**Correspondence**
Dr. Milan Malla
Intern, Patan Academy of Health
Sciences
Email: milanmalla@pahs.edu.np

**Peer Reviewed By**
Prof Dr. Jay N Shah
Patan Academy of Health Sciences

**Peer Reviewed By**
Dr. Sumana Bajrachraya
Patan Academy of Health Sciences

# Prevalence and contributing factors of low birth weight babies in institutional delvery

Milan Malla, Dilip Raj Joshi, Kailash Chhetri, Prabin Pandey

Intern, Patan Academy of Health Sciences, Lagankhel, Lalitpur, Nepal

## ABSTRACT

**Introductions:** Low Birth Weight (LBW) is a sensitive indicator of socio-economic conditions and indirectly measures the health of mother and child. Though, the health situation of Nepal has improved substantially over the years, LBW rate is still high. The present study explores the prevalence and contributing factors of LBW babies delivered in Patan hospital.

**Methods:** The data were collected retrospectively from patients' record for babies born at Patan Hospital, Patan Academy of Health Sciences, Kathmandu, Nepal. Records were retrieved through systematic randomization and IBM SPSS 15.0 was used for analysis. Non-parametric tests were applied with correlation done between dependent and independent variables.

**Results:** A total of 4395 birth occurred during the study period of which 527 met the study criteria and remaining were of normal birth weight. The prevalence of LBW was 11.99% and the average LBW was calculated as 2074.97 ± 344.425 grams. The factors associated with LBW included preterm babies (Pearson correlation coefficient= 0.554, p= 0.001 < 0.05) and oligohydamnious (Spearman's correlation coefficient= 0.307, p= 0.019 < 0.05).

**Conclusions:** This study suggests preterm babies and oligohydramnious to be contributing factors of LBW babies.

**Keywords:** amniotic fluid index, intra uterine growth retardation, maternal risk factors, Patan Hospital, retrospective hospital based study

## INTRODUCTIONS

Birth weight is the single most important criterion for determining neonatal and infant survival. Low Birth Weight (LBW) is a sensitive indicator of socio-economic conditions and indirectly measures the health of mother and child. In 1975, the WHO defined LBW as live born infants with birth weight <2,500 grams, irrespective of the gestational age and considered it as a consequence of premature interruption of pregnancy and/or intrauterine growth restriction (IUGR). A cross-sectional hospital based study done in Western Developmental Region of Nepal showed 29.8% of infants were born with a low birth weight.[3] Despite efforts to decrease the proportion of newborns with LBW, success has been limited.[5] Though, the health situation of Nepal has improved substantially over the years, the low birth-weight rate is still high. This study is to explore the prevalence and contributing factors associated with LBW of institutionally delivered newborns at Patan Hospital.

## METHODS

The present retrospective hospital based study was conducted in Patan Hospital, Patan Academy of Health Sciences (PAHS), Lalitpur, Kathmandu, Nepal. The live born babies with low birth weight <2500 grams irrespective of their gestational age were included by using its WHO definition.

The data was collected from the patient record files. The prevalence was derived from the babies with low birth weight born in the six months of study period Jan 2013 to June 2014 (Magh 2069 to Ashar 2070) and was found to be 11.99%. Its sample size was calculated as 163 from proportion method using this prevalence rate with level of significance as 5% and confidence interval of 95%.

Then systematic random sampling was applied to get the samples among the total 527 low birth weight babies. The history, clinical findings and the investigation results were reviewed from mothers'

files of those babies. The contributing factors were mainly labelled into three categories and were filled in checklist as Maternal, Placental, and Fetal. These all have different contributing factors[3] as the subheadings in the checklist for the study, which was made from the literature reviews.

The data collected were entered in IBM SPSS 15.0 and as the dependent variable didn't follow normal distribution so non-parametric tests were applied and further analysis was done. Correlation was done between the dependent variable and independent variables.

## RESULTS

A total of 4395 births occurred during the study period, of which 527 met the study criteria of LBW. Hence, the prevalence of low birth weight newborns in the present study was found as 11.99%. Out of total newborns with LBW, the average birth weight was 2074.97 ± 344.425 gm, (Figure 1) and median LBW 2200 gm and range was 900-2450 gm and among them male babies were 48.47% and female babies were 51.53%, (Table 1).

The factors associated with LBW included low fetal gestational age (preterm babies) and oligohydamnious (AFI<6cm). The following factors were found as insignificant (p>0.05): race/ethnicity, maternal education, occupation, parity, age of the mother, maternal hematocrit before the delivery, DM, HTN, and some of the other variables were couldn't be assessed because of inadequate information, like maternal body mass index (BMI), other chronic diseases, smoking, alcoholism or substance use, economic status of the family, consanguinity and most of the placental abnormalities.

The Pearson correlation coefficient between LBW (in grams) and gestational age (in weeks) was found to be 0.554 which was statistically highly significant (p= 0.001< 0.05) and the Spearman's correlation coefficient between LBW (in grams) and amniotic fluid index (AFI) in cm was found to be 0.307 and this was statistically significant (p= 0.019 < 0.05).

**Table 1. Maternal variables among who delivered LBW babies**

| Variables | LBW | % |
|---|---|---|
| **Birth weight (gms)** | | |
| Extremely LBW | 3 | 1.8 |
| Very LBW | 13 | 8 |
| LBW | 147 | 90.2 |
| **Sex-wise distribution of LBW babies** | | |
| Male | 79 | 48.47 |
| Female | 84 | 51.53 |
| **Age of Mothers (in years)** | | |
| <=20 | 14 | 8.6 |
| >20 | 148 | 90.8 |
| **Occupation among the mothers** | | |
| Housewife | 68 | 41.72 |
| Teacher | 2 | 1.23 |
| Patan Hospital staffs | 1 | 0.61 |
| Missing | 92 | 56.44 |
| **Caste/Ethnicity among the mothers** | | |
| 1-Dalit | 4 | 2.45 |
| 2-Disadvantaged Janajatis | 15 | 9.2 |
| 3-Disavantaged Dalit Terai caste groups | 6 | 3.68 |
| 4-Religious minorities | 9 | 5.52 |
| 5-Relatively Advantaged Janajatis | 42 | 25.77 |
| 6-Upper Caste groups | 87 | 53.37 |
| **Address of mothers (valley vs outside the valley)** | | |
| Inside the valley (KTM) | 121 | 74.23 |
| Outside the valley | 40 | 24.54 |
| Missing | 2 | 1.23 |
| **Education status of the mothers** | | |
| Illiterate | 5 | 3.07 |
| Primary | 11 | 6.75 |
| Secondary | 28 | 17.18 |
| Higher Secondary | 34 | 20.86 |
| Bachelor | 27 | 16.56 |
| Master | 15 | 9.20 |
| Missing | 43 | 26.38 |
| **HTN among the mothers** | | |
| HTN | 20 | 12.27 |
| No HTN | 143 | 87.73 |

## DISCUSSIONS

Present study found that 11.99% babies born at Patan Hospital had LBW of <2500 gms. This prevalence is less than 17.3% LBW observed in the previous study at this hsopital.[4] It has been drawn that preterm baby (Pearson correlation coefficient = 0.554 and p= 0.001) and oligohydramnious (Spearman's correlation coefficient= 0.307, p= 0.019) are the two important contributors for LBW, which was in conformity with the earlier reports.[2,3] Prevalence of LBW was slightly higher in female babies (51.53%) than in males and most of the mothers were housewives (41.72%). Among the mothers with LBW babies, 63.8% had grade 10

(SLC) schooling or higher. In 12.27% (20) of mothers had HTN. However, parity, maternal hematocrit, age, chronic illness, occupation and education level were not in accordance with the previous studies done in other hospitals of Nepal.[1,3] This may be because of inadequate information from the record files, or adequate and proper care, nutrition, knowledge and regular ANC visits during the pregnancy in the Kathmandu city where most of the health facilities are centralized. This might also hold true for the explanation of the decrease in prevalence of LBW babies in Patan Hospital.

There are number of studies across the globe done on this subject by using different methodologies. Either they evaluate the effects of the factors in isolation through cross tabulations or, utilizing statistical techniques to see the individual factors in presence of others. The information of this study was collected from the hospital records of the mothers. If it was possible to cross check the hospital records with that of mothers' answer, better and adequate information would have been collected. And if it was done longitudinally following those pregnant mothers even better information would be drawn. These were the major limitations of this study. On wrapping up, this study highlights that if the preterm labor and oligohydramnious are addressed by controlling or minimizing their possible causes like preeclampsia, chronic HTN, collagen vascular disease, placental infarction, renal agenesis, etc. (though it is not the domain of this study), the prevalence of LBW will also be lowered.

## CONCLUSIONS

This study shows a decrease in the prevalence of LBW babies born in Patan Hospital and also suggests that low gestational age and oligohydramnious are the two main contributing factors.

## REFRECENCES

1. Kayastha S, Tuladhar H. Study of low birth weight babies in Nepal Medical College. Nepal Med Coll J. 2007 Dec;9(4):266-9.

2.  Joshi HS, Srivastava PC, Agnihotri AK, Joshi MC, Chandra S, Mahajan V. Risk factors for low birth weight (LBW) babies and its medico-legal significance. J Indian Acad Forensic Med. 2010;32(3):212-15.

3.  Yadav DK, Chaudhary U, Shrestha N. Risk factors associated with LBW. J Nepal Health Res Counc. 2011 Oct;9(19):159-64.

4.  Saving Newborn Lives, Save the Children Nepal. State of the world's newborns: Nepal. [Online]. 2002 Jul [cited 2016 Mar 13]; Available from: http://www.savethechildren.org/atf/cf/%7B9def2ebe-10ae-432c-9bd0-df91d2eba74a%7D/newborns_report.pdf.

5.  Laura PTA, Patricia CC, Sergio FH, Juan PVB, Enrique RM. Socioeconomic factors and low birth weight in Mexico. BMC Public Health. 2005;5:20.