



The Clinical, Subclinical Characteristics and the Factor Associated of Intrauterine Fetal Death at ≥ 14 Weeks of Pregnancy

Mai Thi Nga ^{1*}, Tran Thu ², Nguyen Khanh Trinh ³, Trieu Le Phong ⁴

¹⁻⁴ Buon Ma Thuot Medical University - 298, Ha Huy Tap, Buôn Ma Thuot city, Dak Lak province, Vietnam

* Corresponding Author: Mai Thi Nga

Article Info

ISSN (online): 2582-8940

Volume: 06

Issue: 02

April-June 2025

Received: 14-03-2025

Accepted: 17-04-2025

Page No: 77-81

Abstract

The study carried out on 84 women with intrauterine fetal death at ≥ 14 weeks of pregnancy hospitalized at obstetrics and gynecology department in Tay Nguyen Regional General Hospital from 1/2024 to 12/2024. The average age of pregnant women is $30,5 \pm 8,3$ years old, 60,7% of cases were multiparous pregnancy. The average age of stillbirth was $28,7 \pm 9,2$ weeks. 40,5% of pregnant women detect stillbirth because of abdominal pain or vaginal bleeding, 38,1% because the fetus was not moving, and 21,4% discovered the stillbirth during a periodic prenatal examination. 59,5% had regular check-ups during pregnancy. 14% case of them detected abnormalities. In the second trimester, abnormalities detected during prenatal check-ups are usually related to fetal malformations, while in the third trimester, most abnormalities are associated with the placenta, umbilical cord, and amniotic fluid ($p < 0,05$), 2 groups of maternal disease in study are high blood pressure in pregnancy and metabolic disorders. Most participants were multiparous women from rural areas with low educational levels, admitted due to abdominal pain, vaginal bleeding, or absent fetal movement. Despite over half receiving adequate antenatal care, a notable rate of abnormalities was detected—fetal anomalies mainly in the second trimester, and placental, umbilical cord, or amniotic fluid issues in the third ($p < 0,05$). The most common maternal conditions were gestational hypertension and metabolic disorders. These findings highlight the importance of comprehensive prenatal monitoring, especially in high-risk groups.

DOI: <https://doi.org/10.54660/IJMBHR.2025.6.2.77-81>

Keywords: Intrauterine Fetal Death, Clinical, Subclinical, Factor Associated

Introduction

Intrauterine fetal death is a condition where the fetus has died but remains in the mother's uterus at any gestational age ^[1]. This causes significant psychological trauma and poses many dangerous complications threatening the mother's health and life, such as coagulopathy, infection, and adverse outcomes in future pregnancies. According to the World Health Organization, there were 2 million cases of intrauterine fetal death, meaning that one case occurs every 16 seconds. The global average rate is 13.9 per 1,000 births, mostly in poor and developing countries ^[2]. One of the biggest challenges is identifying the cause of fetal death. In reality, up to 60% of cases have no specific cause identified. However, studies have pointed out several factors related to this condition, including maternal illnesses, genetic abnormalities, fetal malformations, and other environmental factors [3]. Identifying these risk factors is crucial for prevention and management in order to reduce the rate of fetal death. Early detection also helps to limit severe complications during fetal retention and expulsion.

The Tay Nguyen Regional General Hospital is the leading healthcare facility in the Central Highlands region, receiving and treating many cases of intrauterine fetal death, especially late-term cases. However, no research has been conducted at the hospital on this issue so far. Based on this reality, we have initiated the study: “The clinical and subclinical characteristics and the factors associated of intrauterine fetal death at gestational age ≥ 14 weeks of pregnancy.”

Methods

- **Study design and setting**
- Cross-sectional descriptive study on 84 cases of stillbirth at ≥ 14 weeks of pregnancy diagnosed and treated at the Department of Obstetrics and Gynecology, Tay Nguyen Regional General Hospital from Jan 2024 to November 2024.
- **Disease selection criteria:** Gestational age ≥ 14 weeks and the pregnancy has been diagnosed with stillbirth.
- **Exclusion criteria:** Gestational age < 14 weeks

Results

Table 1: General characteristics of study subjects

Information	Second trimester		Third trimester		Total	
	n	%	n	%	n	%
Age (year)						
< 20	3	8.6	5	10.2	8	9.5
20 – 34	17	48.6	28	57.1	45	53.6
≥ 35	15	42.9	16	32.7	31	36.9
The average age	30.5 ± 8.3					
Residence						
City	4	11.4	9	18.4	13	15.5
Countryside	31	88.6	40	81.6	71	84.5
Level of education						
Illiterate /Elementary	16	45.7	17	34.3	33	39.3
Secondary school /High school	15	42.9	13	26.5	28	33.3
College/ University	4	11.4	19	38.8	23	27.4

The average age of pregnant women in the study was 30,5 $\pm$ 8,3 years old, the age group from 20 to 34 accounted for the highest proportion (53,6%). Illiterate/ elementary education

Procedure

Questioning the patient: interviewing research subjects according to a pre-designed toolkit. Conduct records and evaluate paraclinical tests.

Statistical analysis

The statistics were recorded, cleaned and statistically processed using IBM SPSS Statistics 20 software. Describe the data using descriptive statistics and analytical statistics. Qualitative variables will be described as numbers and percentages. Quantitative variables with normal distribution are described as mean $\pm$ standard deviation, without normal distribution are described as median and interquartile range. Use the “t” test and the Z formula to compare the average of two observations. With evaluation criteria: $p < 0.05$: statistically significant difference. Use the χ^2 test to compare the difference between two ratios.

level accounts for the majority (39,3%). The common place of residence is in countryside areas (84,5%).

Table 2: Maternal characteristics

	Second trimester		Third trimester		Total	
	n	%	n	%	n	%
Number of previous pregnancies						
0	9	35.7	24	49.0	33	39.3
1-2	17	48.6	19	38.8	36	42.9
≥ 3	9	25.7	6	12.2	15	17.9
Obstetrics history						
History of stillbirth, miscarriage	7	20.6	4	8.2	11	13.1
History of premature birth / SGA/ IUGR	0	0	6	12.2	6	7.1
Maternal disorders						
High blood pressure	1	2.9	14	28.6	15	17.9
Metabolic disorders	0	0	6	12.2	6	7.1

60,7% of cases stillbirth in the study were multiparous pregnancy. There were 11 cases (13,1%) with a history of stillbirth, miscarriage. 6 cases (7,1%) had a history of premature birth, SGA, IUGR. 2 groups of maternal

disease in study are high blood pressure in pregnancy (17,9%) and metabolic disorders (7,1%) include: diabetes and thyroid diseases.

Table 3: Characteristics of gestational age

	Cases (n)	Rate (%)
Second trimester	35	41.7
Third trimester	49	58.3
The average gestational age	28.7 ± 9.2	

The average gestational age is 28,7 ± 9,2 weeks, the uterine fetal death in third trimester accounts for the majority (58,3 %).

Table 4: Clinical characteristics and related factors

			Second trimester		Third trimester		Total		p	
			n	%	n	%	n	%		
Clinical symptom										
Abdominal pain/ Vaginal bleeding			14	40.0	20	40.8	34	40.5		
Loss of fetus moving			9	25.7	23	46.9	32	38.1		
During a periodic prenatal examination			12	34.3	6	12.2	18	21.4		
Check-ups during Pregnancy										
Not having a full prenatal checkup			18	51.4	16	32.6	34	40.5		
Full check-ups during pregnancy – Nomal Results			12	34.3	31	63.3	43	51.2		
Full check-ups during pregnancy – Abnomal Results			5	14.3	2	4.1	7	8.3		
Abnomal fetal										
Fetal malformations			Yes	7	20	2	4.1	9	10.7	0.03
			No	28	80	47	95.9	75	89.3	
Abnormalities are associated with the placenta/ umbilical cord/ amniotic fluid			Yes	0	0	7	14.3	7	8.3	0.04
			No	35	100	42	85.7	77	91.7	

The majority of pregnant women have abdominal pain/ vaginal bleeding (40,5%); 38,1% because the fetus was not moving, and no clinical symptom (21,4%).

59,5% had regular check-ups during pregnancy. 14% case of them detected abnormalities.

10,5% have fetal malformations, mainly in the second trimester of pregnancy ($p < 0,05$)

8,3% have abnormalities are associated with the placenta, umbilical cord, and amniotic fluid, mainly in the third trimester ($p < 0,05$)

Discussion

The average age of pregnant women was 30.5 ± 8.3 years, mostly within the 20–34 age group (53.6%), which is appropriate for reproductive age. This result is similar to the study by Vo Thi Thanh Thanh (2021), which reported 30.4 ± 6.2 years [4]. The group under 20 years old accounted for 9.5%, while those over 35 years old made up 36.9%. This indicates that intrauterine fetal death (IUFD) can occur at any age, though it suggests that women over 35 may be at higher risk, reflecting the adverse impact of maternal age on pregnancy outcomes. 84.5% of the study participants lived in rural areas. According to data published in The Lancet, about 60% of pregnant women with stillbirths reside in rural areas [2]. Educational levels in our study also revealed notable patterns: 39.3% of women were illiterate or had only primary education, 33.3% had secondary or high school education, and college or university graduates had the lowest rate. All these disadvantageous factors are interconnected, leading to limited awareness, poor economic conditions, and restricted access to reproductive healthcare services. In fact, only 59.5% of women had regular prenatal check-ups during pregnancy, and among them, 14% were found to have abnormalities. Similarly, Amin (2019) and Sharma (2021) also found that nearly half of IUFD cases did not have regular prenatal care in their study [5, 6].

Among the 84 study participants, 39.3% were first-time mothers (primigravida), and 60.7% were multiparous. These findings are consistent with the study by Pham Thi Linh and

Truong Thi My Ngoc (2017) [7]. In our study, the proportion of first-time pregnancies was lower than that of multiparous ones, but these cases require significant attention due to the severe psychological impact, especially in those who experienced stillbirth in the later months.

Among pregnant women with IUFD at gestational age ≥ 14 weeks, 13.1% had a history of previous miscarriage or stillbirth. Vo Thanh Thanh's study reported a rate of 28.2% [4]. The rate of women with a history of preterm birth, low birth weight, or fetal growth restriction was 7.1%. The study by Pham Thi Linh and Truong Thi My Ngoc reported a 23.1% rate for history of miscarriage, stillbirth, or congenital defects [7]. This aligns with advancements in medicine aiming to reduce stillbirths. Multiple studies have shown that a poor obstetric history is a risk factor for IUFD [6]. It has been observed that women with such history are three times more likely to experience IUFD in subsequent pregnancies [8, 9]. Regarding maternal medical conditions, 15 women (17.9%) had pregnancy-induced hypertension, and 6 (7.1%) had endocrine disorders, including diabetes and thyroid diseases. This supports Tabatabaee's (2020) conclusion that pregnancy-induced hypertension is a leading cause of stillbirth, especially in the third trimester [6]. The link between gestational diabetes and stillbirth has also been confirmed in several studies [5, 9]. Understanding sample characteristics and identifying risk factors can help improve pregnancy management to prevent repeated adverse outcomes, particularly controllable risk factors.

The average gestational age in our study was 28.7 ± 9.2 weeks, compared to Sharma's (2021) report of 32 ± 5.7 weeks [6]. The difference may be due to variations in sampling methods. Among the 84 cases of IUFD ≥ 14 weeks admitted to Tay Nguyen Regional General Hospital, 35 were in the second trimester, and 49 (58.3%) were in the third trimester. This contrasts with Nguyen Quang Hung's study, where 78.4% of IUFDs occurred in the second trimester and 21.6% in the third [8]. This shift is attributed to improved access to healthcare and early diagnostic techniques, especially ultrasound. This leads to two points: first, early detection and

management of major anomalies in the first trimester; second, the current inadequate pregnancy care, as many women consider prenatal visits to be merely for ultrasound, overlooking maternal health conditions. According to research, many third-trimester stillbirths result from prolonged unmanaged maternal illnesses, underscoring the importance of ending pregnancies at the appropriate time [6]. These insights explain the higher third-trimester IUFD rate and lower second-trimester rate in our study. While ultrasound plays a vital role, comprehensive prenatal care remains critical, particularly in timely pregnancy termination to prevent stillbirth.

We recorded three main reasons for hospital admission: the most common was abdominal pain or vaginal bleeding (40.5%), while incidental detection during routine check-ups was the lowest. This matches our findings that 40.5% of women lacked adequate prenatal care and only visited the hospital when symptoms appeared. Among the reasons for admission, not feeling fetal movement was reported in 38.1% of cases, mostly in the third trimester ($p < 0.05$). This is understandable, as fetal movements are more noticeable in late pregnancy, making any change more obvious. In Muin *et al.*'s (2021) study, IUFD was most frequently diagnosed during routine check-ups (56.3%), followed by reduced fetal movement (27.9%), with lower rates for those presenting with clear symptoms [10]. This is due to better maternal care awareness in Austria—a developed country where prenatal care is thorough. In our study, 59.5% had adequate check-ups, with 14% found to have abnormalities. Nguyen Quang Hung's 2008 study in Hue Central Hospital found that 68% of IUFD cases had only 0–1 prenatal visits [8]. Though not comparable to developed countries like Austria, our findings show an improvement in reproductive healthcare awareness and services in Vietnam. In Sharma's 2021 study in Nepal, only 50% of women with IUFD received prenatal care [6]. These differences reflect disparities in education, economic, and cultural development across countries and highlight the role of prenatal care in reducing IUFD risk, reinforcing the connection between maternal care and pregnancy outcomes. In our study, 10.7% of cases involved fetal abnormalities, mostly detected in the second trimester, and 8.3% involved abnormalities of the placenta, umbilical cord, or amniotic fluid—all in the third trimester. Known abnormalities in the second trimester were primarily fetal defects, while in the third trimester they were placental-related ($p < 0.05$). These results are consistent with Nguyen Quang Hung's (2008) findings [8]. Weeks 20–24 in the second trimester are the optimal window for detecting fetal anomalies, which often lead to early pregnancy termination or spontaneous IUFD. This explains the lower IUFD rate due to anomalies in the third trimester, as most severe cases are detected and managed earlier. In our study, 8.3% of IUFDs were linked to placental, cord, or amniotic fluid abnormalities, all in the third trimester. Muin *et al.* (2021) in Austria reported 10.2% of IUFDs related to cord and amniotic fluid issues in the third trimester [10]. In the last trimester, as fetal organs are fully developed, placental circulation and cord problems become major risks. Disruptions in uteroplacental circulation can cause acute fetal distress and IUFD. Aminu *et al.* identified IUFD causes as maternal factors (8–50%), congenital anomalies (2.1–33.3%), placental issues (7.4–42%), cord problems (2.9–33.3%), and amniotic fluid/uterine factors (6.5–10.7%). The highest stillbirth rates were seen in cases with unknown causes (3.8–57.4%) [9]. Our findings

emphasize the importance of prenatal screening and regular monitoring to detect abnormalities early, especially in the third trimester when the fetus is viable outside the womb. Monitoring placental and cord circulation in late pregnancy and assessing fetal well-being are essential, controllable measures to prevent IUFD.

Conclusion

Most participants were multiparous women from rural areas with low educational levels, admitted due to abdominal pain, vaginal bleeding, or absent fetal movement. Despite over half receiving adequate antenatal care, a notable rate of abnormalities was detected—fetal anomalies mainly in the second trimester, and placental, umbilical cord, or amniotic fluid issues in the third ($p < 0.05$). The most common maternal conditions were gestational hypertension and metabolic disorders. These findings highlight the importance of comprehensive prenatal monitoring, especially in high-risk groups.

References

1. Ministry of Health. Intrauterine fetal death. National guidelines on reproductive health services. 2016:125–7.
2. The Lancet Ending Preventable Stillbirths Study Group. Ending preventable stillbirths. *Lancet*. 2016.
3. Man J, Hutchinson JC, Heazell AE, *et al.* Stillbirth and intrauterine fetal death: factors affecting determination of cause of death at autopsy. *Ultrasound Obstet Gynecol*. 2016;48(5):566–73.
[Translation not a reference, omitted.]
4. Vo Thi Thanh Thanh. Evaluation of the effectiveness of misoprostol in the management of first-trimester intrauterine fetal death [Medical Doctor thesis]. Hue: Hue University of Medicine and Pharmacy; 2021.
5. Amin KV, Chauhan AR, Goel A. Current practices of cervical ripening and induction of labour in intrauterine foetal demise: an observational study. *J Obstet Gynaecol India*. 2019;69(1):37–42.
6. Sharma B, Bhattarai S, Shrestha S, *et al.* Maternal and fetal characteristics and causes of stillbirth in a tertiary care hospital of Nepal: secondary analysis of registry-based surveillance data. *BMJ Open*. 2021;11(8):e045012.
7. Pham Thi Linh, Truong My Ngoc, Le Thi My Tien. Evaluation of the outcomes of pregnancy termination with misoprostol at 13 to 22 weeks of gestation at Can Tho City Obstetrics Hospital. Can Tho: Can Tho City Obstetrics Hospital; 2018.
8. Vo Thi Thanh Huyen. Evaluation of the effectiveness of misoprostol in the management of first and second trimester intrauterine fetal death [Specialist Level II thesis]. Hue: Hue University of Medicine and Pharmacy; 2024.
9. Aminu M, Bar-Zeev S, White S, *et al.* Understanding cause of stillbirth: a prospective observational multi-country study from sub-Saharan Africa. *BMC Pregnancy Childbirth*. 2019;19(1):470.
10. Muin DA, Scharrer A, Farr A, *et al.* Timing of hospital admission for stillbirth delivery on maternal and obstetric outcome: a retrospective cohort study. *Sci Rep*. 2021;11(1):18854.
11. Patel M, Shah A, Patel NM, Patel MR, Patel KR. Nano suspension: a novel approach delivery system for drug. *JPSBR*. 2011;1(1):1–10.

12. Haranath C, Reddy JL, Ahad HA, Reshma T, Shubha BN. Aquasomes: a novel approach for the delivery of bioactive molecules. *J Med Pharm Allied Sci.* 2022;11:5325–30.
13. Eltahir AK, Ahad HA, Haranath C, Meharajunnisa B, Dheeraj S, Sai BN. Novel phytosomes as drug delivery systems and its past decade trials. *Res J Pharm Dosage Forms Technol.* 2023;15(1):51–4.
14. Bhati R, Nagrajan RK. A detailed review on oral mucosal drug delivery system. *Int J Pharm Sci Res.* 2012;3(1):659–81.
15. Mubarak ZO. An overview on buccal drug delivery system. *SunText Rev Pharm Sci.* 2021;2(1):1–6.
16. Haranath C, Poojitha N, Ahad HA, Yarra S, Eranti B. Recent advances in lipid based nanovesicles for transdermal drug delivery. *J Med Pharm Allied Sci.* 2022;11(6):5217–20.
17. Singh RP, Parpani S, Narke R, Chavan R. Emulgel: a recent approach for topical drug delivery system. *Asian J Pharm Res Dev.* 2014;2(2):112–23.
18. Vani YB, Haranath C, Reddy CS, Bhargav E. Formulation and in vitro evaluation of piroxicam emulgel. *Int J Pharm Sci Drug Res.* 2018;10(4):227–32.
19. Mohammed Haneefa KP, Easo S, Hafsa PV, Mohanta GP, Nayar C. Emulgel: an advanced review. *J Pharm Sci Res.* 2013;5(12):254–8.
20. Sultana F, Manirujjaman, Imran-Ul-Haque M, Arafat M, Sharmin S. An overview of nanogel drug delivery system. *J Appl Pharm Sci.* 2013;3(8-1):S95–S105.
21. Zarekar NS, Lingayat VJ, Pande VV. Nanogel as a novel platform for smart drug delivery system. *Nanosci Nanotechnol Res.* 2017;4(1):25–31.
22. Abdul AH, Bala AG, Chintaginjala H, Manchikanti SP, Kamsali AK, Dasari RR. Equator assessment of nanoparticles using the design-expert software. *Int J Pharm Sci Nanotechnol.* 2020;13(1):4766–72.
23. Wang H, Chen Q, Zhou S. Carbon-based hybrid nanogels: a synergistic nanoplatform for combined biosensing, bioimaging, and responsive drug delivery. *Chem Soc Rev.* 2018;47:4198–232.
24. Muthal AD, Kshirsagar SJ, Bhambere DS, Patil MP, Ahhirao SS, Vishwakarm RP. A brief overview of nanogel. *World J Pharm Res.* 2022;11(4):1922–42.