

## Hospital Based Study on Perinatal Mortality in Teaching Hospital, Batticaloa, Sri Lanka

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### Original Research Article

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**Abstract:** Perinatal mortality rate is an important indicator of community health status. This study is to analyze the cause of perinatal death in Teaching Hospital, Batticaloa. A retrospective study was done over a period of last three and half years from January 2014 to June 2017, which included total 21,079 deliveries out of which 204 perinatal deaths occurred, hence perinatal mortality rate was 12.51 per 1000 birth on 2014, 15.11 per 1000 birth on 2015 and 13.28 per 1000 birth on 2016. The causes of perinatal deaths and risk factors were identified and analyzed. Out of 204 perinatal deaths, majority (53.4%) occurred due to preterm with or without associated other factors, majority (87.2%) of perinatal death occurred in maternal age of 20-39 years, and found to be more common in (64.8%) multigravida patients and majority of perinatal deaths (58.3%) occurred during early neonatal period. Early identification of mothers at risk of pregnancy complications, especially intrauterine growth restricted fetuses, through antenatal care screening, educating pregnant women to recognize warning signs of pregnancy complications, timely access to obstetric care, monitoring of labour for fetal distress, and proper newborn resuscitation may reduce some of the categories of deaths. Fetal autopsy in future could detect many unknown causes. There should also be increased communication to work closely between neonatology team and obstetric team to bring down perinatal mortality.

**Keywords:** Perinatal mortality, Still birth, Retrospective study.

### INTRODUCTION

World Health Organization (WHO) defines perinatal mortality as deaths occurring during late pregnancy (>22 weeks of gestation), during birth and within seven days after delivery. In developing countries, a gestational age of 28 weeks or a birth weight of 1000gm is taken as lower cut off for perinatal mortality while in developed countries it is 20 weeks of gestation. Perinatal mortality rate is considered as a health indicator in international comparisons, and within countries and regions to estimate temporal trends. It is considered as an index of quality of antenatal and intrapartum care and socioeconomic condition of the community.

The intrapartum-related events that contribute to the perinatal deaths are birth asphyxia, infection, and complications of prematurity [1]. It is believed that main avoidable stillbirths are largely attributed to inadequate intrapartum care [2].

Perinatal mortality is directly related to various high risk maternal factors and birth weight, gestational

age and characteristics of new born population. Therefore perinatal mortality rate is most sensitive index of health status of children, quality of maternal and child health service [3].

Survival of newborn during first week of life is determined by obstetric risk factors as well as adjustment of newborn to new environment, nutrition and infections. Therefore early neonatal period is most unsafe period of life. Because of the contribution of perinatal mortality to child mortality, the United Nations (UN) in year 2000 made a declaration to include maternal and child mortality reduction as a target in its Millennium Development Goals (MDGs 2011) [4].

Globally, every year over 4 million babies in the first four weeks of life and 3 million in the early neonatal period die. Furthermore, more than 3.3 million stillbirths occur every year. One third of these deaths occur during intrapartum and therefore it is generally can be prevented. Most deaths (98%) take place in the developing world [3]. In developing countries the risk

of death in the neonatal period is six times greater than in developed countries [3]. It is estimated that perinatal mortality rate is 10 per 1000 births in developed countries while the figure is 50 per 1000 births in developing countries [5].

The United Nation's fourth and fifth Millennium Development Goals target for reducing child and maternal mortality by 2015 [6]. Skilled labour care and the first 24 hours postpartum are the keys to achieving this aim [7]. Reduction in the perinatal mortality requires community based interventions in combination with more advanced facilities, technology, and skilled human resources [8, 9].

## BACKGROUND

Sri Lanka is an Island in Indian Ocean with 21 million population live in a land area of approximately 62 700 km<sup>2</sup>. The adult literacy rate is 89.7% for females and 92.6% for males. The mean age at marriage for women is 23.2 years.

Free education, up to completion of university education and free health services are available to all irrespective of their religion and sex. Former contributed in delaying the age at marriage, thereby reducing teenage pregnancies. Education also empowered women.

The Gross Domestic Product per capita in Sri Lanka was last recorded at 3759.20 US dollars in 2016 and is equivalent to 30 percent of the world's average. Approximately 1.8% of gross domestic product is spent on health care; the expenditure on maternal and child health is 0.23%.

In Sri Lanka, stillbirth registration is often incomplete and therefore accurate national perinatal mortality rates are not available. In Sri Lanka, the neonatal mortality rate (NMR) and the infant mortality rate (IMR) have improved in parallel with the other maternal and child health indicators [10, 11]. The NMR and the IMR decreased to 10 and 15 per 1000 live births respectively in 2005 from highs of 80 and 140 per 1000 live births respectively in 1945.

The reductions of deaths are by immunization and those due to other infective causes such as diarrhoea; the main contributors to death in this age group are related to prematurity and perinatal events.

This study was conducted in Teaching Hospital, Batticaloa. Batticaloa is located in the Eastern province

of Sri Lanka. Its total population is about 546791 in 2016 and live in 2610 square km area. This was a hospital-based study. As this is the only tertiary hospital with better health care facilities in this region and about 98% of the deliveries occur in this hospital. Further, the study population includes the vast majority of all women living in this region and therefore it reflects the characteristics of the Batticaloa population. Less than 1% of women who delivered in these hospitals live outside the district and only a minority of women living in the region delivers outside of this area. Thus, this study depicts the perinatal outcome of nearly the complete population although the study was hospital based. This study includes all perinatal deaths regardless of the cause, and in particular includes also fetuses with malformations. In this way it reflects the age-related perinatal mortality rate of this district.

The present study aims to find out the causes in our institute and detect further possible measures to reduce the mortality. This document will allow reviewing our achievements in the area of maternal and neonatal health and compare the results with those obtained by other countries/region. Problems related to early mortality data will stimulate further research.

## METHODS

This is a descriptive, cross-sectional study. The medical record was retrospectively reviewed over a period of last 3 and half years from January 2014 to June 2017 in Teaching Hospital Batticaloa. All the deliveries took place in this hospital during this period were studied.

All the births from the 28 week of gestation until seven days after birth were included in this study. Deaths prior to the 28th week of gestation deaths seven days after delivery were excluded.

## RESULTS

A total of 204 records were reviewed from January 2014 to June 2017. There were 21,079 total deliveries in this hospital during the study period. Among them 204 perinatal deaths occurred. Among them majority of babies (53.4%) were born between 28 week to 37 weeks of gestational age (Table 4) others were term (38 to 42 weeks of gestation). No birth occurred after 42 weeks of gestational age. Majority of perinatal death occurred in maternal age of (87.2%) 20-39 years. Teen age pregnant mother's and elderly pregnant mothers contribute 7.4% and 5.4% of perinatal deaths respectively (

Table 1). Perinatal mortality was found to be more common in (64.8%) multigravida patients (Table 3).

With regard to mode of delivery (Table 7), the majority (47.5%) were normal vaginal deliveries while 43.6% was by caesarean sections. According to timing of death majority of perinatal deaths occurred during (58.3%) early neonatal period (Within 7 days after birth) (Table 5). Of that majority (15.2%)

prematurity and low birth weight were the commonest causes of perinatal death (Table 6). When birth weight was taken for consideration, almost half of the babies (52.5%) were less than 2.5kg, but they include both preterm and IUGR babies (Table 2), (Table 8).

**Table 1: Distribution of Age**

Maternal Age in years	Perinatal Deaths	Percentage (%)
15-19	15	7.4
20-24	47	23.0
25-29	47	23.0
30-34	43	21.1
35-39	41	20.1
40-44	11	5.4
Total	204	100.0

**Table 2: Birth Weight and Perinatal Death**

Birth Weight	Perinatal Deaths	Percentage (%)
500-999	9	4.4
1000-1499	39	19.1
1500-1999	34	16.7
2000-2499	25	12.3
>=2500	97	47.5
Total	204	100.0

**Table 3: Distribution of Parity**

Parity	Perinatal Deaths	Percentage (%)
0-1	72	35.3
2-3	96	47.1
4-5	34	16.7
>=6	2	1.0
Total	204	100.0

**Table 4: Distribution of Gestational Age**

Gestational Age	Perinatal Deaths	Percentage (%)
28-36	109	53.4
37-42	95	46.6
Total	204	100.0

**Table 5: Type of Perinatal Death**

Type of Perinatal Death	Perinatal Deaths	Percentage (%)
Foetal	84	41.2
Early neonatal	119	58.3
Unable to classify	1	.5
Total	204	100.0

**Table 6: Cause of Perinatal Death**

TIMING OF DEATH	Causes (ICD SPECIFIC CATEGORY)	Perinatal Deaths	Percentage (%)
ANTEPARTUM	A1-Congenital malformation & chromosomal abnormalities	9	4.4
	A2-Infection	1	0.5
	A3-Antepartum hypoxia	7	3.4
	A4-Other specified antepartum disorder	6	2.9
	A5-Disorders related to fetal growth	3	1.5
	A6-Fetal death of unspecified cause	56	27.5
	Unable to classify	4	2.0
INTRAPARTUM	I1-Congenital malformation & chromosomal abnormalities	1	0.5
	I3-Acute intra partum event	4	2.0
	I7-Death of unspecified cause	1	0.5
EARLY NEONATAL	N1- Congenital malformation & chromosomal abnormalities	26	12.7
	N2- Disorders related to fetal growth	1	0.5
	N4-Complication of intrapartum events	10	4.9
	N5-Convulsions & disorders of cerebral status	3	1.5
	N6-Infection	18	8.8
	N7-Respiratory & cardiovascular disorder	9	4.4
	N9-Low Birth weight & Prematurity	31	15.2
	N10-Miscellaneous	1	0.5
	N11- Death of unspecified cause	13	6.4
TOTAL		204	100

**Table 7: Mode of Delivery**

Mode of Delivery	Perinatal Deaths	Percentage (%)
NVD	97	47.5
Breech	11	5.4
Forceps	5	2.5
Vacuum	2	1.0
EL/LSCS	16	7.8
EM/LSCS	72	35.3
Hysterotomy	1	.5
Total	204	100.0

**Table 8: Frequency distribution of Birthweight by Gestational age**

Birth Weight (g)	Maturity (Complete weeks)			Total Perinatal Deaths
	28-31	32-36	37-42	
500-999	7	2	0	9
1000-1499	24	12	3	39
1500-1999	6	22	6	34
2000-2499	3	14	8	25
>=2500	1	18	78	97
Total	41	68	95	204

**Table 9: Year wise Still Birth Rate and PNMR**

YEAR	STILLBIRTH RATE	PNMR
2014	6.58 per 1000	12.51 per 1000
2015	11.17 per 1000	15.11 per 1000
2016	6.89 per 1000	13.28 per 1000

## DISCUSSION

Occurrence of stillbirth pose difficult situation for the obstetrician and cause great psychological and emotional trauma to the couple and the family. It reflects the suboptimum quality of maternal and child health services.

Stillbirth rates vary widely depending on geographic region, socioeconomic condition and also in different regions in the same country. In developed countries it is 5 per 1000 or less, but it is in the range of 30-40 per 1000 births in underdeveloped countries [13].

In Sri Lanka, the neonatal mortality rate (NNMR) was 12.5 per 1000 live births in 1995 which accounted for 75.9% of the infant deaths in that year [14]. These infant deaths were related to prematurity and low birth weight (LBW) (30%), infections specific to the perinatal period (15%), intrauterine and birth asphyxia (6%) and other respiratory conditions of the fetus and newborn (13%) [15].

This study shows that in 2014 and 2016 almost same rate but 2015 it was 15.11%. This study also shows that most (58.3%) of the deaths occurred during early neonatal period. This study shows that 15.2% deaths were due to preterm and low birth weight during early neonatal period. The prevention of preterm could be a difficult task in low resource setting. In Sri Lanka we can save babies born after 32 weeks with birth weight of more than 2kg and this study shows 118 babies (57.8%) were born as mentioned above (Table 8) and these perinatal deaths can be prevented by proper maternal and child health care.

Early detection of IUGR in community setting is feasible. Therefore measures should be intensified to detect and timely referral. It will help to reduce the deaths due to undetected IUGR.

World Bank statistics indicate that globally 30-40% of all infant deaths can be averted by good obstetric care alone and another 25% with immediate newborn care. That is, over 50% of all infant deaths can be prevented by effective antenatal, intrapartum and postpartum care [16].

WHO studies reveal that more than two thirds of all new born deaths occur in term well developed babies. Ensuring their survival does not require expensive technology, but simple preventive measures, and prompt extra care [17].

This study shows that 47.5% of the baby's birth weight is more than 2.5 kg. So effective antenatal, intrapartum and postpartum care could have prevented most of the deaths. Further most of the perinatal deaths were not investigated with pathological postmortem. Therefore contribution of anomalous fetus to perinatal

deaths is uncertain. Termination of pregnancy, even the fetus has lethal anomalous, is illegal. But it can be done if the maternal life is at risk.

Several studies show that more perinatal deaths occurred in patients not receiving antenatal care [18, 19]. But In Sri Lanka, 99% of pregnant mothers visits antenatal clinic so improving quality antenatal care delivered to pregnant mothers could bring the mortality rate further. The PMR is more in lower gestational age and births weight. Routine screening programs and expensive equipment with high degree of expertise are needed to pick up anomaly earlier [20].

This study shows that 4.9% of the deaths were due to complication of the intrapartum events such as cord prolapse and placental abruption. Preventive measures can be taken by providing good intrapartum care. 8.8% of the deaths were due to early neonatal infection. Prolonged labour is one the cause for it. Proper use of partogram and timely intervention during delivery will decrease the incidence of prolonged labour and its consequences that arises.

This study shows Prematurity and Low Birth weight & congenital malformation and chromosomal abnormalities contribute more or less equal in neonatal deaths.

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## CONCLUSION

Sri Lanka's maternal and child healthcare service delivery is so successful that the country has a maternal and child health record that is the envy of South Asia. But we still have room for further improvement through the special attention to perinatal care.

Translating lessons learnt into policies, programmes and practices are also of utmost importance. The first step in formulating preventive strategies on perinatal mortality is the accurate capture of all perinatal deaths and classification of the causes of those deaths across all settings, using a globally

applicable and comparable system. Sri Lanka initiated using ICD-PM classification advocated by WHO from January 2016. The ICD-PM is intended to facilitate the consistent collection, analysis and interpretation of information on perinatal deaths.

As much as antenatal care, skilled birth attendance and improved neonatal care, helped us conquer maternal and perinatal deaths. We still need to reduce more by not only awareness of proper antenatal checkup but establishment of emergency obstetric care as well as essential newborn care. Early diagnosis and control of hypertension, early detection of congenital anomaly, and prevention of maternal infections, proper intra partum management and an intensive neonatal unit will further decrease it. Fetal autopsy in future may detect many unknown causes.

In a study conducted in Norway, a large number of women from countries with a high perinatal mortality rate (PMR) settle in countries with a low PMR. A comparison was made between the PMRs for migrants in Norway with the PMRs in their countries of birth. Further it also assessed the risk of perinatal death in offspring of migrant women as compared to offspring of Norwegian women.

The lower PMRs for migrants in Norway as compared to the PMRs in their countries of birth may be explained by access to better health care after migration. Therefore several measures should be taken to enhance antenatal care, intrapartum care and improve neonatal care [21].

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