

RETROSPECTIVE CLINICAL ANALYSIS OF STILL BIRTH AND NEONATAL DEATHSUttam Sapkal¹, Rekha Sapkal²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: OBJECTIVE: Aim was to evaluate clinical and associated risk factors for still births and neonatal deaths at tertiary health care centre. **METHODS:** A retrospective analytical study of new born at birth conducted at tertiary health care centre for three consecutive years. Demographic variables, status of new born at birth, NICU care and neonatal causes of death were analyzed. **RESULTS:** There were 1072,990,995 births for 2011, 2012, and 2013 year respectively Still births were 30, 36 and 41 and newborn deaths were 15,8,15 for three consecutive years. Mean age of mother was 25.35 yrs standard deviation 4.4. 82 % of still births were preterm. Maximum 67% of still births birth weight was less than 1.5 kg. NICU admission included 51% full term neonate, 44% preterm and 5% post term neonate. Maximum (51%) NICU admissions neonatal birth weight was less < 1.5 kg. 79% of dead neonates were preterm. Life threatening congenital defects was seen in 26%. Cause of death birth asphyxia 37% hyaline membrane disease 15%. **CONCLUSION:** Statistically significant mean gestational age of baby with mother was 38.26 weeks (SD 2.260), NICU neonates 36.70 weeks (SD 3.3) and still births 31.34 weeks (SD 4.6). Maternal urinary tract infection, Hypertensive diseases, diabetes mellitus were major reasons for stillbirths. Neonatal mortality from 26% reduced to 8% with increasing birth weight. Major neonatal deaths are because of birth asphyxia, congenital defects. Low Birth Weight and prematurity were overlapping factor for neonatal death. Still birth rate was 35; perinatal mortality rate was 44/1000 live births. Early neonatal mortality rate & Total neonatal mortality rate was 12 /1000 live births each.

KEY WORDS: Still births, Neonatal mortality, early neonatal death, perinatal mortality, Tertiary care, Risk factors.

ABBREVIATIONS: NICU-Neonatal Intensive Care Unit, PIH – Pregnancy Induced Hypertension .LBW – Low Birth Weight, SD – Standard Deviation.

INTRODUCTION: Mortality is a measure of nation's commitment to better health. Mother and child represent one unit. During pregnancy fetal tissue development depends upon mother's health. It gets nutrients and oxygen through placenta. Certain maternal diseases have adverse effect on fetal health. Stillbirth occurs in antenatal and intra natal period. Neonatal deaths usually occur under the roof of level III neonatal care. Various maternal diseases and demographic factors are responsible for still births and neonatal deaths. Still births and neonatal deaths early or late are important and sensitive vital parameters of biostatistics. Death is unacceptable and traumatic event for family and treating doctors. Reducing the number of deaths of fetus and newborn in the population is the goal of health care provider. Still birth is defined as death from 20 week gestation/500 gm. weight. Perinatal deaths include fetal death after 28 weeks with birth weight 1000 grams and early neonatal death up to one week after birth.^{1,2} It is important to know the relative importance of the different causes of still births and neonatal deaths in developing country. Demographic trends and mortality figures are good

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indicators to predict the level of health and its care in community. Each year 10.7 million children under the age of five die. Each year 4 million neonates die during the first four weeks of life in under developed countries, this accounts for 98% of reported neonatal death.³In India perinatal mortality rate decreased from 150—48.5/1000 live births in 2005-2006 (NFHS) This is still higher than the mortality rates in developed countries 10-29/1000 live births. In India total perinatal mortality is 37/1000 live births. In Madhya Pradesh total perinatal mortality is 46/1000 live births.⁴Reducing the number of deaths of fetus and newborn in the population is the goal of health care provider. Safe mother hood and child survival have always been a concern, but still births have not received due attention There are 5.9 million perinatal deaths worldwide, All of which occur in developing countries. Stillbirths account for over half of all perinatal deaths.^{4, 5, 6}Perinatal mortality includes both late fetal deaths and early neonatal death. Mortality data is a major resource for planning and improving the maternal and child health services. It is also useful for implementing and monitoring health care programme. Certain maternal diseases have adverse effect on fetal health .What are the common conditions that run the risk of death of fetus and new born? With this hypothesis study was undertaken. The aim was to determine causes of still births and neonatal deaths in teaching institute.

MATERIAL AND METHODOLOGY: This is a hospital based retrospective study Hospital case records who delivered at the centre from January to December of 2011, 2012 & 2013. Data regarding demographic variables was collected and scrutinized at PCMS & RC tertiary health care center.

Information was retrieved from perinatal and neonatal death case records. Clinical point of view intrauterine death & neonatal deaths after birth were screened for cause of death. Every case was diagnosed according to clinical and investigation criteria .Analysis was done of all births to predict the perinatal mortality rate, still birth rate. Data analysis was done by SPSS Software.

RESULTS: Total births in three years were 3057. There were 1072, 990, 995 births each year under study 64% neonates were full term and 5% post term newborns and rest 31% were preterm. Mean age of mother was 25.38 standard deviation .mean gestational age of pregnancy 37.58 weeks, standard deviation 3.060. 4.212, F value 0.339 & p value =0.712 not significant. Mean gestational age of new born cared by mother at birth was 38.26 weeks with standard deviation range of 2.260. NICU admitted neonate mean age was 36.70 weeks with standard deviation 3.352. In still births mean gestational age was 31.34 weeks, standard deviation 4.611 .F value =370.104, p value = <0.0001 significant.

Maximum 53% of newborn with birth weight less than 1kg were still births .Birth weight of 1-1.5 kg maximum 42 % of them were shifted to NICU. Newborn with mother largest group 45% was birth weight 1.5-2kg and next 32% was above 2 kg. Chi sq. =801.803, P value <0.0001 statistically significant. Caesarean section rate for NICU admissions was 62%, still births 52%for normal care newborn 54%. Statistically not significant. Gestation age of new born NICU admission included 44 % preterm infants, 52% full term and 5% post term. Chi sq. =262.071, P value <0.0001 statistically significant.

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	2011yr	2012yr	2013yr	All
ALL BIRTHS	1072	990	995	3057 ALL
IUD	30	36	41	107(4%)
Still birth rate =SB/SB+LB =3057	28/1000 LB	36/1000 LB	41/1000LB	35/1000LB
LIVE BIRTHS	1042	954	954	2950
BABY WITH MOTHER	745 (70%)	674 (68%)	726 (73%)	2145(70%)
NICU Admission	297 (28%)	280 (28%)	228(23%)	805(26%)
NEONATAL DEATH	15	8	15	38 (4%)
Total neonatal mortality rate	14/1000LB	8/1000LB	16/1000	13/1000LB
EARLY NEONATAL DEATH	11	7	11	29
Early neonatal mortality rate	11/1000 LB	7/1000 LB	12/1000 LB	12/1000 LB
LATE NEONATAL DEATH	4	1	4	
Perinatal mortality rate	38/1000LB	43/1000LB	52/1000LB	44/1000LB

TABLE 1: DISTRIBUTION OF LIVE BIRTHS, STILL BIRTHS, NEONATAL DEATHS

Maximum 82 % of still births were preterm 80% ere macerated still born. Every year still birth varied from 3-4%. As regards the birth order of stillbirths, 50% were primigravida, 41% were second gravida. Majority 56% of still births were preterm and rest were full term. 40% were with birth weight below 1500 grams. Next up to two Kg group were 13%. Above 2 Kg there were 32% and above 3 kg only 4 %.

AGE OF MOTHER		WEIGHT RANGE		BIRTH ORDER		GESTATIONAL AGE AT BIRTH		MODE OF DELIVERY & SEX	
<20 yrs.	2	700-1000 grams	30(28%)	primi	50	preterm	60	vaginal delivery	75
20-30 yrs.	93	1000-1499 grams	24(22%)	second	41	full-term	42	LSCS	29
>30 yrs.	12	1500-1999 grams	14(13%)	third	9	post mature	5		
		2000-2499	20(19%)	fourth	1			male	48
		2500-2999	15(14%)	fifth	1			female	56
		3000-3499	4(4%)	sixth	2				
		all	107		107		107		107

TABLE 2: VARIABLE STUDIED FOR STILL BIRTHS

New born admissions under intensive care unit per year ranged from 22-28%. Among all three years births 805 (26%) were NICU admissions. In 5% of NICU admissions neonatal death was documented. Observed neonatal death in the study was 4%. Among them 76% were early neonatal death and 24% late neonatal death. 66% of dead neonates were born by caesarean section indicating high risk cases. 79% were preterm new born; only 21 % were full term infants. Maximum 26% of neonatal deaths were with least birth weight 1000-1500 gram. With increasing birth weight the neonatal mortality reduced to 8%. 37% cause of neonatal death was birth asphyxia, and 15% as

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hyaline membrane disease. 26% of neonates were congenitally malformed. Meconium aspiration syndrome and sepsis was responsible factor for neonatal death in 8 % of cases each. 3%of neonate's sudden infant death syndrome was observed

		VARIABLES		VARIABLES	
AGE OF MOTHER		WEIGHT < 1 KG	5	PRETERM	30(79%)
<20 YRS	0	1000- 1499	10 (26%)	FULLTERM	8(21%)
20-30 YRS	32	1500-1999	7(18%)	VAGINAL DELIVERY	13(34%)
>30 YRS	6	2000-2499	8 (21%)	LSCS	25(66%)
		2500-2999	5 (13%)	MALE	18 (47%)
		>3000	3 (8%)	FEMALE	20(53%)

TABLE 3: VARIABLES FOR NEONATAL DEATHS 38 CASES

DISCUSSION: In the present study 31 %of new born were preterm & 28 % LBW. Birth weight of 1.5-2 kg was maximum 40%. As such with 56% caesarean section rate, 27% of these new born were for NICU care, indicating high risk cases for delivery and referral center .Mean age of mother was 25 years with standard deviation 4.2 Mean gestation age of pregnancy was 37.5 weeks with standard deviation as 3 .060. In all 4% still births were documented in the study. Among them 50% were Low Birth Weight still births. 53% of stillbirths were below 1 kg; next as 18% still births were from 1.5-2 kg group. Yadkin et al⁷ reported an institutional analysis of 63 unexplained still births, growth restricted fetuses accounted for 40% of fetal deaths.

In this study over all preterm births were 30% Maximum 82 % of still births were preterm. NICU admission for full term neonate was 50%, preterm 44% and post term neonate 5%. Chi Sq. = 262.071 & P Value <0.0001 was statistically significant. Association between genders of baby & NICU admission, 55% were female child birth and 54 % was the NICU admission rate. Chi Sq. value as 0.042 & P Value = 0.979 not significant.

As regards new born baby with mother maximum 42% were with birth weight 1.5-2 kg. For maximum NICU admissions (42 %) neonatal birth weight was 1-1.5 kg and next group 32 % of them birth weight was 1.5-2 kg. Chi Sq. = 801.803, P value < 0.0001 statistically significant. According to W H O global perinatal estimates for year 2000, one third of still births occur during delivery. These deaths are avoidable with skilled care. The following factors are independently associated with still births. IUGR, maternal PIH, urinary tract infection, maternal diabetes anemia, major life threatening congenital defects, Rh isoimmunization and previous still births are the strong predictors of perinatal mortality.

Considering the prematurity as a risk for survival 10% were preterm stillbirths. 40% of preterm neonates were observed in NICU 4% was the documented neonatal death among them. Mean gestational age for NICU admission was 36.77 weeks with standard deviation as 3.4, F value 370.104 and p value as <0.0001 as statistically significant .

Pattern of neonatal death in the present study because of prematurity (30/38) as 79% and LBW (31/38) 82%, while study conducted by Rashid et al it was 60% for prematurity and 67 %for LBW. LBW was overriding factor for majority of neonatal deaths observation is similar in the study conducted by Rashid, Black R E et al. In the present study 26% of new born were shifted to NICU, among them 4% neonates died within 28 days of their life .Birth asphyxia 37%, congenital anomalies

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as 26%, hyaline membrane disease was 13% as cause of death. Sepsis, Meconium stained liquor was contributing for death only in 8 % each. Sudden infant death syndrome was documented in (38) 4% of cases.

Still birth rate in the present study was 35/1000 births .Total neonatal mortality and early neonatal mortality rate was almost same 12/ 1000. Perinatal mortality rate was 44/1000 live births. Documented current perinatal mortality of Madhya Pradesh is 46/1000 live births .Study conducted at Ahmadabad by Chirag D Shah et al 2009-2011 NMR was 41.53 per 1000 live births. Current NMR of Gujarat is 37 (<7days -29) and that of India is 36 (<7days-29) per1000 live births.⁹

Statistical bulletin of 2009 also states the highest mortality rate for extremely low birth weight babies Preterm birth is the most common cause of perinatal mortality causing almost 30 % of neonatal death. Respiratory distress syndrome is a leading cause of death in preterm infants (30%)¹⁰.In the present series it was 40% in preterm neonate. Congenital defects caused 26% of infant death in the present study while statistical bulletin documented 21%of neonatal deaths with birth defect.

STRENGTH & LIMITATION: The unique feature of the study is that causes of still birth and early and late neonatal death are analyzed in detail both during labor and after birth at NICU. Reasons for still births needs further extensive workup with autopsy findings stands as a limitation of the study.

IMPACT OF THE STUDY: Prevention of IUGR and treatment of maternal diseases like urinary tract infection, PIH should be encouraged. Measures to improve the birth weight, mal nutrition, anemia, skilled person to manage new born at birth, are the major issues requiring attention for health care practices in developing country.

CONCLUSION: In the study population 4% were stillbirths & 82% of stillbirths were with prematurity. Urinary tract infection, PIH, IUGR, anemia were the leading causes of still births. Prematurity and LBW was coexistent in 79% of neonatal death also. Low birth weight new born is more susceptible for early neonatal death. Strategies to reduce mortality rate should be avoid preterm birth and malnutrition are improving standards of living, raising the social status of women, high risk pregnancy approach or specialty clinic for IUGR, PIH anemia. Use of partogram will improve the standards of labor management. Maternal steroid administration in preterm labor and treatment of malnourished mother are also some suggested strategies in pregnancy.

Neonatal deaths generally result from complication of prematurity .Strategies to offer quality care at the crucial time of birth should be encouraged. Health professionals attending child birth should be skilled at resuscitation of newborn and identification of high risk newborn at birth. It can be the way forward for reducing the high perinatal death rate in India.

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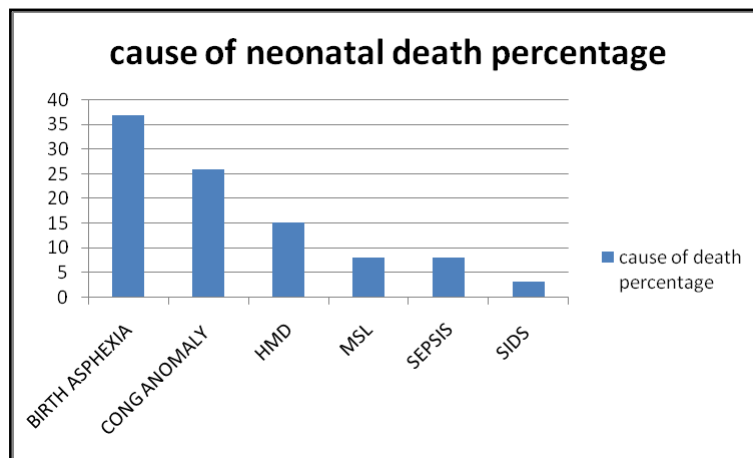


IMAGE 1: CAUSE OF NEANATAL DEATH IN PERCENTAGE

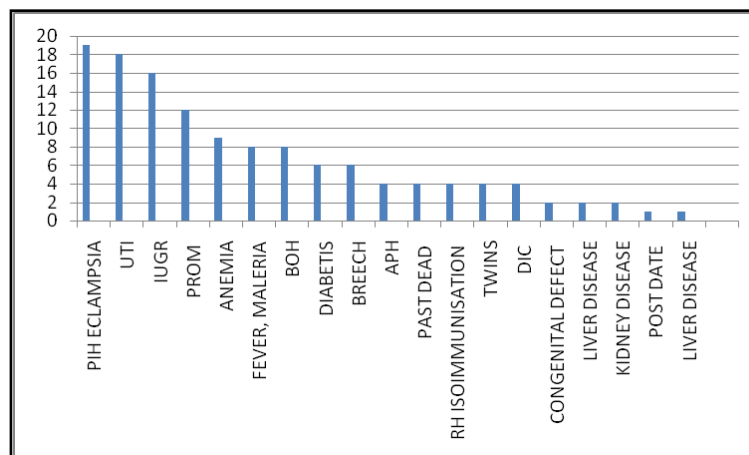


IMAGE 2: CAUSE OF STILL BIRTHS IN PERCENTAGE

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