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Risk Factors Associated with Intrauterine Fetal Death in the City of Yaounde: A Case-Control Study

Facteurs Associés à la Mort Fœtale in Utero à Yaoundé : Une Étude Cas-Témoin

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ABSTRACT

Introduction. Intrauterine foetal death (IUFD); defined as foetal demise occurring after 22 completed weeks of gestation or with foetus weighing ≥500g, is of great concern in our healthcare delivery system. Understanding the factors associated with IUFD is imperative for the elaboration of effective prevention strategies. This study aimed to investigate the factors associated with IUFD in two hospitals in Yaoundé. **Methods.** We conducted a retrospective case-control study at the central hospital and Efoulan district hospital in Yaoundé; two hospitals known to have a high turnover of pregnant cases. We reviewed the medical records of women who delivered in these institutions from March 2021 to March 2023. Cases included files of women who had a confirmed diagnosis of IUFD from 22 completed weeks of gestation and before the onset of labour. Controls consisted of files of women with live births in the same hospitals during the same period, matched against maternal age and parity. A total of 155 cases and 155 controls were included in the analysis. **Results.** Our study identified several significant risk factors associated with IUFD. They include being single, housewife as occupation, a previous history of IUFD, having less than four antenatal contacts, being ill during pregnancy, foetal abnormalities, and placental abnormalities. Conversely, a university-level of education, receiving antenatal care from an obstetrician/gynaecologist or resident in obstetrics and gynaecology, and others were protective factors. **Conclusion.** Poor antenatal care, being single, housewife, having lower level of education, having a history of previous IUFD, maternal illnesses during pregnancy, foetal abnormalities, and placental abnormalities have higher odds of IUFD.

RÉSUMÉ

Introduction. La mort fœtale in utéro (MFIU) est une grande préoccupation dans notre contexte. Comprendre les facteurs y associés est impératif pour l'élaboration de stratégies de prévention. Cette étude visait à étudier les facteurs associés à la MFIU. **Méthodes.** Nous avons mené une étude rétrospective type cas-témoins à l'hôpital central et à l'hôpital de district d'Efoulan à Yaoundé, deux hôpitaux très fréquentés. Nous avons étudié les dossiers médicaux des femmes ayant accouché dans ces établissements de mars 2021 à mars 2023. Les cas comprenaient des dossiers de femmes qui avaient un diagnostic confirmé de MFIU à partir de 22 semaines révolues de grossesse et avant le début du travail. Les contrôles étaient des dossiers de femmes ayant eu des naissances vivantes dans ces hôpitaux durant la même période, appariées selon l'âge et la parité maternels. Au total, 155 cas et 155 témoins ont été inclus. **Résultats.** Notre étude a identifié comme facteurs de risque associés à la MFIU le fait d'être célibataire, une femme au foyer comme profession, l'antécédents de MFIU, avoir moins de quatre contacts prénatals, être malade pendant la grossesse, et des anomalies fœtales et placentaires. Par contre, un niveau d'éducation universitaire, avoir comme prestataire de soins prénatals un spécialiste ou résident en obstétrique-gynécologie, entre autres, étaient des facteurs protecteurs. **Conclusion.** Les soins prénatals inadéquats, être mère célibataire ou femme au foyer, un niveau d'éducation bas, l'antécédents de MFIU, les maladies maternelles pendant la grossesse, des anomalies fœtales et placentaires augmentent le risque de MFIU.

HIGHLIGHTS OF THE STUDY

What is already known on this topic

Commonly identified factors associated with IUFD encompass antepartum haemorrhage, multiparity, hypertensive emergencies during pregnancy, inadequate or absent antenatal care, lower educational level of the mothers, septic deliveries, and cord accidents

What question this study addressed:

Risk factors associated with IUFD in Yaounde.

What this study adds to our knowledge

1. Poor antenatal care, being single, housewife, having lower level of education, having a history of previous IUFD, maternal illnesses during pregnancy, foetal abnormalities, and placental abnormalities have higher odds of IUFD in Yaounde.
2. Our study also revealed a much stronger association with low number of antenatal contacts and highlighted a high occurrence at 22-28 weeks of pregnancy

How this is relevant to clinical practice policy or further research

There is need to offer more than 4 antenatal contacts for every pregnancy, with close monitoring between 22-27 weeks.

INTRODUCTION

The loss of a foetus prior to completion of pregnancy imposes a substantial emotional burden on both parents and the family at large. Regrettably, this remains a prevalent occurrence in our setting, with a reported intrauterine foetal death (IUFD) rate of 3.40% [1].

According to the United States' National Centre for Health Statistics, foetal death is characterized by the delivery of a foetus without any signs of life, indicated by the absence of respiratory activity, heartbeats, umbilical cord pulsation, or definable involuntary muscle movements [2]. For the purpose of international comparison, the World Health Organization (WHO) recommends the definition of stillbirth as the birth of an infant without any signs of life, occurring either at or beyond the completion of 22 weeks of gestation or with a birthweight greater than 500g [3,4].

In 2019, the global incidence of stillbirth occurring at 28 weeks of gestation or beyond stood at approximately 2.6 million cases, with a ratio of 13.9 stillbirths per 1000 total births. However, these ratios varied significantly across different regions of the world. For instance, the United States reported an incidence of 4.96 cases per 1000 births, while France recorded 3.987 cases per 1000 births [5,6]. Over the years, it has been noted that a majority of these cases, roughly 98%, are concentrated in low- and middle-income countries, with more than three-quarters of these occurring in South Asia and Sub-Saharan Africa. Nigeria, for instance, reported an alarming rate of approximately 40 cases per 1000 births [5–7].

Within the context of Cameroon, there have been some prior research works done on this subject. A noteworthy study conducted in Buea in 2020 revealed an incidence of 3.5% [8]. Commonly identified factors associated with IUFD encompass antepartum haemorrhage, multiparity, hypertensive emergencies during pregnancy, inadequate or absent antenatal care, lower educational level of the mothers, septic deliveries, and cord accidents [4,8,9]. A comprehensive understanding of the factors contributing to IUFD within our specific setting holds the potential to facilitate early risk identification, public awareness, and the prevention of this tragic phenomenon. The main objective of this study was to identify the risk factors associated with intrauterine foetal death in two hospitals in Yaoundé through a retrospective case-control study.

MATERIALS AND METHODS

Study design and setting

This was a retrospective case-control study conducted at the gynaecology-obstetrics services of the Yaoundé Central Hospital and the Efoulan District Hospital between November 2022 and May 2023. The study population included all the medical records of women who were delivered in the maternities of these two hospitals from March 2021 to March 2023. We considered as cases all files of women who had confirmed diagnosis of foetal death after 22 completed weeks of gestation. Controls were defined as files of women who gave birth to live babies in the same hospitals during the same period, matched based on maternal age and parity. Our study excluded all instances of foetal deaths occurring after the onset of labour and all incomplete files.

The variables collected included maternal age, marital status, occupation, educational attainment, gravidity, parity, gestational age, history of pregnancy loss, the presence of comorbidities (such as diabetes and hypertensive disorders), substance use, antepartum haemorrhage, number of antenatal contacts, grade of antenatal care provider, daily iron/folic acid supplementation, intermittent preventive treatment for malaria, and the presence of foetal or placental abnormalities. To determine the minimum required sample size, we used the Schlesseman's formula, resulting in a minimum sample size of 79 participants for each group.

Statistical analysis

Data collection was done using a carefully designed and pretested questionnaire. In order to ensure the privacy and confidentiality of the patients, their personal information was coded. Subsequently, the collected data were entered and analysed using the IBM Statistical Package for Social Sciences (SPSS), version 23.0. To present the findings effectively, Microsoft Excel and Word software version 16.53 were used to generate tables and compile the report, respectively. The Pearson’s Chi-square test was used to assess associations among categorical variables. Multivariate binomial logistic regression analysis was used to determine the odds ratios (ORs) for factors linked to IUFD. All P-values less than 0.05 were considered statistically significant, at a 95% confidence interval.

RESULTS

Data collection was done retrospectively covering the period from March 2021 to March 2023. We reviewed 342 medical records over a period of four months spanning from January to April 2023; 32 of these files did not meet the eligibility criteria. Among these, one control file was deemed incomplete, and the remaining 31 case files were either missing or were incomplete. Consequently, a total

of 310 files were retained, equally divided into 155 cases and 155 controls.

Sociodemographic profile of the participants

The majority of our participants fell within the age range of 25 to 30 years. In terms of marital status, 72.9% of our cases were unmarried, whereas a majority (51.0%) in the control group were married. Additionally, over half of the women in both groups had attained at least a secondary level of education. Christianity was the predominant religion, comprising 83.2% of participants among the cases and 82.6% in the control group. In terms of occupation, approximately 36.1% of the cases were housewives, while 27.1% were students. Conversely, the control group was composed of 28.4% of students and 20.0% of housewives (Table 1).

Sociodemographic factors associated with IUFD

Marital status and occupation emerged as factors associated with IUFD. Single women had a 2.8-fold increase in risk ([OR] 2.80, [CI]: 1.74-4.49, p < 0.001). Similarly, housewives faced a 2.3-fold higher risk (OR 2.26, CI: 1.36-3.78, p = 0.001). Conversely, women with a university-level education had reduced risk of IUFD, with an odds ratio of 0.52 (CI: 0.31-0.85, p = 0.006). However, our analysis did not reveal any significant associations between region of origin, or religion, and IUFD (Table 1).

Table 1: Distribution of participants according to sociodemographic characteristics

Variables	Case	Control	OR [CI at 95%]	p-value
	N=155; n (%)	N=155; n (%)		
Age groups (in years)				
[15-20[	14 (9.0)	14 (9.0)	1.00 [0.46-2.17]	**0.578**
[20-25[	39 (25.2)	38 (24.5)	1.04 [0.62-1.73]	**0.500**
[25-30[	46 (29.7)	44 (28.4)	1.07 [0.65-1.74]	**0.450**
[30-35[	25 (16.1)	30 (19.4)	0.80 [0.45-1.44]	**0.276**
[35-40[	22 (14.2)	23 (14.8)	0.95 [0.51-1.79]	**0.500**
[40-45[	9 (5.8)	6 (3.9)	1.53 [0.53-4.41]	**0.299**
Marital status				
Single	113 (72.9)	76 (49.0)	**2.80 [1.74-4.49]**	**<0.001**
Married	42 (27.1)	79 (51.0)	0.36 [0.22-0.57]	
Level of education				
Illiterate	0 (0.0)	2 (1.3)	0.87 [0.31-2.46]	**0.500**
Primary	7 (4.5)	8 (5.2)	**3.20 [1.87-5.47]**	**<0.001**
College	59 (38.1)	25 (16.1)	0.76 [0.48-1.20]	**0.146**
High-school	54 (34.8)	64 (41.3)	**0.52 [0.31-0.85]**	**0.006**
University	35 (22.6)	56 (36.1)		
Religion				
Christian	129 (83.2)	128 (82.6)	1.05 [0.58-1.89]	**0.500**
Muslim	22 (14.2)	27 (17.4)	0.78 [0.43-1.45]	**0.267**
Occupation				
Civil servant	11 (7.1)	29 (18.7)	**0.33 [0.16-0.69]**	**0.002**
Private sector	10 (6.5)	18 (11.6)	0.53 [0.23-1.18]	**0.082**
Informal sector	36 (23.2)	33 (21.3)	1.12 [0.66-1.91]	**0.392**
Student	42 (27.1)	44 (28.4)	0.94 [0.57-1.54]	**0.450**
Housewife	56 (36.1)	31 (20.0)	**2.26 [1.36-3.78]**	**0.001**
Region of origin				
Far North	13 (8.4)	10 (6.5)	1.33 [0.56-3.13]	**0.333**
Centre	74 (47.7)	69 (44.5)	1.14 [0.73-1.78]	**0.324**
Littoral	12 (7.7)	16 (10.3)	0.73 [0.33-1.60]	**0.276**
North/South West	26 (16.8)	24 (15.5)	1.10 [0.60-2.02]	**0.439**
West	28 (18.1)	35 (22.6)	0.76 [0.43-1.32]	**0.199**

Medical and obstetric factors associated with IUFD

A prior history of IUFD (OR 4.29, CI: 2.15-8.53, p < 0.001) and prenatal alcohol consumption (OR 2.53, CI: 1.16-5.51, p = 0.013) were identified as factors that increased the risk of IUFD. Multiparity, chronic hypertension, a history of miscarriages, and smoking during pregnancy were associated with increased odds of IUFD, although these associations were not statistically significant (Table 2).

Table II: Distribution of participants according to medical and obstetric history

Variables	Case	Control	OR [CI at 95%]	p-value
	N=155; n (%)	N=155; n (%)		
Parity				
Primipara	44 (28.4)	43 (27.7)	1.03 [0.63-1.70]	0.500
Paucipara	68 (43.9)	79 (51.0)	0.75 [0.48-1.18]	0.128
Multipara	34 (21.9)	25 (16.1)	1.46 [0.82-2.59]	0.123
Grand multipara	9 (5.8)	8 (5.2)	1.13 [0.43-3.02]	0.500

Table II: Distribution of participants according to medical and obstetric history (next)				
Variables	**Case N=155; n (%)**	**Control N=155; n (%)**	**OR [CI at 95%]**	**p-value**
History of miscarriages				
Yes	55 (35.5)	47 (30.3)	1.26 [0.79-2.03]	0.199
History of intrauterine foetal death				
Yes	41 (26.5)	12 (7.7)	**4.29 [2.15-8.53]**	**< 0.001**
Comorbidities				
Pre-existing hypertension	12 (7.7)	11 (7.1)	1.10 [0.47-2.57]	0.500
Pre-existing diabetes	3 (1.9)	5 (3.2)	0.59 [0.14-2.52]	0.361
HIV infection	4 (2.6)	5 (3.2)	0.80 [0.21-3.02]	0.500
Toxicology				
Alcohol	23 (14.8)	10 (6.5)	**2.53 [1.16-5.51]**	**0.013**
Smoking	2 (1.3)	1 (0.6)	2.01 [0.18-22.4]	0.500

Pauciparas (women who have had 2-3 deliveries), grand multiparas (women who have had >5 deliveries)

Regarding pregnancy monitoring, women who attended fewer than four prenatal consultations had a substantially higher risk, with an odds ratio of 5.12 (CI: 3.16-8.30, p < 0.001). Similarly, pregnancies followed up by a nurse showed a 5.53-fold increased risk (CI: 2.73-11.16, p < 0.001). Women who had antepartum haemorrhage were equally found to be 2.6 times more at risk of IUFD (OR 2.57, CI: 1.09-6.06, p = 0.021). Maternal illness during pregnancy equally raised the odds by 3.17 (CI: 1.91-5.28, p<0.001). Conversely, protective factors against IUFD included receiving antenatal care from a gynaecologist or resident, consistent daily iron/folic acid supplementation, and sleeping under long-lasting insecticide-treated mosquito nets (Table 3).

Table III: Distribution of participants according to antenatal care and maternal health during pregnancy				
Variables	**Case N=155; n (%)**	**Control N=155; n (%)**	**OR [CI at 95%]**	**p-value**
Number of ANC				
≤ 4	128 (62.1)	78 (37.9)	**4.68 [2.78-7.88]**	**< 0.001**
> 4	27 (26.0)	77 (74.0)	**0.21 [0.13-0.36]**	
Gestational age at time of diagnosis				
22 – 27	17 (11.0)	1 (0.7)	**18.97 [2.49-144.42]**	**< 0.001**
28 – 33	56 (36.1)	11 (7.1)	**7.41 [3.73-15.00]**	**< 0.001**
34 – 36	15 (9.7)	24 (15.5)	0.59 [0.29-1.16]	0.12
37 – 40	49 (31.6)	98 (63.2)	**0.27 [0.17-0.4]**	**< 0.001**
> 40	18 (11.6)	21 (13.5)	0.84 [0.43-1.64]	0.61
Qualification of ANC provider				
No follow-up	13 (8.4)	1 (0.6)	**14.10 [1.82-109.16]**	**0.001**
Gynaecologist/Resident	18 (11.6)	76 (49.0)	**0.14 [0.08-0.25]**	**< 0.001**
General practitioner	42 (27.1)	39 (25.2)	1.11 [0.67-1.84]	0.398
Midwife	36 (23.2)	28 (18.1)	1.37 [0.79-2.39]	0.163
Nurse	46 (29.7)	11 (7.1)	**5.53 [2.73-11.16]**	**< 0.001**
Prophylactic measures				
Iron / Folic acid	143 (92.3)	153 (98.7)	**0.16 [0.03-0.71]**	**0.006**
LLIMs	108 (69.7)	138 (89.0)	**0.28 [0.15-0.52]**	**< 0.001**
Bleeding during pregnancy				
Yes	19 (12.3)	8 (5.2)	**2.57 [1.09-6.06]**	**0.021**
Pathologies during pregnancy				
Yes	67 (43.2)	30 (19.4)	**3.17 [1.91-5.28]**	**< 0.001**
Types of pathologies during pregnancy				
Urinary tract infection	10 (6.5)	3 (1.9)	3.49 [0.94-12.95]	0.043
Malaria	27 (17.4)	16 (10.3)	1.83 [0.94-3.56]	0.050
Gestational diabetes	5 (3.2)	1 (0.6)	5.13 [0.59-44.46]	0.107
Hypertensive disorders in pregnancy	12 (7.7)	3 (1.9)	**4.25 [1.18-15.38]**	**0.015**

LLIMNs: Long lasting insecticide-treated mosquito nets

Foetal and placental characteristics and their association with IUFD

Women with placental abnormalities, such as placenta previa and abruptio, were twice as likely to experience IUFD (OR 2.40, CI: 1.06-5.46, p < 0.001). Male foetuses exhibited higher risk of IUFD, with an odds ratio of 2.04 (CI: 1.30-3.22, p = 0.001). While foetuses with congenital abnormalities, like polymalformations and/or intrauterine growth restriction, equally had elevated risk of IUFD, with an alarming odds ratio of 9.42 (CI: 2.14-41.53, p < 0.001) (Table 4).

Table IV: Distribution of participants according to foetal and placental characteristics

Variables	Case	Control	OR [CI at 95%]	p-value
	N=155; n (%)	N=155; n (%)		
Gender of foetus				
Male	100 (64.5)	73 (47.1)	**2.04 [1.30-3.22]**	**0.001**
Female	55 (35.5)	82(52.9)	0.49 [0.31-0.77]	
Adnexal abnormalities				
Yes	46 (29.7)	18 (11.6)	**3.21 [1.76-5.85]**	**< 0.001**
No	109 (70.3)	108 (69.7)	1	
Types of adnexal abnormalities				
Oligohydramnios	10 (6.5)	3 (1.9)	3.49 [0.94-12.95]	0.043
Cord abnormalities	14 (9.0)	6 (3.9)	2.47 [0.92-6.59]	0.052
Placenta previa/abruptio	20 (12.9)	9 (5.8)	**2.40 [1.06-5.46]**	**0.025**
Foetal abnormalities*				
Yes	17 (11.3)	2 (1.3)	**9.42 [2.14-41.53]**	**< 0.001**

*Poly-malformation, intrauterine foetal growth restriction

DISCUSSION

Factors associated with IUFD

Sociodemographic factors:

In our study, single women constituted 72.9% of the cases, and they had a 2.8-fold higher likelihood of having IUFD compared to their married counterparts. This aligns with earlier findings reported by Ntsama et al. in Cameroon, where a significant 79.3% of cases involved single women [4]. This association could be attributed to the fact that many pregnant single women lack the required extra financial and moral support, which could substantially compromise the well-being of both the mother and the foetus.

Our finding that women with a university-level education had reduced risk of IUFD is consistent with the results of Worede et al. in Ethiopia in 2019, who reported that illiteracy and primary education levels increased the risk of IUFD by 3.8 times [9]. This observation can be attributed to the potential challenges in comprehension of prenatal counselling and guidance among individuals with lower educational levels.

Furthermore, women with occupation as housewives faced a 2.3-fold increased risk of experiencing IUFD. This finding aligns with the results reported by Momo et al., who similarly noted a higher risk among housekeepers [10]. This association may be explained by the physically demanding tasks often undertaken by housewives and the challenge of maintaining an adequate source of income. These factors can collectively influence access to quality prenatal contacts, adherence to recommended measures, nutritional choices, and, consequently, the overall well-being of the mother and her pregnancy.

Past medical and obstetric variables:

We observed that a history of IUFD stood out as one of the strongest contributing factors to the recurrence of IUFD, as women with a previous history of IUFD faced a significantly higher risk, approximately 4.3 times higher. This finding is in line with the reported four-fold increase in risk noted by Tolefac et al. in 2017 at the Douala Laquintinie hospital, Cameroon [11]. Similarly, Worede et al. in Ethiopia, and Luguterah et al. in Ghana reported parallel findings [9,12]. This association can be attributed to the absence of routine autopsies in our setting, which often leads to an incomplete understanding of the underlying causes of foetal deaths. This limits the possibility of anticipating and preventing these causes in subsequent pregnancies. Moreover, maternal factors are often not fully investigated and treated before subsequent pregnancies. This is especially true in low resource settings where the cases abound.

There was a significant association between IUFD and alcohol consumption during pregnancy. Specifically, individuals who consumed alcohol during pregnancy had approximately 2.5-fold increased risk. This corroborates results reported by Odendaal et al. in South Africa in 2021, which showed that prenatal alcohol exposure doubled the odds of IUFD [13]. This phenomenon can be explained by the fact that the foetus takes much longer to metabolism and eliminate alcohol [14], leading to sustained exposure to elevated alcohol levels, which can be detrimental to the developing foetus.

Pregnancy Monitoring:

We found out that women who had fewer than five antenatal contacts during the pregnancy had a 4.7-fold increase in risk of IUFD. This is similar to the findings of Chuwa et al. in Tanzania, and Bwana Kangulu et al. in Congo who found that the risk of having IUFD more than doubles among women who have less than four antenatal contacts [15,16]. This phenomenon can be attributed to the limited exposure to adequate information on the WHO recommendations for effective antenatal care. Conversely, we found out that having pregnancies monitored by an obstetrician and gynaecologist or residents in obstetrics and gynaecology, having consistent daily iron/folic acid supplementation, and using long-lasting insecticide-treated mosquito nets served as protective measures against IUFD. These findings are in line with prior reports by Ntsama et al. in Cameroon [4].

Regarding gestational age at occurrence of IUFD, we observed that foetal deaths were most likely to occur between 22 and 27 weeks of gestation as women were up to 19 times more at risk. This was closely followed by gestational age range between 28 and 33 weeks, which had a 7.4-fold increased risk. This is closely comparable to earlier studies in Cameroon by Tolefac et al. and Kasso et al. in Nigeria [11,17]. This observation can be explained by the fact that during this period, foetal vital organs are

still developing and may not be fully functional, therefore, rendering the foetus more vulnerable in the event of any complications. Another factor is that, within this range of gestational ages, women with complications of pregnancy are not readily delivered because of concerns about survival outside the uterus.

Women who experienced antepartum haemorrhage were at more than two-fold increased risk of IUFD compared to those without. This result is consistent with the findings of Momo et al. in 2019, who reported that antepartum haemorrhage more than doubled the risk of IUFD [10]. Oguejiofor et al. reported a similar association in Nigeria [18]. A plausible explanation for this association could be that antepartum haemorrhage is often associated with poor foetal perfusion, which may ultimately reduce foetal reserves and compromise foetal well-being [19]. In some cases, the foetus may even contribute to the bleeding.

Our study further showed that women who developed illnesses during pregnancy, particularly hypertensive disorders in pregnancy, were at significantly increased risk of experiencing IUFD, with a 4.3-fold elevated risk. These results are consistent with earlier findings in 2017 by Tolefac et al. in Cameroon and Tidiani et al. in Mali in 2021 [11,20]. This association can be explained by the fact that hypertensive disorders often result in placental insufficiency, which, in turn, affects foetal perfusion and which may result in foetal demise.

Foetal and placental characteristics:

Our study revealed that 64.5% of cases involved male foetuses, which doubled the odds of having IUFD when compared to pregnancies with female foetuses (OR 2.04, CI: 1.30-3.22, p=0.001). This is in line with the reported 63.1% male predominance of IUFD in 2019 in India [7]. Although the precise mechanism remains unclear, it has been suggested that male embryos tend to develop at a faster rate and possess an elevated metabolic rate compared to female embryos. Consequently, this may render male foetuses more vulnerable to a broader spectrum of stressors and faster nutritional depletion when subjected to stress [21,22].

We also found a significant link between IUFD and placental anomalies, notably placenta praevia and placenta abruptio. A significant 12.9% of cases in this study were associated with one of these abnormalities. This is closely comparable to the 11.5% reported in a similar study conducted by Njoku et al. in Nigeria, and 40% by Lankoande et al. in Burkina Faso [21,23]. The risk for IUFD more than doubled in cases involving these placental anomalies, with an odds ratio of 2.4 (CI: 1.06-5.46, p = 0.025). This association can be explained by the disruption of the normal structure and function of the fetoplacental unit and increased risk of antenatal bleeding associated with these placental abnormalities, ultimately compromising foetal well-being.

Foetal abnormalities (polymalformation and IUGR) were also found to increase the odds of IUFD by a remarkable 9.4-fold. This finding aligns with the report by Worede et al. in Ethiopia, indicating a 10.4-fold increased risk [9]. The explanation for this elevated risk lies in the fact that foetuses with congenital abnormalities frequently have multiple organ damage that may be incompatible with life.

Limitations

A possible weakness in our study is the fact that the medical records were not well organized. Many files were poorly filled and were thus excluded from the study. This may have affected the representation of IUFD in our setting. Furthermore, even though we worked in two hospitals at different referral levels, there could be some selection bias, given that some cases may occur even at lower levels of care and in the community and their determinants may be different.

CONCLUSION

The main objective of this study was to evaluate the factors associated with intrauterine foetal death in two hospitals in Yaoundé. The main identified risks were: poor antenatal contacts (both quantity quality), being single, occupation as housewife, lower level of education, history of prior IUFD, maternal illnesses during pregnancy, vaginal bleeding in pregnancy, presence of foetal or placental abnormalities, and male foetus. Many of these factors could have a direct or indirect link with poverty. A high proportion of IUFDs occurred between 22 and 27 weeks of gestation.

Conversely, a university-level of education, receiving antenatal care from a specialist or resident in obstetrics and gynaecology, consistent daily iron/folic acid supplementation, and sleeping under long-lasting insecticide-treated mosquito nets were found to be protective.

FUNDING

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CONFLICT OF INTEREST

None declared

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee of the faculty of medicine and biomedical sciences, of the University of Yaoundé 1.

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