

Maternal antenatal profile and immediate neonatal outcome in very low birth weight babies

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Abstract

Objective: To find out maternal risk factors associated with VLBW babies and study maternal risk factors associated with morbidity and mortality of VLBW babies. **Method:** The study was a prospective cross-sectional analysis of case records of 110 inborn VLBW babies admitted in Neonatal intensive care unit, Wanless Hospital, Miraj during the period of 1 year. All the babies were studied from the day of admission or birth and followed up till discharge or death. Mothers of these babies were studied to find out maternal risk factors. Morbidity and mortality were compared according to birth weight and gestational age of baby. Only those causes of morbidity where statistical significance with relation to such maternal antenatal factors could be drawn, were studied by using Chi-square test. **Results:** Majority (71.82%) mothers of VLBW babies had adverse risk factors. Anemia, PROM ≥ 12 hrs and PIH were the commonest adverse maternal factors associated with very low birth weight babies. Majority (75.45%) VLBW babies developed one or other kinds of morbidity. The commoner morbidity in VLBW were neonatal sepsis (30%), RDS (19.09%) and NNH (18.18%). The mortality in VLBW babies was only 21.81%. RDS (50%) was the commonest cause of death in VLBW, followed by sepsis (16.6%). The mortality was highest in babies weighing less than 750 gram and less than 28 weeks of gestation. Both morbidity and mortality decreased significantly in babies with higher birth weight. APH, multiple pregnancy and LSCS had statistically significant association ($p < 0.001$) with RDS in VLBW babies. Presence of PROM ≥ 12 hrs and maternal fever increased the risk of neonatal sepsis. Presence of PIH, abnormal presentation, multiple pregnancies and meconium staining of liquor were significantly associated with asphyxia. **Conclusion:** In our studies various adverse maternal factors were associated with very low birth weight and their morbidities. The identification of adverse maternal factors and its appropriate management can lead to better outcome of the baby

Key Word: Maternal antenatal, low birth weight.

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INTRODUCTION

The birth weight is an indicator which gives us an idea about the quality of life, the socio-economic status, health awareness and nutritional status of the

community. The birth weight in all population groups is the single most determinant of the chances of the newborn to survive and experience normal growth and development.¹ Very low birth weight has been defined as birth weight less than 1.5 kg, birth weight being taken preferably within first hour of life before significant weight loss occurs. In India around 3% babies are VLBW babies.² Birth weight is governed by two major processes such as duration of gestation and intrauterine growth rate. VLBW can thus be caused by either a short gestational period or retarded intrauterine growth or a combination of both. Prematurity is usually defined as gestational age less than 37 weeks and small for gestational age (SGA) or small for date (SFD) babies are those with birth weight less than 10th percentile for their gestational age.² As babies weighing less than 2 kg

are more vulnerable to increased morbidity and mortality, they deserve priority in admission to special care nurseries and by this criterion alone, 10% of newborn babies in India qualify for admission to special care nurseries.³ The common causes of morbidity and mortality in VLBW babies include birth asphyxia, respiratory problems of prematurity, neonatal infections, hyperbilirubinemia, hypoglycemia, hypothermia, etc which should be recognized early and promptly managed. VLBW infants weigh <1500 gm and are predominantly premature. The VLBW rate is an accurate predictor of infant mortality rate. VLBW infants account for over 50 % of neonatal deaths and 50 % of handicapped infants, their survival is directly related to birth weight, with approximately 20% of those 2 between 500 and 600 gm and over 90% of those between 1250 and 1500 gm surviving. Perinatal care has improved the rate of survival of VLBW infants. When compared with term infants, VLBW infants have a higher incidence of rehospitalisation during the 1st year of life for sequelae of prematurity, infections, neurologic complications and psychosocial disorders.⁴ The risk of neurodevelopment handicaps is increased 3-fold for LBW babies and 10-fold for VLBW babies (<1500gms). Long term follow up studies of infants with a birth weight of 1500 gm and less have revealed 15 to 20 percent incidence of neurological handicaps in the form of cerebral palsy, seizures, hydrocephalus, microcephaly, blindness due to retinopathy of prematurity, deafness and mental retardation.³ India being a developing country, most people have their socioeconomic status below average and many expectant mothers do not get obstetric services. To overcome these problems, attention has to be directed towards MCH services as a whole, and to get a healthy baby, the mother should be healthy. To study the risk factors affecting birth weight, our approach need to be a thorough one. Due to poverty, illiteracy, unawareness of health, it is difficult to supervise and treat all such risk factors. So, it is necessary to do detail study encompassing significant aspects of risk factors. With help of such studies, we can predict and try to prevent such risk factors in future. The incidence of VLBW babies can be reduced if pregnant women at risk are identified and steps are taken to reduce the risk. It is clear from the multiplicity of risk factors that there is no universal solution. Presently attention is being given to

the ways and means of preventing VLBW through good antenatal care and intervention program, rather than treatment of VLBW infant. We can give best chances of survival and normal development to VLBW babies by giving them best possible neonatal care in well set up nurseries.

MATERIALS AND METHODS

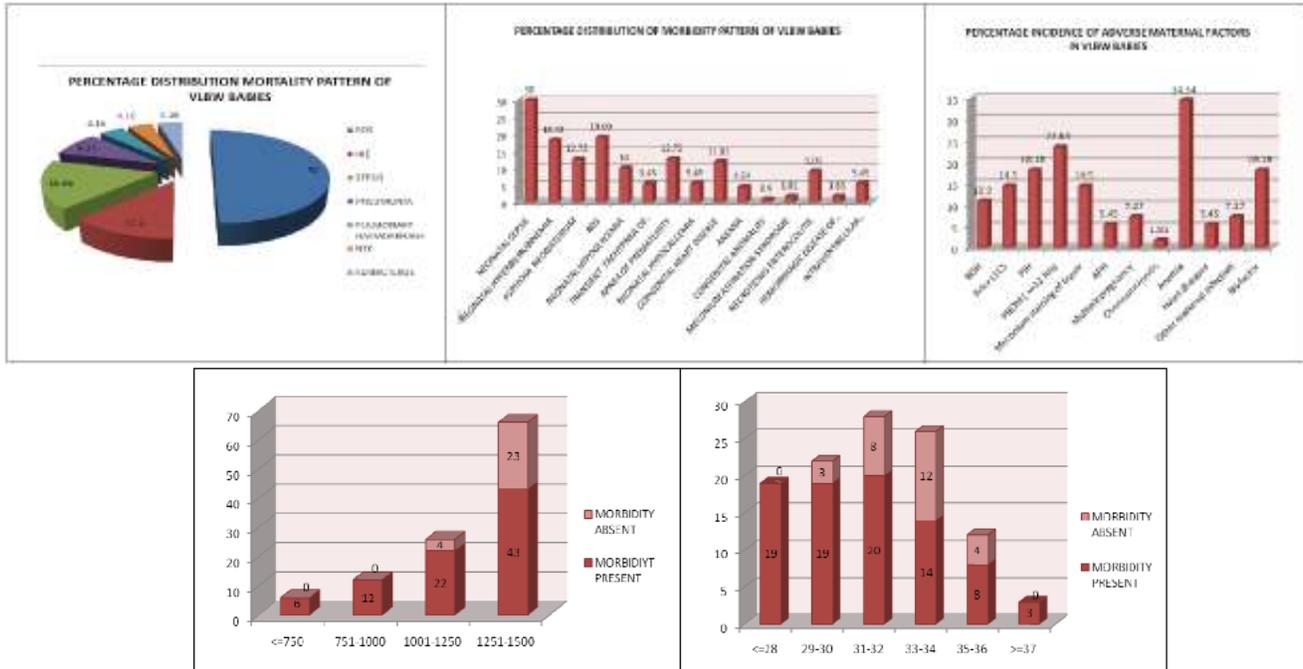
The present study was carried out at Neonatal Intensive Care Unit, Wanless hospital, Miraj over a period of one year .It is tertiary referral centre with level II Neonatal Intensive Care setup catering the population of Western Maharashtra and Northern Karnataka. All the babies having birth weight less than 1.5 kg (VLBW) were studied from the day of admission or birth and followed up till discharge or death. Mothers of these babies were studied to find out maternal risk factors Details regarding obstetric history and antenatal complications were recorded as per in the proforma. The following maternal data was analyzed—antenatal—parity, antenatal care status, anemia, pregnancy induced hypertension (PIH), ante partum hemorrhage (APH), previous preterm delivery, other medical complication including infection, heart disease during pregnancy.

Sample size and sample technique

During this period a total of 110 VLBW babies (birth weight less than 1.5 Kg) admitted to neonatal intensive care unit were studied. This was a prospective cross-sectional analysis of case records of all inborn VLBW babies admitted during the period.

Data Analysis

Complications developed during hospital stay were considered as morbidity and sole cause of death was recorded to count mortality figures. Some babies had more than one kind of morbidity but one of them which were responsible for death was considered in mortality. Morbidity and mortality were compared according to birth weight and gestational age of baby. Only those causes of morbidity where statistical significance with relation to maternal antenatal factors, could be drawn were studied. Neonatal morbidity like neonatal sepsis, asphyxia, RDS was studied with respect to maternal factors whose associations are well documented. Chi square(X²) test was used to determine the statistical significance.



OBSERVATION AND RESULT

Out of 110 cases, 5.45 % babies were <=750 gms , 10.91 % were between 751-1000 gms ,23.64% were between 1001-1250 gms and 60% babies were between 1251-1500 gms birth weight. Among 110 cases,17.27% babies were <=28 weeks,20% babies were between 29-30 weeks, 25.46% were between 31-32 weeks,23.64% were between 33-34 weeks 10.90%were between 35-36 weeks and 2.73% were > = 37 weeks of gestational age. Majority (75.45%) of babies developed some kind of morbidity while only 21.81% babies expired. The male to female ratio was 0.96. Incidence of morbidity in VLBW babies below 1000 gms was 100 %. Morbidity rate in the 1001-1250 gms group and 1251-1500 gms group was 84.61% and 65.15% respectively. Morbidity according to gestational age was 100% in <=28 weeks, 86.36% in 29-30 weeks, 71.42% in31-32 weeks,53.84% in 33-34 weeks, 66.66% in 35-36 weeks and 100% in term VLBW babies. Mortality rate according to birth weight were 100% in <=750 gms, 50% in 750 -1000 gms, 19.23 % in 1001-1250 gms, 10.60% in 1251-1500 gms babies. Mortality according to gestational age was 68.42 % in <=28 weeks, 27.27% in 29-30 weeks,10.7% in31-32 weeks, 3.84% in33-34 weeks,8.33% in35-36 weeks and no death in >=37 weeks babies. One or more adverse maternal risk factors were present in 90 (81.81%) cases while 20 (18.18%) had no risk factor. Commonest maternal risk factors were anemia and PROM >=12 hrs present in 38 (34.54%) and 26 (23.63%) cases respectively, followed by PIH in 20 (18.18%) cases, prior LSCS in 16 (14.5%) cases,

meconium staining of liquor in 16 (14.5%) cases, BOH in 12 (10.9%) cases, multiple pregnancy in 8 (7.27%) cases, maternal infection in 8(7.27%) cases, APH in 6(5.45%) cases ,heart diseases in 6 (5.45%) cases and chorioamnionitis in 2 (1.81%) cases. Thirty (33%) babies had neonatal sepsis, 21 (19.09%) had RDS, 20 (18.18%) had NNH, 14(12.72%) had asphyxia neonatorum and apnea of prematurity each, 13 (11.81%) had congenital heart disease, 11 (10%) had neonatal hypoglycemia and 10 (9.09%) had necrotizing enterocolitis. There were 6 (5.45%) cases each of transient tachypnea of newborn, neonatal hypocalcaemia and Intraventricular hemorrhage. Beyond that 2(1.81%) cases each of meconium aspiration syndrome and hemorrhagic disease of newborn and 1(0.9%) case of congenital anomaly were present. Out of 13 cases of CHD, 9 had PDA, 3 had ASD and 1 had TGA. Out of 24 deaths among VLBW babies, 12 (50%) were due to RDS ,3 (12.5%) were due to HIE ,4 (16.66%) were due to sepsis, 2(8.33%) were due to pneumonia and 1 (4.16%) each due to pulmonary hemorrhage ,NEC and kernicterus. Among the maternal factors, APH, multiple pregnancy and LSCS had statistically significant association (p<0.001) with RDS in babies. Breech, forceps and vacuum delivery had significantly higher incidence of asphyxia than LSCS and normal delivery. Maternal PIH, multiple pregnancy, abnormal presentation and meconium staining of amniotic fluid was significantly associated with asphyxia neonatorum .Incidence of asphyxia was not significant with relation to the parity of mother. ANC

care and maternal APH had no significant association with asphyxia. Maternal fever and PROM \geq 12 hrs had significantly high incidence of neonatal sepsis ($p < 0.001$) while ANC care had no significant association with the incidence of sepsis.

CONCLUSIONS

Majority (75.45 %) VLBW babies developed one or other kind of morbidity and only 21.81 % VLBW babies succumbed to death. Majority (71.82 %) mothers of VLBW babies had adverse risk factors. Maternal anemia, PROM \geq 12 hrs and PIH were the commonest adverse maternal factors associated with very low birth weight babies. Both morbidity and mortality decreased significantly in babies with higher birth weight. Neonatal sepsis and RDS were the commonest causes of morbidity followed by NNH, asphyxia and apnea of prematurity. RDS was the commonest cause of death in VLBW babies accounting for 50% deaths, followed by sepsis accounting for 16.6% deaths. Maternal factors like APH and multiple pregnancies while mode of delivery like LSCS was significantly associated with RDS. Presence of PROM \geq 12 hrs and maternal fever increased the risk of neonatal sepsis. Presence of PIH, abnormal presentation and multiple pregnancies were significantly associated with asphyxia. But absence of antenatal care and APH were not associated with asphyxia. Meconium stained liquor was significantly associated with asphyxia.

RECOMMENDATIONS

In India, the majority of the deliveries are conducted in villages by basic level health workers (medical and paramedical personnel) and transport facilities are poor. Policies should be made to train these people regarding simple essential measures of maternal and neonatal care, and anticipation of premature and high-risk deliveries where expectant mothers can be referred to higher centers directly as the uterus is the best incubator for a premature baby. The important aspect for the betterment of neonatal mortality is a generation of awareness among people so that they can seek early medical help. Timely intervention and appropriate management of maternal high risk factors can lead to a better neonatal outcome. Neonatal Intensive Care Unit (NICU) facility leads to better neonatal survival rate hence policies should be made to increase their number in the rural parts of our country. Comprehensive antenatal care and efficient Mother and child health (MCH) service as a whole can give best chances of survival and normal development of babies.

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