

# Incidence of Stillbirth in a Tertiary Medical College in North- Eastern India and its Associated Maternal and Foetal Factors.

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Received: November 2017

Accepted: November 2017

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## ABSTRACT

**Background:** Perinatal mortality still continues to be high in India. The most important reason is that 60% of perinatal deaths are constituted by stillbirths and reducing stillbirth rate has always been a challenge to obstetricians for decades. In order to reduce the stillbirth rate it is mandatory to ascertain the various determinants of it. Studies regarding this in the north-eastern part of India are almost non-existent. **Objectives:** The objectives of the current study were to estimate the magnitude of stillbirth and also to ascertain the association between stillbirth and maternal and foetal factors. **Methods:** A hospital-based prospective study was done in the Department of Obstetrics and Gynaecology of RIMS, Imphal, Manipur in the year 2003. Data regarding socio-demographic backgrounds, detailed obstetric history, examination and investigative findings and pregnancy outcome was collected from 5,588 mothers who gave to 5,672 deliveries. **Results:** The stillbirth rate was found to be 17.6 per 1,000 births. The statistically significant determinants of stillbirth were rural residency, low educational level, age than 40 years, high parity, un-booked cases, anaemia, hypertension, high parity, twin delivery, presence of risk factors, breech delivery, preterm delivery and low birth weight. **Conclusion:** Stillbirth rate continues to be high in the north-eastern part of the country. And many of the determinants of stillbirth found out were preventable factors.

**Keywords:** Gestational age, Perinatal mortality, Preterm, Stillbirth.

## INTRODUCTION

Several major achievements have been made in global health in the last two decades. One of these major achievements is halving the under-five mortality in children, dropping from 90 to 43 deaths per 1,000 live births between 1990 and 2015.<sup>[1]</sup> This prompted the United Nations to target it to be made at least as low as 25 per 1,000 live births as one of Sustainable Development Goals (SDGs) to be achieved by the year 2030.<sup>[2]</sup> Significant reduction in child mortality has been made but the progress in reducing perinatal mortality is rather slow. In order to achieve the aforementioned SDG target, it is vital to reduce the perinatal mortality.

Stillbirth which is defined as “foetus born dead and weighing over 500g (corresponding to gestational age of 22 weeks or crown-rump length of 25cm, when the birth weight is not known), constitutes about 60% of the perinatal deaths.<sup>[3]</sup> And this is an event which has always challenged the obstetricians for decades.

Various maternal, foetal and placental factors may result to stillbirths.<sup>[4]</sup> A good antenatal care is

supposed to give a health mother and a healthy baby. Histories of abortions, stillbirths or neonatal deaths in the past are well-known risk factors of subsequent obstetric problems. Yet, since many of the women in the country are uneducated or poorly educated, they are not able to give proper history of antenatal or intra-natal period, baby weight, type or cause of stillbirth in previous pregnancies. Further, in spite of the modern facilities available and advances made in the medical field, many times no contributing factors can be attributed to the exact cause of stillbirth and refusal of autopsy examination seals the chapter. Resultantly, there is paucity of data on stillbirth in the north-eastern part of India.

### Objectives

The objectives of the current study were to estimate the magnitude of stillbirth and also to ascertain the association between stillbirth and maternal and foetal factors.

## MATERIALS AND METHODS

A hospital-based prospective study was conducted in the Department of Obstetrics and Gynecology, Regional Institute of Medical College, Imphal, Manipur in the year 2003. A sample size of 4,418 was estimated by using the stillbirth rate of 0.8%,<sup>[5]</sup> 95% confidence level and an allowable error of 10%

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of the estimate. After obtaining informed verbal consent, data from all mothers who delivered in the study place during the period of January-September 2002 collected by using a semi-structured interview schedule, before the pregnancy outcome was not known. The interview schedule consisted of detailed socio-demographic backgrounds, ANC status, present and past obstetric history, associated medical conditions and booking status ( $\geq 3$  ANC visits in the department being defined as booked cases) and period of gestation. A thorough medical examination and necessary clinical investigations were also done after admission. After delivery the type and mode of delivery and the pregnancy outcome were recorded.

Ethical approval for the study was obtained from the Institutional Ethics Committee, RIMS. Both descriptive (percentage) and analytical tests (chi-square and Fischer's exact test) were done by using SPSSv17. A p-value of less than 0.05 was considered to be statistically significant.

## RESULTS

**Table 1: Distribution of stillbirths by socio-demographic backgrounds.**

Socio-demographic factors	No. of live births (%)	No. of stillbirths (%)	p-value
Type of residency Rural (n=3170) Urban (n=2502)	3099 (77.60) 2473 (88.41)	71 (22.40) 29 (11.59)	0.002
Educational status Illiterate (n=885) Up-to VIII standard (n=1130) Up-to X standard (n=2500) $\geq X$ standard (n=1157)	830 (93.79) 1114 (98.58) 2479 (99.16) 1149 (99.31)	55 (6.21) 16 (1.42) 21 (0.84) 08 (0.69)	<0.001
Maternal age (in completed years) <20 (n=223) 20-25 (n=1456) 26-30 (n=1863) 31-35 (n=1358) 36-40 (n=634) $\geq 41$ (n=138)	219 (98.21) 1441 (98.97) 1829 (98.18) 1335 (98.31) 620 (97.79) 128 (92.75)	4 (1.79) 15 (1.03) 34 (1.82) 23 (1.69) 14 (2.21) 10 (7.25)	<0.001
Parity 1 (n=2688) 2 (n=1567) 3 (n=785) 4 (n=373) $\geq 5$ (n=259)	1658 (98.89) 1541 (98.34) 771 (98.22) 360 (96.52) 242 (93.43)	30 (1.11) 26 (1.66) 14 (1.78) 13 (3.48) 17 (6.57)	<0.001

**Table 2: Distribution of stillbirths by booking status and maternal physical findings, parity and pregnancy outcome.**

Socio-demographic factors	No. of live births (%)	No. of stillbirths (%)	p-value
Booking status Booked (n=2491) Un-booked (n=3181)	2476 (99.39) 3096 (97.33)	15 (0.61) 85 (2.67)	<0.001
Haemoglobin level (g/dl) $\leq 6.5$ (n=20) 6.6-8 (n=138) 8.1-10 (n=1577) >11 (n=3987)	13 (65.00) 114 (82.61) 1530 (97.02) 3965 (94.41)	7 (35.00) 24 (17.39) 47 (2.98) 22 (5.59)	<0.001
Blood pressure (mm of Hg) <140/90 (n=5102) $\geq 140/90$ (n=570)	5026 (98.51) 546 (95.79)	76 (1.49) 24 (4.21)	<0.001
Sex of newborn Male (n=2931)* Female (n=2740)*	2876 (98.12) 2695 (98.36)	55 (1.88) 45 (1.64)	0.56
Number of foetus(es) Singleton (n=5506) Twins (n=160) Triplets (n=6)	5411 (98.28) 155 (96.88) -	95 (1.72) 5 (3.12) -	<0.001
Presence of at least one high risk factor Present (n=1786)† Absent (n=3802)†	1708 (95.63) 3780 (94.22)	78 (4.37) 22 (0.58)	<0.001
Mode of delivery Normal vaginal (n=3940) Vaginal, breech (n=75) Assisted (n=526) Caesarean and others (n=1131)	3879 (98.45) 50 (80.00) 519 (98.66) 1128 (98.76)	61 (1.55) 15 (20.00) 7 (1.34) 3 (1.24)	<0.001
Gestational age Preterm (n=235) Term (n=5363) Post-term (n=74)	208 (88.51) 5296 (98.75) 68 (91.89)	27 (11.49) 67 (1.25) 6 (8.11)	<0.001
Weight of newborn (g) $\leq 1.5$ (n=121) 1.6-2.5 (n=1158) 2.6-4 (n=4341) >4 (n=52)	104 (85.95) 1129 (97.50) 4289 (98.80) 50 (96.16)	17 (14.05) 29 (2.50) 52 (1.20) 2 (3.84)	<0.001

\* One newborn which was ambiguous in sex was excluded from the analysis

† Out of all pregnancies

During the data collection period of nine months, there were 5,588 deliveries that included 80 pairs of twins and two sets of triplets giving a total birth of

5,672 births. There was no refusal to participate in the study.

There were altogether 100 stillbirths giving a stillbirth rate of 17.63 per 1,000 births. Among all these 100 stillbirths 52 were fresh stillbirths, the remaining 48 being macerated stillbirths, giving a rate of 9.2 per 1,000 births and 8.5 per 1,000 births, respectively.

The distribution of stillbirths by the background socio-demographic factors of the study-women was as shown in [Table 1].

The proportion of stillbirths was found to be higher among women from rural areas compared to those who resided in urban areas. This difference was found to be statistically significant. Again, stillbirths were found to be occurring much more commonly among illiterate women. There was an inverse relationship between stillbirths and the educational level of the study-women. This finding was found to be highly significant. Further, there was a statistically highly significant trend between stillbirths and the personal age of the study-women [Table 1].

The associations between stillbirths and the booking status along with physical findings on admission and pregnancy outcome are shown in [Table 2].

The proportion of stillbirths was found to be higher among un-booked cases when compared to booked cases (who already have had three or more ANC visits in the institute). This association was found to be statistically significant. There were also statistically highly significant associations between stillbirths and low haemoglobin, high blood pressure and higher parity. Sex of the newborn was not related to stillbirth. But there were highly significant associations with number of foetuses, presence of high risk factors and vaginal (breech) delivery [Table 2].

## DISCUSSION

The present study finding of stillbirth rate being 17.63 per 1,000 births is much higher than the Manipur State stillbirth rate of 0.8% as found out by the latest District Household Survey.<sup>[4]</sup> The later was a community-based study whereas the current study being a hospital-based study may be the main reason for the different findings. It is obvious that, more serious and complicated cases may opt for institution delivery. Hence, the result may show higher rate of stillbirths. Yet, the current study finding is comparably low if compared to other study reports from different parts of the country.<sup>[6-9]</sup> These studies were done in the 1980s and 1990s; and the time-lapse between these studies and the current study may explain the different findings.

The present study showed the stillbirth to be two times higher among women coming from rural areas. Similar finding was found in the PM Survey (FOGSI, 1981). The contrary was found by Swain S et al from their study at Banaras in 1993.<sup>[10]</sup> The

difference may be explained by the fact that most of the study subjects in their study were slum-dwellers who might have problems of illiteracy, ignorance and lack of transport facilities. The inverse relationship between stillbirth rate and educational status of women as found out from the present study is comparable with study findings made by Bhargava H et al, Kumari C et al and the PM Survey Report of FOGSI, 1981.<sup>[11,12]</sup>

The least stillbirth rates seen among women aged 20-25 as found out from the present study as compared to extremes of ages is also comparable with earlier study findings.<sup>[11,13]</sup> In the first instance, immaturity of reproductive organs and inexperience of childbirth may be the reasons and in the later stage, maternal nutritional deficiency and other complications may be the underlying main factors.

In the present study, the overall stillbirth was found to four times higher among un-booked cases compared to booked cases. Non-utilization of antenatal care and its benefits and late detection of complications thereby delaying well-planned treatment procedures may be the reasons. This finding is comparable with the study findings made by Ravikumar et al, Roy Chowdhuri et al and Kumari C et al.<sup>[6,9,12]</sup>

An inverse relationship observed between proportion of stillbirth and haemoglobin level from the present study is expected as lower the haemoglobin level, the more compromise with maternal and foetal nutrition would be there resulting to more foetal loss. The association between high parity and high stillbirth rate also may be because of the later reason. This observation supports the findings made by Nayak AH et al and the PM Survey Report (FOGSI, 1981).<sup>[7]</sup> The higher stillbirth rate among women having blood pressure  $\geq 140/90$  mm of Hg is also expected as hypertension is associated with placental pathology, foeto-placental blood dynamics and other complications during pregnancy.

The insignificant relationship between stillbirth and sex of the newborn could not be compared with any earlier findings as no study has explored in this area. But in the present study, the stillbirth rate among the twin deliveries was found to be two times higher compared to singleton deliveries. Complications of multiple pregnancies like low foetal weight, hydramnios and delivery complications may be the main reasons. The finding supports the study finding made by Swain S et al and Chatterjee AK et al.<sup>[10,14]</sup> The stillbirth rate being higher among women having high risk factors is self-explanatory. The current study finding of highest stillbirth rate among breech deliveries and lowest rate among Caesarean section is comparable with study findings made by Sikdar K et al.<sup>[15]</sup>

Higher stillbirth rates found among the low birth weight newborns and preterm deliveries from the current study is expected. Bhargava H et al also found similar findings from their study.<sup>[15]</sup>

## CONCLUSION

The stillbirth rate (17.6 per 1,000 births) continues to be still high in the north-eastern part of the country. Un-booked status of the pregnant women, women residing in rural areas, anaemia, hypertension, low educational status of women, women aged 40 years or above, higher parity, multiple pregnancy, presence of risk factors and very low birth weight newborns were found to be important determinants of stillbirth. Many of these determinants are preventable factors.

The present study has its own limitations as it was a hospital-based study. Resultantly the stillbirth rate might have been overestimated. Still then, it was the study of its first kind in Manipur State, which lies in the north-eastern part of the country. Community-based studies are recommended to know the stillbirth rate more accurately.

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**How to cite this article:** Devi YG, Singh KB. Incidence of Stillbirth in a Tertiary Medical College in North- Eastern India and its Associated Maternal and Foetal Factors. *Ann. Int. Med. Den. Res.* 2018; 4(1):CM01-CM04.

**Source of Support:** Nil, **Conflict of Interest:** None declared