

PERINATAL MORTALITY: AN OUTCOME OF QUALITY OF PERINATAL CARE

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ABSTRACT

Background: Perinatal mortality is the most sensitive index of health status of pregnant women and the quality of maternal and child health services. This study was carried out to determine the extent and determinants of perinatal mortality.

Methodology: It was an observational study carried out in Gynae B unit, Ayub Teaching Hospital Abbottabad, from January 2005 to December 2007. All perinatal deaths including stillbirths and early neonatal deaths were studied. Women delivered between 24 to 42 weeks gestation were included. Details of maternal age, booking status, parity, and social status were evaluated. Pregnancy related complications, medical disorders, labor details, and fetal conditions leading to perinatal death were taken into account.

Results: During the study period 5412 deliveries occurred. There were 498 perinatal deaths with a perinatal mortality rate of 92/1,000 live births. Among these ladies, 11.2% were booked, and 88.7% un-booked. Perinatal death rate in maternal age <20 years was 9.4%, 21-30 years 44.9%, 31-40 years 39.95% and >40 years 5.6%. There were 26.7% deaths in primipara, 42.9% in para 2-5 and 30.3% in para >5. Gestational age from 24-32 weeks was in 40.3%, 33-36 weeks 31.7% and 37-42 weeks 28.5%. Regarding deaths, 21.8% were due to antepartum hemorrhage, 20.4% hypertensive disorders of pregnancy, 18% mechanical cause, 14.4% congenital anomalies, 12.8% neonatal causes, 5% maternal medical disorders and 8.4% were unexplained.

Conclusion: Perinatal mortality is still high due to poor maternal health, lack of adequate antenatal, intranatal and postnatal care. Improvement in public awareness of health facilities, health status of potential mothers, socioeconomic status, literacy rate and adequate peripartum care can prevent large number of perinatal deaths.

KEY WORDS: Perinatal mortality, Still birth, Early neonatal death.

INTRODUCTION

Perinatal mortality (PNM) refers to the death of a fetus or neonate and is the basis to calculate the PNM rate. It is defined as death of a fetus in uterus or outside from 24 completed weeks of gestation until first 7 days of life. It encompasses all intrauterine deaths, stillbirths and early neonatal deaths. Perinatal mortality is expressed as per 1000 live births. Globally there are about 130 million babies born every year of which 4 million die in the first 4 weeks and 3.3 millions are still births.¹ In Pakistan about 5.3 millions births are occurring yearly out of which 2,70,000 new borns die. This high Perinatal mortality is 10 times higher than that in Unites States.² PNM is a sensitive indicator of quality of care given to pregnant women and their newborn. About 2/3rd of neonatal deaths occur in the 1st week of life and out of these two thirds take place within 1st 24 hours of birth.³ Complications during pregnancy, labor and in neonatal period are major determinants that lead to fetal/ neonatal death. In country like Pakistan 68% of births take place in domiciliary settings⁴ and stillbirths are not

reported. The actual PNM figures may be higher due the fact that births and deaths are not recorded regularly in rural areas. Similarly deaths at home are not reported to the health authorities.

The Perinatal mortality rates reported for Pakistan are between 61-81/1,000.⁴ There are some estimates of PNM from community settings but the country specific estimates are lacking. A demographic survey in Karachi reported 54/1000.⁵ Rural and periurban survey from Lahore reported 67/1000.⁶ There are multiple hospital based studies available on perinatal mortality but large population based surveys are lacking.

Our hospital is a tertiary level hospital, which caters population of nearly 20 million of Hazara division. The objective of this study was to find out the frequency of perinatal deaths (PNDs), causative factors and to identify preventable factors.

MATERIAL AND METHODS

It was a prospective study conducted from 1st January 2005 to 31st December 2007. All pa-

tients delivered in Gynae B unit of Ayub teaching hospital were included in the study. Those with <24 weeks pregnancy were excluded. Maternal demographic details including age, parity and period of gestation were determined. Mode of delivery, pregnancy related complications, medical disorders with pregnancy and other causative factors were evaluated. All perinatal deaths, stillbirths including both fresh and macerated stillbirths were taken into account. Early neonatal deaths up to 7 days of life were analyzed prospectively. Birth weight, apgar scores and congenital anomalies were also noted.

RESULTS

During 3 years period 5412 deliveries took place. There were 498 PNDs with a PNM rate of 92/1,000 live births. Total still births were 401 with still birth rate of 74/1,000. Early neonatal deaths were 97 with early neonatal death rate of 17.9/1,000.

11.20% (56) were booked and 88.70% (442) were unbooked. Maternal age ranged between 15 to 45 years. There were 9.2% (47) PNDs in <20 years age group, 44.9% (224) in 20-30 years age group, 39.9% (199) in 30-40 years and 5.6% (28) in >40 years age group. Primiparae had 26.7% (133) PNDs, para 2-5 had 42.9% (214) PNDs and Para >5 had 30.3% (151) PNDs. Gestational age was divided in groups from 24-32 weeks 40.3% (201), 33-36 weeks 31.7% (155), 37-42 weeks 28.5% (142). Birth weights were assessed, 51% (254) were <2.5 kg, 34.9% (174) between 2.5-3.5 kg, 12.0% (60) between 3.5-4 kg and 2% (10) were >4 kg. Mode of delivery was assessed, 56.6% (282) were spontaneous vaginal deliveries, 10% (50) instrumental deliveries and 33.3% (166) cesarean deliveries. Causes of PNM were evaluated according to Aberdeen classification. Major causes noticed were; antepartum hemorrhage 21.8% (109), hypertensive disorders of pregnancy 20.4% (102), mechanical factors

Table 1: Frequency of deliveries and perinatal deaths.

Variable	Number
Total number of deliveries	5412
Total number of still births	401
Total early neonatal deaths	97
Perinatal mortality rate	92/1,000
Still birth rate	74/1,000
Early neonatal death rate	17.9/1,000

Table 2: Maternal demographic details.

Variables	No of Cases	Percentage
Booked	56	11.20%
Un-booked	442	88.70%
Age		
15-20 years	47	9.40%
21-30 years	224	44.90%
31-40 years	199	39.90%
More than 40 years	28	5.60%
Parity		
Para 0-1	132	26.50%
Para 2-5	213	43%
Para >5	150	30.10%
Gestational age		
24-32 weeks	201	40.30%
33-36 weeks	155	31.70%
37-42 weeks	142	28.50%

18% (90), congenital anomalies 14.4% (72), neonatal problems 12.8% (54), maternal medical disorders 5% (25) and unexplained still births 8.44% (42).

DISCUSSION

In our study PNM rate was 92/1,000, which is similar to other hospital-based studies. A study at Jinnah Postgraduate Medical Center reported 97.2/1,000,⁷ Other studies at tertiary care hospital showed PNM rates of 100.7/1,000,⁸ and 72.7/1,000.⁹ These figures are not comparable to those of developed countries like England¹⁰ and Wales.¹¹ Pakistan has still high rate of PNM 68-81/1,000 as compared to other developing countries like India and Bangladesh.¹²

PNM is a marker to assess the quality of health care delivery and is largely related to social, economical and educational standards of community. A large number of pregnant women do not receive antenatal care due to poverty and illiteracy. Most of the patients at tertiary care hospitals are referrals with obstetrical complications, which result in higher PNM rate. In our study there were 88.7% cases of PNM without any antenatal care. Aziz S reported impact of socioeconomic conditions on perinatal mortality.¹³ Another study

Table 3: Factors related to perinatal mortality.

Factors	Number	Percentage
Antepartum hemorrhage	109	21.80%
Placenta previa	26	5.20%
Abruptio placentae	83	16.60%
Hypertensive disorders	102	20.40%
Eclampsia	55	11.00%
Severe pre eclapmsia	47	9.43%
Mechanical problems	90	18.00%
Obstructed labor	42	8.43%
Cord prolapse	15	3.00%
Ruptured uterus	21	4.20%
Transverse lie	7	1.40%
Breech presentation	4	0.80%
Congenital anomalies	74	14.40%
Hydrocephaly	18	3.60%
Anencephaly	42	8.40%
Neural tube defects	4	0.80%
Multiple anomalies	10	2.00%
Sacroccygeal teratoma	2	0.40%
Neonatal problems	64	12.85%
Meconium aspiration	42	8.43%
Respiratory distress syndrome	8	1.60%
Bleeding disorders	4	0.80%
Septicemia	10	2.00%
Unexplained deaths	42	8.44%
Birth weight >2.5 kg	34	6.83%
Birth weight <2.5 kg	8	1.60%
Maternal medical problems	25	5.00%
Diabetes	11	2.20%
Anemia	6	1.20%
Hepatitis	5	1.00%
Choreoamnionitis	3	0.60%

also related high perinatal mortality to poor socioeconomic status and cultural patterns.⁷

Maternal age is considered to be an important and independent risk factor for adverse pregnancy outcome.¹⁴ It was noted to be significant

risk factor for stillbirths, perinatal and neonatal deaths.¹⁵ In our study 9.4% PNM was in <20 years age group. Teenage maternities contributed to 9.5% of overall neonatal mortality rate in England and Wales.¹⁵ Our results revealed 84.8% of PNDs in 21-40 years age group, which is comparable to 82.9% in another study.⁷ Advanced maternal age is independently associated with specific adverse pregnancy outcomes and is a continuum rather than threshold effect.¹⁶ Our 5.8% PNM in >40 years age mothers is comparable with 7.4%e of other study.⁷

Parity is another determinant of perinatal outcome. Most of perinatal complications occur in primiparae and paras >5. Grandmultiparity is an established obstetrical and medical risk factor for fetomaternal outcome.¹⁷ Certain complications during pregnancy, labor and puerperium are thought to occur with increase frequency in grandmultiparas.¹⁸ Our data revealed 26.5% PNDs in primiparae and 30.1% in grandmultiparas. This together makes 56.6% of perinatal deaths in at high-risk group. A study reported 20.53% death in primiparae and 30.35% in grand multiparas⁸ that is comparable to our study.

Gestational age is strongly related to perinatal outcome. Prematurity is a high risk factor for early neonatal deaths.¹⁹ Pregnancy related complications like eclampsia, severe pre-eclapmsia and antepartum hemorrhage often result in prematurity. Other risk factors for prematurity are maternal age, malnutrition and poor socioeconomic status. 40% of PNDs in our study were <32 weeks and 31% <37 completed weeks this makes a high proportion of babies less than 37 weeks (71%). A study reported 63% contribution in PNM by prematurity.²⁰ Other studies also reported increased frequency of PNM in <37 weeks gestations.^{21, 22}

Causes of PNM were evaluated according to Aberdeen classification of perinatal deaths. Antepartum hemorrhage resulted in 21.8% perinatal deaths. The major proportion is from abruptio placentae 16.6%. It is an increasingly important factor leading to perinatal mortality as reported by other studies.^{21,7} Even in United States about 15% of PNDs are attributed to abruption.²³ Maternal malnutrition, hypertensive pregnancies, folic acid deficiency and physical assault lead to abruption.

Second common risk factor identified in our study is hypertensive disorders which resulted in 20.4% PNDs. Eclampsia is a serious obstetrical emergency that result in higher maternal and PNM. A study has reported 64/1,000 PNDs due to eclampsia and 56% of severe perinatal complications.²⁴ A Nigerian study reported 307/1,000

PNDs due to eclampsia.²⁵ Other studies have also pointed out hypertensive disorders to be the leading cause of perinatal death.¹¹ Our data is comparable to the results of other hospital based studies.^{7,8}

Mechanical factors are the 3rd most frequent cause of PNM in our study. Prolonged and obstructed labor result in intrapartum death, birth asphyxia and meconium aspiration. Ruptured uterus result in fetal death in almost all cases. Neglected transverse lie, cord accidents and breech presentation also cause adverse perinatal outcome. A Ara reported 38% PNDs due to obstructed labor²⁶ and 160/1,000 in another study.²⁷ Our PNM of 18% is comparable to other studies with PNM of 21%⁷ and 14.2%.⁸

Congenital fetal anomalies greatly influence perinatal mortality. Congenital defects have become major cause of perinatal mortality in developed countries resulting in more than 20% of PNM.²⁸ The highest rates of PNM recorded due to congenital anomalies for Ireland is 2.4/1000 and for Malta 2.6/1000.²⁹ Globally about 10% of neonatal deaths are due to congenital anomalies.² Our study revealed 14.4% PNDs due to congenital anomalies which is higher as compared to developed countries but comparable to the locally available data.^{7,8} The rates are usually high where termination of pregnancy for fetal anomaly following prenatal diagnosis is not considered.

There are 10.8% of PNDs due to fetal problems. Birth asphyxia is mainly responsible for increase frequency of respiratory distress syndrome and meconium aspiration. In poorly supervised labors fetal distress remains undiagnosed and timely interventions are not made hence causing early neonatal death. Birth asphyxia has been reported to be responsible for 29% of neonatal deaths.² In our study 10.04.03% deaths were due to birth asphyxia. A multinational study reported 23% deaths due to asphyxia.³⁰ Neonatal sepsis, a hazardous factor related to neonatal deaths and is closely related to intranatal care and cord cutting. It is responsible for 9% of 4 million neonatal deaths yearly.² 2% of deaths in our study are due to neonatal sepsis that is closely comparable to a study reported 1.2%.⁷

Maternal diseases contributed in about 5% of neonatal deaths in our study. Maternal diabetes, anemia and hepatitis are mainly highlighted for perinatal death in this study. Maternal diabetes was responsible for 4.4% of PNDs in a study,⁹ comparable to 2.2% of our study. Anemia is prevalent in 45% of pregnant population in our country and it is directly related to perinatal outcome.³¹ In our study 1.2% PNDs were 1.2% due to maternal anemia which was 0.45% in other study.⁷

Similar factors are operating in our set up as other studies conducted in different hospitals of our country pointed out earlier. The main reason behind the high PNM is suboptimal care of pregnant women and its newborn. Poverty, illiteracy and cultural constraints keep the public away from available health care facilities. Our study reveals that majority of PNDs are preventable as pointed out by ZA Bhutta.³² Antenatal booking of all pregnant females for proper health care cover is necessary to diagnose high risk pregnancies. Pregnancies at extreme of age can be prevented through proper health counseling, adequate family planning practices and discouraging teenage marriages. Grand multiparity needs to be addressed through effective family planning measures and health education. Similarly prematurity is largely associated with poor maternal health, malnutrition and lower socioeconomic status. Addressing maternal malnutrition and improving socioeconomic status can prevent large number of premature births.

PNM due to antepartum hemorrhage can be tackled through antenatal diagnosis. Hypertensive pregnancies need close monitoring and control of blood pressure to prevent complications. Prenatal diagnosis of congenital anomalies and providing services for early termination of pregnancies carrying lethal anomalies can reduce PNDs secondary to birth defects. Mechanical factors need proper care during labor, timely diagnosis of obstructed labor, malpresentations and dysfunctional labors. As suggested by Jokhio training of traditional birth attendants and integrating them in to an improved health care system is effective in reducing perinatal mortality.³³

Neonatal deaths can be reduced through essential new born care intervention that include routine neonatal care, resuscitation, thermoregulation, breast feeding, kangaroo care, care of small baby and management of common illnesses. Improvement in reducing stillbirths by using essential newborn care program has been reported by another study.³⁴

CONCLUSION

The perinatal mortality is still high in our set up which needs effective implementation of measures like improvement in general health of reproductive age females, health awareness of public, necessary antenatal care, prenatal diagnosis, optimal peripartum care, essential new born care program implementation and improving contraceptive prevalence. This all can be accomplished through improving literacy rate, socioeconomic status and provision of free health facilities. Domiciliary midwifery needs to be discouraged throughout the country.

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