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Observational Study of Influencing Maternal Risk Factors on Perinatalmortality

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Abstract
Background: *The greatest risks to life are in its very beginning. Although a good start in a life begins well before birth. It is just before; during and in the very first hours and days after birth that life is a most at risk. This prospective study was designed on maternal risk factors for perinatal mortality.*
Objective: *To study maternal risk factors affecting Perinatal Mortality atSmt.Shardaben Chimanlal Lalbhai Municipal General Hospital(SCL),Saraspur,Ahmedabad,Gujarat.*
Material and Methods: *This was a prospective and observational study conducted in our institute for two years period in 1st May 2017 to 30thApril 2019.The cases were all fresh and macerated still birth and early neonatal death cases during the study period.*
Results: *During this period total numbers of deliveries were 11731 and there were 318 perinatal deaths.The perinatal mortality rate was 27.10%.The most significant risk factor for perinatal mortality were maternal anaemia, pre-eclampsia, Eclampsia and obstructed labour, diabetes,gestational hypertension,abruptio placenta, placenta previa.*
Conclusions: *Perinatal mortality rate serves as the most sensitive index of maternal and neonatal care and prevention of preterm birth may play a key role in the further reduction of PMR.Early diagnosis and management of maternal risk factors can help to reduce perinatal mortality & morbidity.*
Key words; *Antenatal care, early neonatal death, perinatal mortality rate, still birth, Risk factors.*

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I. Introduction

Perinatal mortality rate is defined as the number of deaths among foetuses weighing 1000 grams or more at the birth (28 week of gestation) who die before or during delivery or within the first seven days of delivery [1]. It is the most sensitive index of maternal and neonatal care. 98% of perinatal deaths occur in developing countries[2]. Perinatal mortality is an important indicator for monitoring progress towards sustainable Development Goal (SDG). Perinatal mortality rate is a sensitive indicator of quality and quantity of maternal and neonatal health services. New-borns die because of poor maternal health, inadequate care during pregnancy, inappropriate management during delivery and first few hours of life, and lack of new born care. Progresses of quality improvement in health services are expected to reduce perinatal mortality rates.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. Women who had less than three 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, foetus or new-born 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[4].

Giving birth during Adolescents (less than 20 years) is not only a risk factor for adverse pregnancy outcomes but also has a negative impact on future wellbeing of mother and infant[5]. Women > 35yrs are at higher risk of pregnancy induced hypertension; diabetes and obesity, increased risk of caesarean section, preeclampsia and placenta praevia[6]. Primi & grand multi have been associated with poor perinatal outcome. Premature labour is also associated with perinatal mortality[1].

Complications during pregnancy and labour such as, prolonged or obstructed labour, abnormal foetal position and hypertensive diseases of pregnancy increased the risk of perinatal mortality fivefold. All these factors are responsible for 30% of perinatal deaths[1]. 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 done to find out perinatal mortality rate in a tertiary hospital and to evaluate the maternal risk factors responsible for perinatal death & to evaluate other associated factors for it in order to formulate how we can prevent it.

II. Material And Methods

This is a prospective and observational study conducted in our institute, during the period from 1st May 2017 – 30th April 2019.

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

Gestational age <28 weeks& congenital anomaly of the foetus were excluded from the study. Data was be collected by using pre designed questionnaire. Relevant information's were collected from medical records. Data was analysed by using appropriate computer software.

Table 1: Rate of perinatal death ,still births, intrauterine deaths& early neonatal deathduring study period
(1st May 2017 to 30th April 2019)

Perinatal Mortality	Number	Rate per 1000 Births
Still Birth	64	5.45
Intrauterine Death	196	16.71
Early Neonatal Death	58	4.94
Total Perinatal Death	318	27.10

(Total Delivery-11731)

Observation & 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 foetal health monitoring and institutional care and deficient neonatal care services contributes to the persistent high perinatal mortality.

In this study, the perinatal mortality rate was27.10 per 1000 total births; still birth rate was 5.45 per 1000 total births, intrauterine death rate was 16.71 per 1000 total births and early neonatal death rate was 4.94 per 1000 total births and 11731 deliveries were occurred during 2 years of study period.

In our study, perinatal mortality is 27.10/1000 births whereas perinatal mortality is reported in Anjali Kamath et al study, 40.99/ 1000 births in Panaji, Goa [6].

Table 2: Perinatal death among the study

Perinatal death	Number	Percentage
Still Birth	64	20.13
Intrauterine Death	196	61.64
Early Neonatal Death	58	18.23

Observation& Discussion: In this study, still birth, intrauterine death and earlyneonatal death contributed about 20.13%, 61.64%, 18.23% respectively.

Table 3: Maternal factors for perinatal death

Factors		Number	Percentage
Maternal age	<20 years	90	28.30
	20-34 years	198	62.26
	35 years	30	9.44
Parity	Primi gravida	245	77.04
	Multi gravida	73	22.96
Antenatal visit	Regular ANC(>3 visits)	18	5.61
	Irregular ANC	185	58.18
	No ANC	115	36.51
Recurrent pregnancy loss	Absent	248	77.99
	Present	70	22.01
Period of Gestation	<28 weeks	98	30.82
	28 - 34 weeks	32	10.06
	34.1 - 37 weeks	142	44.65
	37.1 - 40 weeks	40	12.58
	40.1 - 42 weeks	5	1.58
	>42 weeks	1	0.31

(ANC- Antenatal visit)

Observation & Discussion: This table shows that 62.26% of mothers had age between 20-34 years, about 77.04% are primi gravida, only 5.6% cases had regular antenatal visit, 22.01% cases had history of Recurrent pregnancy loss. Perinatal mortality observed between 34.1 and 37 weeks of gestation.

According to Das et al study the PMR was highest in multiparous women (PMR 157.21 in parity >5) and maximum in the age group of > 35 years (PMR 170.13). The mortality rate was lower in women who had antenatal check-ups i.e. booked cases (PMR 88.81) than in unbooked cases (PMR 115.07) [7].

In our study it is found that perinatal death most commonly seen in women of 20-34 years of age, primi gravida and women with irregular ANCvisits.

In Nitin et al study, found that the still birth rate, early neonatal death rate was high in primipara, multipara and grand multipara. Perinatal mortality is very high in mothers above 30 years of age [8].

Table 4: Maternal risk factors (Medical & Obstetrics) for perinataldeath

Risk Factor	Still Birth	IUD	Early Neonatal Death	Total
Medical Risks				
Anaemia				
Hb <6 gm%	18	38	11	67
Hb 6.1-8 gm%	4	28	6	38
Hb 8.1-10gm%	0	2	1	3
Hb >10gm%	0	1	2	3
Diabetes	2	4	3	9
Bronchial Asthma	0	1	0	1
Heart Disease	0	0	1	1
Others	0	3	3	6
Obstetrics Risks				
Hypertensive disorders				
1.Eclampsia	17	42	3	62
2.Pre-eclampsia	12	40	4	56
Obstructed labour	10	0	9	19
Previous caesarean	8	12	1	21
Abruptio placenta	3	9	9	21
Placenta praevia	0	0	1	1
Cord prolapse	3	5	0	8
Ruptured uterus	1	1	0	2

Observation & Discussion: This table shows there are medical & obstetrics risk factors for perinatal death. In (others) category, it includes TORCH infections & thyroid disorders. Maternal anaemia, hypertensive disorders(eclampsia & pre-eclampsia),abruptio placenta and obstructed labourare most important causes for perinatal death. Some patients have more than one risk factor.

In Mumun at el study, 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 haemorrhage [9].

Increasing maternal age is associated with increasing risks for infant mortality [10]. Teenagersremained a higher risk group [11].

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 [12].

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

Table 5: Risk factors for perinatal death
Identified on admission

Risk Factors	Still Birth	Intrauterine Death	Early Neonatal Death	Total
Risk factor present	56	184	57	297
Risk factor absent	8	12	1	21
Single risk factor	30	110	42	182
Multiple risk factors	34	86	16	136

Observation & Discussion: In this study revealed that 297cases of perinatal death associated with were admittedrisk factor and out of them 182 cases had a single risk factor associated with perinatal death whereas 136 cases had multiple risk factors for perinatal death.

Table 6: Mode of delivery&foetal sex

	Still Birth	Intrauterine Death	Early Neonatal Death	Total
Vaginal delivery	38	171	28	237
Breech extraction	3	10	4	17
Caesarean section	22	14	25	61
Caesarean hysterectomy	0	0	1	1
Repair of rupture of uterus	1	1	0	2
Total	64	196	58	318
Foetal sex: male	34	113	34	181
Female	30	83	24	137

Observation & Discussion: In this study, 254 cases had delivered vaginally**,** 61 cases had to perform caesarean section. 12.89% of cases were still birth, 56.92% of cases were IUD and 10.06%of cases were early neonatal death delivered vaginally. Among 318 of perinatal death, 181 were male babies delivered & 137 were female babies delivered.

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

Trauma and asphyxia were the commonest causes of intra-natal death. The majority (79%) of neonatal deaths (*n*=43) were in premature babies, which were defined by low birth weight (<2.5 kg) rather than gestation according to the existing international standards in that era. Main causes of early neonatal death were prematurity (48.9%), asphyxia (18.7%), congenital defects (13.9%) and respiratory distress syndrome (11.6%). The autopsy reports of 21 neonates (14 stillbirth and 7 neonatal) demonstrated anoxia as the commonest finding (52.3%) followed by pulmonary lesions (23.9%), congenital malformations (14.2%) and maceration (4.8%) [13].

Gaddi and Seetharam at el study 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%) [14]. The most frequent cause of neonatal death in USA is congenital malformations, chromosomal disorders (37%), and complication of pregnancy [15].

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. Midwives have a major role to play in the management of labour complications during home deliveries. So in this study was undertaken to find out the maternal risk factors for perinatal mortality.

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

III. 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 Maternal Anaemia,Eclampsia, Pre-Eclampsia, Abruptio placenta and obstructed labour. 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 during labour 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, regular ANC visits, investigations, contraception. 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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