International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Original Research Article

Prevalence and Determinants of Low Birth Weight in Rural Mysore

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Received: 18/05//2013 *Revised: 10/07/2013* *Accepted: 19/07/2013*

ABSTRACT

Background: Birth weight is the single most important determinant of the survival and development of a newborn. Rural India continues to show significant burden of Low birth weight (LBW), which also explains the higher chances of mortality and morbidity in them.
Objective: To estimate the Prevalence of low birth weight and to describe the factors determining it in rural area.
Methodology: Cross sectional community based study was carried out in rural field practice area catering population of 26,700. All births (Both live and dead) during the year 2010 among permanent residents of this area were included. House to house survey was conducted to collect details regarding Antenatal, intranatal and postnatal history by interviewing mother using a pre tested questionnaire. Hospital records were also referred when available.
Results: There were 293 births totally, of which 57 were LBW (20.1%). Mean birth weight was 2723.54 ± 91 gms. Prematurity, intra uterine complications, distance from health centre, consumption of IFA tablets and weight gain during pregnancy were associated significantly with LBW. Distance from any health care centre above 10 Km was an independent risk factor for the low birth weight. There were six perinatal deaths with a Perinatal Mortality Rate of 20.4 per 1000 live births.
Conclusion: Prevalence of LBW was 20.1% which is well below the national average for rural areas indicating improved MCH facilities in the study area.

Key words: Rural area, cross sectional study, low birth weight, distance from health centre, perinatal mortality rate.

INTRODUCTION

The period of intrauterine growth and development is one of the most vulnerable periods in the human life cycle. The weight of the infant at birth is a powerful predictor of infant growth and survival, and is dependent on maternal health and nutrition during pregnancy. Low birth weight (LBW) is defined as weight less than 2,500 g at birth. Low birth weight leads to an impaired growth of the infant with its attendant risks of a higher mortality rate, increased morbidity, impaired mental development, and the risk of chronic adult disease. [1-3] Infants who weight 2,000-2,499 gm at birth have a four-fold higher risk of

neonatal death than those who weight 2,500-3,499 gm. The more severe the growth restriction within the LBW category, the higher is the risk of death. [1] LBW is a strong predictor for size in later life because IUGR infants seldom catch-up to normal size during childhood. [4]

Birth weight is also an important indicator of MCH care. It also determines infant morbidity and mortality as LBW babies are bound to suffer more than the normal birth weight babies. Birth weight depends on factors like age of mother, her nutritional status, SES, parity, personal habits, antenatal complications, maturity of the fetus and many other MCH services. Though India has put considerable efforts to bring down the incidence of LBW, it is still a major problem, especially in rural India. This study was undertaken to estimate the Prevalence of low birth weight in rural area of Mysore and to study the factors determining low birth weight.

METHODOLOGY

This cross sectional, community based study was carried out in villages under a primary health centre catering population of 26,977 Mysore district. Mothers who had delivered during the period of January to December 2010 and permanently residing in the villages under the primary health centre area were included in the study. Women who had come to their maternal house for delivery but are permanent residents of villages other than that covered by the PHC were excluded.

Institutional ethical committee approval was obtained before starting the study. Data collection was carried out during the first half of the year 2011. On visiting each village, mothers who delivered during January to December 2010 were line listed with the help of Anganwadi and ASHA workers. Then every mother was visited at her house by snow ball sampling method along with ASHA/Anganwadi worker and details about antenatal, intranatal and postnatal events were collected using a pretested, semi structured proforma including all the major determinants of low birth weight births, after obtaining consent from the mothers. Factors like, height, weight, age of the mother, past obstetric history, hemoglobin percentage, parity, time interval between successive pregnancies, socio-economic status, literacy status of the mother, birth weight of the baby, antenatal complications, neonatal complications, gestational age at birth and number of antenatal check-ups and weight gain during pregnancy, were included in the proforma. Hospital records like ANC card, hospital discharge card, vaccination card were referred wherever available, otherwise mother was asked for the details required.

There was no scope for clinical examination. In all cases mother was the main respondent as there were no maternal deaths. At the time of interview help of other family members (Husband and mother in law) was also utilized to supplement the information. Mothers were also enquired about the births around their house for finding out unreported births.

RESULTS

Totally there were 293 births in the study area during 2010. Birth weight was measured in 284 births and nine births were missed due to various reasons like home delivery, delivery on the way to hospital. Among the babies measured, 59 (20.1%) were having LBW. There were 15 home deliveries totally. Mean birth weight was 2723.54 $\pm$ 491 gms.

As shown in table 1, more than 50% of mothers had conceived before the age of 20 years, 15% were illiterate and more than 52% mothers had studied upto 10th standard. Majority (70%) of the families belonged to class III and IV of socioeconomic status

according to modified B. G Prasad classification.

Table 1. Sociodemographic features of study population (N=291)**

Variable	Frequency	Population
Mother's age at conception (in years)		
<20	146	50.2
21-25	129	44.4
26-30	14	4.8
>30	2	0.7
Sex of the babies born during the year 2010		
Male	129	44.4
Female	162	55.6
Educational status of mother		
Illiterate	46	15.7
Primary (Class 1 to 4)	18	6.1
Middle (Class 5 to 7)	73	25.3
High school and PUC	146	50
Degree & diploma	8	2.7
Mother's occupation		
Housewives	281	96.6
Working	10	3.4
Father's occupation (N=290)*		
Labour	178	61.8
Semi-skilled	56	19.2
Skilled	52	17.7
Professional	4	1.3
Socioeconomic status		
Class I	12	4.1
Class II	54	18.6
Class III	110	37.8
Class IV	107	36.8
Class V	8	2.7

*Father of the baby was dead

**There were two twin births. Hence the total number of families / mothers / fathers is 291 and total births 293

As described in table 2, among the 59 LBW babies only two (0.7%) were in very low birth weight category (less than 1500 gms). There were no cases of extremely low birth weight. 14 babies (5%) weighed above 3500 gms.

Table.2: Distribution of births according to birth weight.

Birth weight	Frequency	Percent
<1500	2	.7
1500-2499	57	19.4
2500-3499	211	72.0
3500 & above	14	4.8
Not recorded	9	3.1
Total	293	100.0

As observed from table 3, higher prevalence of low birth weight was seen in mothers who had gained weight less than nine kgs during pregnancy, took less than 100 IFA tablets, those who resided more than five kms away from any type of healthcare facility, gave birth to premature babies, suffered from intra uterine complications like IUGR. The association between these parameters with LBW was found to be statistically significant. LBW babies had higher prevalence of perinatal mortality.

Table. 3: Distribution of significant risk factors of LBW according to birth weight.

	<1500gm	1500-2499	2500 & above	*P**
Weight gain (in Kg)				
≤9	2 (1.3)	42 (26.4)	115 (72.3)	0.002
>9	0 (0)	15 (12.0)	110 (88.0)	
IFA tabs				
<100	2(9.1)	9(40.9)	11(50.0)	0.001
≥100	0(.0)	48(18.3)	214(81.7)	
TT injection				
Single dose	2(33.3)	1(16.7)	3(50.0)	0.001
Double dose	0(.0)	56(20.1)	222(79.9)	
Distance from health centre				
<5kms	0(.0)	40(17.2)	193(82.8)	0.001
≥5kms	2(3.9)	17(33.3)	32(62.7)	
Intra partal complication				
Absent	0(.0)	48(18.3)	214(81.7)	0.001
Present	2(9.1)	9(40.9)	11(50.0)	
Intra-uterine complication				
Absent	1(.4)	57(20.3)	223(79.4)	0.029
Present	1(33.3)	0(.0)	2(66.7)	
Gestational age				
Pre-term(<34 weeks)	2(22.2)	4(44.4)	3(33.3)	0.001
Term (≥34 weeks)	0(.0)	53(19.3)	222(80.7)	
Perinatal outcome				
Live	1(.4)	55(19.8)	222(79.9)	0.013
Death	1(16)	2(33)	3(50.0)	

Other factors like maternal age at marriage, mother's height, supplementary nutrition taken during pregnancy, hemoglobin during 3rd trimester, type of family, Socioeconomic status, parity and sex of the baby were also studied. The association was not statistically significant.

As seen in table 4, Binary logistic regression showed distance from any healthcare facility as an independent predictor of low birth weight. Father's occupation (labourers), age at conception (<20yrs), nuclear families, higher birth order problems suffered by mother during antenatal period showed higher odds for low birth weight.

Table.4: Predictors of LBW and their independent strength of association.

Variable	Odds Ratio	*'P'* value
Father's occupation	1.227	0.559
Age at1st conception	1.851	0.062
Type of family (Nuclear)	1.128	0.637
Distance from health centre	2.658	0.042
Birth order	1.039	0.941
Problem during antenatal period	1.653	0.726

Out of 293 births the birth weight was not recorded in nine births because of various reasons like home delivery, delivery on the way to hospital etc. there were 15 home deliveries totally. Health workers measured the birth weight in six births on subsequent day. Though they were aware of the institutional delivery lack of preparedness resulted in the home deliveries.

DISCUSSION

Prevalence of LBW was 20.1 % in the present study population. Study conducted in 1922 in villages of Pune district showed a prevalence of 29%. [5] NFHS data from the year 2005-06 estimated the burden to be 20%.[6] Another community based study conducted in rural Karnataka in 2008-09 observed a prevalence of 22.9%. [7]

Prevalence observed in our study is slightly less than other rural community based studies. This could be due to improved facilities and increased awareness in this area. The prevalence of LBW was 20.1 % which is quite high considering the health facilities present in this area. This can be attributed to some extent to the tradition of early age at marriage (36% got married before 18 yrs), early age at 1st conception (50.2% before 20 yrs). Prevalence of VLBW was only 0.2 % which can be attributed to the completeness of ANC registration (100%), routine ANC check-ups and utilization of MCH services.

Pregnant women who gained weight more than nine kgs, who took sufficient supplementary nutrition and IFA tablets had low risk of LBW babies as seen in other studies. [8] Women living in villages which are nearer to either PHC or talluka head quarters had the lower risk for LBW as they took better advantage of the facilities. Distant places pose the problem of loss of wages to the couple which prevents them from frequent checkups and also to neglect the minor ailments, complications which could have played a role in foetal growth retardation.

As observed in many studies, babies who suffered from intra uterine complications like IUGR and infections, premature births showed more risk for LBW. [8]

Out of six perinatal deaths three had occurred in LBW babies. In normal weight babies the cause of death were chord around the neck, meconium aspiration and another was suspected case of breast milk aspiration, none can be attributed to LBW. In LBW category they died as a result of complications of prematurity and LBW. Causes being kernicterus, sepsis and congenital anomaly (sacral meningocoele) followed by sepsis. Sepsis and kernicterus can be attributed to the reduced systemic resistance of the LBW babies.

Among the other factors studied, young maternal age at marriage, short

stature of the mother, less or no supplementary nutrition taken during pregnancy, anemia during third trimester, nuclear family, lower Socioeconomic status, higher parity of the child and male babies observed higher chances of LBW. These factors did not show statistically significant association with LBW. Thus the prevalence of LBW even in rural area is on the decline. With better utilization of health and nutritional services it can be reduced further.

CONCLUSIONS

Prevalence of LBW was 20.1% which is on the decreasing trend compared to national average. In 3.1% of births, weight was not recorded. Institutional delivery is not 100% yet, but can be achieved in near future. 35% of the mothers were married before the age of 18 yrs. 61% of the mothers were anemic during pregnancy.

Limitations

The present study had been conducted in a limited area (one PHC) with lower sample size in order to explore the facts regarding Low birth weight at the basic functional unit of health care delivery system. Thus authors declare that the results of the present study have limited scope for generalization. Authors recommend further studies on this issue covering larger sample size at widespread geographical areas for generalization of results.

ACKNOWLEDGEMENT

Authors would like to thank all the ASHAs and Anganwadi workers who helped during this study and also mothers who were part of this study for their co-operation.

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How to cite this article: Narayanamurthy MR, Siddalingappa H, Kulkarni P et. al. Prevalence and determinants of low birth weight in rural Mysore. Int J Health Sci Res. 2013;3(8):35-39.

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