

Characteristics and outcomes of low birth weight infants in Bali

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Abstract

Background The prevalence and the mortality of low birth weight infants are still high. Low birth weight (LBW) births are responsible for newborn death. LBW infants are easier to suffer serious health problems and death. Lower infant body weight and younger gestational age are determinants of greater risk of mortality.

Objective To determine the characteristics of LBW infants and their outcomes in Sanglah Hospital, Denpasar.

Methods This prospective study was conducted on all LBW infants in the nursery from their time of admission until discharge for the year of 2011.

Results There were 120 LBW infants admitted to Sanglah Hospital from January 2011 to December 2011. The prevalence of LBW was 8.9%. The birth weight group of 1500-2499 grams had the highest number of infants (79.2%). The gestational age group of 33-36 weeks had 53.3% of the infants, while 68.3% of the LBW infants were of the appropriate gestational age. The most common method of delivery was normal spontaneous delivery (70%). Moderate asphyxia was observed in 25% of the subjects, while severe asphyxia was observed in 22.5% of subjects. The mortality rate was 24.2%.

Conclusions The prevalence of LBW of all newborns in our hospital was 8.9%. Severe asphyxia was observed in 22.5% of subjects. The mortality rate of the LBW infants was 24.2%. Our LBW infants were most commonly in the categories of birth weight of 1500-2499 grams, gestational age was between 33-36 weeks, appropriate for gestational age, as well as delivered spontaneously. [Paediatr Indones. 2012;52:300-3].

Keywords: low birth weight infant, characteristics, mortality

Annually 130 million infants are born worldwide, and an estimated of 4 million of these die during the neonatal period. Most of these deaths occur in developing countries.^{1,2} In Indonesia, according to the 2007 demographic and health survey, the neonatal mortality rate was 19 per 1000 births.³ The causes of these neonatal deaths were preterm infant birth (28%), severe infection (36%) consisting of sepsis / pneumonia (26%), tetanus (7%), and diarrhea (3%); as well as asphyxia (22%), congenital anomalies (7%), and other causes (7%).²

Low birth weight (LBW) contributes to the high mortality and is often directly responsible for newborn deaths during the neonatal period.⁴⁻⁶ Infants with LBW more often die or suffer serious health problems. Low fetal weight during pregnancy may lead to LBW and younger gestational at delivery age in newborns, thereby increasing the risk of morbidity and mortality.⁷⁻⁹ The prevalence of LBW worldwide has been estimated to be 18 million per year.^{2,4} The prevalence of LBW in South Asia was about 22%,

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while in Indonesia the prevalence was about 20%. In a West Java regional referral center, the annual prevalence of LBW was reported to be 20-25%, whereas in rural areas the prevalence was reported to be much lower at 10.5%.³

Considering the problems associated with low birth weight, we report the characteristics and outcomes of LBW infants treated in Sanglah Hospital, Denpasar, with the hope that this information can be used to improve the care of these infants.

Methods

This study was conducted in the Neonatology Ward at Sanglah Hospital, Denpasar from January 2011 to December 2011. This was a prospective study, in which every newborn who met the study criteria at the time of admission was followed up until discharged from the hospital. Inclusion criteria were infants with birth weight of <2500 g, newborn babies either born in or referred to the hospital. We excluded infants with incomplete data and infants who were discharged against medical advice. We collected the following data from the subjects: gender, mode of delivery (spontaneous, Caesarean section), state of infant at birth (vigorous baby, moderate asphyxia, or severe asphyxia), gestational age (<28 weeks, 28-32 weeks, 33-36 weeks, or >37 weeks), birth weight (<1000 g, 1000-1499 g, or 1500-2499 g), and classification of infant (appropriate gestational age, small for gestational age, or large for gestational age). Subject outcomes were grouped into survived or died. Characteristics of the LBW infants who were born in Sanglah Hospital were recorded at birth, while referred patients' data was recorded during the time of admission. This study was approved by the Research Ethics Committee of Udayana University Medical School/Sanglah Hospital, Denpasar.

Results

Of the 1,518 infants admitted to Sanglah Hospital, LBW was observed in 135 infants (prevalence 8.9%). Of these LBW infants, 15 were excluded because they were discharged against medical advice. A total of 120

LBW subjects were enrolled, consisting of 55 referrals and 65 subjects born in Sanglah Hospital.

The majority of LBW subjects, weighed 1500-2499 g, were in the gestational age category of 33-36 weeks, and were appropriate for gestational age. In addition, most subjects were delivered spontaneously (70%) and 22.5% had severe asphyxia at birth (**Table 1**). The mortality rate was 24.2%. As shown in **Table 2**, more LBW infants who were delivered spontaneously died than those delivered by Caesarean section.

Fifty-seven LBW infants had moderate or severe asphyxia at birth. Most LBW infants who died had severe asphyxia (44%), while 16% of those who died were in the vigorous category at birth (**Table 2**).

Based on gestational age, there was a high mortality rate of LBW infants in the 28-32 week age group, compared to the others age groups (**Table 2**). In addition, most LBW infants who died were in the 1500-2499 gram birth weight group (**Table 2**). We also found that mortality was higher in the appropriate for gestational age LBW group (15.9%) (**Table 2**).

Table 1. Characteristics of LBW infants

Characteristics	n=120
Male gender, n (%)	65 (54.2)
Mode of delivery, n (%)	
- Spontaneous	84 (70)
- Caesarean section	36 (30)
Condition based on APGAR score, n (%)	
- Vigorous baby	63 (52.5)
- Moderate asphyxia	30 (25)
- Severe asphyxia	27 (22.5)
Gestational age, n (%)	
- 28-32 weeks	32 (26.7)
- 33-36 weeks	64 (53.3)
- 37-42 weeks	24 (20)
Birth weight, n (%)	
- < 1000 grams	3 (2.5)
- 1000-1499 grams	20 (16.6)
- 1500-2499 grams	97 (80.8)
Low Birth Weight classification, n (%)	
- AGA LBW	82 (68.3)
- SGA LBW	28 (23.3)
- AGA ELBW	7 (5.8)
- SGA ELBW	3 (2.5)

AGA: appropriate for gestational age; SGA: small for gestational age; ELBW: extremely low birth weight

Table 2. Outcomes of the subjects

Characteristics	Outcomes		Total n= 120
	Survived	Died	
	n= 91	n= 29	
Mode of delivery, n (%)			
Spontaneous	64 (76.2)	20 (23.8)	84
Caesarean section	27 (75)	9 (25)	36
APGAR score, n (%)			
Vigorous baby	53 (84.1)	10 (15.9)	63
Moderate asphyxia	23 (76.7)	7 (23.3)	30
Severe asphyxia	15 (55.6)	12 (44.4)	27
Gestational age, n (%)			
28-32 weeks	19 (59.4)	13 (40.6)	32
33-36 weeks	54 (84.4)	10 (15.6)	64
≥37 weeks	18 (75)	6 (25)	24
Birth weight, n (%)			
<1000 grams	1 (33.3)	2 (66.7)	3
1000-1499 grams	11 (55)	9 (45)	20
1500-2499 grams	77 (81.1)	18 (18.9)	95
2500-3999 grams	2 (100)	0 (0)	2
LBW classification, n (%)			
AGA LBW	69 (84.1)	13 (15.9)	82
SGA LBW	17 (60.7)	11 (39.3)	28
AGA ELBW	3 (42.9)	4 (57.1)	7
SGA ELBW	2 (66.7)	1 (33.3)	3

Discussion

Low birth weight is a public health issue because it is associated with 70% of the morbidity and mortality in the neonatal period. In addition, LBW infants who survive tend to be more prone to infection as well as have impaired growth and development.^{8,10}

The prevalence of LBW is estimated to be 15% of all births worldwide, with a range of 3.3 to 38%. Higher LBW prevalence has been observed in developing countries than the other countries.^{1,4} In the United States, the prevalence of LBW in 2004 was 8.1%, while that of extremely low birth weight was 1.47%.¹¹ Studies from Canada,⁶ Turkey,¹² and India¹³ reported the LBW prevalences to be 5.8%, 5.7% and 30%, respectively. We found that the prevalence of LBW in Sanglah Hospital was 8.9%. Studies on LBW in the United Kingdom reported an prevalence of 18.5%,¹² while that in a West Java regional referral center reported 20-25% LBW.³

Low birth weight mortality remains very high, especially in developing countries. According to

WHO reports, 29% of deaths in the neonatal period are caused by LBW, and the risk of mortality is 20 times greater than normal.^{1,4,9} In our study of 120 LBW infants, 24.2% died. Sitorus *et al.*,¹⁴ in Balikpapan found LBW mortality to be 13.3%. This figure was much higher than those of developed countries, where LBW may occur in as many as 4/1000 live births.^{1,4}

In our study, we found that the percentage of LBW mortality was greater in the Caesarean section group, history of asphyxia at birth, and those who were SGA LBW (**Table 2**). This study was descriptive, therefore, further investigation is needed to evaluate how mode of delivery, asphyxia, LBW classification, and birth weight affects the risk for death in LBW infants.

In conclusion, we found that the prevalence of LBW was 8.9% in our hospital. Severe asphyxia was observed in 22.5% of subjects, while the mortality rate was 24.2%. Our LBW infants were most commonly in the categories of birth weight of 1500-2499 grams, gestational age between 33-36 weeks, AGA, as well as delivered spontaneously.

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