational age at Delivery		
Premature 28-36 weeks 6days	14	41.7
Term 37-42weeks	20	58.3
Status at Delivery		
Alive	30	88.4
Death	4	11.6
Weight(grams)		
Low birth weight (< 2500g)	3	8.2

Normal weight (2500-3000g)	9	26.7
Big baby (3500-4000g)	9	26.7
Macrosomic baby (>4000g)	13	38.4
Neonatal Complications		
Hypoglycaemia	12	35.9
Respiratory distress	4	11.7
Abortions	4	11.76
Birth obstetrical trauma	1	2.5
Neonatal infection	8	23.2
Neonatal Jaundice	3	8.3
Still birth	3	8.82
Abortions	4	11.6
None	2	5.8

DISCUSSION

The prevalence of GDM in our survey was 5.2% and was within the estimated range as described by Sobgwi *et al* in their Cameroonian survey in a six-region based sample. They reported a prevalence of GDM varying from 5-17% in 2010 to which our finding is similar, probably due to context-related specificities of common population characteristics [11].

Most women were symptomatic with cardinal syndrome comprising polyuria (94.2%), polydipsia (64.1%) and polyphagia (61.6%) which is consistent with the clinical presentation of diabetes mellitus. This probably reflected elevated blood sugar levels with potential adverse effects on fetus, although correlation with cut-off values for blood glucose was not enquired. With regards to prominent symptomatology, the majority of women was diagnosed very early in pregnancy (73.3%) and was regular in follow-up, being managed with Insulin. Age maturity, level of education, and reduced occupational stress due to self-employment may have contributed to these prompt interventions, as well as patients' observance of hospital appointments throughout the pregnancy. This is indicated by the fact that most women (21: 61.6%) benefited from specialized follow-up in order to reduce perinatal complications as much as possible [12-20]. There were no other major complications during pregnancy if not for increased malaria and urinary tract infections, probably due to hyperglycemia and glycosuria (97.6%). However, the low rates of abortion and still births (11.6%) attested for keen follow-up, although contrasting high rate of premature delivery up to 41.7% was noted. Nevertheless, this could be due to factors related to the fetus, such as hyper uterine distension and increased pressure on cervix from larger size for gestational age.

In effect, up to 64.1% women affected with GDM gave birth through caesarean section which was prophylactic in most

cases and some other times in context of emergency. This is an eventuality in GDM as majority of fetuses abnormally gain weight because of excess glucose availability from diabetic mother. This increases fetal metabolism with excess liver storage of glycogen, from which biotransformation into fats occurs. Large fetus for gestational age predisposes to several obstetrical complications, of which dystocia. However, the high caesarean delivery rate found in our survey is lesser than that reported by Ethridge *et al* in 2014 where in 77.0% of women with GDM delivered through Caesarean section [21]. More so a similar study conducted by StbyMuche *et al* in 2018 in Ethiopia revealed a 67% incidence of caesarean delivery in such women, which exceeds our findings [22] limited evidence was available on potential impacts of gestational diabetes mellitus using updated international diagnostic criteria on adverse maternal outcomes. Therefore, this study aimed to assess the effects of gestational diabetes mellitus on the risk of adverse maternal outcomes in Northwest Ethiopia.

Methods
A prospective cohort study was conducted among pregnant women followed from pregnancy to delivery. Gestational diabetes mellitus status was determined by using a two-hour 75 g oral glucose tolerance test and based on updated international diagnostic criteria. Multivariable log-binomial model was used to examine the effects of gestational diabetes mellitus on the risk of adverse maternal outcomes.

Results
A total of 694 women completed the follow-up and included in the analysis. Women with gestational diabetes mellitus had a higher risk of composite adverse maternal outcome (ARR=1.58, 95% CI: 1.22, 2.04. Although caesarean section is a surgical intervention with related risks due to surgery and anesthesia, its practice is beneficial and indispensable in most cases with macrosomia to prevent perinatal complications [21-31]. As a matter of facts, the of live births rate above 88% found in this survey justifies the large indications observed, with marked reduction of birth obstetrical trauma as low as 2.5%.

Although macrosomia (32.5%), cephalo-pelvic disproportion (17.5%) and preeclampsia (23.3%) were common and notable indications of caesarean section in obstetrics, they may be particularly increased in context of GDM. Furthermore, it appeared that fetuses and neonates from pregnancies with GDM were particularly vulnerable and even more at onset and progress of labor, especially when they were of male sex. This was indicated by considerably high level of fetal distress in 23.3% of these fetuses. This calls for immediate and rigorous assessment of newly born infants from mothers with GDM [23-25]. Moreover, the mothers should also be continuously monitored and reassured to prevent complications due to stress-bound or strenuous delivery process and/or caesarean section. Likewise, neonates should be closely followed-up in the short and long terms [32-38].

Some limits in the interpretation of the results of this survey may be related with the retrospective nature of our survey,

implying we could not control the accuracy of initial patients' informations. More so, issues with non-systematic screening for GDM in our context, as well as the absence glycated hemoglobin sampling and other important laboratory records necessary for disease prognosis were difficulties encountered.

CONCLUSION

From these results, we observed that GDM is a major issue in pregnancy in our milieu, this with potential of inducing considerable perinatal complications in both newly delivered women and their babies. There is therefore a need for the systematic screening of all pregnant women as early as possible during antenatal consultations, which would enable adequate diagnosis. Furthermore, these women must benefit regular follow-up, adequate and specialized management including multidisciplinary interventions during pregnancy, delivery, postpartum, and of course neonatal care, for favorable outcomes.

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CONFLICT OF INTEREST

The authors declare that they have no competing interest.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

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