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Original Research Article

Maternal and obstetric characteristics of stillbirths at a rural tertiary care centre in Chhattisgarh, India: a retrospective descriptive study

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ABSTRACT

Background: A baby who dies after 28 weeks of pregnancy, but before or during birth, is classified as a "stillbirth". It remains a major yet preventable public health challenge, particularly in rural India where timely access to quality maternal and obstetric care is often limited. This study aimed to identify and describe determinants contributing to stillbirths in a rural setting at a tertiary care centre, Rajnandgaon, Chhattisgarh.
Methods: A retrospective descriptive study was conducted using clinical records of all deliveries from June 2021 to May 2025. Among 12,636 deliveries, 417 stillbirths were identified. Data on maternal age, booking status, distance of the patient's residence from the study centre, gravida status, gestational age at delivery, fetal weight, characteristics of stillbirth and associated maternal risk factors were collected, checked and analysed using descriptive statistics.
Results: The stillbirth rate in this study was 33 per 1,000 births (3.3%). Majority of patients were unbooked (81.3%) and living 31-50 km away from the study centre (38.1%). Primigravidae contributed 49.2% of the total. Most stillbirths occurred <37 weeks (57.7%), with fresh stillbirth 65% and macerated 35%. Key contributing factors were recorded as unexplained in 34.5%, preeclampsia in 8.8% and meconium-stained liquor in 6.7%.
Conclusions: The study highlights gaps in antenatal care, intrapartum monitoring, and healthcare access in rural areas. Strengthening obstetric services and community awareness programs is absolutely crucial to reducing the stillbirth rate in rural scenario.

Keywords: Stillbirth, Rural healthcare, Antenatal care, Maternal risk factors, Intrapartum monitoring

INTRODUCTION

Stillbirth remains a major public health concern with profound psychological, social, and economic impacts on families and communities. For international comparison, World Health Organization (WHO) defines a stillbirth or fetal death, as a death of fetus with a birthweight ≥1000 grams or a gestational age of ≥28 weeks or a body length of ≥35 cm.[1] India contributes significantly to the global stillbirth burden, with an estimated stillbirth rate of 13 per 1,000 total births as of 2024, many of which occur in rural areas. In Chhattisgarh the stillbirth rate was reported to be equal or more than 10 per 1000 births.[2] The rural healthcare scenario in India is characterized by disparities in access to quality antenatal care (ANC), intrapartum monitoring, emergency obstetric services, and timely referral systems. Socioeconomic constraints, lack of awareness, and underutilization of maternal healthcare services further exacerbate these issues. Studies suggest that most stillbirths in rural India are preventable.[3]

Several maternal factors have been strongly associated with stillbirth, including advanced maternal age, teenage pregnancies, anaemia, hypertensive disorders of pregnancy, diabetes, infections, a history of previous stillbirth education, gravidity, concomitant medical

conditions and obstetric conditions.[4] Fetal factors such as congenital anomalies, intrauterine growth restriction (IUGR), multiple pregnancies, and cord accidents are also significantly linked. Furthermore, health system-related issues, such as delays in accessing care, lack of skilled birth attendants, and poorly equipped healthcare facilities, remain pivotal contributors in rural settings.[5]

Recent research emphasizes the "Three Delays Model" in maternal care as a key framework to understand stillbirth causation. These include: delay in recognizing complications and deciding to seek care, delay in reaching a health facility, and delay in receiving appropriate care at the facility. In rural India, these delays are prevalent due to financial and infrastructural barriers. However, the actual implementation and utilization of such programs vary across regions and are often hindered by sociocultural and logistic challenges.[6] This study aimed to identify the determinants of stillbirth to improve existing management framework in the rural scenario.

METHODS

Study design and setting

A hospital record based retrospective descriptive study was conducted at the Department of Obstetrics and Gynaecology at Bharat Ratna Late Shri Atal Bihari Vajpayee Memorial Government Medical College, Rajnandgaon, Chhattisgarh, India. The study population included all the cases of stillbirths out of total deliveries recorded between the study period from 1st June 2021 to 31st May 2025.

Inclusion criteria

The study included women who were admitted with the diagnosis of Intrauterine fetal death or who had intrauterine fetal death during the course of hospital stay, and delivered stillbirth.

Exclusion criteria

Cases were excluded if the gestational age was less than 28 weeks. Patients who delivered at home or at another health care facility and were referred to our hospital after delivery were also excluded from the study.

Data were collected from individual maternal case records and labour room delivery registers, which included maternal age, booking status, distance of the patient's residence from the study centre, gravida status, gestational age at delivery, mode of delivery, fetal weight, gender, type of stillbirth (fresh or macerated) and high-risk maternal conditions associated with stillbirth. All the data entries were checked and analysed manually using descriptive statistics only. Variables were summarized as frequencies and percentages.

RESULTS

In our institution a total of 12,636 babies were delivered during the study period; among them there were 417 stillbirths with Stillbirth rate of 33.0 per 1000 total births. The demography of the patients with stillbirths are shown in Table 1.

Majority of the patients (52.5%) in the study were aged 21 to 25 years while mean age 25±3.94 years. 64% were educated up to primary school while only 2.4% were found to be undergraduate. Out of the total, 65% were belong to below poverty line and 38.1% women lives 31 to 50 Kms away from our institute. Unfortunately, 81.3% women were found unbooked on admission in the study.

Table 1: Demographic profile of the study population (n=417).

Variables	Frequency	(%)
Age (years)		
18-20	21	5.0
21-25	219	52.5
26-30	133	31.9
31-35	35	8.4
36-40	9	2.2
Education		
Uneducated	39	9.3
Primary	267	64.0
Secondary	101	24.2
Undergraduate	10	2.4
Family income		
APL (Above poverty line)	146	35.0
BPL (Below poverty line)	271	65.0
ANC registration		
Booked	78	18.7
Unbooked	339	81.3
Distance from health centre (kms)		
<10	31	7.4
11-30	138	33.1
31-50	159	38.1
>50	89	21.3

Out of the total patients in the study, nearly half (49.2%) were primigravida while period of gestation was <37 weeks in 57.8% (35.5% between 32 to 37 weeks, and 22.3% are between 28 to 32 weeks). Undiagnosed cases of IUFD on admission were slightly more (52.7%) than diagnosed cases (47.2%). Majority of the patients (86.8%) delivered vaginally while only 13.1% needed caesarean section (Table 2).

In the present study, number of male babies were slightly more (52.3%) than female babies (47.7%). The most common weight range was <2 Kgs (60.9 %) while 39.3% were weight >2 Kgs. Fresh stillbirth was more common (65%) than macerated stillbirth (35%) (Table 3).

Table 2: Obstetrics profile and labour outcome (n=417).

Variables	Frequency	%
Gravida Status		
Primigravida	205	49.2
Second gravida	115	27.6
Third gravida and above	97	23.3
Gestational Age		
28 to 31+6 weeks	93	22.3
32 to 36+6 weeks	148	35.5
> 37 weeks	176	42.2
Status of IUFD		
Diagnosed	197	47.2
Un-Diagnosed	220	52.7
Mode of Delivery		
LSCS	55	13.1
Vaginal Delivery	362	86.8

Table 3.: Characteristics of stillbirth (n=417).

Details of the Baby	Frequency	%
Gender of Baby		
Female	199	47.7
Male	218	52.3
Birth Weight (Kgs)		
< 0.5 Kgs	9	2.2
0.5 to 1 Kgs	85	20.4
1.1 to 1.5 Kgs	51	12.2
1.6 to 2 Kgs	109	26.1
2 to 2.5 Kgs	94	22.5
> 2.5 Kgs	70	16.8
Fresh or macerated		
Fresh	271	65.0
Macerated	146	35.0

Table 4: High-risk factors associated with stillbirth (n=417).

Factors	Frequency	%
Unexplained etiology	144	34.5
Preeclampsia	37	8.87
Meconium-stained liquor	28	6.7
Eclampsia	22	5.3
Prom	20	4.8
Postdate	18	4.3
Preterm	16	3.8
VBAC	12	2.9
Obstructed labour	11	2.6
Placental abruption	8	1.9
Placenta previa	8	1.9
Cord prolapse	7	1.7
Anaemia	2	0.5
Diabetes mellitus	1	0.2
Hepatitis B	1	0.2
HIV	1	0.2
Trauma	1	0.2
Uterine rupture	1	0.2

In 144 cases (34.5%), no maternal high-risk factors were identified hence categorized as unexplained etiology. Preeclampsia (8.8%) and Meconium-stained liquor (6.7%) were the next most frequent factors. Eclampsia (5.3%) and premature rupture of membrane (PROM) (4.8%) also contributed notably. Conditions like preterm labour (3.8%), vaginal birth after caesarean section (VBAC) (2.9%), and obstructed labour (2.6%) were present but less frequent (Table 4).

DISCUSSION

Stillbirth remains a critical public health challenge in developing countries underscoring the need for equitable access to quality antenatal care. The findings align with and diverge from recent Indian studies, highlighting critical areas for intervention. Below, the results are discussed in comparison with similar studies, focusing on demographic distribution, healthcare access, clinical outcomes, and risk factors.

Sociodemographic profile

The study found that the majority of stillbirths occurred in women aged 21–25 years (52.5%). This contrasts with a study by Avachat et al (Maharashtra), where the highest stillbirth rates were observed in women aged 26–30 years (45%), likely due to higher fertility in that age group in their cohort.[7] Similarly, a study by Venkatesh et al (Uttar Pradesh), reported a peak in stillbirths among women aged 25–29 years (38%), attributing this to higher parity and limited healthcare access in older age groups.[8] The younger age peak in our study may reflect early marriages and pregnancies in rural Chhattisgarh, emphasizing the need for targeted antenatal care for younger mothers.

The socio-economic status and female literacy also influence pregnancy outcome. Women's education is associated with decline in SBR. This study has revealed that most of the women who landed with stillbirth were less educated, 64% were educated up to primary school and from below poverty line (65%), which can be compared to studies conducted by Asalkar et al (Maharashtra), where 57.8% were educated up to high school and Mufti et al (Srinagar, Jammu and Kashmir), where 74.7% belonged to lower middle class.[9,10]

Healthcare access and antenatal care

A significant proportion of women lived 31–50 km from health centres (38.1%), with 21.3% residing >50 km away. This echoes findings by da Costa Pereira et al (Jharkhand), where distance (>30 km) was associated with 50% higher stillbirth risk due to delayed care.[11] Conversely, a study by Gautam et al in Punjab found that even women living <10 km away faced stillbirths, emphasizing quality over proximity.[12] The rural-urban disparity in our study underscores the need for mobile health units and community-based care.

Unbooked pregnancies dominated (81.3%), consistent with Almeta et al in Assam, where 75% of stillbirths occurred in unbooked cases due to lack of risk stratification.[13] In contrast, a study by Gwako et al (Tamil Nadu), reported lower unbooked rates (60%), attributing better outcomes to universal antenatal coverage.[14] The high unbooked rate in our study reflects systemic barriers like poverty, illiteracy, cultural practices and poor health-seeking behaviour.

Nearly half (49.2%) of stillbirths occurred in primigravida women, while 23.3% were in women with third gravida or above. This aligns with findings from Wie et al where primigravida accounted for 48% of stillbirths, likely due to inexperience in recognizing pregnancy complications.[15] Conversely, a study by Nath et al in Kerala reported higher stillbirth rates in multigravida (35%), linking it to cumulative risks like anaemia and hypertensive disorders.[16] The high primigravida proportion in our study underscores the importance of first-pregnancy care in rural areas.

Most stillbirths (57.8%) occurred <37 weeks, followed by >37 weeks (42.2%), this mirrors findings from a study by Pandey et al (Andhra Pradesh, reported a higher proportion of preterm stillbirths (28–32 weeks, 40%), mainly attributed to hypertension and infection.[17] In contrast, a study by Altijani et al in Rajasthan, where term stillbirths (>37 weeks) dominated (45%), often due to intrapartum complications like obstructed labour.[18] The high preterm stillbirths in our study suggests gaps in antepartum monitoring and emergency obstetric care in rural scenario. Undiagnosed IUFD cases (52.7%) were slightly higher than diagnosed ones (47.2%). This aligns with Patidar et al in Uttarakhand, where 55% of IUFDs were undiagnosed, citing poor ultrasound access.[19] The high undiagnosed rate in our study calls for enhanced fetal movement awareness and routine Doppler screenings in high-risk pregnancies.

The most common birth weight range was 1.6–2 kg (26.1%), with 20.4% weighing 0.5–1 kg. This aligns with Gupta et al in Bihar, where low birth weight (<2.5 kg) accounted for 60% of stillbirths, linked to maternal malnutrition and poor fetal growth.[20] Conversely, a study by Singh et al (Odisha) found higher proportions of extremely low birth weight (<1 kg, 25%), emphasizing the role of preterm delivery.[21] The predominance of moderately low birth weights in our study suggests chronic malnutrition and suboptimal antenatal care.

Characteristics of stillbirth and SBR

The stillbirth rate (SBR) observed in our hospital was 33 per 1,000 births, which is notably higher than the rates reported in several recent Indian studies. For instance, Gupta et al documented an SBR of 20.5 per 1,000 births in Bihar, attributing the comparatively lower rate to enhanced antenatal care coverage and increased institutional deliveries, similarly Pandey et al reported an SBR of 24

per 1,000 births in Andhra Pradesh, where early identification of high-risk pregnancies and improved emergency obstetric care contributed to better outcomes (12,17,20). In Punjab, Gautam et al recorded an even lower SBR of 18 per 1,000 births, which was linked to higher literacy rates and better healthcare accessibility in the region.[12,17,20]

The higher stillbirth rate in our study can be explained by several contextual factors. A significant proportion of women (38.1%) resided 31–50 km away from healthcare facilities, leading to delays in seeking and receiving timely care. Additionally, the majority were recorded as unbooked at the study institution. The predominance of fresh stillbirths (65%) further underscores gaps in intrapartum monitoring and emergency obstetric services in our scenario.

Fresh stillbirths (65%), macerated cases (35%), indicating intrapartum events as a major contributor. Similar findings were reported by Ritesh et al in Madhya Pradesh, often due to delays in seeking care.[22] In contrast, a study by Shah et al Mumbai reported equal proportions, linking macerated stillbirths to undiagnosed antepartum complications.[23] The high fresh stillbirth rate in our study highlights the need for improved intrapartum care and timely referrals.

High-risk factors contributing to stillbirth

The most common aetiology was unexplained in 34.5% of patients, followed by preeclampsia (8.8%) and Meconium-Stained Liquor (6.7%), similar findings were reported by Usmani et al in Delhi, where 30% of stillbirths had no identifiable cause.[24] In contrast, a study by Kumar et al in Haryana identified PIH (25%) and anaemia (20%) as leading causes.[25]

CONCLUSION

In this study, stillbirths were frequently observed among unbooked pregnancies, primigravidae and pregnancies with a gestational age <37 weeks. A considerable proportion of stillbirth were fresh stillbirths, with the underlying cause remaining unexplained in several cases. Additionally, many women resided at considerable distances from the healthcare facility potentially contributing to delay in accessing appropriate obstetric care. These findings highlight the need to strengthen antenatal care, identify high risk pregnancies, timely recognition of fetal compromise, ensure timely referral, improve healthcare accessibility, and provide quality intrapartum care to reduce stillbirths in the study setting.

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