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A prospective observational study to evaluate mode of delivery in antepartum still birth in a tertiary care set up of South Gujarat

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Abstract
Objective: Stillbirth, particularly antepartum foetal demise, represents a profound obstetric tragedy with significant impact on global and national health, as well as medicolegal implications in modern times. Despite advancements in maternal care, stillbirth rates remain a concern, especially in low and middle-income countries like India. The optimal mode of delivery in these sensitive circumstances balances maternal physical safety with psychological well-being and future reproductive health.
This paper aims to provide a comprehensive review of the modes of delivery for antepartum stillbirth, evaluating maternal outcomes, exploring ethical considerations, and identifying critical research gaps relevant to the Indian context.
Results: Vaginal delivery, primarily through induction of labor, is generally recommended as the preferred mode for most antepartum stillbirths due to lower maternal morbidity compared to caesarean section. However, individualized care considering gestational age, maternal obstetric history (e.g., prior uterine scar), and patient preference is paramount. Caesarean section is reserved for specific maternal indications. The psychological impact of stillbirth is profound, with the mode of delivery potentially influencing maternal mental health, necessitating compassionate, patient-centred counselling and support.
Conclusion: To conclude, effective management of antepartum stillbirth requires adherence to evidence-based guidelines while prioritizing maternal autonomy and emotional support. Addressing existing research gaps, particularly in data collection is crucial for improving outcomes and providing holistic care in India.

Keywords: Stillbirth, antepartum foetal demise, medicolegal, modes of delivery, induction of labor, maternal outcomes

Introduction
Stillbirth remains a significant global health challenge, representing a devastating outcome for families and a substantial public health concern. Approximately 1.9 million babies were stillborn worldwide in 2021, translating to a rate of 14 stillbirths per 1,000 total births [1]. This burden is disproportionately high in low-income countries. The Global Burden of Disease study confirmed that India contributed the highest number (397,300) of stillbirths globally in 2021 [2].
A significant proportion of these losses, over 40%, occur during labor (Intrapartum Stillbirths), which are largely preventable with improved quality of care during childbirth, including routine monitoring and timely access to emergency obstetric interventions. The high burden of stillbirths in low-income countries and regions like Southern Asia, is deeply intertwined with broader issues such as healthcare access, the quality of care provided, and underlying socioeconomic determinants. Improving stillbirth outcomes, therefore, requires addressing systemic factors within health systems and society, making the optimization of delivery modes a critical component of a larger public health strategy. India, recognizing this challenge, has pledged to reduce its stillbirth rate to less than 10 per 1,000 births by 2030 [1], aligning with the global every new-born action plan.
Stillbirth is fundamentally defined as the death of a foetus prior to its complete expulsion or extraction from a woman. This diagnosis can be made in utero by the absence of foetal heart sounds, often confirmed by imaging techniques, or at delivery by the absence of any signs of life after birth or attempted resuscitation.

The World Health Organization (WHO) and the Indian Council of Medical Research (ICMR) recommend defining stillbirth as the birth of a foetus without any sign of life at or after 28 weeks of gestation for international comparisons [3].

The varying gestational age thresholds (e.g., 20, 22, 28 weeks) used for defining stillbirth across different international bodies (CDC, UNICEF, WHO) and for national data collection (ICMR) creates substantial challenges for accurate global and national burden estimation and for comparing data across different regions and studies [3]. This inconsistency can lead to underreporting or misclassification of stillbirth events, which directly hinders the development of effective policies and targeted interventions.

The Indian Council of Medical Research's decision to adopt the WHO definition for stillbirth for international comparisons suggests a recognition of previous issues with data harmonization [3]. Establishing universally accepted definitions is a fundamental prerequisite for robust epidemiological research and the formulation of evidence-based health policies.

The management of antepartum stillbirth demands careful consideration of numerous factors to ensure the physical safety and psychological well-being of the bereaved parents. The chosen mode of delivery can profoundly impact maternal morbidity, the speed and nature of recovery, and future reproductive health.

Materials and Methods

An observational study was conducted collecting data from medical records of 55 consenting women with antepartum stillbirth (diagnosed on clinical examination by absence of foetal heart sound and confirmed with ultrasound reports showing absent foetal cardiac activity) at New civil Hospital, Surat a tertiary health care centre of South Gujarat over a period of 12 months after HREC approval.

After obtaining informed consent, cases were thoroughly interviewed, systematically examined, antepartum and intra-partum details and investigation reports were recorded on the MoHFW (Ministry of Health and Family Welfare) Stillbirth review proforma (taken from the Operational Guidelines for establishing Sentinel Stillbirth Surveillance System of Government of India, June 2016).

Study Population

The study population included consenting women who had antepartum still birth at gestational age more than 20 weeks or new-born birth weight of more than 500 grams. Excluding women with multifetal gestation, intrapartum still birth.

Data Analysis

Data was coded and recorded in MS Excel and analyzed using SPSS v25. Descriptive statistics included means, medians, standard deviations, and frequencies. Graphs such as histograms, bar charts, and pie charts were used for visualization. Group comparisons were made using independent t-tests, ANOVA, and Chi-squared tests. A p-value of less than 0.05 was considered statistically significant.

Results

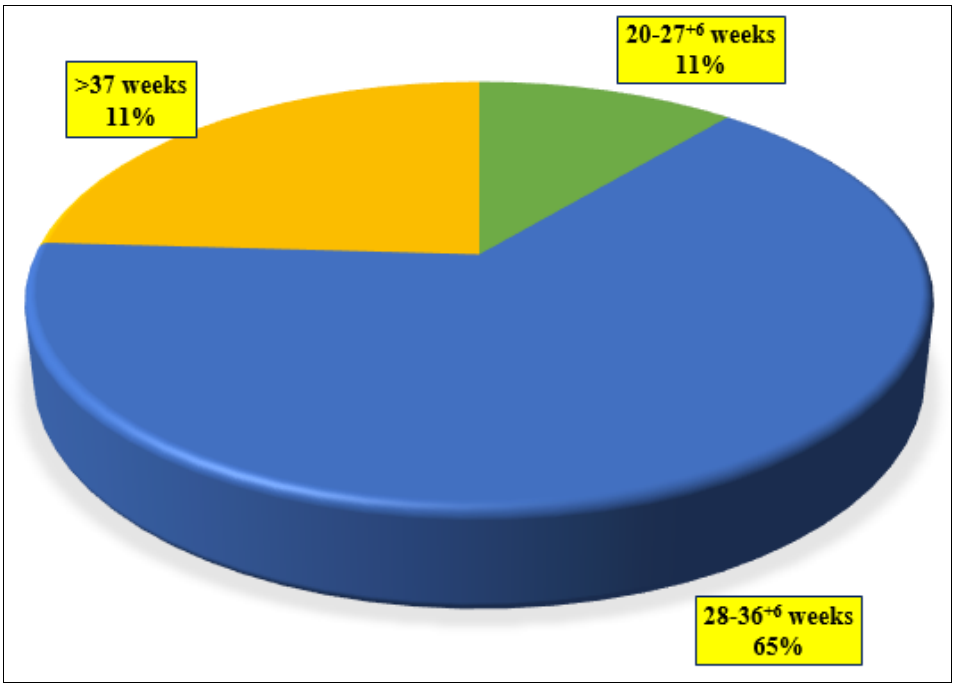

Fig 1: Distribution of antepartum still birth according to gestational age in weeks

Table 1: ReCoDe classification alongside delivery and maternal outcome data

Recode (N=54)	Recode Classification	Details	Number of cases	Percentage of cases
Recode Classification	**F1**	**Hypertensive disorders in pregnancy**	**14**	**25.9%**
	C1	Abruptio Placenta	10	18.5%
	I1	Unexplained	22	40.74%
	A3	Foetal growth restriction	1	1.85%
	F5	Maternal conditions	5	9.25%
	A1	Congenital anomalies	1	1.85%
	F2	Diabetes	1	1.85%

Onset of labour		Spontaneous	21	38%
(N=54)		Induced	33	62%
Method of induction		Mechanical + Cerviprime Gel	9	27%
(N=33)		Cerviprime Gel	15	46%
		Mechanical+ Misoprostol	9	27%
Result of induction		Successful Vaginal Delivery	30	90%
(N=33)		Failed (LSCS)	3	10%
Mode of delivery		Vaginal	47	87%
(N=54)		Abdominal (Caesarean Section)	7	13%
Maternal outcome		Discharged (Postnatal Ward)	43	80%
(N=54)		Transfer to OBICU	10	18%
		Death	1	2%

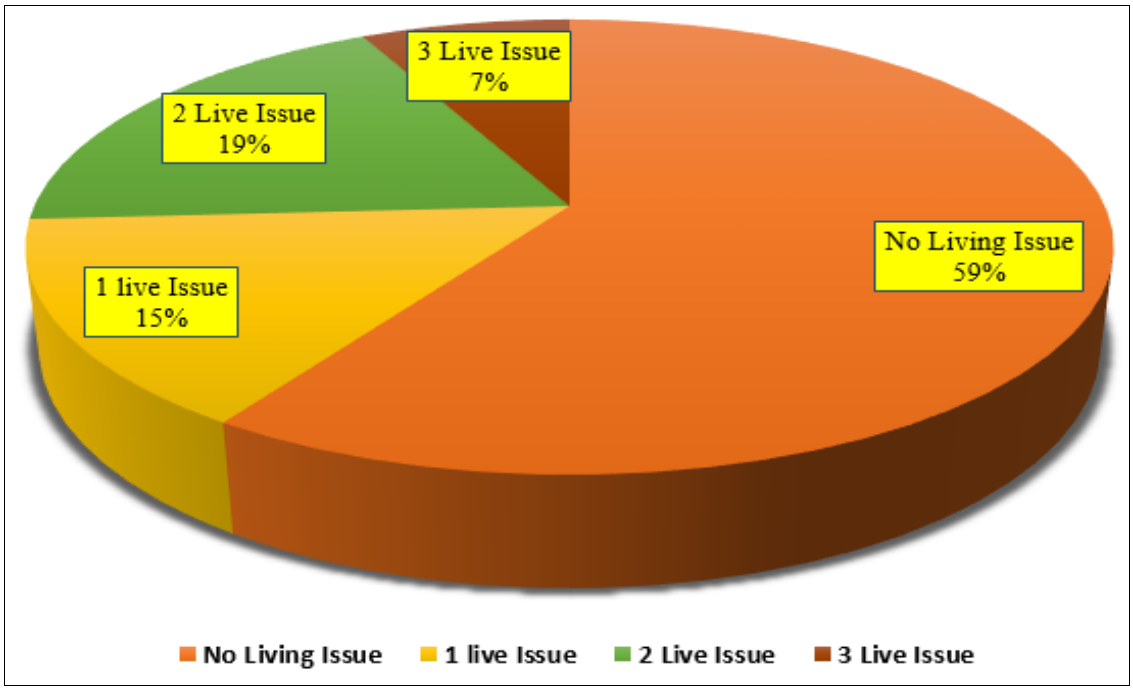

Fig 2: Distribution of antepartum still birth with respect to past history of live birth

Table 2: Mode of previous and current delivery in relation to labor status on admission

Previous mode of delivery (N=22)	Status on Admission	Current Mode of Delivery	
		Vaginal (N=16)	LSCS (N=6)
Vaginal (20)	In Labor	10	2
	Not in Labor	5	3
LSCS (2)	In Labor (1)	1	-
	Not In Labor (1)	-	1

Table 3: Indications of OBICU admission in study subjects

Indications of OBICU Admission			
Indication of OBICU Admission		**No of Subjects**	**Percentage**
Hypertension with complications (N=9)	*Abruptio Placenta*	4	82%
	Antepartum Eclampsia	2	
	Severe Preeclamptic Toxaemia	3	
Obstetric Hysterectomy for observation		1	9%
Severe Anaemia		1	9%

Discussion

These findings highlight a significant proportion of unexplained stillbirths (40.74%), with hypertensive disorders and abruption placentae as notable causes. The preference for vaginal delivery, with 87% of cases, and a high induction success rate (90%) underscore the clinical approach to managing such cases.

The study's preference for vaginal delivery aligns with international guidelines, such as those from RCOG (2010) and ACOG (2020), which advocate for vaginal birth to minimize maternal morbidity, given the potential complications of caesarean sections affecting future fertility [4, 5]. The 90% success rate for induction further supports this, indicating effective management strategies in the studied population.

However, the high rate of unexplained stillbirths (40.74%) warrants further exploration. Comparative analysis with other Indian studies reveals variations. A study from Mumbai (2022) reported only 7.3% unexplained cases using ReCoDe, with hypertensive disease in pregnancy as the leading cause (27.6%), and foetal growth restriction at 10.9% [6]. Similarly, a Kerala study (2017) found 12.42% unexplained, with Intra Uterine

Growth Restriction (IUGR) leading at 41.8% [7]. These differences suggest potential gaps in investigation completeness in the Surat study, possibly due to limited access to advanced diagnostics like autopsy or placental examination, which are crucial for reducing unexplained cases.

Hypertensive disorders, at 25.9%, align with findings from these studies, reinforcing their role as a significant contributor to stillbirths [6]. The higher unexplained rate in this study (40.74%) compared to 15.2% in a global cohort using ReCoDe (BMJ, 2005) further highlights the need for enhanced diagnostic capabilities, particularly in resource-limited settings [8].

Public health implications include the need for targeted interventions to improve antenatal care and reduce stillbirth rates, aligning with global efforts like every new-born action plan. The psychological impact on mothers, with 18% requiring OB-ICU admission and 2% resulting in maternal death, underscores the importance of compassionate, patient-centred care and support systems.

The overwhelming majority of stillbirths occur in the late preterm period (28-36+6 weeks). This finding suggests that this particular gestational window is a critical period for interventions aimed at reducing stillbirth rates. Potential factors contributing to stillbirths in this period could include complications related to placental insufficiency, foetal growth restriction, infections, or other underlying maternal conditions that become more pronounced as the pregnancy progresses but before full term.

The significant percentage of stillbirths occurring at term (>37 weeks) is also concerning. While these represent a smaller proportion than the late preterm group, stillbirths at term are particularly tragic as the pregnancy is considered to be at a mature stage. This category may encompass cases related to placental abruption, umbilical cord accidents, unmonitored foetal distress, or other unpredictable events that can occur even in seemingly healthy pregnancies close to term. It underscores the importance of continued vigilance and monitoring even in the final weeks of gestation.

Among the 22 women included in the study, 20 had a previous vaginal delivery and 2 had a previous lower segment caesarean section (LSCS). Of those with a previous vaginal delivery, 10 were admitted in labor and 5 were not. Among the previously vaginally delivered women, 15 delivered vaginally again, while 5underwent LSCS. Among women with a previous LSCS, only one was admitted in labor and delivered vaginally, while 1 was not in labor and underwent repeat LSCS. This suggests that women with a history of LSCS were more likely to have a repeat caesarean and to be admitted before labor onset.

Conclusion

The management of antepartum stillbirth in a tertiary care setting in South Gujarat highlights the preference for vaginal delivery, primarily through induction of labor, due to its lower maternal morbidity and high success rate (90%), aligning with global guidelines such as those from RCOG and ACOG. Our findings reinforce the prevailing clinical preference for vaginal delivery aligning with international guidelines advocating for vaginal birth to minimize maternal morbidity and preserve future reproductive health, particularly given the potential complications associated with caesarean sections.

A significant proportion of stillbirths in our study remained unexplained (40.74%), highlighting a critical gap in diagnostic capabilities, likely due to limited access to advanced investigations such as foetal autopsy and placental examination. This contrasts with findings from other Indian studies and global cohorts, underscoring the urgent need for enhanced diagnostic infrastructure in resource-limited settings to reduce the burden of unexplained cases and improve our understanding of stillbirth aetiologies. Hypertensive disorders in pregnancy and abruption placentae were identified as other major contributors, consistent with existing literature.

The study also revealed that the majority of stillbirths occurred in the late preterm period (28-36+6 weeks), emphasizing this as a crucial window for targeted interventions. While a smaller proportion, term stillbirths (> 37 weeks) remain a concern, necessitating continued vigilance and monitoring even in the final weeks of gestation. Furthermore, our analysis of previous and current modes of delivery indicated that women with a history of LSCS were more likely to undergo a repeat caesarean and be admitted before labor onset.

The profound psychological impact of stillbirth on mothers, evidenced by the 18% requiring OB-ICU admission and 2% resulting in maternal death, underscores the paramount importance of compassionate, patient-centred care and robust support systems. To effectively address the challenge of antepartum stillbirth in India, it is imperative to strengthen antenatal care, improve diagnostic capabilities, and ensure adherence to evidence-based guidelines while prioritizing maternal autonomy and emotional well-being. Bridging the existing research gaps, particularly in comprehensive data collection and investigation, is crucial for developing targeted public health strategies and providing holistic care to affected families.

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Conflict of Interest

Not available

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Not available

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