Risk Factors Associated with Intrauterine Fetal Demise (IUFD) in Pregnant Women Managed at a Tertiary-Level Hospital in Neiva, Huila, from January 2018 to September 2023

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DOI: 10.22517/25395203.25747

Abstract

Objective: Determine the risk factors associated with stillbirth at the Hospital Universitario Hernando Moncaleano Perdomo from January 1, 2018, to September 30, 2023.

Methodology: Retrospective, observational study conducted at a single center on the clinical characteristics of pregnant women who experienced stillbirth. A probabilistic sampling, by convenience, using simple randomization was performed. Consecutive records from patients diagnosed with stillbirth and admitted to the Hospital Universitario Hernando Moncaleano Perdomo in Neiva, Huila, Colombia, between January 2018 and September 2023.

Results: A total of 79 patients were included during the study period who met the inclusion criteria. The main findings related to fetal death in the studied population were that 49.4% of the mothers had attended fewer than three prenatal visits (21.5% had no prenatal visits), with the presence of pathologies such as diabetes (5.1%) or hypertension during pregnancy (3.8%), as well as excess weight during pregnancy.

Stillbirth occurred more frequently in the third trimester (82.3%), however, 74.7% of the deaths occurred before 37 weeks. Additionally, 3.8% of fetal deaths occurred in women with a history of ≥2 previous losses in 5.1% of the patients.

Conclusion: The most frequent findings in cases of fetal death were intrauterine abruptio placentae, followed by cord prolapse and fetal malformations, mainly congenital heart defects. None of these findings showed statistical significance.

Keywords: Stillbirth, risk factors, maternal characteristics, fetal characteristics.

Introduction

There are different definitions of fetal death. According to the American College of Obstetricians and Gynecologists (ACOG), it is defined as death occurring at or after 20 weeks of gestation (when gestational age is known) or with a weight equal to or greater than 350 grams if unknown, this weight corresponding to the 50th percentile at 20 weeks of gestation (1). In turn, the International Federation of Gynecology and Obstetrics (IFGO) defines it as fetal death that occurs before the complete expulsion or extraction of the product of conception, regardless of the duration of pregnancy (2). In the institution where this study was conducted, fetal death is considered as such when it occurs at or after 22 weeks of gestation.

In Colombia, several studies have analyzed the risk factors associated with fetal death; however, at the local level, information remains limited. This highlights the need to characterize the population attended at the Hernando Moncaleano Perdomo University Hospital, in order to identify risk factors that enable the timely detection of these critical events during prenatal care or emergency services.

This retrospective, observational, single-center study describes the clinical characteristics of pregnant women who experienced fetal death in this hospital during the period between January 2018 and September 2023. Its objective is to identify preexisting risk factors associated with this adverse outcome.

It is expected that the findings will contribute to strengthening knowledge on the risk factors associated with fetal death, both locally and nationally, and will help guide strategies aimed at reducing its incidence and preventing fetal mortality in the region.

Methodology

Study typ

This was an observational, retrospective, single-center study conducted at the Hernando Moncaleano Perdomo University Hospital, located in Neiva, Huila, Colombia.

Design and samplin

A non-probability convenience sampling method was used, with consecutive selection of clinical records of patients who met the diagnosis of fetal death during the period between January 2018 and September 2023.

Inclusion criteria

- Pregnant women, with no restrictions on maternal age, with a gestational age ≥22 weeks and a fetal weight ≥500 grams.
- Admission or discharge diagnosis consistent with fetal death.

Exclusion criteria

- Incomplete medical records.
- Patients referred to other institutions in whom comprehensive care was not completed at the study hospital.
- Cases of fetal death secondary to violent events, such as trauma, burns, poisoning, or placental abruption due to falls.

Procedure

The research protocol was approved by the Ethics Committee of the Hernando Moncaleano Perdomo University Hospital. Subsequently, data were collected through manual review of medical records, using a standardized form (CRF-1) specifically designed for this study.

The variables collected included sociodemographic data, obstetric history, maternal and fetal clinical characteristics, pregnancy-related conditions, and identified risk factors. The information was systematized in an Excel® database for subsequent statistical analysis.

Given the retrospective nature of the study and the use of secondary information, informed consent from the patients was not required, in accordance with current ethical regulations for this type of research.

Results

A total of 79 pregnant women met the inclusion criteria. The basic sociodemographic and obstetric characteristics of the population are presented in Table 1. The mean maternal age was 26.6 years, and 92.4% of the patients were Colombian nationals.

Table 1. Demographic characteristics

Characteristics	n= 79
Age in years	
Median (Q1, Q3)	26 (15 - 46)
Average	26,6
Range of age in years	
<20, no. (%)	14 (17,7)
≥20 a <30, no. (%)	43 (54,4)
≥30 a <40, no. (%)	17 (21,5)
≥40, no. (%)	5 (6,3)
Maternal nationality	
Colombiana, no. (%)	73 (92,4)
Immigrant, no. (%)	6 (7,6)

Regarding the timing of fetal death, 82.3% occurred during the third trimester of gestation, while 17.7% occurred in the second trimester. Likewise, 74.7% of cases occurred before 37 weeks, indicating that the majority corresponded to preterm pregnancies.

With respect to prenatal care, 49.4% of patients attended fewer than three prenatal visits, and within this group, 21.5% had no recorded visits. In terms of parity, 70.9% were multiparous, 3.8% corresponded to multiple pregnancies, and 78.5% of deliveries were resolved vaginally (Table 2).

Table 2. Gestational characteristics.

Characteristics	n= 79
Gestational age	
22 a 27,6 weeks, no. (%)	19 (24)
28 a 36,6 weeks, no. (%)	40 (50,7)
≥ a 37 weeks, no. (%)	20 (25,3)
Pregnancy trimester	
Second, no. (%)	14 (17,7)
Third, no. (%)	65 (82,3)
No of pregnancies	
1, no. (%)	23 (29,1)
2, no. (%)	29 (36,7)
3, no. (%)	11 (13,9)
≥4, no. (%)	16 (20,3)
Prenatal controls	
0, no. (%)	17 (21,5)
Between 1 and 3, no. (%)	22 (27,9)
>3, no. (%)	40 (50,6)

Pregnancy type	
Unique, no. (%)	76 (96,2)
Twin, no. (%)	3 (3,8)*
Hemoglobin values(g/dL)	
Average(Q1, Q3)	12,1 (6,8 - 16)
<11, no. (%)	60 (75,9)
≥11, no. (%)	18 (22,8)
ND	1 (1,3)

* One of the patients lost both fetuses (male) ND: No data

Regarding obstetric history (Table 3), 17.7% of the patients had a history of miscarriage, 25.3% had a history of cesarean delivery, and 3.8% had a history of fetal death. In addition, 5.1% had a history of two or more previous pregnancy losses.

Table 3. Obstetric history

Characteristics	n= 79
History of abortion	
1 abortion, no. (%)	11 (13,9)
2 abortions, no. (%)	3 (3,8)
None, no. (%)	65 (82,3)
History of cesarean section	
Yes, no. (%)	20 (25,3)
No, no. (%)	59 (74,7)
History of death	
Yes, no. (%)	3 (3,8)
No, no. (%)	76 (96,2)
Deaths during hospital care	
Yes, no. (%)	2 (2,6)
No, no (%)	77 (97,4)

The analysis of fetal characteristics showed that 34.2% of the fetuses had a birth weight below 1,500 grams, 24.1% weighed between 1,500 and 2,499 grams, and 26.5% had a weight equal to or greater than 2,500 grams. The average weight was 1,890 grams. No significant differences were found regarding fetal sex. The most frequent congenital malformations were of cardiac origin, including hypoplastic left heart, aortic stenosis, ventriculomegaly, and other complex cardiopathies (5.1%).

Among the associated uterine complications, abruptio placentae was identified in 7.6% of cases, and umbilical cord accidents (true knots and double nuchal cords) in 2.5%. A total of 6.3% of fetal deaths occurred during hospital stay (Table 4).

Table 4. Fetal characteristics

Characteristics	n= 79
Fetal weight(g)	
≥ 500 to < 1500, no. (%)	27 (34,2)
≥ 1500 to < 2500, no. (%)	19 (24,1)
≥ 2500, no. (%)	21 (26,5)
ND, no. (%)	12 (15,2)
Gender	
Female, no. (%)	33 (41,8)
Male, no. (%)	33 (41,8)
Not determined, no. (%)	3 (3,8)
ND, no. (%)	10 (12,7)
In-hospital death	
Yes	5 (6,3)
No	74 (93,7)
Blood type	
O+, no. (%)	28 (35,4)
A+, no. (%)	4 (5,1)
B+, no. (%)	4 (5,1)
ND, no. (%)	43 (54,4)
Fetal pathology	
Cardiac pathology, no. (%)	4 (5,1)
Pulmonary atresia, no. (%)	1 (1,3)
Gastroschisis, no. (%)	1 (1,3)
Diaphragmatic hernia, no. (%)	1 (1,3)
Cleft lip and palate, no. (%)	1 (1,3)
Fetal Hydrops, no. (%)	1 (1,3)
None reported, no. (%)	70 (88,6)
Maternal-fetal pathology	
Placental abruption, no. (%)	6 (7,6)
Umbilical cord accidents, no. (%)	2 (2,5)
IUGR, no. (%)	1 (1,3)
None reported, no. (%)	70 (88,6)

Regarding maternal characteristics, 3.8% of the patients had a history of psychoactive substance use. The most prevalent infectious pathology was syphilis (8.9%), followed by chronic hypertension and hypothyroidism (3.8% each). During pregnancy, the most frequent complication was preeclampsia (13.9%), followed by gestational diabetes and gestational hypertension. In terms of nutritional status, 7.6% of the pregnant women presented nutritional deficiency, and 21.5% obesity (BMI ≥30) (Table 5).

Table 5. Maternal characteristics

Characteristics	n= 79
Lifestyle background	
Drug addiction, no. (%)	3 (3,8)
Smoking, no. (%)	0 (0)
Alcoholism, no. (%)	0 (0)
None other, no. (%)	76 (96,2)
History of chronic pathology	
Syphilis, no. (%)	7 (8,9)
High blood pressure, no. (%)	3 (3,8)
Hypothyroidism, no. (%)	3 (3,8)
Diabetes, no. (%)	2 (2,5)
Chronic kidney disease, no. (%)	1 (1,3)
Asthma, no. (%)	0 (0)
Heart disease, no. (%)	0 (0)
Depression, no. (%)	0 (0)
HIV, no. (%)	0 (0)
Epilepsy, no. (%)	0 (0)
Autoimmune disease, no. (%)	0 (0)
Pathology during pregnancy	
Preeclampsia, no. (%)	11 (13,9)
Gestational diabetes, no. (%)	4 (5,1)
Gestational hypertension, no. (%)	3 (3,8)
HELLP, no. (%)	1 (1,3)
Autoimmune disease, no. (%)	1 (1,3)
Eclampsia, no. (%)	0 (0)
Cholestasis, no. (%)	0 (0)
Body mass index during pregnancy (Kg/mt²)	
<20, no. (%)	6 (7,6)
≥20 to <25, no. (%)	25 (31,7)
≥25 to<30, no. (%)	28 (35,4)
≥30 to <35 no. (%)	12 (15,2)
≥35, no. (%)	5 (6,3)
ND, no. (%)	3 (3,8)
Infection during pregnancy	
Syphilis, no. (%)	5 (6,3)
Toxoplasmosis, no. (%)	3 (3,8)
Infection during pregnancy	
Chorioamnionitis, no. (%)	2 (2,5)
Bronchitis, no. (%)	1 (1,3)
None, no. (%)	68 (86,1)

The association analysis did not show a statistically significant relationship between the presence of abruptio placentae and maternal conditions such as preeclampsia, eclampsia, HELLP syndrome, or gestational hypertension ($p > 0.05$) (Table 6).

Table 6. Bivariate analysis results

Variables	Test	p Value	Interpretation
Abruptio placentae - Preeclampsia	Chi-square	p = 0.415	No statistically significant association was found
Abruptio placentae - Eclampsia	Chi-square	p = 1.0*	No statistically significant association was found
Abruptio placentae- Hellp	Chi-square	p = 1.0*	No statistically significant association was found
Abruptio placentae - Gestational hypertension	Chi-square	p = 0.880	No statistically significant association was found

* Data does not have enough variation, resulting in analysis with no practical meaning.

Discussion

Fetal death remains a high-impact event in global public health. It is defined as the absence of fetal cardiac activity after 22 weeks of gestation, which implies that, after induction of labor, the product is delivered without spontaneous breathing, heartbeat, or movement (3).

The present study analyzed the factors associated with fetal death in a tertiary hospital in Colombia, showing that most cases occurred in preterm pregnancies, with a high frequency of insufficient prenatal care and the presence of maternal comorbidities. This type of analysis is fundamental to reducing preventable factors and improving perinatal outcomes for both mothers and fetuses.

Obstetric complications and infections associated with preterm birth represent a significant proportion of fetal deaths. Evidence suggests that preconception care and adequate prenatal follow-up have the potential to significantly reduce stillbirth rates, particularly through early detection and management of conditions such as fetal growth restriction, infections, preeclampsia, and gestational diabetes (4). In this cohort, 49.4% of the pregnant women attended fewer than three prenatal visits, and 21.5% had none, highlighting both barriers to accessing the health system and deficiencies in maternal self-care.

The etiology of fetal death is multifactorial. Several studies have demonstrated a significant association with factors such as maternal obesity, history of fetal death, gestational diabetes, hypertensive disorders, and habits such as smoking (5,6). Consistent with the literature, the study population

showed relevant rates of obesity (21.5%), diabetes (5.1%), and gestational hypertension (3.8%). These findings reinforce the relationship between maternal diseases and an increased risk of intrauterine fetal death.

Regarding fetal characteristics, no differences were found by sex, which is consistent with other reports that do not identify a significant association between fetal sex and the risk of death (7).

In terms of parity, a high proportion of multiparous women (70.9%) was observed, a factor that has been identified in other studies. On the other hand, although multiple pregnancy is a documented risk factor for complications such as growth restriction, twin-to-twin transfusion, and fetal death (8,9), it was reported in only 3.8% of cases in this population.

Most fetal deaths occurred in the third trimester (82.3%), although 74.7% occurred before 37 weeks, which is consistent with studies reporting that a significant proportion of fetal deaths occur in preterm pregnancies (10,11).

Regarding obstetric history, 3.8% of pregnant women had a history of fetal death, and 5.1% had experienced two or more previous losses. Evidence shows that adverse obstetric history, such as miscarriage or previous fetal death, significantly increases the risk of recurrence in subsequent pregnancies (12,13).

Among obstetric causes, abruptio placentae was the most frequent uterine complication (7.6%), followed by umbilical cord accidents (2.5%), which is consistent with the literature describing these conditions as common causes of fetal death, generally sudden and difficult to predict (14–16). In particular, premature placental abruption interrupts fetal blood flow, leading to acute hypoxia and death (14). Umbilical cord abnormalities, such as true knots or multiple loops, can cause vascular compression and cessation of fetal blood flow (15,16).

With regard to the mode of delivery, most pregnancies with fetal death were resolved by vaginal birth (78.5%), consistent with international recommendations for this outcome, as cesarean section is only indicated under specific obstetric circumstances.

The maternal pathologies identified, such as syphilis (8.9%), preeclampsia (13.9%), chronic hypertension, and diabetes, constitute preventable risk factors with adequate prenatal follow-up and timely access to the health system (17,18).

No statistically significant association was found between abruptio placentae and hypertensive disorders of pregnancy ($p > 0.05$), which may be

related to the sample size or the retrospective nature of the study.

Among the limitations of this study is its retrospective design, which may involve biases derived from incomplete records, limited variable availability, and limited control over confounding factors. Despite this, the analysis provides relevant information for the characterization of fetal death in the population treated in the southern Colombian region.

Conclusions

During the period between January 2018 and September 2023, a total of 79 cases of fetal death were documented at the Hernando Moncaleano Perdomo University Hospital in the city of Neiva, Huila.

The most frequent mode of delivery in cases of fetal death was vaginal birth (78.5%), consistent with international recommendations for this type of obstetric outcome.

The most commonly associated causes of fetal death included abruptio placentae, umbilical cord accidents (true knots and nuchal cords), and congenital malformations, mainly of cardiac origin. However, these associations did not reach statistical significance in the present analysis.

The findings highlight that the most relevant risk factors in this population were multiparity, history of cesarean section, syphilis (either as a past condition or active infection during pregnancy), preeclampsia, and metabolic diseases such as diabetes and gestational hypertension. Additionally, insufficient access to adequate prenatal care emerged as a key determinant.

These results underscore the need to strengthen prenatal follow-up strategies, focusing on the management of maternal chronic diseases, monitoring of obstetric complications, and the promotion of adequate preconception and prenatal care, in order to reduce the incidence of fetal death in the region.

Funding: None.

Conflicts of Interest: None declared.

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