

Study of causes and risk factors of perinatal mortality in Al Ameen Medical College, Vijayapur

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Abstract: *Objective:* Perinatal mortality rate is a sensitive indicator of quality and quantity of maternal and neonatal health services. Our aim was to study the causes of perinatal deaths and the trends of early neonatal deaths in NICU with respect to the causes and to estimate determinants of perinatal mortality and suggest remedial measures for its reduction. *Background:* Perinatal mortality is mirror reflection of maternal and child health and socioeconomic environment of community. It is influenced by various avoidable and unavoidable causes. It can be reduced by improving maternal and child health services and by health education. *Methods:* Our study was carried out in labour room and N.I.C.U. of Al Ameen Medical College, Vijayapura. We included still born babies with gestational age >28 weeks and early neonatal deaths i.e, till 7th day of life in this study. Fetomaternal factors like maternal age, religion, residence, parity, mode of delivery, booking status, antenatal complications, birth weight, congenital anomalies, neonatal complications influencing perinatal mortality rate were tabulated and analyzed. Cause of perinatal death was assessed. *Results:* Perinatal mortality rate was 33.84/1000 total births. Maternal factors like age more than 35 years, inadequate antenatal care, primiparity, grand multiparity, induced deliveries and neonatal factors like low birth weight, prematurity were associated with increased perinatal mortality. The leading cause of stillbirth was hypertensive disorders of pregnancy and prematurity for neonatal mortality. *Conclusion:* Apart from clinical causes high perinatal mortality was due to poverty, illiteracy, lack of health awareness, inadequate antenatal care and delayed referral. Health education, identification of high risk mothers, timely referral, advanced life support of preterm neonates should significantly help to reduce perinatal deaths.

Keywords: Perinatal Mortality, Still Births, Birth Asphyxia.

Introduction

Perinatal death (PND) is a profound and common experience and one that is often underestimated in terms of its frequency and impact. Despite improvements in antenatal and intrapartum care, stillbirth as well as early neonatal mortality remains an important, largely unstudied and poignant problem in obstetrics worldwide, especially so in reference to developing country like India. Perinatal mortality (PNM) rate is one of the most important index which reflects the quality of services provided by an institution and overall obstetric care in community [1].

Despite intensive investigation of potential causes, in large proportion of stillborns, no significant causes can be identified, and then the so called “unexplained” adds to the agony and frustrations of the grieving parents, who remains

unsure what happens next. It has been a common practice to classify PND according to maternal conditions that initiated the events that lead to death. However, such an approach tends to ignore the fetal and neonatal conditions. It is also very important to identify the risk factors of PNM because if especially the maternal risk factors are identified early, preventive measures, if any, may be adopted; and it might reduce the PNM to a significant extent in subsequent pregnancies.

There are several institutional studies which show PNM associated with several factors like prematurity, low birthweight (LBW), perinatal asphyxia and maternal variables like low socioeconomic status, multiparity, bad obstetric history etc. Considering the possible changing trend, we had planned to explore the

causes and risk factors of PND and its magnitude and the outcome in a tertiary teaching hospital.

Aims and Objectives: Perinatal outcome may be improved by enhanced antenatal care, which is easier to obtain in developed countries; but in developing country like India, still it is difficult to achieve. A continuous monitoring of PNM in a tertiary teaching institution like ours' is one of the practical ways to substantially accelerate the improvement of pregnancy outcome, as because neonatal intensive care facility is much developed in this institution compared to others in this region of our country. Many Indian studies have shown that LBW contribute substantially to PND in India [1-2] and the neonatal survival can be improved by specialized neonatal care [3]. This observational study was planned in our tertiary care hospital with following *specific objectives*:

1. To identify the causes & risk factors of perinatal mortality.
2. Identification of health intervention needed.
3. Maternal morbidity and obstetrical management.
4. Strategies for reduction of PNM

Material and Methods

It is an observational study conducted at The Department of Obstetrics & Gynecology, Al-Ameen Medical College and Hospital, Vijayapura from November 2016 to June 2018.

Inclusion Criteria:

1. All patient attending prenatal care and delivering in Al Ameen Hospital.
2. Greater than 28 weeks estimated GA.
3. Upto 7 days post delivery is also considered

Exclusion Criteria:

1. Perinatal mortality before 28 weeks of gestation.

2. Neonates after 7 days of delivery.

Scheme of Investigations for perinatal deaths:

a) At the Diagnosis of Fetal Death:

i) Maternal History

- Record full maternal history

ii) Ultrasound Scan

- Fetal anomalies
- Placental abnormalities
- Amniotic fluid index

iii) Blood Tests

- Full blood examination and smear
- Blood group and antibody tests
- Infection screen for malaria etc.
- Renal and liver function tests
- HbA_{1c}
- Anticardiolipin antibodies and lupus anticoagulant

b) Following Birth

i) Baby

- External examination
- Clinical photographs
- Autopsy if possible

ii) Placenta and Cord

- Cord blood for grouping and typing if the mother is Rh negative
- Acroscopic examination

Results

Total number of deliveries during the study period were 1138; total no. of PND 30. PNMR of our hospital is 26.6 per 1000 total births. Classifying the causes of perinatal deaths;

Commonest cause of perinatal deaths (PND) as per Wigglesworth classification in our hospital is unexplained antepartum fetal death (26.67%) followed by Death from IntrapartumAsphyxia (20%) (Table 1).

Code	Description	No. of death	Percentage
A	Congenital defect or malformation	5	16.67
B	Unexplained antepartum fetal death	8	26.67
C	Death from intrapartum asphyxia, anoxia, trauma	6	20
D	Immaturity	5	16.66
E	Other (infection, other specific cause, accident)	0	0
F	Unclassified or unknown	6	20

Table-2: Classifying perinatal deaths as per ReCoDe classification [5] (n=30)

Code			Total no.	Percentage
Group A	Fetus	Congenital anomaly, isoimmunisation	5	16.67
Group B	Umbilical cord	Prolapse, velamentous insertion etc.	0	0
Group C	Placenta	Placenta previa, abruption placentae	3	10
Group D	Amniotic fluid	Chorioamnionitis, Oligo/polyhydramnios	1	3.33
Group E	Uterus	Uterine rupture, anomaly	0	0
Group F	Mother	RHD,HTN,Cervical Incompetence, ,Anaemia	9	30
Group G	Intrapartum	Asphyxia, birth trauma	6	20
Group H	Trauma	External or iatrogenic	0	0
Group I	Unclassified	no relevant condition identified no information available	6	20

Unlike Wigglesworth classification system, the most common cause as per ReCoDe classification is maternal complications which may be a direct cause of death or in some cases a risk factor for PND (Table 2).

Major factors associated with perinatal deaths: LBW is a major cause and/or risk factor in both low and average socioeconomic status; LBW being slightly more common in low socioeconomic status. Educational status of mother and PND: Majority (70.86%) of PND occurred in the mothers with poor educational status. Association of PND with previous pregnancy loss: In their previous pregnancies, 4 mothers had spontaneous abortion, 3 had perinatal deaths. Thus, a total of 6 i.e. 20% mothers had history of previous loss. Although, first trimester antenatal check up was done by majority (76.67%) of the mothers, incidence of maternal complications are found to be more common in those without ANC.

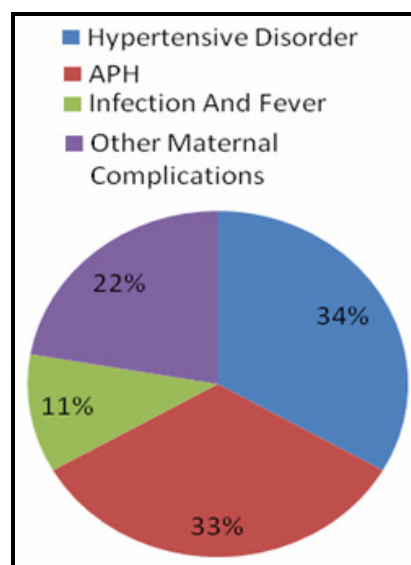
Maternal complications associated with perinatal deaths;

Table-3: Distribution of maternal complications associated with perinatal death (n=9)

Complications	No. of cases	Percentage of maternal complication
Hypertensive disorders	3	33.33%
APH	3	33.33%
Infection & fever	1	11.12%
Other maternal complications	2	22.22%

In some cases there is simultaneous infection, fever and APH associated with PIH (Table 3).

Fig-1: Distribution of Maternal Complications



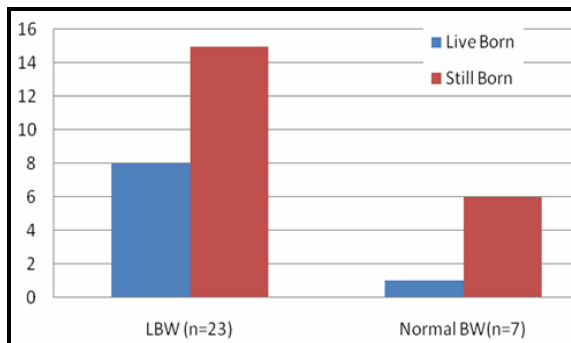
Among total of 30 cases of PND, majority (30%) were associated with maternal complications. Maternal hypertension (PIH/pre-eclampsia, eclampsia and pre-existing hypertension) is the single most important risk factor associated with perinatal death (contributing 66.67% of the maternal medical complications). Other complications include multiple gestation, anaemia, RHD (Figure 1).

Low birthweight in perinatal deaths;

Classifying livebirths and stillbirths according to LBW and normal birthweight (n=30).

Among 30 cases of PND, 23 babies had low birthweight, 7 had normal birthweight. Hence, majority (76.66%) of PND were associated with LBW of the baby (Figure 2).

Fig-2: Distribution of live born and still born babies according to low birth weight and normal birth weight



Mean birthweight of total 1138 babies delivered in our institution over the study period is 2573.32 g; SD 576.58 whereas mean birthweight of the babies died perinatally is 1765.27 g; SD 701.04 (p < 0.001). The birthweight is classified into 4 categories as per standard guidelines [3, 5], Majority of the babies belonged to low birth weight (1500-2499 g) category.

Gestational age of babies died perinatally;

Gestational age (week)	No. of cases	Percentage
28-31 ⁺⁶	7	23.33
32-36 ⁺⁶	13	43.33
37-41 ⁺⁶	10	33.34

Among the total 30 cases of PND 20 were premature <37 weeks which includes 14 of total 23 stillborns (60.87% of total stillborn) and 6 of total 7 livebirths(85.71% of total livebirths) (Table 4). Majority of early neonatal death has occurred in the babies born at gestational age between 32-36⁺⁶ weeks (55.56%). Causes are mainly perinatal asphyxia.

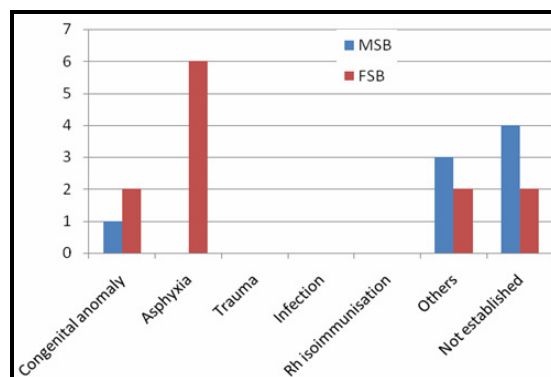
Classifying perinatal deaths;

Asphyxia as well as group where no cause could be identified seems to be the major cause of stillbirth (6 caseses each contributing 28.57% each). MSB babies were suspected to be asphyxiated when there was APH, maternal PIH,

severe maternal anemia, prolonged PPRM, meconium stained liquor or after delivery baby found to have cord around the neck. In cases of FSB along with the above mentioned causes, pathological cardiotocography (CTG) finding and prolonged labour were taken into account.

Causes	MSB	FSB	Total
Congenital anomaly	1	2	3
Asphyxia	0	6	6
Trauma	0	0	0
Infection	0	0	0
Rh isoimmunisation	0	0	0
Others	3	2	5
Not established	4	2	6
Total	9	12	21

Fig-3: Distribution According to Causes of death in stillborns



Most common cause of early neonatal death is perinatal asphyxia (44.44%). Perinatal asphyxia is present in 4 out of 9 liveborn (44.44%) and in stillborn 6 out of 21 stillborn; PIH being the most common cause (contributing to 30%) followed by APH (20%). A large proportion (70%) of the PND occurred between 28weeks to term. Congenital anomaly, maternal complications, IUGR are the causes and associated risk factors for these PNDs.

Discussion

Neonatal deaths account for an increasing proportion of childdeaths now (41%) and must be reduced to achieve Millennium

Development Goal 4. Newborn survival is also related to MDG5 for maternal Health as the interventions are closely linked [6]. Total number of deliveries during the study period is 1138 and then of PND is 30. Therefore the PNMR in our hospital is 26.6 per 1000 live births. Most of the mothers of the cases in this study came referred very late and with serious obstetric complications where nothing much could have been done.

In a similar study by Bai NS et al in the same hospital between 1986-87, the PMR was 42.75 [7]. The leading causes of death were birth asphyxia (31.28%), prematurity (15.6%), congenital malformations (8.4%), and infections (7.2%). The trends have changed in 20 years and in the present study, when subjected to multivariate analysis, only maternal complications and congenital anomaly were found to be highly significant. Nearly two-third of the total perinatal deaths were preterm, and the association of preterm delivery with higher rate of perinatal mortality is well noted in several studies [8-13]. In our study 76.66 % were low birth weight. Similar results were found by Ravikumar et al. In his study on stillbirth rate in a tertiary care hospital, described that 74.6% were low birth weight [12].

In our study we found that the socio-demographic factors resulting in increased perinatal loss include adolescent pregnancies, maternal undernutrition, poor socioeconomic status, iron-deficiency anemia and other micro-nutrient deficiencies and lack of antenatal care. In this study, the common obstetric complications associated with preterm births were G.HTN, Preterm labour, APH, Multiple Pregnancy and PROM which altogether contributed for about two third of all preterm births. Hypertension itself contributed to 34% of maternal causes of stillborn

and along with APH resulted in 66% of maternal causes. Shah D et al described that hypertension in the mother increases perinatal mortality [13].

Conclusion

Prevention of PND should be a holistic approach, which should include 5 closely linked key interventions:

- (1) Preconceptional counseling and care,
- (2) Early detection of maternal or fetal complications (e.g., PIH, fetal anomaly etc.),
- (3) Confirmation of fetal growth restriction and hypoxia,
- (4) Organised referral system for preterm delivery and for other maternal-fetal complications, and
- (5) Prompt detection and intervention of intrapartum hypoxia.

These involve community awareness, quality improvement of obstetric care, and resource mobilisation for maternity services. There should be multidisciplinary approach for prevention and management of PND. The team should include obstetrician, neonatologist, radiologist, paediatric pathologist, paediatric surgeon and clinical geneticist. Perinatal autopsy should be done when there is difficulty in diagnosing the actual cause of death. Social and cultural barrier must be overcome by more persuasive counseling. Perinatal mortality surveillance should include socio-demographic variable of mothers/parents and relevant medical, obstetric and neonatal factors. Regular perinatal audit can also contribute to quality of perinatal care and guide preventive strategy.

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