Characterization of failed pregnancies treated in Tunja, Colombia: retrospective observational study

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Abstract

Introduction: A failed pregnancy, also known as a miscarriage, can occur due to various factors. It has been reported that intrauterine fetal death is often an unexplained process or may be related to intrapartum factors or complications. Worldwide, fewer than 5% of fetal deaths are recorded, with intrauterine fetal death being the fifth leading cause of death worldwide**.**

Objective: This research is therefore proposed to characterize failed pregnancies treated in the city of Tunja and their main related factors.

Methodology: A descriptive, cross-sectional study. Pregnant women with failed pregnancies treated at healthcare institutions in the municipality of Tunja between January 1, 2023, and June 19, 2025, were included. Information was obtained and analyzed based on death certificates completed in RUAF-ND-v 2.0, with prior authorization for use.

Results: A total of 143 fetal losses were reported, of which 31.47% were male and 15.38% were undetermined. 88.81% were spontaneous births, and 90.91% were preterm. Risk factors found included maternal age, previous deaths, being a primiparous mother, and social factors**.**

Conclusions: Pregnancy failures that result in fetal death can be due to multiple factors related to the mother's health, uterine abnormalities, implantation problems, or, primarily, fetal genetic abnormalities, which the body itself is responsible for selecting for each. Therefore, it is important to conduct prenatal testing to reduce the risk of miscarriage during pregnancy.

Keywords: Pregnancy failure; Abortions; Risk factors; Perinatal death

Introduction

A failed pregnancy is also referred to as pregnancy loss, which may occur due to various factors. It has been reported that intrauterine fetal death is often an unexplained process or may be associated with intrapartum factors or complications. Globally, fewer than 5% of fetal deaths are registered, and intrauterine fetal death is the fifth leading cause of death (1).

Currently, there is limited understanding of the pathophysiology underlying fetal death; moreover, unexplained fetal deaths are reported in up to 76% of cases worldwide. Estimates of the causes of intrauterine fetal death are hindered by the use of different classification systems; however, in 18 countries with reliable data, congenital anomalies account for a median of only 7.4% of intrauterine fetal deaths. Many conditions associated with intrauterine fetal death are potentially modifiable and often coexist, including maternal infections (population attributable fraction: malaria 8.0% and syphilis 7.7%), noncommunicable diseases, nutritional and lifestyle factors (each approximately 10%), and advanced maternal age over 35 years (6.7%). Prolonged pregnancies contribute to 14.0% of intrauterine fetal deaths. The causal pathways of intrauterine fetal death frequently involve impaired placental function, either with fetal growth restriction or preterm birth, or both. Approximately two-thirds of births are registered; however, fewer than 5% of neonatal deaths, and even fewer fetal deaths, have an official death record (2–4).

Intrauterine fetal death has multiple causes, including intrapartum complications, hypertension, diabetes, infections, congenital and genetic anomalies, placental dysfunction, and pregnancies extending beyond forty weeks. This is a catastrophic event with long-lasting consequences for society (5,6). A failed pregnancy is defined as pregnancy loss, that is, the termination of pregnancy before the fetus is capable of survival (7,8). Spontaneous abortion refers to the natural and involuntary loss of pregnancy before 20 weeks of gestation (9–12). In contrast, intrauterine fetal death or stillbirth is defined as fetal loss prior to complete expulsion or extraction from the uterus, generally occurring after 20 to 28 weeks of gestation or with a fetal weight greater than 500 grams, and is characterized by the absence of cardiac activity and vital signs (13–16).

Therefore, this study aims to characterize failed pregnancies managed in the city of Tunja and their main associated factors.

Methodology

An observational, retrospective, and descriptive study was conducted based on secondary records, including pregnant women with failed pregnancies who were treated at healthcare provider institutions in the municipality of Tunja between January 1, 2023, and June 19, 2025. The information was obtained and analyzed from death certificates recorded in the RUAF-ND v2.0 (Unique Registry of Affiliates – Births and Deaths), with prior authorization for its use.

A data collection form was designed, and the database was constructed in Microsoft Excel. The dataset was recorded in Excel version 2013 and analyzed using the statistical package SPSS version 22 (© Copyright IBM Corporation, License IBM Z125-3301-14). Data review and verification were performed by the researchers to ensure quality, consistency, and efficiency in data extraction.

Data were analyzed using descriptive statistics, employing the mean or median as measures of central tendency, and the standard deviation or interquartile range as measures of dispersion, depending on the data distribution.

Potential biases included selection bias; however, this was controlled through the appropriate definition of inclusion criteria for data analysis. Likewise, information bias was minimized by reviewing data completeness prior to inclusion in the study.

In accordance with Resolution 8430 of 1993, this research is classified as risk-free, as it is a secondary data study based on information obtained from the RUAF-ND v2.0, with prior authorization for its use.

Results

Population Characteristics

A total of 143 fetal losses were reported, of which 31.47% corresponded to male sex and 15.38% were indeterminate (Table 1).

Table 1. Sociodemographic and occurrence characteristics of failed pregnancies

Variables 2023 (n: 70)		Year						Total (n: 143)	%
		%	2024 (n: 44)	%	2025 (n: 29)	%			
Day shift	Day	24	16,78	26	18,18	19	13,29	69	48,25
	Night	46	32,17	18	12,59	10	6,99	74	51,75
Gender	Female	24	16,78	12	8,39	9	6,29	45	31,47
	Undetermined	9	6,29	8	5,59	5	3,50	22	15,38
	Male	37	25,87	24	16,78	15	10,49	76	53,15
Residence Department	Bogotá	1	0,70	0	0,00	0	0,00	1	0,70
	Boyacá	65	45,45	43	30,07	27	18,88	135	94,41
	Cundinamarca	2	1,40	0	0,00	2	1,40	4	2,80
	Magdalena	1	0,70	0	0,00	0	0,00	1	0,70
	Santander	1	0,70	1	0,70	0	0,00	2	1,40
Municipality Residence	Tunja	20	13,99	12	8,39	10	6,99	42	29,37
	Others	50	34,97	32	22,38	19	13,29	101	70,63
Residency Area	Header	37	25,87	22	15,38	18	12,59	77	53,85
	Dispersed rural	33	23,08	22	15,38	11	7,69	66	46,15

Source: own elaboration based on secondary records from RUAF-ND

It was found that 88.81% of the cases corresponded to spontaneous deliveries, while 90.91% occurred in preterm condition. (Table 2)

Table 2. Characteristics of the failed pregnancy.

Variables 2023 (n: 70)		Year						Total (n: 143)	%
		%	2024 (n: 44)	%	2025 (n: 29)	%			
Death Relationship Delivery	Before	68	47,55	41	28,67	25	17,48	134	93,71
	During	2	1,40	3	2,10	4	2,80	9	6,29
Type of Delivery Pregnancy Multiplicity	Cesarean	5	3,50	4	2,80	5	3,50	14	9,79
	Spontaneous	63	44,06	40	27,97	24	16,78	127	88,81
	Instrumented	2	1,40	0	0,00	0	0,00	2	1,40
Weeks	Double	4	2,80	3	2,10	0	0,00	7	4,90
	Simple	66	46,15	41	28,67	29	20,28	136	95,10
	Preterm	63	44,06	41	28,67	26	18,18	130	90,91
	Term	7	4,90	3	2,10	3	2,10	13	9,09
Death Relationship Delivery	No	31	21,68	20	13,99	14	9,79	65	45,45
	Yes	35	24,48	18	12,59	15	10,49	68	47,55
	Yes by gestational week	4	2,80	6	4,20	0	0,00	10	6,99

Risk factors and causes. Among the identified risk factors were maternal age, history of previous deaths, primigravida status, and social factors (Table 3)

Table 3. Risk factors and causes

Variables 2023 (n: 70)		Year						Total (n: 143)	%
		%	2024 (n: 44)	%	2025 (n: 29)	%			
Risk Age	Over 35 years old	14	9,79	6	4,20	7	4,90	27	18,88
	Minor	5	3,50	4	2,80	0	0,00	9	6,29
	None	51	35,66	34	23,78	22	15,38	107	74,83
Primigravida	No	36	25,17	19	13,29	19	13,29	74	51,75
	Yes	34	23,78	25	17,48	10	6,99	69	48,25
Previous Deaths	No	58	40,56	28	19,58	21	14,69	107	74,83
	Yes	12	8,39	16	11,19	8	5,59	36	25,17
Mother's Marital Status	Married	12	8,39	5	3,50	1	0,70	18	12,59
	Separated	0	0,00	1	0,70	0	0,00	1	0,70
	Single	10	6,99	12	8,39	6	4,20	28	19,58
	Common-law union	48	33,57	26	18,18	22	15,38	87	60,84
Mother's Last Year of Studies	Primary	4	2,80	5	3,50	1	0,70	10	6,99
	Secondary	4	2,80	3	2,10	3	2,10	10	6,99
	Specialist	2	1,40	0	0,00	0	0,00	2	1,40
	High School	42	29,37	24	16,78	18	12,59	84	58,74
	Technical/Technologist	7	4,90	9	6,29	6	4,20	8	5,59
	Professional	11	7,69	3	2,10	1	0,70	15	10,49
Mother's Social Regime	Contributory	25	17,48	13	9,09	12	8,39	50	34,97
	Exception	2	1,40	1	0,70	0	0,00	3	2,10
	Not insured	3	2,10	3	2,10	1	0,70	6	4,20
	Subsidized	40	27,97	27	18,88	16	11,19	83	58,04
Causes of Death	Miscarriage	6	4,20	20	13,99	14	9,79	40	27,97
	Chorioamnionitis	2	1,40	0	0,00	2	1,40	4	2,80
	Infection in pregnancy	5	3,50	1	0,70	1	0,70	7	4,90
	Congenital malformation	3	2,10	1	0,70	1	0,70	5	3,50
	Placental pathologies	42	29,37	19	13,29	5	3,50	66	46,15
	PROM	5	3,50	1	0,70	3	2,10	9	6,29
	AMI	0	0,00	1	0,70	0	0,00	1	0,70
	FHR deceleration	7	4,90	1	0,70	3	2,10	7	4,90

Source: own elaboration based on secondary records from the RUAF-ND

Discussion

Spontaneous abortion is a pregnancy complication that affects between 12% and 15% of pregnant women worldwide (17). It is also estimated that approximately 23 million spontaneous abortions occur annually, equivalent to an average of 44 pregnancies ending prematurely every minute (18). Despite the influence of various known risk factors, between 30% and 50% of spontaneous abortions are attributed to unidentified causes (19,20).

Spontaneous abortion is a multifactorial complication influenced by numerous risk factors reported across different studies, which vary depending on the context. These include extreme maternal age (under 20 years or over 35 years), a history of spontaneous abortion, very low or high body mass index, night shift work, and exposure to air pollution, stress, smoking, and pesticides (21–23).

Other identified risk factors include active smoking during pregnancy, having more than four children, a family history of spontaneous abortion, fertility problems, lack of medical assistance for conception, air travel during pregnancy, and low educational level (24).

Additional factors associated with spontaneous abortion include the consumption of caffeine, tobacco, alcohol, cocaine, and heroin, as well as a history of spontaneous or induced abortions, maternal age, chromosomal abnormalities, uterine anatomical defects, menstrual, endocrine, and immunological disorders, and certain maternal infections (25,26). It has also been suggested that the risk may increase in the presence of conditions such as polycystic ovary syndrome or uterine malformations (27).

Failed pregnancies, in which fetal death occurs, may result from multiple factors related to maternal health, uterine abnormalities, implantation problems, and, primarily, fetal genetic alterations, in which various biological mechanisms may be involved. Therefore, preconception studies are recommended in order to reduce the risk of pregnancy loss during gestation.

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