

**‘TO STUDY THE RATE AND CAUSES OF STILLBIRTH IN A TERTIARY CARE TEACHING INSTITUTE: A PROSPECTIVE OBSERVATIONAL STUDY’****Dr Banker Khyati Mahesh<sup>1</sup>, Dr Devjanani Raiguru<sup>2</sup>, Dr Sadhna Mathur<sup>3</sup>, \*Dr Ashwani Verma<sup>4</sup>**<sup>1</sup>Postgraduate Resident, Department of Obstetrics and Gynaecology, National Institute of Medical Sciences, Jaipur, Rajasthan, India<sup>2</sup>Assistant Professor Department of Obstetrics and Gynaecology, National Institute of Medical Sciences Jaipur, Rajasthan, India<sup>3</sup>Professor and Head of Department of Obstetrics and Gynaecology, National Institute of Medical Sciences Jaipur, Rajasthan, India<sup>4</sup>Assistant Professor Department of Obstetrics and Gynaecology, National Institute of Medical Sciences Jaipur, Rajasthan, India

\*Corresponding Author- Dr Ashwani Verma, Assistant Professor Department of Obstetrics and Gynaecology, National Institute of Medical Sciences Jaipur, Rajasthan, India

**Email: [ashwaniverma270891@gmail.com](mailto:ashwaniverma270891@gmail.com)****Abstract**

**Background:** Stillbirth is a devastating event for families and a significant public health concern. Despite advances in prenatal care, the incidence of stillbirth remains high in many parts of the world. Understanding the factors contributing to stillbirth and its impacts is crucial for developing effective prevention strategies and support systems.

**Aim and objective:** To study the rate and causes of stillbirth in a tertiary care teaching institute

**Method:** A prospective observational study carried out at the Department of Obstetrics and Gynecology, National Institute of Medical Sciences, Jaipur, Rajasthan over a period of 18 months.

**Result:** The stillbirth rate in our study was 23.2 per 1000 births. Maximum patient was in age group of 20-30 years, with 79.5% were unbooked cases, maximum period of gestation of stillbirth were 28-32 weeks with 3 had previous history of stillbirth. Hypertension was seen only in 1 patient, 1 was APLA positive and no diabetic. Maximum stillbirth 58.98% were macerated. Three stillbirth baby was with neural tube defect, 1 with hydrops and 1 with Budd Chiari syndrome. Blood group was negative in only 2 patients. Placental autopsy was done in 6 cases, no fetal autopsy was performed.

**Conclusion:** Stillbirth remains an issue with multifaceted causes and significant emotional and psychological impacts. Enhanced support systems for affected families are essential to mitigate the psychological toll of stillbirth. Further research is needed to explore innovative prevention strategies and to better understand the long-term impacts on families.

**Keywords:** stillbirth, risk factors, prevention, prenatal care, support services.

**INTRODUCTION**

Maternal health and neonatal outcome are two most important indicators of health care and development of a country. A stillbirth makes a negative impact on these statistics.

WHO defines stillbirth for international comparison as a baby is born with no signs of life at or after 28 weeks' gestation. Globally, an estimated 2.6 million stillbirths occur each year which account to nearly 7,200 babies stillborn each day. Amongst the total 1.19 million (45%) are intra-partum and 1.46 million

(56%) are antepartum. Current global stillbirth rate is 18.9/ 1000 total births and the average annual rate of global decline in stillbirths between 1995 and 2009 has been 1.1%, much slower when compared to the decline in maternal and child mortality. In India, estimated 6 lakh stillbirths occur every year. As per the national HMIS 3,03,857 stillbirths were reported for the year 2015-16.<sup>1</sup>

The stillbirth rate is a key indicator of quality of care during pregnancy and childbirth<sup>1</sup>

Definitions commonly used for recording stillbirths are as follows;

- ICD-10 defines a fetal death as death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles without specification of the duration of pregnancy. The denominator is all live births plus late fetal deaths.
- World Health Organization defines that stillbirth is a baby born with absolutely no signs of life at or after 28 weeks gestation, weight  $\geq 1000$  g, crown-heel length (CHL)  $\geq 35$  cm.
- Under India's HMIS a stillbirth has been defined as "complete expulsion or extraction of baby from its mother where the fetus does not breathe or show any evidence of life, such as beating of the heart or a cry or movement of the limbs" b) For the purpose of sentinel surveillance in the country the following definitions will be used
- Early fetal deaths: An early fetal death is death of a fetus weighing at least 500 grams (or, if birth weight is unavailable, after 20 completed weeks gestation, or with a crown-heel length of 25 centimetres or more).
- Late fetal deaths (stillbirths): A late fetal death is defined as a fetal death weighing at least 1000 grams (or a gestational age of 28 completed weeks or a crown-heel length of 35 centimetres or more).
- Fresh stillbirth or Intra partum stillbirths are defined as stillbirths occurring after the onset of labour in less than 12 hours before delivery with no skin changes weighing more than 1,000 grams and more than 28 weeks of gestation, but excludes severe lethal congenital abnormalities.
- Macerated stillbirth or Antepartum stillbirth is a baby born with all the changes which occur in a fetus retained in utero after death and the death occurred before the initiation of labour. A "macerated" fetus shows skin and soft-tissue changes (skin discoloration or darkening, redness, peeling, and breakdown)

In India, there are an estimated 613,500 third trimester still birth every year, with a rate of 22 per 1000 total birth but variation between states is large, with rates of less than 20 per 1000 total birth in Kerala and 66 per 1000 still birth or more in Central India<sup>2,3</sup>

Worldwide still birth rates have declined by 14% from 1995 to 2009 resulting in annual decline of 1.1% per year. But improvement of still birth rate is less in developing countries.<sup>4</sup>

Labour and birth are the time of highest risk accounting for an estimated 45% of the yearly worldwide third trimester stillbirths.<sup>5</sup>

There are well documented risk factors associated with stillbirth without a clear causal pathway, e.g. advanced age, maternal obesity, and smoking. There are many classification systems available in the literature based on fetal, associated maternal conditions or placental pathology.<sup>6-10</sup>

This study was planned to evaluate the causes and rate of stillbirth in our teaching institute.

## **AIMS AND OBJECTIVES**

To study the rate and causes of stillbirth in a Tertiary care teaching institute.

## **MATERIAL AND METHODS**

### **Place of study**

The study was carried out on the patients with stillbirths who were willing to participate at the Department of Obstetrics and Gynecology, National Institute of Medical Sciences, Jaipur, Rajasthan after taking approval of the protocol committee and institutional ethics committee.

### **Design of study**

Prospective observational study.

### **Study duration**

The study was conducted over a period of 18 months.

### **Study population**

The subjects in this study included all the booked/ unbooked pregnant women, these women were explained in detail about the study and informed consent was taken after verifying inclusion and exclusion criteria

### **Inclusion criteria**

1. Still born babies at or after 28 weeks of gestation.
2. Stillborn babies with birth weight more than 1000 gm.
3. APGAR score 0 and 0 at 1 and 5 minutes of birth.

Gestational age of the women, who delivered a stillbirth  $\geq 28$  weeks of gestation was calculated by LMP of woman or dating done on the basis of early gestation ultrasonography.

### **Exclusion criteria**

1. Baby Showed any Sign of life after birth.
2. Baby born with APGAR score more than 0 and 0 at 1 and 5 minutes of birth.

## **METHODOLOGY**

Detailed history of all the patients included the demographic profile of the patient, obstetric history, menstrual history, dating of pregnancy was done by last menstrual period. When the woman was not sure of her dates, it was calculated from first ultrasound. General physical examination included present height, built and weight. Vitals such as blood pressure, pulse, temperature, respiratory rate, chest and cardiovascular examination was done. All the patients were subjected to a thorough systemic examination. Per abdomen and pelvic examination of the patients was done.

Routine investigations which included complete hemogram, ABO Blood group, HIV, HbsAg, Anti-HCV, VDRL, urine routine and microscopy, serum TSH, OGCT with 75 g of glucose and special set of investigations which included renal function tests, liver function tests, coagulation profile, bleeding time, clotting time, ultrasonography and any other investigation special to the case, to look for the cause of stillbirth.

The pregnancy, labor events were noted and at delivery gross examination of baby along with the placenta were done to further look for any obvious cause of IUFD. The patients delivered vaginally or cesarean section was done as per the obstetrical indications.

If the consent was given the stillborn was sent for autopsy along with the placenta and cord for complete histopathological examination.

### Statistical analysis

All the data was collected and analyzed using SPSS 24.

**Results:** Total deliveries occurred in our institute during 18 months were 1681 and 39 were Still births. Stillbirth rate was 23.2 per 1000 births.

The distribution of stillbirths on the basis of demographic features, booking status, gestation, previous history of stillbirth, medical disorder in antenatal, birth weight, type of stillbirth, cord complications, autopsy performed or not, mode of delivery, colour of liquor and gender of baby blood group of patients are shown in tables 1 to 17

**Table 1: Distribution of age.**

Age	N=39	Percentage
<20 Years	2	5.1%
20-30 Years	25	64.1%
>30 Years	12	30.8%

**Table 2: Distribution of booking status.**

Booking status	N=39	Percentage
Yes	8	20.5%
No	31	79.5%

**Table 3: Distribution of Period of gestation (POG).**

POG	N=39	Percentage
<28wks	10	25.6%
28-32wks	3	7.7%
32-34wks	11	28.2%
34-37wks	9	23%
>37wks	6	15.4%

**Table 4: Distribution of history of stillbirth**

Previous stillbirth	N=39	Percentage
Yes	3	7.7%
No	30	92.3%

**Table 5: Distribution of hypertension.**

Hypertension	N=39	Percentage
--------------	------	------------

Chronic	0	0%
Gestational Hypertension	0	0%
PE	1	2.5%
Eclampsia	0	0%
No	38	97.5%

**Table 6: Distribution of birth weight.**

Birth weight	N=39	Percentage
<1000 gms	16	55.2%
1000-1500 gms	4	10.25 %
1500-2000 gms	4	10.25%
2000-2500 gms	9	23.07%
>2500 gms	6	15.38%

**Table 7: Distribution of APH.**

APH	N=39	Percentage
Placenta previa	0	0%
Abruption	3	7.7%
No	36	92.3%

**Table 8: Distribution of type of stillbirth.**

Type of stillbirth	N=39	Percentage
Fresh Stillbirth	16	41.02%
Macerated Stillbirth	23	58.98%

**Table 9: Distribution of sex of baby.**

Sex of baby	N=39	Percentage
Male	23	58.98%
Female	16	41.02%

**Table 10: Distribution of cord complications.**

Cord complications	N=39	Percentage
Cord presentation	0	0%
Cord prolapse	0	0%
Knots	1	2.56%
Loop around the	1	2.56%

neck		
No	37	94.87%

**Table 11: Distribution according to residence**

Residence	N=39	Percentage
Rural	18	46.15%
Urban	21	53.84%

**Table 12: Distribution according medical disorder**

Medical disorder	N=39	Percentage
Anaemia	18	46.1%
Epilepsy	2	5.1%
ARDS	1	2.5%
Hypothyroidism	3	7.7%

**Table 13: Distribution according to mode of delivery**

Mode of delivery	N=39	Percentage
Vaginal Delivery	27	69.23%
LSCS	12	30.77%

**Table 14: Distribution according to colour of liquor**

Colour of liquor	N=39	Percentage
Clear	22	56.41%
Blood stained	8	20.51%
Meconium	4	10.25%
Dark	4	10.25%
Anhydramnios	1	2.56%

**Table 15: Distribution according to congenital anomaly**

Congenital anomaly	N=39	Percentage
NTD	3	7.69%
Hydrops	1	2.56%
Budd Chiari II	1	2.56%
No	34	87.17%

**Table 16: Distribution according to Blood Group**

Blood group	N=39	Percentage
Positive	37	94.87%
Negative	2	5.1%

**Table 17: Distribution according to Autopsy done**

Autopsy done	N=39	Percentage
Yes	6	15.38%
No	33	84.62%

One patient was APLA positive, no patient was diabetic, no eclampsia cases were reported and autopsy of placenta was performed only in 6 cases.

### Discussion:

In present study the still birth rate was 23.2 per 1000 births. Total number of deliveries were 1681 in our institute which is comparable to study done by Singh et al in delhi<sup>15</sup> 29.15/1000 births but higher than the study done in Himachal by sharma et al<sup>16</sup> 10.1 per 1000 births and done in Purbey A et al<sup>17</sup> i.e 12.9 per 1000 births and less than study done by Konda KR et al<sup>18</sup> 52.41/1000 births and done in Kothiyal S et al<sup>19</sup> which was 78.3/1000 births

In present study, majority of patients were in age group of 20-30 years. Unbooked patients account majority of still births (79.5%). Only 3 patients had previous history of IUFD.

Macerated still births were 58.98%, cord abnormalities seen only in 2 patients, maximum SB occurs between 28-32 weeks of gestation (77%) and 16/39 were birth weight < 1000 gms.

No fetal autopsy was done and autopsy of placenta was performed in 6 cases. Majority of cases 37/39 were Rh positive and only 2 were Rh negative pregnancy with hydrops fetalis. There were no intrapartum stillbirth occurred in our institute during the study period, all were diagnosed stillbirths when they got admitted to our institute.

Ours institute is a tertiary care centre but a private facility and probably the reason why we had a number of deliveries. As The reason for higher stillbirth as most of them were unbooked and referred cases. As majority of cases were unbooked and referred cases regular Antenatal screening with identification high risk cases and timely referral to high centers to decrease incidence of SB.

### Conclusion:

Still birth and pregnancy losses are not given enough importance despite their high occurrence. Though the stillbirth rate is declining over the period but still the reduction rate is very slow especially in developing countries like India. Reducing the stillbirth rate in any country involves a multifaceted approach that addresses various health, social, and economic factors. Some strategies that can help to reduce stillbirths:

- Improve Access to Quality Prenatal Care -Ensure all pregnant women have access to regular and comprehensive prenatal care. Screen for and manage conditions such as hypertension, diabetes, and infections that can increase the risk of stillbirth.



- Enhance Health Infrastructure- Strengthen healthcare facilities, particularly in rural and underserved areas. Equip facilities with necessary resources, including trained healthcare providers and essential medical supplies.
- Training and Support for Healthcare Providers- Train healthcare providers on best practices for managing high-risk pregnancies
- Promote Healthy Lifestyles- Encourage smoking cessation, reduced alcohol consumption, and maintaining a healthy weight before and during pregnancy. Support programs that address substance abuse and provide mental health services.
  
- Implement National Health Policies- By implementing these strategies, a country can work towards reducing the stillbirth rate and improving overall maternal and child health outcomes.

### References:

1. Operational Guidelines for Establishing Sentinel Stillbirth Surveillance System: MoHFW.pdf
2. Bhutta Z, Nundy S, Abbasi K. is there hope for South Asia? *BMJ*. 2004;328:777-8.
3. Bang AT, Bang RA, Baitule SB, Reddy MH, Deshmukh MD. Effect of home-based neonatal care and management of sepsis on neonatal mortality: field trial in rural India. *Lancet*. 1999;354:1955-61.
4. Cousens S, Blencowe H, Stanton C, Chou D, Ahmed S, Steinhardt L, et al. National, regional and worldwide estimates of stillbirth rate in 2009 with trends since 1995: a systematic analysis. *The Lancet*. 2011;377(9774):1319-30.
5. Wang H, Yuan X, Yan S. monitoring and intervention of infant mortality rate in Beijing, 1992-2000. *Zhonghua Yi Xue Za Zhi*. 2001; 81:1424-6.
6. Froen JF, Gordijn SJ, Abdel-Aleem H, Bergsjø P, Betran A, Duke CW, et al. Making stillbirths count, making numbers talk—issues in data collection for stillbirths. *BMC Pregnancy Childbirth* 2009;9:58.
7. Lawn JE, Wilczynska-Ketende K, Cousens SN. Estimating the causes of 4 million neonatal deaths in the year 2000. *Int J Epidemiol* 2006;35:706–18.
8. Lawn JE, Yakoob MY, Haws RA, Soomro T, Darmstadt GL, Bhutta ZA. 3.2 million stillbirths: epidemiology and overview of the evidence review. *BMC Pregnancy Childbirth* 2009;9:S2.
9. Goldenberg RL, Kirby R, Culhane JF. Stillbirth: a review. *J Matern Fetal Neonatal Med* 2004;16:79–94.
10. Hogberg L, Cnattingius S. The influence of maternal smoking habit on risk of subsequent Stillbirth: is there a causal relation? *BJOG* 2007;114:6990704.
11. UNICEF. Stillbirths. <https://data.unicef.org/topic/child-survival/stillbirths/>; 2020. Accessed February 21, 2022.
12. 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(10302):P772–P785. [https://doi.org/10.1016/S0140-6736\(21\)01112-0](https://doi.org/10.1016/S0140-6736(21)01112-0).
13. Altijani N. Stillbirth among women in nine states in India: rate and risk factors in study of 886,505 women from the annual health survey. *BMJ Open*. 2018;8:e022583. <https://doi.org/10.1136/bmjopen-2018-022583>.
14. India Newborn Action Plan. New Delhi: Ministry of Health and Family Welfare; Government of India; 2004. Available from: [https://www.newbornwhocc.org/INAP\\_Final.pdf](https://www.newbornwhocc.org/INAP_Final.pdf) [cited 2022 Jun 15].

15. Singh et al An Analysis of Cause of Stillbirth in a Tertiary Care Hospital of Delhi: A Contribution to the WHO SEARO Project The Journal of Obstetrics and Gynecology of India (March–April 2019) 69(2):155–160.
16. Sharma A et al. enquiry evaluating the rate and causes of stillbirth in a tertiarycare centre of northern india . ejpmr, 2023, 10(5), 169-175