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Original Research Article

Improving Stillbirth Documentation: A Retrospective Observational Study Using the ReCoDe Classification System

Pappu Tejasri Sowmya[1], Sirisha Paidi[2], M. Bheema Bai[3], I. Vani[4]

[1]Post Graduate Student, Department of Obstetrics and Gynaecology, Andhra Medical College, Visakhapatnam, India

[2]Associate Professor, Department of Obstetrics and Gynecology, Government Medical College, Rajamahendravaram, India

[3]Associate Professor, Department of Obstetrics and Gynecology, Government Medical College, Vijayanagaram, India

[4]Professor, Department of obstetrics and gynaecology, Andhra Medical College, Visakhapatnam, India

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Corresponding Author: Sirisha Paidi

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Abstract:

Background: Stillbirth is a major public health concern in India, particularly in settings with limited access to antenatal and emergency obstetric care. A large proportion of stillbirths often remain unexplained due to inadequate evaluation and documentation. The Relevant Condition at Death (ReCoDe) classification provides a clinically meaningful approach to identify the most likely contributing condition at fetal demise.

Aim: To determine the etiology of antepartum stillbirths using the ReCoDe classification system and evaluate associated maternal and fetal characteristics.

Materials and Methods: A retrospective observational study was conducted in the Department of Obstetrics and Gynecology, King George Hospital, Andhra Medical College, Visakhapatnam, from October 2023 to October 2024. A total of 71 singleton antepartum stillbirths ≥28 weeks or ≥1000 g were included. Data were collected from hospital records and classified as per ReCoDe.

Results: The stillbirth rate was 23.1 per 1000 total births. Most cases occurred in unbooked mothers (61%), mothers >30 years (38%), and primigravidas (38%). A higher proportion of stillbirths occurred at ≥40 weeks of gestation (34%). Male fetuses were slightly more affected (55%). Hypertensive disorders (18%), diabetes (13%), and oligohydramnios (11%) were the most common associated risk factors. Fetal growth restriction emerged as the leading cause under ReCoDe classification (27%), followed by maternal conditions (34%). Only 13% remained unexplained.

Conclusion: The ReCoDe classification significantly improves the identification of clinically relevant causes of stillbirth and reduces the proportion of unexplained cases. Enhanced antenatal care, growth monitoring, and timely obstetric interventions can help prevent a substantial number of stillbirths in resource-limited settings.

Keywords: Stillbirth, ReCoDe Classification, Fetal Growth Restriction, Maternal Disorders, Antenatal Care.

Introduction

Stillbirth remains a major global public health challenge, representing a tragic and often preventable outcome of pregnancy. The World Health Organization (WHO) defines stillbirth as fetal death occurring at or after 28 completed weeks of gestation or with a birth weight ≥1000 grams, with no signs of life after delivery [1]. Stillbirth is a key indicator of the quality of antenatal and intrapartum healthcare within a population [2,3].

Globally, about 2 million stillbirths occur annually, accounting for approximately one stillbirth in every 72 births, with a disproportionate 98% occurring in low- and middle-income countries [4]. India remains one of the highest contributors to the global burden, with an estimated stillbirth rate of around 10 per 1000 live births [4,5]. Higher rates are reported among rural women due to inadequate antenatal services, lack of skilled birth attendance, and delayed access to emergency obstetric care [6].

Stillbirth reduction has not progressed at the same pace as declines in maternal and neonatal mortality [4,7]. Nearly half of all stillbirths in resource-limited regions occur during labor, contrasting with high-income countries where most stillbirths occur antepartum due to chronic maternal or fetal conditions [8,9].

Stillbirth has a profound psychological impact on families, leading to feelings of guilt, intense grief,

depression, anxiety, and even suicidal tendencies in affected women if adequate emotional support is not provided [10,11]. This highlights the importance of understanding causative factors to guide both prevention and counseling for future pregnancies.

A major limitation in stillbirth evaluation has been the high proportion classified as unexplained, often exceeding 50% when older classification systems are used or when investigations are incomplete [12]. Traditional classification systems such as the Wigglesworth model are limited in identifying specific maternal or fetal contributors [12].

To overcome this, Gardosi et al. developed the ReCoDe (Relevant Condition at Death) classification system, which focuses on identifying the most relevant clinical condition present at the time of fetal demise rather than requiring a complete causal pathway [13]. Evidence suggests that the ReCoDe system can reduce unexplained stillbirths to around 15%, providing greater clinical utility in audits and prevention planning [13,14].

In India, where the stillbirth burden remains high, application of classification systems such as ReCoDe can improve etiological understanding, enhance documentation rigor, and support preventive efforts including early fetal surveillance, maternal risk screening, and timely referral. Therefore, this study aims to classify stillbirths using the ReCoDe classification system in a tertiary care hospital in South India to strengthen clinical interpretation and improve future pregnancy outcomes.

Materials and Methods

Study Design: A retrospective observational study was conducted to evaluate and classify stillbirths using the Relevant Condition at Death (ReCoDe) classification system.

Study Site and Duration: The study was performed in the Department of Obstetrics and Gynecology, King George Hospital, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India, over a period of one year from October 2023 to October 2024.

Study Population: All women who delivered a stillborn fetus at the study center during the specified duration were screened. Medical records, labor room registers, and hospital delivery data were reviewed to identify eligible cases.

Sample Size: A total of 71 cases fulfilling the eligibility criteria were included in the study.

Inclusion Criteria

- Singleton pregnancies with antepartum stillbirth confirmed clinically or by obstetric ultrasound
- Gestational age ≥28 weeks, or fetal weight ≥1000 g where gestational age was uncertain
- Women who gave informed consent for the use of their clinical data for research purposes

Exclusion Criteria

- Multiple gestation stillbirths
- Fetal weight <1000 g when gestational age was unknown
- Cases with incomplete or missing medical documentation

Data Collection: Data were collected from patient case files, antenatal records, and delivery reports using a structured proforma. The following variables were recorded:

- Maternal demographic details: age, parity, antenatal registration status, socioeconomic status
- Maternal medical and obstetric conditions including diabetes, hypertensive disorders, thyroid disorders, prior stillbirths, and other comorbidities
- Gestational age at fetal demise
- Ultrasound findings related to fetal growth, anomalies, placental location, and amniotic fluid volume
- Delivery findings including presence of meconium-stained liquor, retroplacental clots, cord complications, placental calcifications, infarctions, and congenital anomalies
- Fetal details: sex, birth weight, maceration status

Classification Method

Each case was categorized using the ReCoDe classification system (Groups A–I), which identifies the most relevant clinical condition present at or near the time of fetal death. When multiple contributing factors were identified, the most significant relevant condition was assigned as the primary category.

Ethical Considerations: Institutional Ethics Committee approval was obtained before initiating the study. Confidentiality of patient records was strictly maintained, and only anonymized data were used for analysis.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using descriptive statistics. Categorical variables were expressed as frequencies and percentages.

Results

During the study period from October 2023 to October 2024, there were 5306 total deliveries at King George Hospital, Andhra Medical College. Among them, 123 were stillbirths. After applying the inclusion criteria, 71 singleton antepartum stillbirths were included in the final analysis. The

stillbirth rate at the center was calculated as 23.1 per 1000 total births.

A majority of stillbirths occurred in mothers who had not received proper antenatal care. Out of 71 cases, 43 (61%) were unbooked, while 28 (39%) were booked (Table 1). This highlights the role of inadequate antenatal check-ups in poor pregnancy outcomes.

Table 1: Antenatal Registration Status

Registration Status	Number (n=71)	Percentage (%)
Booked	28	39
Unbooked	43	61

Evaluation of maternal age revealed that stillbirths were more common among women >30 years (38%), followed by teenage mothers <20 years (23%). The remaining cases occurred in the age brackets of 21–25 years (18%) and 26–30 years (21%) (Table 2).

Table 2: Maternal Age Distribution

Age Group (years)	Number of Cases	Percentage (%)
<20	16	23
21–25	13	18
26–30	15	21
>30	27	38

Parity distribution showed primigravidae contributing to 38% of cases and grand multipara to 34%, suggesting increased risk at both first and higher-order pregnancies (Table 3).

Table 3: Parity Distribution

Parity	Number of Cases	Percentage (%)
Primigravida	27	38
Multigravida	20	28
Grand multipara	24	34

Assessment by gestational age showed that most stillbirths occurred around term and post-term. A total of 24 cases (34%) occurred ≥40 weeks, while only 27% occurred before 34 weeks (Table 4). This indicates a need for better fetal monitoring closer to term.

Table 4: Gestational Age at Fetal Demise

Gestational Age	Number of Cases	Percentage (%)
28–34 weeks	19	27
34–37 weeks	15	21
37–39 weeks	13	18
≥40 weeks	24	34

Male fetuses accounted for 55% of stillbirths. Maceration features were seen in 19 cases, indicating late detection of fetal demise (Table 5).

Table 5: Fetal Characteristics

Parameter	Number of Cases	Percentage (%)
Male	39	55
Female	32	45
Maceration present	19	—

Clinical and placental assessments showed abnormalities like meconium-stained liquor, retroplacental clots, calcifications, and cord issues in a notable proportion of cases (Table 6), suggesting intrapartum as well as placental causes.

Table 6: Delivery and Placental Findings

Findings	Number	Percentage (%)
Meconium-stained liquor	14	20
Retroplacental clots	9	12.7
Calcifications/infarctions	7	9.8
Cord loops/constriction	4	5.6
Congenital anomalies	5	7.0

Maternal risk factors played a major role. Hypertensive disorders were the most common factor (18%), followed by diabetes (13%) and oligohydramnios (11%). In 13% of cases no identifiable cause was found (Table 7).

Table 7: Maternal and Fetal Associated Conditions

Condition	Number	Percentage (%)
Hypertensive disorders	13	18
Diabetes in pregnancy	9	13
Oligohydramnios	8	11
Abruptio placentae	6	9
Placenta previa	2	3
Uterine rupture	2	3
Cholestasis	1	1
APLA syndrome	1	1
Congenital anomalies	5	7
Unexplained	9	13

Classification using the ReCoDe system showed that maternal conditions constituted the highest category (34%), while fetal causes—mainly fetal growth restriction—accounted for 27%. Only 9 cases (13%) remained unclassified (Table 8).

Table 8: ReCoDe Classification of Stillbirths

ReCoDe Group	Description	Number	Percentage (%)
A	Fetal causes (incl. FGR)	19	27
B	Umbilical cord	1	1
C	Placental	8	12
D	Amniotic fluid	8	11
E	Uterine	2	3
F	Maternal	24	34
I	Unclassified	9	13

Discussion

Stillbirth continues to be a significant adverse pregnancy outcome, predominantly in low-resource settings where comprehensive antenatal care is limited. In the present study, the stillbirth rate was 23.1 per 1000 births, which is higher than recent national estimates reported in India but comparable to other tertiary-care based studies reporting rates between 18–30 per 1000 births [15,16]. This reflects the referral nature of the hospital, receiving a high proportion of complicated and unbooked cases.

Antenatal care is essential for monitoring pregnancy risks. In our study, 61% of cases occurred among unbooked mothers, consistent with other Indian data showing inadequate antenatal surveillance as a major contributor to fetal mortality [17,18]. Lack of timely diagnosis and delayed referral likely resulted in missed opportunities to prevent stillbirth.

Extremes of maternal age were associated with increased stillbirth risk. Mothers above 30 years accounted for the highest proportion, aligning with evidence that advanced maternal age is associated with placental insufficiency and chronic comorbidities [19]. Teenage pregnancy also contributed significantly, often linked to anemia, malnutrition, and poor healthcare utilization [20].

In our study, primigravidae and grand multipara were most affected. Primigravida women may have unrecognized complications, whereas high-parity women face increased placental disorders and reduced birth spacing, which have similarly been reported as risk factors in prior studies [21].

More than half of the stillbirths occurred at or beyond term. This demonstrates the need for better fetal surveillance in late gestation, particularly for high-risk pregnancies. Similar findings from other Indian cohorts suggest that intrapartum monitoring and timely delivery interventions could play a vital preventive role [22].

Maternal hypertension was the most common associated medical condition leading to fetal demise. Hypertensive disorders compromise uteroplacental blood flow and are widely recognized as a major cause of fetal mortality [23]. Diabetes in pregnancy was the second major contributor and has been linked to macrosomia, placental dysfunction, and fetal metabolic compromise [24].

Placental and cord pathologies, including abruption and cord compression, were also evident in this study. These acute events require rapid obstetric intervention, and delays often result in preventable stillbirths [25]. Congenital anomalies accounted for 7% of cases, similar to published regional findings [26].

Application of the ReCoDe classification system demonstrated its usefulness in improving etiological attribution. Only 13% of cases remained unclassified compared with higher proportions typically seen using conventional systems [27]. Fetal growth restriction was the leading category under fetal causes, emphasizing the need for serial growth monitoring to identify small-for-gestational-age fetuses early [28]. The prominent maternal contribution (34%) underscores preventable etiologies related to chronic disease management and timely intervention.

Overall, the findings highlight that most stillbirths in this population were associated with modifiable maternal and fetal factors. Strengthening antenatal screening, intrapartum monitoring, and emergency obstetric services can substantially reduce preventable stillbirths. Enhanced documentation and review practices using clinically relevant tools like ReCoDe should be routinely adopted to guide quality improvement in perinatal care.

Conclusion

The present study demonstrated that most stillbirths occurred among unbooked mothers, those at the extremes of reproductive age, and pregnancies complicated by hypertensive disorders, diabetes, or placental dysfunction. A significant proportion of fetal deaths also occurred at or near term, indicating that timely detection and intervention could potentially prevent many of these losses.

Application of the ReCoDe classification system proved to be effective in determining relevant clinical factors associated with fetal demise. Only a small percentage of cases remained unexplained, highlighting the improved diagnostic clarity achieved with this method.

Overall, the findings emphasize the need for improved antenatal registration, early identification and close monitoring of high-risk pregnancies, and strengthening intrapartum care services. Implementing systematic classification tools like ReCoDe should be encouraged as part of routine stillbirth surveillance to guide targeted preventive strategies and improve perinatal outcomes.

References

1. World Health Organization. International statistical classification of diseases and related health problems: Tenth revision (ICD-10). Geneva: WHO; 2010.
2. ICD-10 Classification. Geneva: World Health Organization; 2004.
3. Ministry of Health and Family Welfare, Government of India. INAP: India Newborn Action Plan. New Delhi; 2014.
4. Hug L, You D, Blencowe H, et al. Global, regional, and national estimates and trends in stillbirths from 2000 to 2019: A systematic assessment. Lancet. 2021; 398:772-785.
5. Cousens S, Blencowe H, Stanton C, et al. National, regional, and worldwide estimates of stillbirth rates in 2009 with trends since 1995: A systematic analysis. Lancet. 2011;377(9774):1319-1330.
6. Altijani N, et al. Stillbirth among women in nine states in India: Rate and risk factors from the Annual Health Survey. BMJ Open. 2018;8: e022583.
7. UNICEF Data. Stillbirths: State of the World's Children Report. New York: UNICEF; 2020.
8. Bhutta ZA, et al. Stillbirths: evidence-based solutions. Lancet. 2011; 377:1448-1463.
9. Flenady V, et al. Major risk factors for stillbirth: a systematic review and meta-analysis. Lancet. 2011; 377:1331-1340.
10. Cacciatore J. Psychological effects of stillbirth. Clin Obstet Gynecol. 2010; 53:691-699.
11. Rådestad I. Parents' experience following stillbirth. Acta Obstet Gynecol Scand. 2002; 81:122-128.
12. Flenady V, Pinar H, et al. An evaluation of classification systems for stillbirth. BMC Pregnancy Childbirth. 2009; 9:24.
13. Gardosi J, Kady SM, McGeown P, et al. Classification of stillbirth by relevant condition at death (ReCoDe): Population based cohort study. BMJ. 2005; 331:1113.
14. Ego A, Zeitlin J, et al. Role of fetal growth restriction in stillbirth classification using ReCoDe. BMC Pregnancy Childbirth. 2013; 13:182.
15. Singh P, et al. Stillbirth trends in tertiary care: An Indian observational study. J Obstet Gynecol India. 2020;70(4):275–80.
16. Pandey S, et al. Perinatal outcomes in referral hospitals of India. Int J Reprod Contracept Obstet Gynecol. 2019;8(3):1125–30.
17. Sharma D, et al. Association of antenatal care with perinatal outcomes in low-resource settings. Indian Pediatr. 2016;53: PC15–20.
18. Gaikwad P, et al. Unbooked pregnancies and fetal loss. J Evol Med Dent Sci. 2018; 7:1002–6.
19. Lean SC, et al. Advanced maternal age and adverse pregnancy events. BJOG. 2017; 124:843–54.
20. Mukhopadhyay P, et al. Teenage pregnancy risk and outcomes. J Obstet Gynaecol India. 2019; 69:38–44.
21. Hussain R. Parity and stillbirth risks: A global review. BMC Reprod Health. 2021; 18:52–60.
22. Choudhary A, et al. Late pregnancy monitoring and perinatal outcomes in India. Int J Gynecol Obstet. 2020; 150:273–9.
23. Abalos E, et al. Severe hypertensive disorders and perinatal outcomes. Cochrane Database Syst Rev. 2018;10:CD009775.

24. ACOG Practice Bulletin. Gestational diabetes diagnosis and management. Obstet Gynecol. 2018;131: e49–64.
25. Tikkanen M. Placental abruption epidemiology and outcomes. Acta Obstet Gynecol Scand. 2011; 90:140–9.
26. Boyle B, et al. Congenital anomalies and fetal death prevalence. Eur J Med Genet. 2018; 61:707–15.
27. Cortes E, et al. Improving stillbirth classification with ReCoDe. Eur J Obstet Gynecol Reprod Biol. 2019; 236:144–50.
28. Mendez-Figueroa H, et al. Small for gestational age outcomes in stillbirth. Obstet Gynecol. 2017;129:459–65.