



ISSN: 0975-833X

RESEARCH ARTICLE

FACTORS ASSOCIATED WITH PREVALENCE OF LOW BIRTH WEIGHT IN A RURAL COMMUNITY

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ARTICLE INFO

Article History:

Received 10th March, 2015

Received in revised form

28th April, 2015

Accepted 06th May, 2015

Published online 30th June, 2015

Key words:

Low birth weight,
Maternal literacy,
Paternal age,
Rural community.

ABSTRACT

Introduction: The prevalence of Low Birth weight in India is 28% as compared to 6-7% among developed countries, the major burden being Intra Uterine Growth Retardation. Low Birth weight (<2.5kg) babies pose an increased risk of Morbidities and leads to impairment in growth and development. There are numerous factors contributing to low birth weights, which includes maternal, paternal and socio-demographic factors.

Objectives: To study the prevalence of low birth weight in a rural community and to study the association of various factors on the prevalence of low birth weight.

Methods: A cross sectional study in a rural community of South India. Study population constitutes 285 babies born during study period in the primary health center area of Vantamuri. **Results:** Out of 285 infants, 13.68% of the children were low birth weight (<2.5 kg). Maternal factors associated with low birth weight includes mother's education, iron intake during pregnancy, birth order, maternal age and pregnancy induced hypertension (P<0.05). Paternal factors associated with low birth weight were literacy status, occupation and number of dependents (p<0.05).

Conclusion: Majority of the factors associated with Low birth weight are preventable. The focus should be on health education and periodic monitoring of pregnant women.

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Citation: Vijayashree Shivprasad, Vijaya A Naik, Mahantshetti, N. S and Javali, M.S. 2015. "Factors associated with prevalence of low birth weight in a rural community", *International Journal of Current Research*, 7, (6), 17533-17535.

INTRODUCTION

Birth weight is the most important determinant of nutritional status of mother and predicts the future growth and development of infants, (Prasad *et al.*, 1994 and Park, 2005). Low birth weights is Birth weight of less than 2.5kgs with measurement taken within first hour of birth (Park, 2005). About 2.92% of Indian population is constituted by infants. (Park, 2005) Infants constitute a vulnerable group since they are at increased risk of malnutrition. The prevalence of Low Birth weight in India is 28% as compared to 6-7% among developed countries major burden being Intra Uterine Growth Retardation. Low Birth weight (<2.5kg) babies pose an increased risk of Morbidities and hence succumb to malnutrition. Growth impairment and infections during infancy critically affects the development of the child as a whole. The burden of morbidity and mortality among infants is highest in developing countries. Majority of the studies are hospital based and have focused on maternal factors.

There are very few studies in the rural community. Hence this study was carried out in a rural community with the objective to assess the prevalence of low birth weight and maternal, socio- demographic and paternal factors contributing to it.

MATERIALS AND METHODS

This cross sectional study was carried out in a rural community of Vantamuri Primary Health Center (PHC) area. Study population consisted of babies born during May-October 2012. Sample Size of 285 was calculated taking Annual Birth rate (19.5/1000/year). Inclusion criteria were singleton live born babies, whose weight at birth is recorded. Mothers residing in PHC areas for at least 6 months duration before the commencement of study. Multiple births and home deliveries were excluded from the studies. Data was obtained from mothers using semi structured pretested questionnaire. The baseline data collected includes the socio demographic profile, maternal factors like illness during pregnancy, medications, death of siblings. Paternal factors included were addiction to alcohol, paternal age, education and occupation. Data was

collected by the trained Anganwadi Workers. Training was carried out in their respective anganwadi's. The data was cross verified by the principle investigator for validity. Chi square test was used to test the association between variables on low birth weight ($p < 0.05$ was considered significant). Ethical clearance was obtained from Institutional Ethical Committee of KLE University Belgaum. Informed consent was obtained from the mothers.

wages as drivers, cooli, farmers etc. 152(53.3%) fathers were employed in industries, small business etc and 45(15.8%) fathers were government servants. Majority 115(40.3%) children were of 3rd or more birth order whereas only 84(29.5%) were 1st babies. Two hundred thirty three (81.7%) mothers consumed iron folic acid tablets of ≥ 90 tablets. 52(18.2%) mothers had consumed less than 90 IFA tablets. 33(11.6%) mothers had less than 3 visits of ANC.

Table 1. Association of various factors on Low birth weight

Factors	Variables	Low birth weight		Normal birth weight	Total	Chi square and p value
		No.	%			
Maternal age	>30years	8	17.4	38	46	63.7 (p=0.00001)*
	≤ 20 years	24	43.6	31	55	
	21-29 years	5	2.7	179	184	
Birth order	≥ 3	29	25.2	86	115	25.7 (p= 0.00001) *
	2	5	5.8	81	86	
	1	3	3.6	81	84	
History of abortion	Yes	8	16.7	40	48	0.7 (0.404968)
	No	29	12.2	208	237	
Birth spacing	<2years	11	16.2	57	68	0.8(p=0.369)
	>2 years	26	12	191	217	
Pregnancy induced Hypertension	Yes	14	43.7	18	32	30.2 (< 0.00001)*
	No	23	9	230	253	
Mothers education	illiteracy to primary	34	30.9	76	110	51.0 (< 0.00001)*
	Secondary education	2	1.8	110	112	
	Pre university education	1	2	47	48	
	Degree	0	0	15	15	
IFA Tablets	<90	32	61.5	20	52	53.001, P=0.000*
	90-100	5	3.4	140	145	
	>100	0	0	88	88	
Paternal Factors Fathers Age	>35years	0	0	38	38	33.2 (0.00001)*
	31-35 years	2	3.3	59	61	
	21-30 years	23	14.5	135	158	
	<20 years	12	42.8	16	28	
Fathers education	illiteracy to primary education)	22	38.6	35	57	43.0 (p= 0.00001)*
	Secondary education	7	10.4	60	67	
	Pre university	4	3.8	101	105	
	Degree	4	7.1	52	56	
Addiction to alcohol	Yes	7	8.1	79	86 (30.2%)	2.5 (p=0.109802)
	No	30	15.1	169	199	
Number of dependents	>5	21	36.2	37	58 (20.3%)	36.7 (p= 0.00001)*
	3-4	11	6.2	181	192	
	1-2	5	14.3	30	35	
Fathers occupation	Daily wages	27	30.7	61	88 (30.9%)	35.3 (< 0.00001)*
	Fixed salary	8	5.3	144	152	
	Government servant	2	4.4	43	45	
Others Death of sibling	Yes	6	33.3	12	18 (6.3%)	7.0 (0.007954)
	No	31	11.6	229	267	

*p<0.001

RESULTS

Out of 285 infants, 144 (50.53%) were males and 141 (49.47%) females. 184(64.6%) mothers were in the age group of 21-29 years whereas teenage pregnancy and advanced age high risk pregnancy was seen in 55(19.3%) and 46(16.1%) mothers respectively. Among fathers majority 158(55.4%) were 21-30 years and 61(21.4%) fathers were 31-35 years. 110(38.6%) mothers and 57 (20%) fathers were either illiterate or studied till primary education whereas only a meager population of 15(5.3%) mothers and 56 (19.6%) fathers had completed degree. As per the occupational status 152(53.3%) mothers were home makers. 88(30.9%) fathers were working for daily

History of abortion and pregnancy induced hypertension was seen among 48(16.8%) and 32(11.2%) mothers respectively. Addiction to alcohol among 86(30.2%) fathers and history of death of elder sibling in 68(23.8%) were the other factors associated with low birth weight. The prevalence of Low birth weight among 285 infants was 37(13.68%) of which male and females constituted 24(8.4%) and 15(5.3%) respectively. The mean birth weight was 2.4kg with a range being 1.2 to 2.8. 17(5.9%) and 22 (7.8%) of the infants were in the range of 1.5-2 and 2.1-2.4kgs respectively. Factors showing significant association with Low Birth Weight were maternal age that is teen age pregnancy was more associated with Low birth weight, illiterate fathers and mothers were more prone to have LBW babies.

DISCUSSION

According to NFHS 3 the prevalence of low birth weight in Karnataka is 18.7%. Whereas the prevalence as been 13.68% in our study perhaps because of the sample size. Teenage pregnancy (<20years) and pregnancy (>34 years) was 26.1% and 20.1% respectively. 24.6% LBW was seen with birth order >3. Among Illiterate mothers and low socio economic status the prevalence of Low birth weight was 26.2% and 25.4% respectively. All these results are similar to our observations were significant association was seen with respect to teenage pregnancy, illiteracy and birth order, ([http:// www.Nfhsindia.org/data/ka-pre.pdf](http://www.Nfhsindia.org/data/ka-pre.pdf)) In a study conducted at Muhimbili National Hospital, Tanzania, the prevalence of Low birth weight was 26.4%. There was no association seen between age of the mother with low birth weight although association was seen between multiple births and LBW (Adamson, 2006). Whereas our study showed an association with age since majority of the children were of birth order >3. This could be because of male child preference seen among rural community.

The association of psychological morbidities with low birth weight is not well established. A study carried out at district hospital in Goa showed a significant association with psychological morbidity and Low birth weight (odds ratio 1.44, 95% CI 1.0-2.07) but the study done in UK revealed that there is no association between maternal depression and outcome of low birth weight. In our study 33.3% of LBW babies were seen among those mothers who had lost their older children which can be attributed to psychological factors (Patel and Prince, 2006; Evans *et al.*, 2007). The present study shows that almost a quarter of LBW babies were born to mothers whose age was < 20 years. In a hospital based study carried out in Kolkata and west Bengal revealed a significant association between younger age of pregnancy and low birth weight (Mukhopadhyay *et al.*, 2010 and Banerjee *et al.*, 2009). Case control studies carried out in Tanzania, Pakistan and India showed numerous maternal factors associated with low birth weight which were decreased intake of iron during pregnancy, lower hemoglobin level, young age, less spacing, poverty, maternal malnutrition, inadequate ANC (OR-4.98, 95% CI-2.64 to 9.39), maternal weight before delivery 55 kg (OR-4.81, 95% CI-2.53 to 9.15) and height 145 cm (OR-4.13, 95% CI- 2.04 to 8.37) (Rizvi *et al.*, 2007; Khan *et al.*, 2003 and Mumbare *et al.*, 2006). These findings are similar to our study were significant association was seen with respect to young age, illiteracy among fathers and mothers, higher birth order, less spacing, more number of dependents, inadequate iron intake and fathers occupation.

Paternal factors: Various factors contributing to Low birth weight as revealed by systematic review and cross sectional study carried out among US urban population were advanced paternal age, height of fathers, birth weight of fathers, fathers occupation and education (Reichman *et al.*, 2006; Shah *et al.*, 2010). Inverse relationship was seen between literacy status of father and LBW.

Highest prevalence seen being illiterate fathers. Other factors were 36.2% LBW was seen among fathers who had more than 5 dependents. Though addiction to alcohol didn't show any association but death of the older child showed a significant association to LBW. Other factors showing significant association were Fathers occupation, number of dependents and history of abortions.

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