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Original Article:

Stillbirth in a Tertiary Care Referral Hospital in North Bengal - A Review of Causes, Risk Factors and Prevention Strategies

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Abstract:
Background and Aims: Stillbirth is one of the most common adverse outcomes of pregnancy, accounting for half of all perinatal mortality. Each year approximately 4 million stillbirths are reported, with 97% occurring in developing countries. The objective of the present study was to evaluate the stillbirth rate, exploring the risk factors and causes of stillbirth and suggest policies to reduce it. **Settings and Design**: A retrospective study of stillbirth among all deliveries over 5 years at North Bengal Medical College, a referral tertiary care teaching hospital in a rural background. The stillbirth rate and its trend were defined and the probable causes and risk factors were identified. **Results:** Stillbirth rate is 59.76/1000 live births, and Perinatal Mortality 98.65/1000 births. Of the still births, 59.72% were fresh and 40.27% were macerated. Among the causes of stillbirths, poor antenatal attendance and low socioeconomic status were important; other risk factors included prematurity, PIH, birth asphyxia, poor intrapartum care including prolonged and obstructed labour. In 23% cases, the cause remained unexplained. **Conclusion:** In addition to poor antenatal care, low socioeconomic condition, poor referral service, suboptimal intrapartum care in health facilities including tertiary centre were mainly responsible for majority of still births which could have been prevented. We speculate that upgrading the existing health system performance, particularly high quality intrapartum care by skilled health personnel, will reduce stillbirths substantially in our institute.
Key Words: Still birth; Intrapartum stillbirth; Perinatal Mortality

Introduction:

Stillbirth generally accounts for half of all perinatal mortality, with an estimated 4 million occurring worldwide each year. More than 97% of these stillbirths take place in developing countries.[1] For many reasons, stillbirths have been understudied, underreported and rarely have been considered in attempts to improve adverse pregnancy outcome in developing countries.[2] Perinatal mortality reflects one of the important health index of a country and it is one of the sensitive indicators of maternal and child health (MCH) care. Nearly 60% of perinatal deaths in our country are stillbirths and are preventable.[3]

In developed countries, stillbirth has generally been defined as fetal loss beyond 20 weeks of gestation, however, some developed countries such as Sweden still use 28 weeks as the lower cut off for still birth. In less developed countries, a gestational age of 28 weeks or a birth weight of 1000gm is often the lower cut off used.[4] There exists no standard international classification system that defines causes of fetal death, nor is there any agreement about the lower limits of birth weight or gestational age that define stillbirth, making comparisons of causes of stillbirth or rates over time or between sites problematic.[5] Stillbirths that occur more than 12-24 hours prior to delivery result in maceration of skin, while those occurring in the intrapartum period or immediately prior to delivery are generally normal in appearance and are often called fresh stillbirth.[2] Stillbirth can be sub classified according to the gestational age at birth, typically into early stillbirth (20-28 weeks) and late stillbirth (after 28weeks).[6] Stillbirths are also sub classified by whether death occurred before or after the onset of labour – termed antepartum or intrapartum respectively. However the primary method of classification of still birth is according to the presumed causes or associated obstetric disorders.

In general, the study of specific causes of stillbirth has been affected by scarcity of uniform protocols for assessment and classification of stillbirths and falling autopsy rates. In most cases, death certificates are filled out before the results of postnatal investigations are available.

Aims and Objectives

We have analyzed the still birth over a period of five years from 2004 to 2009 in North Bengal Medical college which is a referral tertiary care teaching hospital of West Bengal, India at the foothills of Himalayas in a rural back ground. Our goal in this study was to determine the stillbirth rate and thereby assessing the magnitude of the problem, exploring the risk factors

for stillbirth and its possible causes and recommend remedial measures to be adopted in an attempt to reduce stillbirth rate in our facility.

Materials and Methods:

This is a retrospective study over a period of five years from January 2004 to December 2009 on stillbirth.

To find out possible causes of stillbirth, maternal details like age, parity, socioeconomic status, antenatal check up, gestational age, associated medical disorders, and presence of any obstetric complications were noted.

Changing trends of still births for last five years were also evaluated. Pregnant women having at least three antenatal check ups in our hospital were considered as booked cases. The gestational age was assessed from LMP and clinical examination of the baby. The cut off point of gestational age for still birth was taken as 28 weeks. All relevant investigations e.g. Hb%, ultrasound and other antenatal investigations available were also noted. The modes of delivery, sex and birth weight of fetuses were recorded. The babies were examined for any congenital anomalies and placentae were examined for any retroplacental clots and any other abnormalities. Autopsy was performed where consent was given by parents. If an obvious cause of death was not found, then by way of exclusion, stillbirth was usually considered unexplained.

Results:

During the study period, the total number of deliveries were 27541 and stillbirths were 1646, including 17 sets of twins. The stillbirth rate was 59.76/1000 (Fresh 59.72% and macerated 40.27%). The perinatal mortality was 98.65/1000 (Table 1).

Table 1: Stillbirth rate and Perinatal mortality rate	
Total deliveries	27,541
Total no of stillbirths	1646
Stillbirth rate	59.76/1000
Fresh stillbirth	983(59.72%)
Macerated stillbirth	663(40.27%)
Perinatal death	2717
Perinatal mortality rate	98.65/1000

Table 2 shows that there was a decreasing trend of Still Birth Rate from 74.43 in 2004-2005 to 44.36 in 2008-2009. The Perinatal Mortality Rate (PMR) also showed a decreasing trend from 120.16 in 2004-2005 to 80.38 in 2008-2009.

Table 2: Year wise distribution of stillbirth and PMR

Year	No of Deliveries	No. of stillbirths	No. of neonatal deaths	No. of perinatal deaths	Stillbirth rate	PMR*
2004-2005	4702	350	215	565	74.43	120.16
2005-2006	4507	331	195	526	73.44	116.70
2006-2007	5853	357	214	571	60.99	97.55
2007-2008	6371	337	227	564	52.89	88.52
2008-2009	6108	271	220	491	44.36	80.38

*Perinatal Mortality Rate

Table 3 shows that 70.28% cases were unbooked and only 29.71% were booked cases. Maximum cases were from low socio economic status (61.93%). In 66.23% cases age of the mothers were between 20-30 years, primigravida constitutes 56.72% and multigravida 43.27% cases. In 47.26% cases, gestational age was between 28-37 weeks and vaginal delivery constituted 72.98% among stillbirths.

Table 3: Profile of women. n=1629 (17 sets of twins)		
	No of women	**Percentage**
1) Antenatal check-up		
Unbooked	1145	70.28%
Booked	484	29.71%
2) Age		
<20 years	198	12.15%
20-30 years	1079	66.23%
>30 years	352	20.60%
3) Socio-economic status		
Low	1009	61.93%
Middle	504	30.93%
High	146	8.96%
4) Parity		
Primi	924	56.72%
Multi	705	43.27%
5) Gestational age		
Preterm (28-37wks)	770	47.26%
Term (37-42wks)	556	34.13%
Post term (>42wks)	81	4.97%
Undetermined	222	13.62%
6) Mode of delivery		
Vaginal delivery	1189	72.98%
Caesarean Section	264	16.20%
Instrumental vaginal delivery	120	7.36%
Destructive operation	56	3.43%

Table 4 shows that amongst the stillbirth babies, 71.20% were between 1500gm to 2500gm and in 16.46% cases birth weights were more than 2500 gm. Table 5 depicts the different causes of stillbirths of which prematurity (21.20%), malpresentation (17.48%), preeclampsia and eclampsia (10.66%) were the leading causes. However, in 23% cases no definite cause could be found. Table 6 shows that amongst the stillbirths, 59.72% (n=983) were fresh and 40.27% (n=663) were macerated.

Table 4: Birth Weight amongst stillbirth babies (n=1646)		
Wt in grams	**Number**	**Percentage**
1000-1499	203	12.33%
1500-2500	1172	71.20%
>2500	271	16.46%

Table 5: Causes of stillbirth (n=1646)		
Causes	**Number**	**Percentage**
Unexplained	381	23.14%
Prematurity	348	21.20%
Malpresentation	287	17.48%
Preeclampsia & Eclampsia	175	10.66%
Obstructed labor	149	9.07%
IUGR	66	4.02%
Medical disorders of Pregnancy	57	3.47%
Peripartum hypoxia	49	2.98%
APH	44	2.68%
Uterine rupture	38	2.31%
Congenital malformation	21	1.27%
Infections	18	1.09%
Post maturity	13	0.79%

Table 6: Classification of stillbirth (n=1646)	
Fresh stillbirth 983 (59.72%)	Registered: 292(29.70%) Unregistered: 691(70.29%)
Macerated stillbirth 663 (40.27%)	Registered: 197(29.71%) Unregistered:466(70.28%)

Discussion:

Stillbirth is a traumatic experience for mother and obstetrician alike. Stillbirth and perinatal mortality remains the index of efficacy of not only antenatal and intranatal care but also of the socioeconomic condition of the entire community. Despite the significant advances in fetomaternal medicine and economic growth, stillbirth continues to be high, especially in the developing countries, contributing to 97% of 3.3 million stillbirths reported worldwide annually.[13]

Stillbirth rates vary widely depending on geographic region, socioeconomic condition and also in different regions in the same country. While in developed nations stillbirth rate is 5 per 1000 or less, it is in the range of 30-40 per 1000 births in underdeveloped countries.[14]

The average stillbirth rate in India as a whole is 39 per 1000 births[15] with the reported stillbirth rate varying from 23 to 140.69/1000 births.[3,7-12,15] Underreporting of stillbirth is a common problem in our country.[16] Also, the lower limit of gestational age or birth weight adopted in developed countries is 20 weeks, whereas in India, the cut-off gestational age is 28 weeks.

The stillbirth rate in our study, though well above the national average of 39 per thousand, is comparable to Chitrakumari(64.1),[11] less than Sujata(110)[12] but more than Korde & Nayak(35.2)[3](Table 7)

Table 7: Stillbirth rates in different studies

Studies	Rates per 1000 births
Nayak AH et al[7]	23.4
Korde - Nayak et al[3]	35.2
Kameshwaran C et al[8]	35.1
Githa K et al[9]	42
Ravikumar M et al[10]	43
Chitrakumari EY al[11]	64.1
Sujata et al[12]	110.69
Present study	59.76

The most striking finding of the study was the high rate of stillbirth (59.76 per 1000 birth) in a community where the women were delivered in a tertiary care hospital by a doctor or a midwife with an overall 16.2% caesarean section rate. Moreover, more than 1/3rd of the stillbirth was at term and another 20% were late preterm (34-36 weeks). There were few (1.27%) congenital malformation and most were without maceration, indicating that many of the stillbirths occurred in the peripartum period and thus were salvageable during the time of labour and delivery.[16]

Lawn et al[13] noted that appropriate timing of caesarean section should prevent many of the fetuses from dying during labour and further suggest that many of these deaths would be avoided with improved obstetric care and more rapid response to obstetrical complications.[16]

Thirty percent of women were registered in our study and 70% were unregistered, whereas 84.9% were unregistered in study by Korde & Nayak.[3] Stillbirth rate is 4 to 5 times higher among unregistered women, which is also evident in other studies.[3,8,10]

Socioeconomic status and literacy also influence pregnancy outcome. In our study, 62% belonged to lower most socioeconomic class with poor perinatal outcome, which is comparable to the other.[3]

In developed countries, most of the stillbirths occur antenatal and therefore frequently become macerated.

In our study and other studies from different developing countries, most stillbirths were fresh (59.72%), indicating that most fetal deaths were peripartum. A population based study in rural Pakistan with a stillbirth rate of 47/1000, 75% were fresh stillbirths[17,18] which is similar to our study. The occurrence of an intrapartum stillbirth in developed country is considered the result of inadequate care[23] whereas in developing country it may represent inadequate access to essential obstetric care and inadequate care.[24] The staggering high rate of stillbirths is also related to poor education, lack of awareness of available health facilities, regular antenatal check-ups, early detection of pregnancy complications and proper monitoring by skilled provider during labour and timed referral in higher centers. Stillbirth is highest among the unregistered women (70.28%) which are similar to other study.[3] Among the mothers with stillbirth nearly 30% were booked, 34.1% were at term and another 5% were postterm and 16% of them underwent caesarean section. Thus the findings from this study suggest that despite giving birth in a health facility and having cesarean section rate even higher than recommended for many developing countries, women may not have received appropriate obstetric care.[19] Many women were referred late at a desperate, do or die situations where limiting maternal deaths were more important than fetal salvage. Therefore our study reinforces findings from other recently published studies that report a failure of health facilities to offer essential and comprehensive obstetric care.[17,19-21] Reasons for this may be many, including inadequate number of skilled providers, qualitative differences in the staff competence, delay in referral to higher health facilities to avail comprehensive obstetric care etc. Although 34.13% stillbirths were term, preterm births also were significantly associated with stillbirths similar to other studies.[17,22] In spite of the fact that preterm births were significantly higher among stillbirths, term or near term deliveries also were very high compared to the western figures where 50% of the stillbirths occur at less than 28 weeks of gestation and 80% were preterm.[16] This data suggests that many of the peripartum stillbirths were potentially salvageable during labour and delivery.

Thus it appears that suboptimal antepartum and intrapartum service may be operating in our health system which contributes to a very high stillbirth and perinatal mortality rate. This could be at various levels including primary, secondary and tertiary. Patients themselves may contribute to suboptimal management of their own pregnancy. Seventy perecnt of our unbooked cases contribute to suboptimal care by non-utilization of antenatal services. Poverty, ignorance, illiteracy and poor support from family especially from male members also responsible for inadequate care. Among the registered cases the causes of poor outcome might be late registration and failure to appreciate the significance of less fetal movement. Defaulted follow-up and non-compliance of doctor's advice were other factors. Primary health care providers contribute to the suboptimal care by failure to recognize the high risk cases. Poor monitoring of labour, leading to late referral and not being able to manage the emergency cases efficiently, including resuscitation of asphyxiated babies, may be other factors responsible. Reasons for this may be lack of obstetric skill, appliances and support.

Even at the tertiary level, the care may be the suboptimal, reasons being overcrowding by too many serious high risk cases referred from periphery at late stage, disparity in the number of patients and service providers and the service load etc.

Conclusions:

This study suggests that we have a long way to go to reach national goal of perinatal mortality of 30 per 1000 live births. Many stillbirths in the present study seemed to be preventable. A thorough up-gradation of health care delivery system in the community is necessary. Although improvement of socioeconomic condition, literacy and health education among women will definitely be important to curb the staggeringly high stillbirth rate, but the need of the hour is to deploy adequate number of dedicated skilled providers with proper attitude for service delivery. Importance of institutional delivery must be stressed by health workers. There should be a widespread pro-

paganda about the various ongoing Government Health Programmes, including JSY (Janani Suraksha Yoyana) etc., so that more and more women come into the health care net. There should be a good intercommunication between both the peripheral and tertiary care hospitals and a smooth, timed referral of emergency cases, so that valuable time is not wasted in the transit. We therefore speculate that upgrading the existing health system performance will reduce the high stillbirth rates and other adverse pregnancy outcomes even in population with adequate access to maternity care, not only antenatal care. The fact that most of the stillbirths were fresh and many were in term or near term suggests that stillbirth rates could be substantially reduced by high quality intrapartum care.

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