

# Perinatal Mortality: Does Antenatal Care Matters? A Retrospective Analysis

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## Abstract

**Introduction:** Perinatal mortality rate (PMR) is the most sensitive index of the health status of women and quality of maternal and child health services. Over 130 million babies are born every year, large numbers of children die soon after birth, many of them in the first 4 weeks of life (neonatal deaths) and most of them in the first week (early neonatal deaths).

**Objective:** The objective of this study was to find out the prevalence of perinatal mortality and the factors associated with perinatal death.

**Methods:** A retrospective analysis was done in a tertiary care center. All perinatal deaths during the period between January and December 2015 were included in the study.

**Results:** There were 6722 deliveries and 256 perinatal deaths during the study period. PMR was 37.2/1000 births. The stillbirth rate was 26.2/1000 births, and early neonatal death rate was 11.06/1000 births. Severe pre-eclampsia/eclampsia and antepartum hemorrhage (APH) were the common causes of perinatal deaths. Of concern, we found more percent of unbooked cases associated to stillbirth (119 vs. 61) with severe pre-eclampsia/eclampsia, APH, and undetermined causes were main factors related to stillbirth death.

**Conclusion:** Poor antenatal care was found associated with increased PMR. Hypertension and APH are leading causes of perinatal deaths. The majority of these complications occur in the later part of pregnancy, increased vigilance during antenatal care at the base level can reduce these deaths.

**Key words:** Antenatal care, Causes, Perinatal deaths, Tertiary care center

## INTRODUCTION

Perinatal mortality rate (PMR) is the most sensitive index of the health status of women and quality of maternal and child health services. Over 130 million babies are born every year, large number of newborns die soon after birth, many of them in the first 4 weeks of life (neonatal deaths) and most of them in the first week (early neonatal deaths). For every baby who dies in the first week after birth, another

is born dead (fetal deaths/stillbirths). More than 98% of the estimated 3.7 million neonatal deaths and 3.2 million stillbirths per year occur in the developing countries.<sup>1</sup>

For international comparison, 1000 g and/or 28 weeks gestation is recommended. The global estimation of PMR is 10/1000 births in developed countries, 50/1000 births in developing countries, and 60/1000 births in least developed countries.<sup>2</sup> According to the WHO, global perinatal estimates for the year 2000 for India is 70, one-third of stillbirths occur during delivery.<sup>3</sup> The PMR (2005-2006) in India is 49/1000 births as per the WHO.<sup>4</sup> Although this decrease is evident even in India, perinatal mortality is still high as compared to developed countries.

Ensuring that the labor and the first 24 h postpartum are managed by a skilled care provider is one of the keys to

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achieving this aim.<sup>5</sup> Measures of perinatal mortality can be derived using data from vital statistics, routine health services data, or sample surveys. However, in developing countries, incomplete registration of the births and deaths results in inaccurate vital statistics.<sup>6</sup> Reduction in the perinatal mortality requires community-based interventions in combination with more advanced facilities, technology, and skilled human resources.<sup>7,8</sup> The present study aims to find out the causes in our institute and detect further possible measures to reduce the mortality.

## MATERIALS AND METHODS

The study is a retrospective analysis of all deliveries conducted at the Niloufer Hospital, Osmania Medical College from January 2015 to December 2015. All perinatal deaths, i.e. stillbirths and early neonatal deaths were analyzed in detail. Pregnant women having at least three antenatal visits were considered as booked cases while others were taken as unbooked cases. Parameters studied include age, parity, booked or unbooked, different causes of deaths including antepartum, intrapartum and early neonatal death, birthweight as well as gestational age.

Stillbirth defined as fetal death more than or equal to 28 weeks gestation or more than 1000 g and early neonatal death defined as death occurring in the first 7 days of birth. PMR was calculated by stillbirths plus early neonatal death per 1000 total births.

The data obtained were tabulated and analyzed using rates, ratios, and percentages.

## RESULTS

There were a total of 256 perinatal deaths out of 6869 births during the study period giving a PMR of 37.2, stillbirth rate 26.2, and early neonatal mortality rate of 11.06/1000 births as shown in Table 1. There were 256 perinatal deaths, of which, 9 (3.51%) had multiple pregnancy. Delivery was conducted vaginally in vertex presentation in 204 births (79.6%), assisted breech delivery in 5 (1.95%), and cesarean section in 38 births (14.84%).

Out of 256 deaths, 180 (70.31%) were unregistered. According to gestational age, most of the perinatal deaths were in preterm (57%) than terms. Perinatal mortality was highest in low birthweight babies (<2500 g). The maximum perinatal death was seen in 20-30 years age group and primigravida constituted maximum perinatal deaths (Table 2).

Most of the perinatal deaths were due to severe pre-eclampsia, antepartum hemorrhage (APH), and prematurity

**Table 1: Perinatal index**

Characteristics	Booked	Unbooked	Total
Total births	5768	954	6722
Antepartum deaths	47	104	151
Intrapartum deaths	14	15	29
Early neonatal deaths	15	61	76
Stillbirths (Ante partum+Intra partum)	61	119	180
Perinatal deaths	76	180	256
Perinatal mortality rate (PMR) per 1000 births	11.0	26.2	37.2
Stillbirth rate per 1000 births	8.88	17.32	26.20
Early neonatal death rate per 1000 live births	2.18	8.88	11.06

**Table 2: Demographic variables and perinatal mortality**

Demographic variables	Total births	Perinatal deaths (%)
Gestational age (weeks)		
28≤32	152	58 (22.65)
32≤37	587	88 (34.37)
37≤42	5934	110 (42.96)
≥42	9	0 (0)
Birthweight (g)		
500≤1000	108	22 (8.59)
1000≤1500	231	98 (38.28)
1500≤2500	2289	90 (35.15)
>2500	4231	46 (17.96)
Age in years		
10≤20		20 (7.8)
20≤30		208 (81.2)
30≤40		25 (9.7)
≥40		3 (1.17)
Parity		
Primi		129 (50.39)
G2		59 (23.04)
G3		49 (19.14)
G4		11 (4.29)
≥G5		8 (3.12)

mainly. However, the cause was undetermined in 37 cases (14.4%) (Table 3).

## DISCUSSION

Niloufer Hospital for Women and Children is a tertiary care teaching hospital that receives several high-risk pregnancies in the state of Telangana and adjoining states of Maharashtra, Andhra Pradesh, and Karnataka. Most of them are transported without proper stabilization from referral hospitals. Hospital-based data on perinatal mortality are not truly representative of the community at large because the data often pertain to selective population of high-risk mothers.<sup>9</sup>

The PMR in our study is 37.2/1000 births. In booked cases, it is only 11.0 compared to 26.2 in unbooked cases which is comparable with other studies.<sup>10-13</sup> This was expected as the

**Table 3: Showing different causes of deaths**

Causes	Stillbirth (AP+IP)*	Early neonatal death	Total death (n=256) (%)
Severe pre-eclampsia and eclampsia	35	22	57 (22.2)
APH	35	15	50 (19.5)
Undetermined	28	9	37 (14.4)
Prematurity	16	21	37 (14.4)
Oligohydramnios	15	1	16 (6.25)
IUGR	12	2	14 (5.4)
Congenital anomaly	13	0	13 (5.07)
Multiple pregnancy	9	0	9 (3.5)
Birth asphyxia	7	1	8 (3.1)
MAS	3	2	5 (1.95)
Severe anemia	3	1	4 (1.56)
Gestational diabetes	2	1	3 (1.17)
Infections	2	0	2 (0.78)
Cord prolapsed and cord problems	0	1	1 (0.39)

\*AP: Antepartum hemorrhage, IP: Intrapartum hemorrhage, MAS: Meconium aspiration syndrome, IUGR: Intrauterine growth restriction, APH: Antepartum hemorrhage

study was carried out in tertiary care hospital where many of the pregnant women are referred from the peripheral hospitals because of high-risk pregnancy. Stillbirth rate in the study is 26.2/1000 births. The rate is higher in unbooked cases (17.32 vs. 8.88/1000 births). The early neonatal rate is only 11.06/1000 live births. More perinatal deaths occurred in patients not receiving antenatal care, and these are consistent with following studies.<sup>10-12,14,15</sup>

Perinatal deaths were more in primigravida compared to multigravida were similar noted in other studies.<sup>12,16,17</sup> The PMR is more in lower gestational age and births weight.<sup>10,11,13,14</sup> Preterm labor has been the subject of research for many years. The major causes are pre-eclampsia or eclampsia, APH, prematurity, oligohydramnios, intrauterine growth restriction (IUGR), congenital anomaly, and cord problems. Undetermined group still constitutes about 14.4% of the perinatal deaths. Fetal autopsy may help to determine some of the causes. Antenatal steroids and up gradation of the neonatal set up will further decrease deaths. Pre-eclampsia/eclampsia accounted for 22.2% of deaths but mostly related to lack of proper antenatal care with poor nutrition. APH can be anticipated to some extent by early localization of placenta by ultrasonography. Severe pre-eclampsia/pre-eclampsia and APH were the important causes of the perinatal deaths; similar findings were noted in other studies<sup>10-14</sup>. Congenital abnormality also accounted for 5.07%. Routine screening programs and expensive equipment with a high degree of expertise are needed to pick up anomaly earlier. Some of the cord problems can also be tackled by identification of malpresentations early and availability of emergency obstetric care unless brought late in the hospital. Birth asphyxia is another cause

of neonatal death. Better use of partogram and timely intervention during delivery will decrease the incidence. Infections, multiple pregnancies, meconium aspiration syndrome, severe IUGR, obstructed labor, gestational, oligohydramnios, and severe anemia are other causes.

High stillbirth rates add to PMR for the country as seen in our case. A high percent of unregistered cases are associated with high stillbirth rate (total = 180; 119 unbooked cases). Of concern, antepartum deaths are more with 151 among which 104 were unbooked cases. Developing countries are particularly affected and continue to have high stillbirth rates compared with those of the developed world, where a decline has been observed over the last decades. It is estimated that stillbirth rates for developing countries are as high as 25.5/1000 deliveries, compared with 5.3/1000 deliveries for developed countries.<sup>18</sup>

Effective antenatal care is still lacking among the pregnant women. We still need to reduce more by not only awareness of proper antenatal checkup but the establishment of emergency obstetric care as well as essential newborn care. The number of stillbirths has reduced more slowly than has maternal mortality or mortality in children younger than 5 years, which were explicitly targeted in the Millennium Development Goals. The Every Newborn Action Plan has the target of 12 or fewer stillbirths per 1000 births in every country by 2030 which in turn will reduce the Under 5 Mortality Rate. Early diagnosis and control of hypertension, early detection of congenital anomaly, and prevention of maternal infections, proper intrapartum management, and an intensive neonatal unit will further decrease it. Fetal autopsy in future may detect many unknown causes. Socioeconomic status and literacy influences adverse pregnancy outcome, hence education automatically increases awareness and help in overall improvement.

## CONCLUSION

In the present study, the PMR was more in the unbooked cases. Stillbirths accounted for a major chunk of perinatal mortality. Adequate antenatal care can thus prevent many future consequences of low birthweight babies, stillbirths, and neonatal deaths. Early registration helps in proper evaluation and identification women at risk. Improving the Women's education not only improves effective ANC but also improves awareness especially during emergencies.

## RECOMMENDATIONS

First, community awareness and health education on the availability and importance of antenatal care services

should be scaled up. This may improve awareness of timing and adherence to prenatal services.

Second, an inquiry should be conducted on the supplementation intake among women who access antenatal services. In that way, possible causes may be identified and addressed.

Third, an exploration should be made of the possibility of introducing ultrasound screening at least once during pregnancy for all women attending antenatal care in the region. In that way, fetal well-being may be assessed, and possible supportive measures may be implemented.

Finally, pre-pregnancy health awareness and education should be enhanced. Women need to be educated about healthy living, alcohol avoidance, smoking, and pregnancy planning in terms of timing and spacing.

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