

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

Kamsu Zicfried*, Carinele Tchinda Tidang, Raïssa Monayong Mendo, Laura Kuate Makowa, Sonia Zambou Zebaze, Audrey Thérèse Mbang, Christiale Batibonak, Aurore Albane Essomba

¹Faculty of Medicine and Biomedical Sciences, the University of Yaoundé I, Yaoundé, Cameroon

*Corresponding author

Kamsu Zicfried, Faculty of Medicine and Biomedical Sciences, the University of Yaoundé I, Yaoundé, Cameroon.

Submitted: 26 Apr 2022; Accepted: 24 May 2022; Published: 26 May 2022

Citation : Kamsu Zicfried, Carinele Tchinda Tidang, Raïssa Monayong Mendo, Laura Kuate Makowa, Sonia Zambou Zebaze, Audrey Thérèse Mbang, Christiale Batibonak, Aurore Albane Essomba, (2022). Perinatal Outcomes of Gestational Diabetes: A Hospital-Based Investigation in Yaoundé, Cameroon, *J Pediatr Neonatal Biol* 7(1): 72-77.

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 a cross-sectional design at the Yaoundé Central Hospital (YCH) and the Yaoundé 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 to 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 were followed by both gynecologists and endocrinologists (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 mainstay of the management was insulin therapy (25: 73.3%). The rate of cesarean delivery was (22: 64.1%) and most were term (20: 58.3%) live births (30: 88.4%). Nevertheless, 14: 41.7% were born prematurely. The majority of neonates were macrosomes (13: 38.4%) and big babies (9: 26.7%) with the 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 with the potential of severe perinatal implications in both newly delivered women and babies. Adequate management includes prompt diagnosis and multidisciplinary follow-up until after delivery to prevent complications.

Keywords: 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 cesarean delivery, and related complications have been described [2-6]. Furthermore, perinatal mortality rates are as well increased among women with GDM [7]. Meanwhile fe-

tal 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 and regularly followed-up develop fewer 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 Yaoundé Central Hospital and Yaoundé Gynaeco-Obstetric and Pediatric Hospital, which are two referral and university

teaching hospitals in Yaoundé, 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 I: Pregnancy follow-up

Variables	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 were term (20: 58.3%)

live births (20: 88.4%). Nevertheless, 14 (41.7%) neonates were 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 II: 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 + 6 days	14	41.7
Term 37-42 weeks	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 are consistent with the clinical presentation of diabetes mellitus. This probably reflected elevated blood sugar levels with potential adverse effects on fetus. With regards to this, the majority of women were diagnosed very early in pregnancy (73.3%) and were 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 and patients' observance of hospital appointments throughout the pregnancy. This is indicated by the fact that most women (21: 61.6%) benefited from specialized management in order to reduce perinatal complications as much as possible [12-17]. 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 high rates of abortion and still births (11.6%) attested for the necessity to reinforce the follow-up of such women. This was further confirmed by the rate of premature delivery as high as 41.7%. 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 due to excess glucose availability from diabetic mother. This increases fetal metabolism with excess liver storage of glycogen, from which biotransformation into fats occurs in addition to hyperinsulinism which acts as a growth factor. 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 wherein 77.0% of women with GDM delivered through Caesarean section [18]. More so a similar study conducted by stby Muche et al in 2018 in Ethiopia revealed a 67% incidence of caesarean delivery in such women, which exceeds our findings [19]. 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 [20-25]. As a matter of facts, the rate of live births 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 are 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 [25-27]. 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 [28-30].

Some limits in the interpretation of the results of this survey may be related with the retrospective nature of our study, due to the possible inconsistencies of the initial 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 the potential of inducing considerable perinatal complications in both newly delivered women and their babies. Therefore, there is 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.

Funding

Private.

Conflict of Interest

The authors declare that they have no competing interest.

Ethical Approval

The study was approved by the Institutional Ethics Committee.

Acknowledgements

Hospitals authorities, all collaborators to this project.

References

1. Muche, A. A., Olayemi, O. O., & Gete, Y. K. (2019). Prevalence and determinants of gestational diabetes mellitus in Africa based on the updated international diagnostic criteria: a systematic review and meta-analysis. *Archives of Public Health*, 77(1), 1-20.
2. Benhalima, K., Devlieger, R., & Van Assche, A. (2015). Screening and management of gestational diabetes. *Best practice & research Clinical obstetrics & gynaecology*, 29(3), 339-

3. Opara, P. I., Jaja, T., & Onubogu, U. C. (2010). Morbidity and mortality amongst infants of diabetic mothers admitted into a special care baby unit in Port Harcourt, Nigeria. *Italian journal of pediatrics*, 36(1), 1-6.
4. Wakwoya, E. B., & Fita, F. U. (2018). Adverse maternal outcome and its association with gestational diabetes among women who gave birth in selected public hospitals in Eastern Ethiopia. *Tropical Journal of Obstetrics and Gynaecology*, 35(1), 58-62.
5. Östlund, I., Haglund, B., & Hanson, U. (2004). Gestational diabetes and preeclampsia. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 113(1), 12-16.
6. Moyo, G. P. K., Ngwanou, D. H., Sap, S. N. U., Nguéfack, F., & Mah, E. M. (2020). The Pattern of Breastfeeding among a Group of Neonates in Yaoundé, Cameroon. *International Journal of Progressive Sciences and Technologies*, 22(1), 61-66.
7. Kamana, K. C., Shakya, S., & Zhang, H. (2015). Gestational diabetes mellitus and macrosomia: a literature review. *Annals of Nutrition and Metabolism*, 66(Suppl. 2), 14-20.
8. Moyo, G. P. K., Sobguemezing, D., & Adjifack, H. T. (2020). Neonatal Emergencies in Full-Term Infants: A Seasonal Description in a Pediatric Referral Hospital of Yaoundé, Cameroon. *American Journal of Pediatrics*, 6(2), 87-90.
9. Landon, M. B., Spong, C. Y., Thom, E., Carpenter, M. W., Ramin, S. M., Casey, B., ... & Anderson, G. B. (2009). A multicenter, randomized trial of treatment for mild gestational diabetes. *New England Journal of Medicine*, 361(14), 1339-1348.
10. Werner, E. F., Pettker, C. M., Zuckerwise, L., Reel, M., Funai, E. F., Henderson, J., & Thung, S. F. (2012). Screening for gestational diabetes mellitus: are the criteria proposed by the International Association of the Diabetes and Pregnancy Study Groups cost-effective?. *Diabetes care*, 35(3), 529-535.
11. Lee, K. W., Ching, S. M., Ramachandran, V., Yee, A., Hoo, F. K., Chia, Y. C., ... & Veettil, S. K. (2018). Prevalence and risk factors of gestational diabetes mellitus in Asia: a systematic review and meta-analysis. *BMC pregnancy and childbirth*, 18(1), 1-20.
12. Ovesen, P. G., Jensen, D. M., Damm, P., Rasmussen, S., & Kesmodel, U. S. (2015). Maternal and neonatal outcomes in pregnancies complicated by gestational diabetes. A nation-wide study. *The Journal of Maternal-Fetal & Neonatal Medicine*, 28(14), 1720-1724.
13. Moyo, G. P. K. (2020). Epidemio-clinical Profile of the Baby Blues in Cameroonian Women. *Journal of Family Medicine and Health Care*, 6(1), 20-23.
14. Moyo, G. P. K., & Djoda, N. (2020). The Emotional Impact of Mode of Delivery in Cameroonian Mothers: Comparing Vaginal Delivery and Caesarean Section. *American Journal of Psychiatry and Neuroscience*, 8, 22-25.
15. Foumane, P., Olen, J. P. K., Fouedjio, J. H., Moyo, G. P. K., Nsahlai, C., & Mboudou, E. (2016). Risk factors of maternity blues after caesarean section in Yaoundé, Cameroon: a case-control analysis. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 5(12), 4424-4428.
16. A Antoniou, M. C., Gilbert, L., Gross, J., Rossel, J. B., Fischer Fumeaux, C. J., Vial, Y., & Puder, J. J. (2019). Potentially modifiable predictors of adverse neonatal and maternal outcomes in pregnancies with gestational diabetes mellitus: can they help for future risk stratification and risk-adapted patient care?. *BMC pregnancy and childbirth*, 19(1), 1-12.
17. Ovesen, P. G., Jensen, D. M., Damm, P., Rasmussen, S., & Kesmodel, U. S. (2015). Maternal and neonatal outcomes in pregnancies complicated by gestational diabetes. A nation-wide study. *The Journal of Maternal-Fetal & Neonatal Medicine*, 28(14), 1720-1724.
18. Ethridge Jr, J. K., Catalano, P. M., & Waters, T. P. (2014). Perinatal outcomes associated with the diagnosis of gestational diabetes made by the international association of the diabetes and pregnancy study groups criteria. *Obstetrics and gynecology*, 124(3), 571.
19. Iltanchez, D. (2010). Foetal and neonatal complications in gestational diabetes: perinatal mortality, congenital malformations, macrosomia, shoulder dystocia, birth injuries, neonatal complications. *Diabetes & metabolism*, 36(6 Pt 2), 617-627.
20. Georges Pius, K. M., Aurore Albane, E., & Marie-Paul, B. (2022). Neonatal Sepsis: Highlights and Controversies. *J Pediatr Neonatal*, 4(1), 1-5.
21. Hermann, N. D. (2020). Neonatal Determinants of Inadequate Breastfeeding: A Survey among a Group of Neonate Infants in Yaoundé, Cameroon. *Open Access Library Journal*, 7(07), 1.
22. Dany, H. N., Moyo, G. P. K., Ejake, L., Nguéfack, F., Mah, E., Maguip, L., ... & Chiabi, A. (2020). Determinants of Breastfeeding Initiation Among Newly Delivered Women in Yaounde, Cameroon: a Cross-Sectional Survey. *HEALTH SCIENCES AND DISEASE*, 21(9).
23. Moyo, G. P. K., & Hermann, N. D. (2020). Clinical Characteristics of a Group of Cameroonian Neonates with Delayed Breastfeeding Initiation. *American Journal of Pediatrics*, 6(3), 292-295.
24. Moyo GPK, Mendomo RM, Batibonack C Mbang AT et al. (2020). Neonatal Determinants of Mothers' Affective Involvement in Newly Delivered Cameroonian Women. *Journal of Family Medicine and Health Care*, 6(2), 125-128.
25. Chiabi, A. (2019). Relevance and Applicability of the Apgar Score in Current Clinical Practice. *EC Paediatrics*, 8, 1-7.
26. Moyo, G. P. K., & Tetsiguia, J. R. M. (2020). Discussing the "First Cry" as an Initial Assessment for Neonates. *American Journal of Pediatrics*, 6(2), 129-132.
27. Moyo, G. P. K. (2021). Perinatal and Childbirth as a Factor of Decompensation of Mental Illness: The Case of Depressive States in Newly Delivered Cameroonian Women. *Arch Med*, 7(2).
28. Moyo, G. P. K., & Hermann, N. D. (2020). The Psycho-Sociocultural Considerations of Breastfeeding in a Group of Cameroonian Women with Inadequate Practices. *Journal of Psychiatry and Psychiatric Disorders*, 4(4), 130-138.

-
29. Moyo, G. P. K., & Djoda, N. (2020). Relationship between the Baby Blues and Postpartum Depression: A Study among Cameroonian Women. *American Journal of Psychiatry and Neuroscience*, 8(1), 26-29.
 30. Moyo, G. P. K., Ngwanou, D. H., Sap, S. N. U., Nguefack, F., & Mah, E. M. (2020). The Pattern of Breastfeeding among a Group of Neonates in Yaoundé, Cameroon. *International Journal of Progressive Sciences and Technologies*, 22(1), 61-66.

Copyright: ©2022 Kamsu Zicfried, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.