

ENQUIRY EVALUATING THE RATE AND CAUSES OF STILLBIRTH IN A TERTIARY
CARE CENTRE OF NORTHERN INDIA

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Article Received on 02/03/2023

Article Revised on 22/03/2023

Article Accepted on 12/04/2023

ABSTRACT

Introduction: Birth of a baby holds a very important role the journey of parenthood but the whole process of giving birth *i.e.* parturition carries a high risk of death, disability and loss of developmental potential for the infant, which further has major social implications. The aim of this study is to evaluate the rate and causes of stillbirth in a Medical college. **Materials and Methods:** The prospective observational study was carried out on the patients with stillbirths, who were willing to participate, at the Department of Obstetrics and Gynaecology, Dr. Rajendra Prasad Govt. Medical College, Kangra at Tanda (Himachal Pradesh) over a period of one year. Data including detailed history, investigations, placental histopathology and autopsy of stillborn fetus was taken to classify the cause of stillbirth. **Discussion:** In present study the incidence of stillbirth is 10.1 / 1000 live births which was further classified as per the various observations made into various causes like Intrapartum causes, maternal causes, fetal causes, placental causes, amniotic fluid related causes, cord related complications etc.

INTRODUCTION

If a healthy baby is not less than gift of God, the birth of a dead baby is a bitter calamity.^[1] Every stillbirth is a tragic experience for parents and family. Psycho-social consequences for parents include, anxiety, long-term depression, post-traumatic stress disorder and stigmatisation.^[2] Sadly, women who have experienced a stillbirth are more likely to experience this again in subsequent pregnancies than those who have not.^[3]

The definition of stillbirth has changed over time despite clear worldwide guidelines and inconsistent use of terminology has contributed to great confusion about stillbirths. There is much variation between countries, with greater variability in high income countries than in low income countries.^[4,5] The International Classification of Diseases, 10th revision (ICD-10)^[6] refers to fetal deaths, as "death prior to the complete expulsion or extraction of product of conception from the mother, 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." ICD defines fetal death as still birth when the weight is ≥ 500 grams or gestation \geq or, if both these criteria are unknown, by crown-heel length of ≥ 25 cm. While WHO determines still birth as late fetal deaths (third trimester) either with birth weight ≥ 500 grams or gestation ≥ 24 weeks or body length ≥ 35 cm.^[7] These parameters have been set after considering worldwide neonatal intensive care as well as survival rates of babies born at these gestation and with these weights.^[8,9,10] The WHO has

reported 2.6 million stillbirths in the year 2015 globally, with 5,92,090 occurring in India only, making it to be at the top of this list.^[11,12,13,14]

It is important to build capacity of health care providers to carry out perinatal death audit using clear guidelines and a suitable classification system that enables causes and risk factors to be identified. Further research should be done to focus on standardization and reporting of stillbirths, including the development of a simple classification system. Therefore, this study was undertaken to evaluate the various etiological factors of stillbirth in the Department of Obstetrics and Gynecology, Dr. Rajendra Prasad Government Medical College, Kangra at Tanda.

AIMS AND OBJECTIVES

This study was carried out in the Department of Obstetrics and Gynecology, Dr. Rajendra Prasad Govt. Medical College, Kangra at Tanda, District Kangra, Himachal Pradesh to evaluate the rate and causes of stillbirth over a period of one year.

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, Dr. Rajendra Prasad Govt. Medical College, Kangra at Tanda, District Kangra, Himachal Pradesh, India 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 one year.

Study population

The subjects in this study included all the booked/unbooked pregnant women, who delivered at gestation \geq 24 weeks or with birth weight \geq 500gm with stillbirth, at the Department of Obstetrics and Gynecology, Dr. RPGMC Tanda. 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 24 weeks of gestation.
2. Stillborn babies with birth weight more than 500 gm.
3. APGAR score 0 and 0 at 1 and 5 minutes of birth.

Gestational age of the women, who delivered a stillbirth \geq 24 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

All the women along with family member were explained about the study in detail, counselled about the IUFD, the current status of the patient and further management.

Detailed history of all the patients with documented IUFD was taken. It included the demographic profile of the patient, obstetric history, menstrual history, dating of pregnancy was done by last menstrual period if patient was sure of her dates. When the woman was not sure of her dates, it was calculated from first ultrasound. General physical examination included present weight, built and height. Vitals monitoring 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.

Every patient was ordered a set of 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.

In all the women with fresh (intrapartum) stillbirth, included in the study, the various variables observed were recorded.

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

Data collection

The data was collected and transferred to Microsoft Excel sheet.

Statistical analysis

The demographic variables like age, parity, booking status, and socioeconomic status were Analysed and Presented as frequency and percentage.

All the data was collected, put into master chart and was analysed using Epi-Info software.

Ethical issues

There was no drug trial or human/ animal experiment involved. All the women were treated in their best interest in consultation with the consultant on duty.

Conflict of interest

None declared.

Financial disclosures

The facility for investigations and management already exist in the Department of Biochemistry, Pathology and the Department of Obstetrics and Gynecology, Dr.R.P.G.M.C. Tanda at Kangra, Himachal Pradesh. This study was not being financed by any organization.

OBSERVATION

The study conducted in the Department of Obstetrics and Gynaecology, Dr. R.P.G.M.C, Kangra at Tanda (H.P) on women who were admitted to the antenatal ward or the labour room. The patients presenting with either USG proven IUFD or who had intra partum IUFD during the course of labour were included in study. The women who were fulfilling the inclusion criteria and willing to participate were explained about the study in detail and were enrolled after taking written informed consent. There were a total of 9820 deliveries that took place in our institute and there were 101 cases of stillbirth giving an incidence of 10.1 stillbirths per 1000 births in our institute.

The various variables studied, with the aim to evaluate the Prevalence and Causes of stillbirth were:

Table 1: Distribution of age.

Age	Frequency(n)	Percentage	95% CI
<20 Years	14	13.9%	8.1% - 22.5%
20-25 Years	44	43.6%	33.8% - 53.8%
26-30 Years	32	31.7%	23.0% - 41.8%
31-35 Years	11	10.8%	5.8% - 19.0%
Total (N)	101	100%	

Table 2: Distribution of education.

Education	Frequency(n)	Percentage	95% CI
Illiterate	7	6.9%	3.1% - 14.2%
Primary	15	14.9%	8.8% - 23.6%
Middle School	33	32.7%	23.9% - 42.8%
High School	27	26.7%	18.6% - 36.6%
Graduate And Above	19	18.8%	12.0% - 28.1%
Total(N)	101	100%	

Table 3: Distribution of booking status.

Booking status	Frequency(n)	Percentage	95% CI
Yes	71	70.3%	60.3% - 78.8%
No	30	29.7%	21.2% - 39.7%

Table 4: Distribution of place of booking.

Place of booking	Frequency(n)	Percentage	95% CI
Unbooked	4	4.0%	1.3% - 10.4%
Sub Centre	19	18.8%	12.0% - 28.1%
PHC	29	28.7%	20.4% - 38.7%
DH	27	26.7%	18.6% - 36.6%
Private Hospital	10	9.9%	5.1% - 17.9%
Medical College	12	11.9%	6.6% - 20.2%
Total (N)	101	100%	

Table 5: Distribution of BMI

BMI	Frequency(n)	Percentage	95% CI
<18.5 Kg/m ²	8	7.9%	3.7% - 15.5%
18.5-24.9 Kg/m ²	75	74.3%	64.4% - 82.2%
25-29.9 Kg/m ²	14	13.9%	8.1% - 22.5%
30-34.9 Kg/m ²	4	4.0%	1.3% - 10.4%

Table 6: Distribution of POG.

POG	Frequency(n)	Percentage	95% CI
Term	51	50.5%	40.4% - 60.5%
Pre-Term	49	48.5%	38.5% - 58.6%
Post-Term	1	1.0%	0.1% - 6.2%
Total (N)	101	100%	

Table 7: Distribution of history of stillbirth.

Previous h/o stillbirth	Frequency(n)	Percentage	95% CI
Yes	5	5.0%	1.8% - 11.7%
No	96	95.0%	88.3% - 98.2%
Total(N)	101	100%	

Table 8: Distribution of hypertension.

Hypertension	Frequency(n)	Percentage	95% CI
Chronic	11	10.9%	5.8% - 19.0%
Gestational Hypertension	10	9.9%	5.1% - 17.9%
PE	29	28.7%	20.4% - 38.7%
Eclampsia	10	9.9%	5.1% - 17.9%

Hypertension	Frequency(n)	Percentage	95% CI
No	41	40.6%	31.1% - 50.8%
Total (N)	101	100%	

Table 9: Distribution of diabetes.

Diabetes	Frequency(n)	Percentage	95% CI
Overt Diabetes	11	10.9%	5.8% - 19.0%
GDM	15	14.9%	8.8% - 23.6%
No	75	74.3%	64.4% - 82.2%
Total (N)	101	100%	

Table 10: Distribution of IUGR.

IUGR	Frequency(n)	Percentage	95% CI
Mild	12	11.9%	6.6% - 20.2%
Severe	31	30.7%	22.1% - 40.8%
No	58	57.4%	47.2% - 67.1%
Total(N)	101	100%	

Table 11: Distribution of APH.

APH	Frequency(n)	Percentage	95% CI
Placenta previa	8	7.9%	3.7% - 15.5%
Abruption	12	11.9%	6.6% - 20.2%
No	81	80.2%	70.8% - 87.2%
Total (N)	101	100%	

Table 12: Distribution of preterm labor.

Preterm labor	Frequency	Percentage	95% CI
Spontaneous	21	20.8%	13.6% - 30.2%
Induced	14	13.9%	8.1% - 22.5%
No	66	65.3%	55.2% - 74.4%
Total	101	100%	

Table 13: Distribution of cholestasis in pregnancy.

Cholestasis in pregnancy	Frequency(n)	Percentage	95% CI
Yes	22	21.8%	14.4% - 31.3%
No	79	78.2%	68.7% - 85.6%
Total (N)	101	100%	

Table 14: Distribution of timing of IUD.

Timing Of IUD	Frequency(n)	Percentage	95% CI
Antenatal	93	92.1%	84.5% - 96.3%
Intranatal	8	7.9%	3.7% - 15.5%
Total (N)	101	100%	

Table 15: Distribution of Intrapartum IUD.

Intrapartum IUD	Frequency(n)	Percentage	95% CI
1st Stage	8	7.9%	3.7% - 15.5%
2nd Stage	93	92.1%	84.5% - 96.3%
Total (N)	101	100%	

Table 16: Distribution of type of stillbirth.

Type of stillbirth	Frequency(n)	Percentage	95% CI
Fresh Stillbirth	18	17.8%	11.2% - 27.0%
Macerated Stillbirth	83	82.2%	73.0% - 88.8%
Total (N)	101	100%	

Table 17: Distribution of sex of baby.

Sex of baby	Frequency(n)	Percentage	95% CI
Male	61	60.4%	50.1% - 69.8%
Female	40	39.6%	30.2% - 49.9%
Total (N)	101	100%	

Table 18: Distribution of weight of baby.

Weight of baby	Frequency	Percentage	95% CI
<1000 Gram	19	18.8%	12.0% - 28.1%
1000-1500 Gram	14	13.9%	8.1% - 22.5%
1501- 2000 Gram	29	28.7%	20.4% - 38.7%
2001- 2500 Gram	29	28.7%	20.4% - 38.7%
2501- 4000 Gram	9	8.9%	4.4% - 16.7%
>4000 Grams	1	1.0%	0.1% - 6.2%
Total	101	100%	

Table 19: Distribution of cord complications.

Cord complications	Frequency	Percentage	95% CI
Cord presentation	2	18.2%	3.2% - 52.2%
Cord prolapse	6	54.5%	24.6% - 81.9%
Knots	1	9.1%	0.5% - 42.9%
Loop around the neck	2	18.2%	3.2% - 52.2%
Total	11	100%	

Table 20: Distribution of congenital malformations.

Congenital malformation	Frequency(n)	Percentage	95% CI
Yes	9	8.9%	4.4% - 16.7%
No	92	91.1%	83.3% - 95.6%

(8.9%) fetuses had gross birth defect. Among these 9 fetuses with visible gross birth defects

- 2 had anencephaly
- 1 had cleft lip and palate with imperforate anus.
- 1 had hydrocephalus.
- 2 were having non immune hydrops fetalis.
- 1 had visible meningomyelocele

Table 21: Distribution of fetal autopsy.

Fetal autopsy	Frequency(n)	Percentage	95% CI
Anomaly Detected	5	5.0%	1.8% - 11.7%
Not Done	96	95.0%	88.3% - 98.2%
Total (N)	101	100%	

5(5.0%) fetuses had anomalies detected in autopsy.

- The fetus having cleft lip and palate with imperforate anus had congenital diaphragmatic hernia on autopsy.
- One fetus with non immune hydrops had duodenojejunal atresia on autopsy.
- One fetus with anhydramnios and IUGR had pulmonary hypoplasia with bilateral renal agenesis on autopsy.
- Two fetuses sent for autopsy had no visceral malformations on autopsy.

Table 22: Classification of Causes of Stillbirth.

Associated Factor	Cause of stillbirth	No.
Foetus	Lethal congenital anomalies	5
Non immune hydrops		1
Isoimmunization		4
Pre term		49
Foetal growth restriction		43
Umbilical Cord Related	Prolapse	6
Presentation		2
Knots		1
Placenta Related	Abruption	15

Placenta previa		8
Vasa previa		0
Amniotic Fluid	Anhydramnios	20
Oligohydramnios		20
Polyhydramnios		6
Maternal Diseases	Diabetes	26
Chronic Hypertension		11
Hypertensive disease in pregnancy		49
Cholestasis		22
Intra partum	Birth asphyxia	8

DISCUSSION

A stillbirth can happen to pregnant women of any age, background, or ethnicity. They can be unpredictable – 1/3 of cases go unexplained. With the early diagnosis and termination of the fetuses having cytogenetic abnormalities, congenital anomalies and intrauterine fetal infections, which constitute a major chunk of intrauterine deaths later, there is substantial decrease in stillbirth rate. Further, owing to the improvement in the antenatal and intranatal care, it has been made possible to reduce stillbirths occurring due to preventable causes. This study was done in the Department of Obstetrics and Gynaecology, Dr R.P.G.M.C, Kangra at Tanda (H.P) on pregnant women who reported to labour room or admitted to the antenatal ward with IUFD or women who had IUFD during the course of labour, with the aim of study was to evaluate for rate and causes of stillbirth and the observation made have been discussed.

In present study the incidence of stillbirth is 10.1 / 1000 live births which was comparable to the study conducted by Devi KS et al^[11] which was 11.3 per 1000 live births and to Patel et al^[15] which was 10.6 / 1000 live births. In the present study, majority of the patients that is 96% were booked because of better health services in our state. In a similar study conducted by Parpillewar MB et al^[16] and Shrestha J et al,^[17] the percentage of booked patients were 92.3% and 91% respectively. In this study, hypertensive disorder of pregnancy contributed to 59.4% of the stillbirths in our study population. Devi et al^[11] reported similar incidence of hypertensive disorder of pregnancy contributing to stillbirth i.e. 59.2%. In our present study diabetes contributed to stillbirth in 21.8% cases while Devi KS et al^[11] observed diabetes in 11.6% women which was lower in comparison to the present study.

Intrapartum Birth asphyxia with MSL was the major contributor of intrapartum stillbirth (8%). Korde-Nayak and Gaikwad^[18] reported a similar occurrence of birth asphyxia at 8.4%.

In our study, 61% of the foetuses delivered were male and the rest 40% of the foetuses were female. There were no foetuses having ambiguous sex. This result is comparable to study conducted by Parpillewar MB et al^[16] where the male to female ratio was almost similar to our study at 56.95% and 43%.

CONCLUSION

The birth of a dead baby is a dreadful for both family and health care system. Though the stillbirth rate is declining over the period but still the reduction rate is very slow especially in developing countries like India. Identification of the causes of IUFD will be helpful in counselling of parents as well as for formulating preventive measures at community level.

In our study a total of 9820 deliveries took place and there were 101 cases of stillbirth giving an incidence of 10.1 stillbirths per 1000 births in our institute and majority of antepartum stillbirths were associated with IUGR, hypertension in pregnancy, APH, diabetes mellitus, ICP and congenital malformations. Majority of these women with antepartum IUFD had their ANC at a primary health care centre which were lacking in specialist care facility and timely recognition of danger signs. Conditions like Hypertension, ante partum haemorrhage, diabetes, ICP and IUGR can be prevented by good quality obstetric care during the antenatal period with routine antenatal check-ups, prenatal screenings and prophylaxis for various diseases, early recognition of danger signs along with early referral. Some of the lethal congenital foetal malformations should have been recognized by detailed ultrasonography before 20 weeks of gestation at a tertiary care centre.

The majority of the intrapartum stillbirths in our institute were due to birth asphyxia and hypertensive disorders of pregnancy, cord complications and prolonged labour. These could have been prevented by strict intrapartum foetal heart rate surveillance and identifying risk factors like pre-eclampsia, at early weeks of gestation and initiating appropriate strategies for their management.

Most of the maternal and foetal complication that led to stillbirth was preventable. Improving the uptake of ANC and timely identification along with effective management of these maternal and foetal complications could reduce preventable stillbirths. Meeting these results will require that the national health community, country leaders, and individual women and men must collaborate more effectively in support of the following actions:

1. Deliberate leadership at global and country level, especially from policy makers.

2. Increased voice, especially of women, to break the silence and reduce stigma and taboo surrounding stillbirths.
3. Implementation of integrated interventions across the maternal and child health continuum, with investment that is commensurate with the scale of the national burden of stillbirth.
4. Availability of better medical care facilities, advanced diagnostics, and specialist care at PHC level along with a robust and prompt referral system with the availability of feto-maternal autopsy option in case a stillbirth happens.
5. Definition and use of indicators to measure progress and quality of care.
6. Investigation of gaps in knowledge on stillbirth prevention and bereavement support.
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