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Original Research Article

Study of obstetric factors in perinatal morbidity and mortality at a tertiary centre

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ABSTRACT

Background: Safe motherhood and child survival have always been a concern for the policymakers but perinatal mortality, especially stillbirths, have not received due attention. There are 5.9 million perinatal deaths worldwide, almost all of which occur in developing countries. Stillbirths account for over half of all perinatal deaths. This study was aimed to determine perinatal mortality rate and related obstetrics risk factors. Perinatal mortality is only a tip of the iceberg, morbidity being much higher. Vital statistics obtained through this study may serve an important source of information to guide the public health policy makers and health care providers in future.
Methods: Present observational study was undertaken in a tertiary center to look into various maternal factors and possible cause of perinatal death. All perinatal deaths including stillbirths (SBs) and early neonatal deaths (ENNDs) within 0-7 days of birth after 28 weeks of gestation were analysed. The data was collected through a pre-designed proforma.
Results: Perinatal mortality is 66.27/1000 births in our centre, where 37% were intrauterine deaths, 34% were neonatal deaths and 29% were still births. Preterm, pregnancy induced hypertension; abruptio placentae remain the most important factors for perinatal loss.
Conclusions: One of the reasons for high perinatal mortality in tertiary centres is because of poor antenatal care at peripheral centres and late referrals. Early detection of obstetric complications and aggressive treatment is one of golden rule to reduce perinatal loss.

Keywords: Antenatal care, Neonatal death, Perinatal mortality, Stillbirths

INTRODUCTION

India is a country of extreme contrasts. Along with the feeling of progress and moving forward, there is an undercurrent of poverty and ill health. These contrasts are especially sharp when it comes to health.

At one end, India is placed among the top three medical tourism destinations in Asia, mainly due to the low cost of treatment, quality healthcare infrastructure and availability of highly-skilled doctors, says a study and on other hand perinatal mortality continues to remain high.[1]

Perinatal mortality is taken as an index of the efficacy of not only antenatal and intranatal care, but also of the socioeconomic condition of the community.[2] Perinatal mortality rate in developing countries is three to five folds higher than that in developed countries.[3] The advent of effective antibiotics, establishment of organized blood transfusion services, introduction of routine antenatal care and neonatal facilities has led to a decreasing perinatal mortality. Though this decrease is evident even in India, perinatal mortality is still high as compared to developed countries.[3] Safe motherhood and child survival have always been a concern for the policymakers but

perinatal mortality, especially stillbirths, have not received due attention.[4] There are 5.9 million perinatal deaths worldwide, almost all of which occur in developing countries. Stillbirths account for over half of all perinatal deaths.[5] These deaths are largely avoidable with skilled care.[6] Although services like emergency obstetric care are the most challenging and costly to provide, they also have the highest potential to save lives.[7]

The term "perinatal mortality" includes deaths that are attributed to obstetric events, such as stillbirths and neonatal deaths in the first week of life. Perinatal mortality is an important indicator of maternal care, health and nutrition; it also reflects the quality of obstetric and Pediatric care available. The vast majority of global perinatal deaths occur in the low- and middle-income countries. The perinatal mortality and stillbirth rates for India according to National Family Health Survey-3 (2005-06) are 48.5 per 1000 live births and 19.2 per 1000 pregnancies, respectively.[8]

A number of studies have shown that suboptimal care, particularly inadequate, inappropriate, or delayed care of complications such as obvious fetal distress, placental abruption, breech presentation, twin pregnancy, or eclampsia, is associated with increased perinatal mortality. Two thirds of the neonatal deaths occur in first week of life and of these, two third occur in first 24 hours. Health of a mother determines the health of her child and maternal health is in turn affected by health over the life cycle starting from girl child through adolescence and pregnancy.

Complications during pregnancy and labour therefore remain important factors to determine fetal and neonatal survival and health. Our hospital, being a tertiary level facility receiving complicated cases from urban as well as remote areas.

This study was aimed to determine perinatal mortality rate and related obstetrics risk factors. Perinatal mortality is only a tip of the iceberg, morbidity being much higher. Vital statistics obtained through this study may serve an important source of information to guide the public health policy makers and health care providers in future.

Aims and objectives of this study were to study the magnitude of perinatal morbidity and mortality at a Tertiary Hospital, to study the various obstetric factors leading to perinatal morbidity and mortality and to find out possible interventions to decrease perinatal morbidity and mortality.

METHODS

A retrospective observational study was undertaken in a tertiary center from January 2013 to December 2013. All perinatal deaths including stillbirths (SBs) and early neonatal deaths (ENNDs) within 0-7 days of birth after 28 weeks of gestation were analysed. The data was collected through a pre- designed proforma. In case of Intrauterine death and still birth placenta was examined for any gross abnormalities. This study was carried out to look into various maternal factors and possible cause of perinatal death. Patient was explained the study and consent taken.

Inclusion criteria

Any death occurring from 28 weeks of gestation to 7 days of birth at our tertiary centre.

Exclusion criteria

- Any death occurring before 28 completed weeks of gestation.
- Any neonatal death occurring after 7th day of life.

Any neonatal death occurring in a neonate delivered outside our tertiary centre and referred to neonatal ICU of our hospital.

RESULTS

An observation study was undertaken in a tertiary care hospital from January 2013 to December 2013.There were total 8600 deliveries and 570 perinatal deaths. Following factors were studied and their incidence was observed in studied population. The observations were as follows:

- Total deliveries in 2013:8600
- Total Intrauterine deaths in 2013:212
- Total still births in 2013:167
- Total neonatal deaths:191
- Total perinatal deaths in 2013:570

Table 1: Monthly perinatal loss.

	Jan	Feb	March	April	May	June	July	August	Sep	Oct	Nov	Dec	Total
IUD	14	23	18	15	15	19	19	12	14	21	21	21	212
SB	09	15	17	17	09	19	14	17	12	14	16	08	167
NND	11	11	17	15	07	08	21	17	32	17	19	16	191
Total	34	49	52	47	31	46	54	46	58	52	56	45	570

Table 2: Patient registration.

Registered	No. of cases (n=570)	Percentage
Yes	541	95
No	29	5

Out of the total 570 patients 541 cases i.e. 95 % were registered and only 29 cases i.e. 5 % cases were unregistered and had not had a single antenatal visit earlier. Out of the total registered patients (541), 123 cases i.e. 23% were registered at our hospital and 418 cases i.e. 77% were registered outside in this study.

Among the total patients who experienced perinatal mortality, 4% were below 20 completed years of age, majority i.e. 89% were between 20 to 30 years and 7% were more than 30 years of age as shown in Table 3.

Table 3: Age.

Age group	No. of cases (n=570)	Percentage
<20 Years	23	4
20-30 Years	506	89
>30 Years	41	7

Out of the total 570 patients 254 cases (45%) were primigravidae and 316 cases (55%) were multigravida as shown in the Table 4.

Table 4: Gravidity.

Gravida	No. of cases (n=570)	Percentage
Multigravidae	316	55
Primigravidae	254	45

Out of the total 316 multigravida cases (55%), 20 cases (6%) had one or more pregnancy loss with no living child. 33 cases (11%) had at least 1 previous perinatal death and had at least 1 living child. Majority of cases i.e. 263 (83%) had no previous perinatal death with at least 1 living child. This is shown in Table 5.

Table 5: Obstetric history of multigravida patients.

Previous history	No. of cases (n=316)	Percentage
No previous perinatal death	263	83
At least one previous perinatal death	33	11
No living child	20	6

Out of the total 570 cases, birth rate of multiple gestations was 1.7% which contributed to 4% of perinatal mortality.

As shown in Table 7, 505 i.e. 88.60% had no earlier history of any medical disorders and 65 cases i.e. 11.40% had one or more pre-existing medical conditions, commonest being anaemia with 28 cases i.e. 4.91% cases.

Table 6: Multiple gestation.

Multiple gestations	No. of cases (n=570)	Percentage
No	548	96
Yes	22	4

Table 7: Pre-existing medical conditions.

Condition	No. of cases (n=570)	Percentage
None	505	88.60
Anaemia (haemoglobin, 8 mg/dl)	28	4.91
Hypertension	13	2.28
Diabetes mellitus	11	1.93
Hypothyroid	7	1.23
Anti-Phospholipid antibody syndrome	2	0.35
Hypothyroid/ anti-phospholipid antibody	1	0.18
syndrome		
Hypertension/ anti-phospholipid antibody	1	0.18
Syndrome		
Hypertension/Diabetes mellitus	1	1.18
Heart disease	1	0.18

Out of total cases, 261 cases i.e. 46% had pregnancy induced hypertension and 151 cases i.e. 58% were multigravida. Out of the 41 patients with age above 30, 28 cases i.e. 68% developed Pregnancy induced hypertension.

Table 8: Pregnancy induced hypertension.

Pregnancy induced hypertension	No. of cases (n=570)	Percentage
No	309	54
Yes	261	46

Table 9: Premature rupture of membranes.

Gestational age (in weeks)	No. of cases (n = 245)	Percentage
28-32	188	77
33-36	52	21
>37	5	2

Out of the total perinatal deaths, premature rupture of membranes was seen in 43 %. Out of the total cases 188 cases (77%) were between 28-32 weeks of gestation, 52 cases (21%) cases were between 33-36 weeks of gestation and only 5 cases (2%) were above 37 weeks of gestation.

Maternal infection was seen only in 17 cases (3%) whereas 553 cases (97%) had no documented maternal

infection. Out of the 17 cases, 15 cases (88%) had premature rupture of membranes.

As shown in Table 10, 92.6 % had no mechanical problem whereas 7.4% had some kind of mechanical problem. Commonest being prolonged or traumatic labour which was seen in 5% of cases. Cord prolapse was seen in 2% cases and there was 1 case each of transverse lie with cord prolapse and face presentation.

Table 10: Mechanical problems data.

Mechanical problems	No. of cases (n=570)	Percentage
No mechanical problem	528	92.6
Prolonged/traumatic labor	27	5
Cord prolapse	13	2
Transverse lie with cord prolapse	1	0.2
Face presentation	1	0.2

There was no placental pathology in 81% cases whereas 19% showed some pathology and commonest being retroplacental clot seen in 17%.

Table 11: Placental pathology.

Placental pathology	No. of cases (n=570)	Percentage
No pathology	463	81
Retroplacental clots	95	17
Calcification	7	1
Oedematous	3	0.5
large	2	0.4

Out of 570 perinatal deaths, 37% were intrauterine deaths, 34% were neonatal deaths and 29% were stillbirths. Out of the 191 neonatal deaths 37 case (19%) were within 1 day of life.

Table 12: Perinatal loss.

Perinatal loss	No. of cases (n=570)	Percentage
Intrauterine death	212	37
Neonatal death	191	34
Stillbirth	167	29

Out of all cases, 21% were below 1-kilogram birth weight and 35% were between 1 kg and 1.5 kg, both together contributing to more than half i.e. 56% of perinatal mortality.

Almost half of all cases had perinatal mortality because of prematurity (49%).

Other common causes of perinatal loss were abruption 16%, pregnancy induced hypertension 11%, meconium aspiration syndrome 6%, medical disorders 4%.

Table 13: Neonatal deaths according to birth weight.

Birth weight (Kilograms)	No. of cases (n = 570)	Percentage
<1	119	21
1-1.5	197	35
1.5-2	106	19
2-2.5	82	14
2.5-3	48	8
>3	18	3

Table 14: Cause of death.

Causes	No. of cases (n = 570)	Percentage
Preterm	280	49
Abruptio Placentae	93	16
Pregnancy induced hypertension	64	11
Meconium aspiration syndrome	33	6
Medical disorders	25	4
Undetermined	21	4
Cord Accidents	15	3
Congenital heart disease	12	2
Intrauterine growth restriction	11	2
Maternal infection	9	2
Rhesus Isoimmunization	4	1
Aspiration	2	0.4
Congenital diaphragmatic hernia	1	0.2

Table 15: Common causes of death as per gestational age.

Condition	28-32%	33-36%	≥37%
Preterm	72	26	0
Pregnancy induced hypertension	11	13	6
Abruptio placentae	8	29	21
Meconium aspiration syndrome	0	6	31

DISCUSSION

Perinatal death is a traumatic experience for both mother and the obstetrician. The advent of effective antibiotics, establishment of organized blood transfusion services, introduction of routine antenatal care and neonatal facilities has led to a decreasing perinatal mortality. Though this decrease in evident even in India, perinatal mortality is still high as compared to developed countries.[2]

This hospital based study was undertaken to know the causes of perinatal mortality and thus help in its prevention in future.

One of the reason for high perinatal mortality is poor antenatal visits and late referrals. In our study, there were 8600 deliveries in a year and there total 570 perinatal deaths. Perinatal mortality for year 2013 was calculated as 66.27 per 1000 births where 37% were intrauterine deaths, 34% were neonatal deaths and 29% were still births. 19% of total neonates died within 24 hours of birth and 81% died between 1 to 7 days of life. Present results were higher than national average but lower than other study.[9]

Our perinatal mortality is higher than national average because of high percentage of referrals when complication had already occurred. In the present study majority of cases i.e. 95% were registered as against other studies where majority of the perinatal deaths occurred among unregistered group.[2,9,10] Our being a city based tertiary centre with better awareness among patients and health campaigns, registration was higher but regular antenatal care, compliance and follow up remained poor. Most of the patients had one or two antenatal visits only before an adverse obstetric event occurred. This is one of the areas in developing country like India needs efforts to implement effective antenatal care. Majority of perinatal deaths were seen in referred patients which constituted 77% of the present study group. When patient presents with intrauterine death or advanced labor, nothing much can be done as damage had already been done and no interventions could save the pregnancy and our aim was to minimize maternal morbidity and mortality.

Though risk of adverse perinatal event increases in teenage pregnancy and in elderly gravida, in the present study majority of patients were between 20-30 age group. Approximately 94% of all deliveries were in females between 20-30 years of age, it means 6% of patients below 20 years of age and above 30 years of age contributed to 11% of perinatal mortality. This is comparable to many studies.[11,12] Perinatal deaths were more in multigravidae compared to primigravidae as noted in other studies.[9,12]

With increasing parity risk of anaemia increasing predisposing to various risk factors like pregnancy induced hypertension, abruptio placentae. Also chances of twin gestation increases with age, which in itself is a risk factor for increased perinatal loss. Twin pregnancy contributes significantly to perinatal mortality because of risk of premature rupture of membranes, preterm birth, low birth weight, pregnancy induced hypertension and various other complications. This is comparable to other studies.[13]

Perinatal mortality was more in pregnancies complicated by medical disorders like anaemia, hypertension diabetes, similar to other studies.[13] Pre-existing maternal disorders are associated with increase perinatal loss and need more aggressive antenatal management.

In the present study anaemia was most commonly associated with perinatal loss, similar association are seen in other studies.[12,13] Many other studies show similar association of other factors like hypertension, diabetes mellitus hypothyroidism, and antiphospholipid antibody syndrome with perinatal loss.[14] Also, pregnancies complicated with pre-existing medical disorders are more likely to develop pregnancy induced hypertension which is independent risk factor for perinatal loss.

Pregnancy induced hypertension remains one of most important cause for perinatal loss and risk of having an adverse perinatal event increases with age and parity as seen in study.[15] Severe pre-eclampsia is the most important risk factor for developing abruption and in the present study 97% patients having abruption had preceding pre-eclampsia. Unless urgent delivery does not happen, abruptio placentae usually results in intrauterine death. In the present study Abruptio placentae and severepre-eclampsia were the important cause of perinatal mortality. Similar findings were noted in other studies.[2,16,17]

Though there are no strategies at present to prevent these conditions but severity of its effect and mortality can reduced by effective antenatal care, intranatal care and good neonatal care.

Premature rupture of membranes is an important cause for prematurity. In the present study 43% of cases of perinatal loss were associated with premature rupture of membranes. Usually perinatal loss occurs because of prematurity and low birth weight and neonatal septicaemia. Preterm birth was the single most important cause of perinatal loss either because of twins, premature rupture of membranes or in case of severe uncontrolled pregnancy induced hypertension when preterm induction of labour was mandatory. Preterm babies have less chances of survival because of asphyxia, hyaline membrane disease, hypoglycemia and septicemia. Present results were comparable to other studies.[2,16,17]

Higher perinatal mortality was seen in pregnancies complicated by intrauterine growth restriction, similar to study.[17] Undetermined causes were present in 4%. Perinatal mortality due to placenta previa has reduced because of almost universal use of ultrasonography. A patient with even a single visit to a hospital also has an ultrasonography report so this condition is fortunately identified, and perinatal loss averted. Present study differed from other studies where perinatal mortality was high due to placenta previa.[18] Similarly perinatal mortality because of rhesus isoimmunization has reduced because if a patient has had even a single hospital visit, her blood group is mandatory done and mentioned on antenatal card and due to free of cost availability of anti D injection in hospitals.

The most unfortunate perinatal loss was due to meconium aspiration syndrome due prolonged or traumatic labour.

In our study there were 33 babies who had a still birth or early neonatal death due to meconium aspiration which was 5.7% of total perinatal loss. Traumatic labour was observed in 27 cases. It was lesser than other studies where it was 6.6% and 9% respectively of total perinatal deaths.[2,19] These were the babies who could have been saved with timely referrals and early intervention.

Cord accidents are definitely tragic, but little can be done if operation theatre facilities are not available and patient has to be referred. During the transportation time loss usually occurs and little can be done when patient reaches tertiary center with absent fetal heart activity. In such cases timely identification of risk factors like abnormal lie, polyhydramnios and early referral can go the long way.

Congenital abnormality was present in total 9% cases, commonest being congenital heart disease. With rampant use of ultrasonography even in peripheral areas, it is disheartening to see such high number of congenital malformation as cause of perinatal loss. It is higher than similar studies.[2,17]

91% were delivered by vaginal route and only 1 required forceps. 48 patients required cesarean delivery commonest indication being failure of induction and foetal distress. Our cesarean sections rates and instrumental delivery rates were lower than other studies.[19] We had no destructive procedures carried out.

Obvious abnormal placental morphology was seen in 17% cases, commonest being retroplacental clots in cases of abruption. Also observed were calcifications, large and edematous placenta.

In the present study 56% of perinatal loss occurred below 1.5 kg of weight. Low birth weight remains an important cause of perinatal mortality. Neonates with low birth weight, either because of preterm or intra uterine growth restriction are prone to neonatal mortality.[2,11]

It is important to know that there may be more than one cause for perinatal loss. The perinatal loss in such case was multifactorial. In the present study if have tried to give the primary single most important factor as cause of death but there may be more than one causative factor.

Preterm, abruption and pregnancy induced hypertension were responsible for 76% of perinatal loss, which unfortunately cannot be prevented but reduced definitely by early registration, identification of risk factors and good antenatal care. Other important causes were obstructed labour causing fetal distress with meconium aspiration syndrome, cord accidents and congenital malformations.

India is a country with diversity, unfortunately this diversity also exists in health care facilities and utilization. India has proven its metal in various spheres and it's not the lack of technology or resources but failure of implementation which has stopped India to achieve perinatal mortality of developed countries. Though the perinatal rate has shown a decreasing trend we cannot be content till India starts to be included in developed countries and this will not happen unless health of India improves as a whole, which in true sense is reflected by perinatal mortality.

CONCLUSION

Immunoglobulin prophylaxis in mothers with negative blood group, perinatal loss due to rhesus iso-immunization has decreased. Availability of antibiotics have reduced perinatal loss due to maternal infections. Perinatal loss due to congenital malformation and meconium aspiration syndrome can be decreased further.

Preterm, pregnancy induced hypertension; abruptio placentae remain the most important factors for perinatal loss and can be reduced with good antenatal care with early detection and aggressive management.

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