

## Influence of maternal and fetal factors on low birth weight at Teaching Hospital, Batticaloa

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(Key Words: maternal factors, fetal factors, low birth weight)

### Abstract

**Objective** To determine the mean birth weight and prevalence of low birth weight and to assess the influence of maternal (ethnicity, age and parity) and fetal factors (gender and singleton or multiple) on LBW.

**Methods** A hospital based descriptive cross sectional study was conducted among all live births during June to August 2010 at Teaching Hospital Batticaloa. Data was obtained from birth registry in the Labour Ward.

**Results** 1715 babies were born during the study period. The mean birth weight of all newborn was 2917.43g and the prevalence of LBW was 15.41%. The prevalence of LBW was higher among Tamils than Muslims. Higher prevalence rate of LBW were below 25 years and above 36 years age group. Prevalence of LBW was significantly high in first & second parity and over 6<sup>th</sup> parity. Female babies had higher prevalence rate for LBW than male babies. Twin babies were more vulnerable to be born as LBW than Single birth.

**Conclusions** Both maternal and fetal factor considered for LBW in this study were found to be significantly associated with LBW. Reductions in teenage, elderly pregnancy and above 6<sup>th</sup> parity are essential for reducing LBW.

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### Introduction

Low birth weight (LBW) has been defined by the WHO as weight at birth of less than 2,500 grams. A baby's low weight at birth is either the result of preterm birth or of restricted fetal growth. Low birth weight is closely associated with neonatal mortality and morbidity, inhibited growth and cognitive development, and chronic diseases later in life [1]. LBW infants have 40-fold greater risk of dying in the neonatal period [2]. LBW still remains a major public health problem. Globally, more

than 20 million infants are born with low birth weight and level of low birth weight in developing countries (16.5 per cent) is more than double the level in developed regions (7 per cent) [1].

Even though several risk factors have been identified, they operate to different extent in different culture and environment. As far as we are aware, research on low birth weight and its association with risk factors has not yet done in eastern Sri Lanka.

Objective of this study is to determine mean birth weight and the prevalence of low birth weight; to assess the influence of maternal factors (ethnicity, age and parity) and fetal factors (gender and singleton or multiple) on LBW at Batticaloa Teaching Hospital.

### Methods

A hospital based descriptive cross sectional study was conducted among all live births during June to August 2010 at the Teaching Hospital Batticaloa. Ethical clearance for this study was obtained from Ethical Review Committee, Faculty of Health-Care Sciences, Eastern University, Sri Lanka.

Data regarding age, parity and ethnicity of mother, gender of newborn, birth weight and outcome of pregnancy (singleton or multiple) were obtained from birth registry in labor Ward. Data Recording Form was used to collect data. Data were entered into Microsoft Excel worksheet then analyzed with SPSS software (ver.19.0). Birth weight was categorized into LBW (<2500g) and normal weight (≥2500g) groups. Age and parity were also categorized into subgroups. Associations between birth weight and risk factors were assessed with chi-square test, taking a level of significance of  $P < 0.05$ .

### Results

1715 babies were born during study period. Birth weights

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of two newborns were not available and hence they were excluded from the study. The mean birth weight was 2917.43g (SD 484.94g). Among 1713 babies, 264 babies were of low birth weight so overall prevalence of LBW was 15.41% (264/1713).

Out 1713 babies, 1083 of them were born to Tamil, 628 babies to Muslim and 2 babies to Sinhala mothers. Hence babies were born to Sinhala mothers were excluded for chi-square test when assessing ethnicity and birth weight. Prevalence of LBW was 18.3% in Tamils and 10.5% Muslim community. The association between ethnicity and birth weight was found to be highly significant ( $X^2=18.41, P<0.001$ ).

Ages of 1683 mothers were available and they were categorized into subgroups. LBW prevalence rates were 20%, 17.3%, 13.5%, 13.8%, 16.8% and 50% in below 19 years, 19-24 yrs, 25-30 yrs, 31-36 yrs, 37-42 yrs and over 42 yrs age groups respectively. A statistically significant association between maternal age and weight of baby was found in this study ( $X^2=11.1; P=0.049$ ).

LBW prevalence rates were 16.2%, 14.2%, 9.7% and 40% in 1<sup>st</sup>&2<sup>nd</sup>, 3<sup>rd</sup>&4<sup>th</sup>, 5<sup>th</sup>&6<sup>th</sup> and over 6<sup>th</sup> parity respectively. The relationship between parity and birth weight was

found to be significant ( $X^2=8.36; P=0.039$ ).

Prevalence of LBW was 17.8% in female and 13.1% in male. The association between gender and birth weight was found to be significant ( $X^2=7.22; P=0.007$ ). Prevalence of LBW was 63.2% in babies who were born from twin pregnancy and 14.3% among singleton. Highly significant ( $X^2=97.96; P<0.001$ ) association was found in chi-square test.

### Discussion

This study revealed a relatively higher value for mean birth weight when compared to study by Nanayakkara *et al* at Teaching Hospital Kandy (2854g) [3]. The prevalence of LBW in Sri Lanka is 16.6% according to the DHS 2006/ 07 which fluctuated between 16% and 18% over last two decades [4]. However, lower prevalence of LBW was observed in this study (15.41%).

The prevalence of LBW was higher in Tamils (18.3%) than Muslim community (10.5%). Since there is a significant difference in LBW between two ethnic groups, study of socio-economic factors should be taken into consideration.

**Table 1: Relationship between risk factors and birth weight**

Risk factor	Newborns (n)	LBW (n)	(%)	P value
Ethnicity	Tamil	1083	198	18.3%
	Muslim	628	66	10.5%
Maternal age (years)	<19	105	21	20.0%
	19-24	485	84	17.3%
	25-30	614	83	13.5%
	31-36	348	48	13.8%
	37-42	125	21	16.8%
	>42	6	3	50.0%
Parity	1 <sup>st</sup> &2 <sup>nd</sup>	1193	193	16.2%
	3 <sup>rd</sup> &4 <sup>th</sup>	393	56	14.2%
	5 <sup>th</sup> &6 <sup>th</sup>	113	11	9.7%
	Above 6 <sup>th</sup>	10	4	40%
Gender	Male	870	114	13.1%
	Female	843	150	17.8%
Outcome of pregnancy	Singleton	1675	240	14.3%
	Twin	38	24	63.2%

Low prevalence of LBW was found in 25-30years and 31-36years age groups. Under 25years and over 36years age groups were having higher prevalence rates. Even though maternal age under 25 years found to be having more risk of LBW, 35.1% (590/1683) newborns were born to mothers belong to this age groups. Sharma *et al* [5] and Shiva *et al* [6] have reported that babies born to mothers younger than 20 years having more risk.

Prevalence of LBW that was significantly high in first & second parity and over 6<sup>th</sup> parity when compared to 3<sup>rd</sup> & 4<sup>th</sup> and 5<sup>th</sup> & 6<sup>th</sup> parities. Study of Malik *et al* revealed that LBW rate in 1<sup>st</sup> parity mothers was significantly higher than 2<sup>nd</sup> and 3<sup>rd</sup> parous mothers [7]. Joshi *et al* found first and over fourth parity having high prevalence rate [8]. LBW prevalence was higher in female (17.8%) than male (13.1%). Amosu *et al* also found similar finding in their study [9].

### Conclusions

All considered maternal and fetal factors were significantly associated with LBW. Reductions in teenage, elderly pregnancy and above 6<sup>th</sup> parity are essential for reducing LBW. Since there is a significant different in LBW between two ethnic groups, study of socio-economic factors should be taken into consideration.

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