# MATERNAL RISK FACTORS FOR PERINATAL MORTALITY

**Manisha Behal[1], Rajeev Vinayak[2,*]**

[1]Assistant Prof. of Department of Obs. & Gynae), [2]Assistant Prof. of Department of Pediatrics,
Goldfield Institute of Medical Sciences & Research, Faridabad, Haryana

***Corresponding Author:**
E-mail: rjv.vinayak@gmail.com

## ABSTRACT

**Objective:** *This prospective clinical study was designed on maternal risk factors for perinatal mortality.*

**Material and Methods:** *This is cross sectional study conducted in the Department of Obstetrics & Gynae and Department of Pediatrics, Goldfield Institute of Medical Sciences & Research, Village Chhainsa, Faridabad, Haryana, during the period from 1st July 2012 – 30th June 2014. Here study population were all fresh & macerated stillborn & early neonatal death cases during the study period. For convenience total 100 cases were studied for this study during the study period.*

**Results:** *During this period 8202 deliveries were done & there were 678 perinatal deaths. From this study it was revealed that most important maternal risk factor for perinatal mortality was pre-eclampsia, eclampsia and obstructed labour.*

**Conclusion:** *Perinatal mortality rate serves as the most sensitive index of maternal and neonatal care.*

## INTRODUCTION

Perinatal mortality rate is defined as the number of still births and the first week death per thousand total births. It is the most sensitive index of maternal and neonatal care. 98% of perinatal deaths occur in developing countries .Perinatal mortality is an important indicator for monitoring progress towards Millennium Development Goal. Without reducing perinatal mortality it is not possible to reduce neonatal mortality rate, infant mortality rate & under 5 mortality rate. Among the main causes of perinatal mortality high risk pregnancies comprise the commonest one.

Among perinatal death 70% were still births. 15.5% in 24 hours of birth and rest of deaths occurred between 2-7 days after birth. Pregnancy & delivery related causes were responsible for 21% of perinatal death. Women who had less than two visits were more likely to experience perinatal death than those who had more.

High risk pregnancy is broadly defined as one in which the mother, fetus or newborn is at risk of morbidity or mortality before, during or after delivery.

Factors associated with high risk pregnancies are maternal age, period of gestation, complications during pregnancy and labour, previous bad obstetric history, maternal disease, poor economic condition, cigarette smoking.

Adolescents are at increased risk for preeclampsia, eclampsia, IUGR, and maternal malnutrition. Women > 35yrs are at higher risk of pregnancy induced hypertension; diabetes and obesity, increased risk of cesarean section, preeclampsia and placenta praevia. Primi & grand multi have been associated with poor perinatal outcome. Premature labour accounted for 27% of perinatal mortality.

Complications during pregnancy and labour such as, prolonged or obstructed labour, abnormal fetal position and hypertensive diseases of pregnancy increased the risk of perinatal mortality fivefold. All these factors are responsible for 30% of perinatal deaths. Maternal diseases such as Diabetes mellitus, hypertension, heart disease, TORCH infection, sexually transmitted diseases are also a perinatal risk factor.

Identification of maternal risk factor with effective & timed intervention may help to reduce the perinatal mortality.

The present study was conducted to find out perinatal mortality rate in a tertiary level hospital and to assess the maternal risk factors responsible for perinatal death & to assess other associated factors for it in order to formulate the measure for prevention.

It was found that most important maternal risk factors for perinatal mortality are pre-eclampsia, eclampsia and obstructed labour.

## MATERIAL AND METHODS

This is a cross sectional study conducted in the Department of Obstetrics & Gynae and Department of Pediatrics Goldfield Institute of Medical Sciences & Research, Village Chhainsa, Faridabad, Haryana, during the period from 1st July 2012 – 30th June 2014.

Purpose of study was designed on maternal risk factors for perinatal mortality. Here study population were all fresh & macerated stillborn & early neonatal death cases during the study period. For convenience sampling total 100 cases were studied.

The inclusion criteria were gestational age >28 weeks. Birth weight <1 kg.

Gestational age <28 wks & congenital anomaly of the fetus were excluded from the study.

Data was be collected by using pre designed questionnaire. Relevant information's were collected from medical records. Data was analyzed by using appropriate computer software.

**Table I: Rate of perinatal death, still births& early neonatal death during study period (1st July 2012 – 30th June 2014)**

| | |
|---|---|
| Total delivery- 8202 | |
| Perinatal death- 678 | Perinatal mortality rate- 82.66 |
| Still births- 538 | Still births rate- 65.59 |
| Early neonatal death- 140 | Early neonatal death rate- 17.06 |

**Table I**. Shows that the perinatal mortality rate was 82.66 per 1000 total births; still birth rate was 65.59 per 1000 total births and early neonatal death rate was 17.06 per 1000 total births.

**Table II: Perinatal death among the study population (n-100)**

| Perinatal death | Number | Percentage (%) |
|---|---|---|
| Still birth | 73 | 73 |
| Early neonatal death | 27 | 27 |

**Table II**: Shows still birth rate was 73% and early neonatal death rate was 27%.

**Table III: Socioeconomic and educational status of the patient with perinatal death (n= 100).**

| Factors | | Number | Percentage |
|---|---|---|---|
| Socio economic condition | Lower class | 48 | 48 |
| | Lower middle class | 33 | 33 |
| | Middle class | 19 | 19 |
| Educational status | No education | 45 | 45 |
| | Primary | 36 | 36 |
| | Secondary | 14 | 14 |
| | Higher secondary | 3 | 3 |
| | Higher education | 2 | 2 |

**Table III:** Shows that perinatal mortalities are associated with lack of education 45% and lower socio-economic condition 48%.

**Table IV: Causes of delay in getting admission (n-100)**

| Causes | Number | Percentage (%) |
|---|---|---|
| Economic | 30 | 30 |
| Distance | 26 | 26 |
| Decision making | 45 | 45 |
| Ignorance | 27 | 27 |

**Table IV:** Shows that decision making (45%) is the main cause of delay in getting admission. Some patients have more than one cause.

**Table V: Maternal factors for perinatal death (n-100)**

| Factors | | Number | Percentage |
|---|---|---|---|
| Maternal age | <18 year | 28 | 28 |
| | 19-34 year | 65 | 65 |
| | >35 year | 7 | 7 |
| Parity | Primigravida | 61 | 61 |
| | Multigravida | 39 | 39 |
| Antenatal visits | Regular ANC | 6 | 6 |
| | Irregular | 54 | 54 |
| | No ANC | 40 | 40 |
| Recurrent pregnancy loss | Absent | 79 | 79 |
| | Present | 21 | 21 |

*(ANC-Antenatal care)

**Table V:** Shows that 28% of mothers had age below 18 years, about 61% are prim gravida, only 6% cases had regular antenatal visit, 21% cases had history of Recurrent pregnancy loss.

**Table VI: Risk factors for perinatal death identified on admission (n-100)**

| Risk factors | Number | Percentage |
|---|---|---|
| Risk factors present | 85 | 85 |
| Risk factors absent | 15 | 15 |
| One risk factor | 58 | 58 |
| Multiple risk factors | 27 | 27 |

**Table VI:** Shows 85% of cases were admitted with risk factors.

**Table VII: Maternal risk factors for perinatal death identified on Admission (n-100)**

| Risk factors | Number | Percentage |
|---|---|---|
| Eclampsia | 11 | 11 |
| Pre-eclampsia | 19 | 19 |
| Heart diseases | 1 | 1 |
| Diabetes | 1 | 1 |
| Bronchial Asthma | 1 | 1 |
| Placenta Praevia | 6 | 6 |
| Cord prolapse | 4 | 4 |
| Obstructed labour | 24 | 24 |
| Ruptured uterus | 2 | 2 |
| Intra uterine death | 10 | 10 |
| Abruptio placenta | 5 | 5 |
| Previous caesarean section | 8 | 8 |
| Others | 8 | 8 |

**Table VII.** Shows eclampsia & pre-eclampsia & obstructed labour are most important causes for perinatal death. Some patients have more than one risk factor.

**Table VIII: Mode of delivery (n-100).**

| Variables | Number | Percentage |
|---|---|---|
| Vaginal delivery | 47 | 47 |
| Ventouse | 8 | 8 |
| Forceps | 9 | 9 |
| Breech extraction | 9 | 9 |
| Caesarean section | 24 | 24 |
| Caesarean Hysterectomy | 1 | 1 |
| Repair of rupture uterus | 2 | 2 |

**Table VIII:** Shows 47% cases had vaginal delivery and 24% had Caesarean section.

**Table IX: At 1 and 5 minutes APGAR score in case of Early neonatal death (n=27)**

| APGAR SCORE | APGAR SCORE @ 1 MIN. Number | APGAR SCORE @ 1 MIN. Percentage | APGAR SCORE @ 5 MIN Number | APGAR SCORE @ 5 MIN Percentage |
|---|---|---|---|---|
| 0 | 0 | 0 | 4 | 14.81 |
| 1 - 4 | 10 | 37.03 | 14 | 51.85 |
| 5 – 6 | 14 | 51.85 | 7 | 25.92 |
| 7 – 8 | 3 | 11.11 | 2 | 7.4 |
| 9 - 10 | 0 | 0 | 0 | 0 |

**Table IX:** shows that among the 27 cases of early neonatal death 37.03% were born with an APGAR score 4 or below and 14.81 % had APGAR score 0 at 5 minute. In about 7.4 % cases APGAR score was 7-10 at 5 minutes but ultimately they died.

**Table X: Fetal condition at the time of admission**

| Fetal condition on admission | Percentage |
|---|---|
| Dead | 55 |
| Severe fetal distress | 30 |
| Mild | 11 |
| No fetal distress | 4 |

**Table X** Shows condition of fetus on admission @ Goldfield Institute Of Medical Sciences & Research, Faridabad, and Haryana. More than half (55%) of the patient were admitted when the fetus was already dead and another 41% had fetal distress (Severe FD 30% and mild FD 11%).

**Table XI: Presentation of the fetus on admission**

| Presentation | Percentage |
|---|---|
| Cephalic | 75 |
| Breech | 17 |
| Shoulder | 8 |

**Table XI** Shows that in 75% of cases there were cephalic presentation and 17% cases had breech presentation.

**Table XII: Probable cause of early neonatal death (n-27)**

| Causes | Number | Percentage |
|---|---|---|
| Perinatal asphyxia | 19 | 70.03 |
| Infection | 7 | 25.92 |
| Birth trauma | 1 | 3.7 |

**Table XII**: Shows that the most common cause of early neonatal death is perinatal asphyxia (70.03%).

**Table – XIII - Time interval between birth & death in cases of early neonatal death**

| Time interval between birth & death | Number | Percentage |
|---|---|---|
| < 10 min. | 9 | 33.33 |
| 10 – 60 min. | 7 | 25.92 |
| 1 – 6 hrs | 5 | 18.51 |
| 6 – 24 hrs | 3 | 11.11 |
| 2 – 4 days | 1 | 03.70 |
| > 4 days | 2 | 07.40 |

**Table XIII** shows 33.33% of neonatal death occurred within 10 minutes of birth and 88.87% within 24 hours of life.

## DISCUSSION

The perinatal mortality rates in countries of the Indian subcontinent are three to four folds higher than in the developed countries. Lack of antenatal care, facilities for prenatal fetal health monitoring and institutional care and deficient neonatal care services contributes to the persistent high perinatal mortality.

In India, the perinatal mortality rate is higher. In rural Haryana, this mortality rate is even higher than that of other regions of India. Many factors such as lack of education, socioeconomic, cultural customs, decision making are the main cause of delay in getting admission. So the study was important to find out the actual causes associated with higher perinatal death in this region.

In this study perinatal death rate is 82.66 /1000 births. Goldfield Institute of Medical Sciences & Research is a tertiary care referral hospital. Still births & early neonatal deaths contributed about 73% and 27% respectively,

Eclampsia came out as the most common risk factor where young age and under nutrition were the causative factors for Eclampsia.

It was found that most of the perinatal deaths were associated with lack of education (45%) and poor socioeconomic condition (48%), 28% of mother was below 18 years, 61% were prim gravida, only 6% cases had regular ante-natal visit and 21% cases had a history of perinatal deaths.

In this study it was revealed that 85% of perinatal mortality cases had one or more risk factor. Among them 58% cases were presented with one risk factor and 27% cases with multiple risk factors. Eclampsia

(11%), Preeclampsia (19%), Obstructed labour (24%) were major risk factors.

In the present study 47% cases had vaginal delivery and 24% had LSCS. Here presentation of fetus was cephalic in 75% and breech in 17% cases.

In 55% cases fetus were already dead and in another 30% cases there were severe fetal distress on admission.

Among the 27 cases of early neonatal death 37.03% were born with an APGAR score 4 or below and 14.81% had APGAR score 0 at 5 minute. In about 7.4% cases APGAR score was 7-10 at 5 minutes but ultimately they died.

About 33.33% of neonatal death occurred within 10 minutes of birth and about 88.87% within 24 hours of life.

Most common cause of early neonatal death was perinatal Asphyxia (70.03%).

Several studies done in developing countries identified asphyxia and birth trauma is important causes for perinatal death.

A survey by Gaddi and Seetharam shows the common causes of perinatal mortality includes low birth weight (16%), perinatal asphyxia (17%), infections (12%), congenital malformations (7%), birth trauma (5%), and respiratory distress syndrome (13%) [12]. The most frequent cause of neonatal death in USA is congenital malformations, chromosomal disorders (37%), and complication of pregnancy[13].

Neonatal mortality can be reduced by early diagnosis and pregnancy termination in case of congenital malformations.

Another study identified the risk factors for perinatal deaths in a rural community in Manikgang district, Bangladesh. 186 infant deaths were recorded, the perinatal death rate was 64.5/1000 births. Another clinical trial conducted between 1994 and 1997 at MCH/FP hospital in Mirpur, Dhaka, Bangladesh. The risk of perinatal mortality was as high as 2.7 times more likely in women with hypertensive disorders, 5 times as high for women who had ante partum hemorrhage. [14]

The six leading risk factors for perinatal death were preeclampsia, antepartum hemorrhage, post maturity, hypertension, prolonged labour and severe anaemia.

Increasing maternal age is associated with increasing risks for infant mortality.[15] Teenagers remained a higher risk group[16].

Complication during labour and delivery increase the risk of perinatal mortality to five fold.

Other risk factors of Kusiako study were eclampsia, pre-eclampsia, breech presentation, prolonged labour, multiple pregnancies and ante partum haemorrhage.

Intranatal care by untrained birth attendance is another risk factor for perinatal mortality. Trained supervision at delivery reduces the chance of fresh stillbirth 5 times [18]. Midwives have a major role to play in the management of labour complications during home deliveries [19]. So in this study was taken to find out the maternal risk factors for perinatal mortality.

## CONCLUSION

Perinatal mortality is a sensitive indicator of the quality of health care provided to pregnant women and the new born.

The main causes of stillbirth in this study were eclampsia, pre-eclampsia, obstructed labour. Other causes were home trial, injudicious use of oxytocin, lack of recognition of contracted pelvis, mal presentation and late referral at critical state.

The major cause of early neonatal death is birth asphyxia due to difficult labour. The increased deaths due to asphyxia reflect inadequate and inappropriate monitoring and late referral of fetal distress cases leading to still birth.

In order to improve the situation, the targeted population should be given health education, encouraged to take advantage of the available health services which are being underutilized.

The legislation compelling antenatal care and hospital delivery can also be useful. The other options are to improve facilities of peripheral health infrastructure for managing the high risk cases.

The perinatal mortality among the institutionalized cases could be reduced by effective and timed intervention among high risk cases. Appropriate intrauterine monitoring and timely delivery of the babies are important .Advanced life support in the form of mechanical ventilation can improve the outcome in sick babies.

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