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Research Article

LOW BIRTH WEIGHT BABIES SURVIVAL PREDICTORS IN A TERTIARY CARE SCENARIO- AN EXPERIANCE FROM MIDDLE LEVEL CITY, BHUBANESWAR, ODISHA, INDIA

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ABSTRACT

In developing countries like India, Low Birth Weight or preterm babies have always been a cause of concern, as in the existing compromised conditions of healthcare, their survival has always been a cause of concern. The current study was a cross sectional analysis done for 149 babies who had weight less than the normal, delivered in a tertiary care hospital and were analysed for survival outcomes, that is, discharge or admission into Neonatal Intensive Care Unit (NICU) or death over a period of one month. The data was taken as a tool to develop tentative risk criteria for the urban women regarding an antenatal alert for low birth weight babies and also the possible vulnerabilities that these babies face after birth. 57% of the women were primigravida; nearly 15% were multi gravida 4, 81% were delivered by caesarean section; 2.68% deaths were reported and the range of admission varied from 1-150 days. Age of the mother (mean weight being $1.100211 \pm .11112$) and a history of abortions (1.677 ± 4.251503) are emerging as predictors. The range of days of hospitalization of such babies varies from 1 to 150 days and fetal distress was identified as the major cause in 18.1% of cases and also the cause of death in 4 out of the sample of 149. This clearly brings out the needs of equipping our centres with qualitative NICU set ups for sound management and survival of such new-born.

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INTRODUCTION

Infant mortality and birth weight have had an eternal connection as Low birth weight (LBW) is one of the main risk factors for infant morbidity and mortality. A foetus when small for its gestational age, it is important to determine intra-uterine growth restriction (IUGR), prematurity or other constitutional factors. Prematurity has been defined (American Academy of Paediatrics, 1935) as the birth of a live infant weighing 2500 g or less, evidence showed that that many of these infants were not actually premature, but rather full-term foetuses from a pregnancy in which growth had been limited due to different factors. In 1967 the World Health Organization (WHO) recognized this fact, designating infants weighing 2500 g or less as "low birth weight". (De Bernabe *et al*, 2004; Hirve *SS et al*, 1994; Mumbare *SS et al*, 2012)

In the current context in India, where institutional delivery have gained momentum in the last 10 years, it offers an added advantage of weighing the baby during the first hour after birth, before the appreciable postnatal loss of weight occurs. India and more so the Empowered Action Group (EAG) state as is Odisha in question, this offers to take a step ahead approach to

dwel into possible gaps or reasons that can probably help in improving the survival of these new borns. Presently as per SRS 2013 data, 37 neonates are dying every year out of 1000 live births in our state. Common causes of neonatal deaths are Birth asphyxia, Prematurity and infection or sepsis. (www.nrhmorissa.gov.in)

Hence, a cross sectional study was done among all the low birth weight babies (taking all babies of 2.5kg birth weight or less) born between March 2016-March 2017 and assessed for possible maternal factors of low birth weight, survival and reasons of admissions in the Neonatal Intensive Care Units.

The study can be considered as a dipstick measurement of the causes in for LBW babies, their common infections and some necessary measures to manage their survival in a tertiary care centre of the capital of the state, Odisha i.e. Bhubaneswar.

Objectives

1. To assess the intranatal or immediate maternal factors in LBW babies in the sample
2. To determine the survival outcomes in the given sample and make some recommendations thereof.

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METHODOLOGY

The study was planned from March 2016 to March 2017 prospectively on all babies born in a tertiary care center under monitored paediatric care, the inclusion criteria being- live birth, the weight at time of birth being equal to or less than 2500 grams or 2.5kg, irrespective of the mode of delivery and the mother willing to cooperate in the immediate postpartum period. In case of twins or more than 2 babies being born live, the children are to be followed up to at least 24 hours after birth and in case of no negative outcome; the mother would be requested to be a respondent in the study. All mothers who are not willing to participate and those seeking immediate discharge after delivery due to whatever reasons would be excluded from the study. Taking the current prevalence of LBW reported in India (Bharati P *et al*, 2011) as 20%, within 95% CI and an absolute error of 5%, the optimum sample for the study was calculated as 128. The tertiary care centre i.e. Kalinga Institute of Medical Sciences which has a very well equipped NICU and is a prominent referral center in the state, had nearly 251 deliveries whose birth weight was 2.5kg or less (during the study period) of which 149 babies whose mothers fulfilled the inclusion criteria to be included in the study. A pretested, predesigned questionnaire was used as the tool for data collection wherein information regarding sociodemographics, birth details and details regarding hospital stay and final outcomes were documented. The data was collated and analysed in SPSS 13 software. Sociodemographic parameters were assessed as categorical variables and predictors determined by two sample T test which compared the mean weight in each category with the SD and CIs and the p value <0.5 considered as significant. Very low birth weight was also assessed for any association for demographic factors in the given sample using chi square and Fischer’s exact test where applicable.

RESULTS

Table 1 Sociodemographic and obstetric history details of the sample

Variables	Freq	%	Mean weight, SD	95% CI 2 sample t test
Sex of child	42	28.19	1.68119±.420036	1.550298 1.812083
Female	107	71.81	1.549813±.4470047	1.464138 1.635488;p<0.94
Male	45	30.20	1.614444 ±.4353032	1.483665 1.745224
Residence	104	69.80	1.574904±.0437973	1.488042 1.661765; P<0.7
Rural	81	54.36	1.628889±.4405735	1.53147 1.726308
Urban	68	45.64	1.53676±.442049	1.429766 1.643763; p<0.9
Delivery mode	85	57.05	1.5425882 ±.45604707	-
Caesarean	41	27.52	1.6626829 ±.40839946	-
Normal	23	15.44	1.6152174 ±.44577684	P<0.32
Birth order	12	08.05	1.100211±.11112	1.10012 1.32415
1 st	68	45.64	1.456671±.32451	1.45223 1.73431
2 nd	69	46.31	1.623412±.435422	1.62345 2.32312;p<0.01
3 and above	119	79.87	1.564118±.4451936	1.4833011.644934
Mother's age(years)	19	20.13	1.677±.4251503	1.518246 1.835754;p<0.1
<18	04	2.68	1.975±.4031129	1.333557 2.616443
18-30	145	97.32	1.576138 ±.4395992	1.50398 1.648296;p>0.03
>30				
Abortions				
none				
One and more				
Immediate outcome				
Dead(within 1 month)				
Alive				

In the above table, it was observed that out of the select sample 71.8% were males and the mean weights of male and female were not statistically different. It being a tertiary care center, most of the mothers were from urban areas (69.8%), 54.36% were delivered by caesarean section and 57.05% were the first order babies. Most of the variables judged did not affect the mean weight of the sample significantly except the age of the mother. Babies born to mothers less than 18 years of age were seen to have mean weight 1.100211± .11112, which was statistically significant.

Being an urban center and located in capital of state of Odisha, antenatal care was good for all the women in the study in terms of early registration, two doses of Tetanus and consumption of iron folic acid tablets at least for three months of the gestational period.

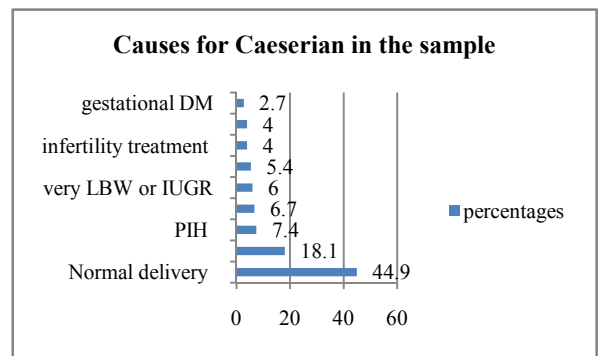


Fig 1 Causes of Caesarian Section in the sample

The above figure indicates the causes for caesarean section in the sample. In this study fetal distress accounted for the leading cause i.e. 18.1%, followed by PIH which was 7.4%. Twin pregnancy also accounted for 6.7% of the cases. 4 cases died, 3 males and 1 female all because of fetal distress.

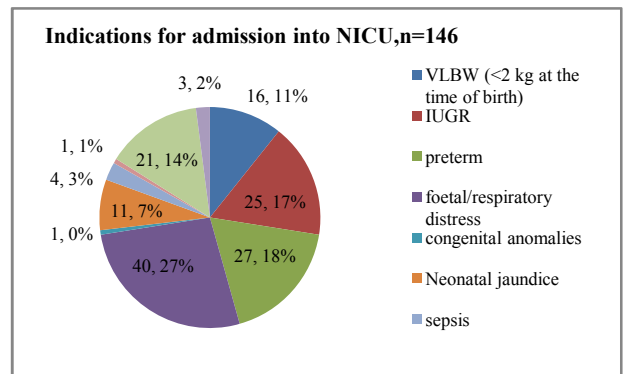


Fig 2 Causes of admission of LBW babies in NICU

Table 2 LBW categories against some demographic variables

Variables	LBW (%)	VLBW (%)	Total	P value
Sex				
Female	12(28.57)	30(71.43)	42	
Male	22(20.56)	85(79.44)	107	P<0.294
Residence				
Rural	9(20.00)	36(80.00)	45	
Urban	25(24.04)	79(75.96)	104	P<0.590
Abortions				
No	23(19.33)	96(80.67)	119	
Yes	11(36.67)	19(63.33)	30	P<0.04*
Birth order				
1 st	15(17.65)	70(82.35)	85	
2 nd	12(29.27)	29(70.73)	41	
3 rd	7(30.43)	16(69.57)	23	P<0.22

The figure above indicates the causes for admission in the NICU among the sampled children. Nearly 40.27% were VLBW babies, followed by IUGR and preterm babies above 25% each. The range of days of admission varied from 1-150 days, mean being 67 ± 5.8 days.

Table 2 compared some of the variables for association between LBW and VLBW babies and the history of abortions was seen to be significantly associated with VLBW babies.

DISCUSSION

In the present study maximum percentage of low birth weight (LBW) babies were observed in more than 20 years of age and above 30 years of age. Similar findings were seen in Kiranet *et al* who observed similar relationship between age of the mother and birth weight. It presents probability of LBW increase in extreme of age's i.e., more than 30 years of age. (Agarwal K *et al*, 2011) This study confirms the previous studies also so that probability of LBW infants is higher among mother aged 30 years and over and 20 years and under. (Raman TS *et al*, 1998; Negi KS *et al*, 2006) In this study finding indicates that history of abortion is significant determinants of LBW which is consistent with findings that weight of the baby is influenced by maternal factors. (Kapil U *et al*, 2009)

The findings of this study strongly decries the perception that LBW is a problem among the poor and the malnourished (Joshi HS *et al*, 2005; Mavalankar DV *et al*, 1992; Chabra p *et al*. 2004) as the current population where the study was attempted, represented an urban and elite population, who had sound access to health care. The paper strongly brings out the necessity of well equipped child health care services to manage this very prevalent problem which may arise even in the best possible care available. The study brings out the LBW and VLBW were also twins and children borne out of infertility treatment which are adding to the basket of this problem especially in the urban areas. Thus the coming down of deaths in LBW babies which was 4% in our study, urgently calls for well equipped NICUs and trained paediatric specialists along with full antenatal care. The worrisome hints coming out of this study is the scope of referrals and management in lower centres or rural areas for this problem which is a precursor or a comorbid condition existing with many other like congenital anomalies, foetal distress, jaundice or seizures.

Thus, a mid level country like ours where the birth rate is now being controlled and every pregnancy is precious and supervised, there is a dire need to develop centres for management of LBW babies and also develop channels of referrals of such children at the earliest to nearest such centres.

This could be probably the major cause why our Infant Mortality is coming down, however the neonatal mortality rate is not showing much change over the years. This urges the states to better their secondary care levels after having considerably improved upon the primary health care.

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