# INTRAPARTUM STILLBIRTH, ASSOCIATED RISK FACTORS AND DELAYS IN A TERTIARY CARE HOSPITAL

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**ABSTRACT**
**Background:** Each year, 1.2 million intrapartum stillbirths occur globally. An understanding of the risk factors associated with intrapartum stillbirth will facilitate the development of preventative strategies to reduce the associated burden of death. This study was conducted in a tertiary-care setting with the aim to identify risk factors associated with intrapartum stillbirth.
**Methods:** This was an observational prospective study conducted in the Department of Obstetrics and Gynaecology, S.M.G.S. Hospital, Jammu over a period of one year i.e from September 2017 to August 2018 after approval from the Hospital Ethical Committee. Subjects were patients coming to the hospital with documented IUD and patients with stillbirth occurring during the hospital stay, with gestational age>22 weeks and birth weight >500gm.
**Results:** In our study, we observed that a total of 22,723 deliveries occurred in the hospital out of which 800 were stillbirths; stillbirth rate was found to be 35.20 per 1000 births.The mean age of patients was 26.57±4.65years . Majority of the patients in the study were primigravida (43.13%). Prematurity was the most common intranatal risk factor (8.98%) followed by abruption (6.86%) and acute fetal distress(AFD) (6.11%).
**Conclusions:** Being born preterm with a small-for-gestational age was associated with the highest risk for intrapartum stillbirth. The most common delay associated with intrapartum stillbirth was in reaching the hospital.

**KEYWORDS :** Stillbirth, IUD, Intrapartum, risk factors.

## INTRODUCTION

Stillbirth has a traumatic effect on the life of a woman and her family. It has been a worry that reduction of stillbirths was not regarded as one of the Millennium Development Goals and that India continues to be at top of the list recording the highest number of stillbirths.WHO reported that in 2015 there were 2.6 million stillbirths globally, this accounts for over 7178 deaths per day (18.4 stillbirths per 1000 total births , compared with 24.7 stillbirths in 2000)[1]. The majority of these deaths occurred in developing countries.75% of the stillbirths occurred in South Asia and sub-Saharan Africa and 60% out of this occurred in rural families from these areas. It is said that about 66% of the worldwide stillbirths is contributed by developing nations like India, Pakistan, Nigeria, China, Demographic Republic of Congo, Ethiopia, Bangladesh, Indonesia, Tanzania and Afghanistan. India, with 592,100 stillbirths, accounted for 22.6% of the global burden of stillbirths in 2015.

Of the total number of stillbirths that occur in South Asia, 57 % are during the intrapartum period. Variation in the rate of intrapartum stillbirth within countries is wide and depends upon the health facilities providing intrapartum care, as well as the preparedness of the birth attendant for each delivery. Identifying risk factors for intrapartum stillbirth and delays in the quality of care provided, is critical to identify appropriate interventions.

A systematic review by Lawn et al. examining risk factors for intrapartum stillbirth indicated that intrapartum stillbirth is preventable, as 25–67 % are primarily due to preventable intrapartum complications, such as prolonged labor[3].

In India the stillbirth prevalence is underestimated, due to improper reporting, home births and stigma attached to delivering a dead foetus. The reported incidence of stillbirth varies significantly between different countries depending on the definitions used. With improvement in prenatal and intranatal care, some of these can be prevented.

## METHODS

This was an observational prospective study conducted in the Post Graduate Department of Obstetrics and Gynaecology, S.M.G.S. Hospital, Jammu over a period of one year i.e from September 2017 to August 2018 after approval from the Hospital Ethical Committee. Subjects were patients coming to the hospital with documented IUD and patients with stillbirth occurring during the hospital stay, with gestational age>22 weeks and birth weight >500gm. A thorough history of the patient and a gross examination of the delivered baby was done.

## RESULTS

Majority of the patients in the age group of 20-25 years (359; 44.88% ), followed by 26-30 years (299; 37.38%), 31-35 years (83; 10.38%) and >35 years (38; 4.75). Only 21 patients (2.63%) were in the age group of <20 years (Table no.1).

**Table no.1 : Age distribution of patients**

| Age(years) | No. | Percentage(%) |
|---|---|---|
| <20 | 21 | 2.63 |
| 20-25 | 359 | 44.88 |
| 26-30 | 299 | 37.38 |
| 31-35 | 83 | 10.38 |
| >35 | 38 | 4.75 |
| Total | 800 | |

We observed that maximum patients i.e. 305 (38.12%) were primigravida .228(28.50%) were observed to be second gravida whereas third gravida were 130(16.25%) . 70(8.75%) and 67(8.37%) were fourth gravida and above respectively (Table no.2).

**Table no.2: Gravidity of patients**

| Gravidity | No. | Percentage(%) |
|---|---|---|
| 1 | 305 | 38.12 |
| 2 | 228 | 28.50 |
| 3 | 130 | 16.25 |
| 4 | 70 | 8.75 |
| 5 or more | 67 | 8.37 |
| TOTAL | 800 | |

Majority of patients i.e.36%(288) had gestational age between 36 to<40 weeks, 23.50% (188) had gestational age of 32 to<36 weeks.A cumulative 35.25% (282) patients were of <32 weeks gestational age and only 5.25%(42) patients were postdated(Table no.3).

**Table no. 3 : Distribution of patients according to gestational age**

| Gestational age (in weeks) | No. | Percentage (%) |
|---|---|---|
| 22-<28 | 122 | 15.25 |
| 28-<32 | 160 | 20.00 |
| 32-<36 | 188 | 23.50 |
| 36-<40 | 288 | 36.00 |
| 40 or more | 42 | 5.25 |
| Total | 800 | |

Majority of patients 418(52.25%) resided in the rural area while 382(47.75%) patients were residing in urban areas(Table no.4).

**Table no.4 : Residence**

| Residence | No. | Percentage(%) |
|---|---|---|
| Urban | 382 | 47.75 |
| Rural | 418 | 52.25 |
| Total | 800 | |

We observed that 235(29.38%) patients were illiterate, while 71 (8.88%) and 211(26.38%) had education till 5th and 10th standards respectively. 226 (28.25%) patients were educated till 12th standard and only 57(7.13%) were graduates and above(Table no. 5).

**Table no.5 : Educational status**

| Education | No. | Percentage(%) |
|---|---|---|
| Illiterate | 235 | 29.38 |
| Primary | 71 | 8.88 |
| Upto 10th | 211 | 26.38 |
| 10th -12th | 226 | 28.25 |
| Graduate and above | 57 | 7.13 |
| Total | 800 | |

The vast majority of patients, 696(87%), were not booked in our hospital. Only 83(10.38%) patients were booked cases of our hospital. 21 patients (2.62%) had no prior AN checkups ( Table no.6).

**Table no.6 : Booking status**

| Booking status | No. | Percentage(%) |
|---|---|---|
| Booked in SMGS | 83 | 10.38 |
| Booked elsewhere | 696 | 87.00 |
| No ANC | 21 | 2.62 |
| Total | 800 | |

455 out of 800(56.88%) patients belonged to middle class group while 19.88% belonged to lower class and lower middle class combined. About 133 (16.63%) belonged to the upper middle class while a relatively small percentage of patients 53 (6.63%) were from upper class (Table no.7).

**Table no. 7: Socio-economic status**

| S-E status | No. | Percentage(%) |
|---|---|---|
| Lower class | 15 | 1.88 |
| Lower middle class | 144 | 18.00 |
| Middle class | 455 | 56.88 |
| Upper middle class | 133 | 16.63 |
| Upper class | 53 | 6.63 |
| Total | 800 | |

(According to B.G. Prasad scale)

On admission 675 (84.38%) women had absent fetal heart sounds as documented on USG and only125 (15.63%) had a live fetus (Table no.8).

**Table no. 8: Fetal status on admission**

| Fetal status | No. | Percentage (%) |
|---|---|---|
| IUD | 675 | 84.38 |
| Live fetus | 125 | 15.63 |
| Total | 800 | |

(on USG)

The majority of IUD babies delivered were fresh i.e. 443 (55.38%) whereas 357 (44.63%) were macerated (Table no.9).

**Table no.9 : Type of IUD**

| Type | No. | Percentage(%) |
|---|---|---|
| Fresh | 443 | 55.38 |
| Macerated | 357 | 44.63 |
| Total | 800 | |

Maximum number of babies were male 413( 51.63%), followed by female 381( 47.63%)and 6 had ambiguous sex( 0.75%)(Table no.10).

**Table no.10: Sex of stillborns**

| Sex | No. | Percentage(%) |
|---|---|---|
| Male | 413 | 51.63 |
| Female | 381 | 47.63 |
| Ambiguous | 6 | 0.75 |
| Total | 800 | |

The most common intrapartum risk factor was prematurity (8.98%) followed by abruption (6.86%) and acute fetal distress(6.11%). Other causes were prolonged or obstructed labor and chorioamnionitis (Table no.11).

**Table no.11: Risk factors associated with stillbirth in study patients**

| Risk factors | No. | | Percentage (%) | |
|---|---|---|---|---|
| Intranatal risk factors | | | | |
| Prematurity | <28 weeks | 36 | 4.49 | 8.98 |
| | 28 weeks-term | 36 | 4.49 | |
| APH | Placenta previa | 25 | 3.12 | |
| | Abruptio placenta | 55 | 6.86 | |
| Prolonged leaking/ chorioamnionitis | 22 | | 2.74 | |
| Prolonged / obstructed labor | 22 | | 2.74 | |
| Cord accidents | 29 | | 3.62 | |
| Rupture uterus | 18 | | 2.24 | |
| AFD | 49 | | 6.11 | |
| No risk factor | 112 | | 14 | |
| Antenatal risk factors | 778 | | | |
| Total | 1182 | | | |

The possible delays associated with intrapartum stillbirths were analysed and it showed that majority were due to delay in reaching the hospital (Table no.12).

**Table no.12: Delay associated with intrapartum death**

| Type of delay | No. | Percentage |
|---|---|---|
| Type 1 | 45 | 18.90 |
| Type 2 | 183 | 76.89 |
| Type 3 | 10 | 4.20 |
| Total | 238 | |

Type 1- delay in seeking treatment
Type 2-delay in reaching the hospital
Type 3-delay in receiving treatment

**DISCUSSION**
Our study examined various demographic and obstetric risk factors and their association with intrapartum stillbirth in a tertiary hospital setting. The most common intrapartum risk factor in our study was observed to be prematurity due to preterm labour pains. Prematurity accounted for 8.98% of the patients out of which half were <28 weeks of gestation. This corresponds with the study by McClure et al(2017)[4] in which 12.8% patients had stillbirth with prematurity being the only apparent risk factor. Also in the case control study by Ashish et al(2016)[5] in a tertiary care center in Nepal about 16.9% of total stillbirth cases were premature.

The next risk factor was antepartum hemorrhage(APH) which comprised of 6.68% cases of abruption with 3.12 % cases of placenta previa with a combined 9.8% patient population. The results are similar to the study by Newtonraj et al(2017)[6] in a Chandigarh based mutli agency study India in which 7% of intrapartum stillbirths were due to APH. In the study by Njoku et al(2016)[7] in Nigeria 2.2% cases of stillbirth were due to placenta previa and 9.3% due to abruption.

Another major intrapartum risk factor is prolong or obstructed labour and prolonged leaking both of which account for 2.74% each. In the study by Garg et al(2017)[8] at the Maharishi Markandeshwar Institute

of Medical Sciences and Research, Ambala, Haryana 3.75% cases of stillbirth were due to obstructed labour which is similar to our study results.

Another quite obvious risk factor was cord accidents which included cord prolapse, loop and knots. In our study these contributed to 3.62% of the risk factors. This is in accordance to the study by Jindal et al(2018)[9] in Himachal Pradesh which had 3.1% cord accidents. In the study by Njoku et al(2016)[7] in Nigeria about 2.9% stillbirths were associated with cord prolapse/cord accidents.

Uterine rupture was another important risk factor for the occurrence of stillbirth especially in multigravida. In our study 2.24% cases of uterine rupture were reported which were managed by laparotomy and delivery of a stillborn baby. The study by Jindal et al(2018)[9] in Himachal Pradesh had similar results with 3.1% stillbirths being attributed to uterine rupture.

Acute fetal distress in the form of irregular fetal heart or bradycardia in patients with a regular fetal heart earlier was also an important risk factor as it accounted for 6.11% of the patients. In the systemic review by Aminu et al(2014)[10] intrapartum asphyxia and distress varies from 3.1-25%. In the study by Rai et al(2018)[11] in Sikkim birth asphyxia due to meconium aspiration (13.3%) was a notable factor leading to early neonatal deaths; whereas in the study by Jindal et al(2018)[9] in Himachal Pradesh peripartum asphyxia accounted for 9.09% of the cases. This parameter varies in all studies as all institutes have different protocols and techniques of fetal heart rate monitoring and also different referral rates.

Lastly, we observed that in 14% patients no apparent risk factor could be found, antepartum or intrapartum. Similar results were observed in studies by Jindal et al(2018)[9] in Himachal Pradesh and Garg et al(2017)[8] in Haryana in which 11.7% and 17.5% cases of stillbirth were unexplained.

We also observed the delays associated with intrapartum risk factors where possible. Nonmedical factors contributing to stillbirths included delays in receiving appropriate management, inadequate intrapartum monitoring, inappropriate interventions, and wrong diagnosis.These delays were classified as type 1(delay in seeking care), type 2 (delay in reaching the hospital) and type 3(delay in receiving treatment at the hospital). All 3 types of delay were significantly associated with intrapartum stillbirth. In our study the majority of delays were type 2 (76.89%) followed by type 1 (18.9%). Type 3 delays constituted 4.2% . This relates with the fact that majority of the cases in our study were unbooked and possibly referred at the time of labour to our hospital which accounts for the vast majority of type 2 delays.

In our study (51.63%) fetuses were males, 381 (47.63%) were females and 0.75% had ambiguous sex due to extreme prematurity. This is similar to the result of a retrospective observational study by Sailaja et al(2018)[12] in a tertiary perinatal institute in Southern India which had 50.7% male and 48.6% female stillborn babies. In a systemic review and meta-analysis of more than 30 million births by Mondal et al(2014)[13] the crude mean rate (stillbirths/1,000 total births) was 6.23 for males and 5.74 for females.

The presence (or absence ) of the fetal heart sound at the time of admission were taken into account and 675 (84.38%) women had absent fetal heart sounds as documented on USG and only125(15.63%) had a live fetus on admission. This in conjunction with the type IUD delivered gives an insight into the possible delay encountered while seeking or getting treatment as the majority of IUD babies delivered were fresh i.e. 443 (55.38%) whereas 357 (44.63%) were macerated IUDs. This is in accordance to the research article by Dandona et al(2017)[14] based on the multistage stratified random sampling approach in clusters in Bihar , India in which the majority of patients, 671 out of 915(73.33%) had a fresh IUD delivery.

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