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Low Birth Weight Infants Outcome In Single Tertiary Referral Hospital

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ABSTRACT

Background: Low birth weight (LBW) is defined by infants with birth weight less than 2500 gram,commonly caused by prematurity, Preterm infants are prone to problems such asorgan immaturity, neurodevelopmental impairment until behavior disorder. Hypertention on pregnancy and preeclampsia is the most case reffered and treated in dr. soetomo General Hospital as a single tertiary teaching hospital in Surabaya, Indonesia wich require early delivery and possess consequences to maternal and perinatal slide. **Objective:** This study aims to determine the incidence and outcome of LBW infants born in dr. Soetomo General Hospital. **Methods:** Retrospective cross-sectional by using medical record data of dr. Soetomo General Hospital on January 2014 – December 2017. **Results:** There were 2350 infants with birth weight of 500-2499 gram, in which majority was on the range of 2001-2499 gram (38%). Hypertension on pregnancy and the complications were the most indication for pregnancy termination that LBW infants. This study also found that the LBW outcome was linear with birth weight. In addition, the gestational age and five minutes APGAR score also had important role to the LBW outcome. **Conclusion:** The major cause of LBW infants in dr. Soetomo General Hospital was hypertension on pregnancy. There was a positive trend of survival in infants with birth weight range of 1501-2000gram.

Introduction

Low birth weight (LBW) is defined by infants with birth weigh less than 2500 gram. Globally, more than 20 million infants are born with LBW each year, 96,5% of them in developing countries (WHO, 2011). Low birth weight is strongly associated with neonatal morbidity and mortality. As many as 27% of neonatal deaths each year are caused by complications from preterm birth or LBW (Lawn, 2010). Indonesia, as one of developing country with the third largest population in Asia, has dr. Soetomo General Hospital as the only tertiary referral center in eastern Indonesia. Based on national medical research, in 2013 the percentage of children under five (0-59 months) LBW in Indonesia was 10.2%. Primarily, LBW is caused by two things, premature gestational age and impaired fetal growth in utero (Kemenkes, 2014). The main problem for premature infants is

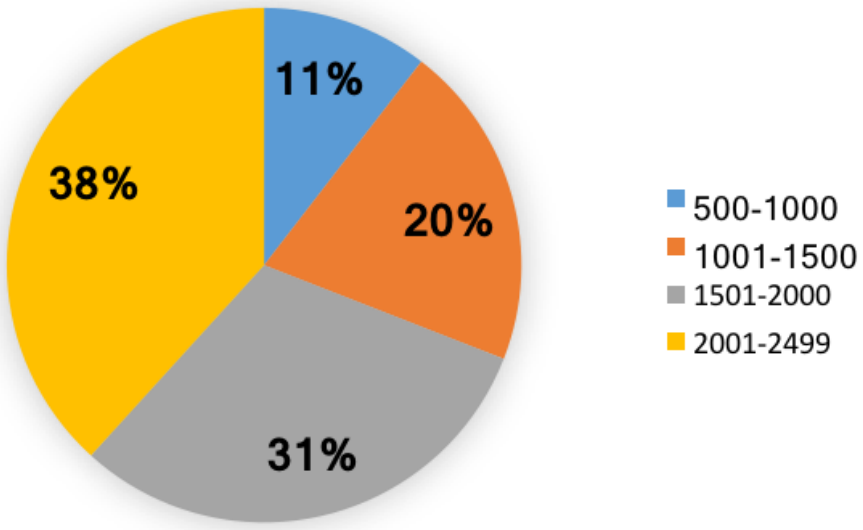
organ prematurity with all the risks. A fetus with growth disorders in utero is at risk of developing metabolic syndrome such as cardiovascular disease and diabetes in adults. LBW is still a health problem in many countries, because it is considered to be one of the most common factors causing infant mortality (Praamono, 2004; Kumar, 2012), and also as an indicator of the quality of public health service (WHO, 2011). Most indications of pregnancy termination at dr. Soetomo General Hospital are hypertension in pregnancy and its complications to maternal and neonatal. This study aims to determine the incidence and outcome of LBW infant born in dr. Soetomo General Hospital as a single tertiary teaching hospital in East Java.

Method

This study was a cross-sectional retrospective study using electronic medical data records in dr. Soetomo General Hospital at January 2014 until December 2017. The inclusion criteria of this study were infants with birth weight less than 2500 grams, while for exclusion criteria were birth weight less than 500 grams, fetus died in utero and stillbirth. The data obtained were grouped by gestational age at termination, five-minute APGAR score and birth weight. From these data, we traced the outcome of the infant.

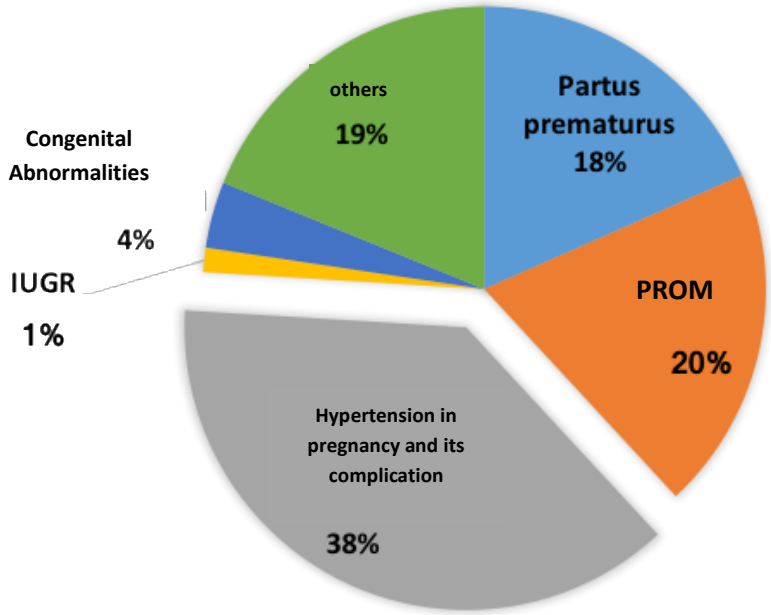
Results and Discussion

During the period January 2014 until December 2017, there were 2350 infants with birth weights less than 2500 grams. Birth weight of infants was classified into 4 ranges, to make it easier to identify LBW ranges that could be treated and survived in NICU (Neonatal Intensive Care Unit) dr. Soetomo General Hospital. Picture 1 shows the percentage of LBW based on birth weight, which the most birth weight is in the range of 2001-2499 grams by 38%.



Picture 1. Percentage of LBW cases in dr. Soetomo General Hospital at January 2014-December 2017

Some risk factors (maternal factors) for LBW incidence are rural areas, nutritional status, basic medical diseases and obstetric complications (Cunningham, 2014). Hypertension in pregnancy is a deadly triad along with post-partum hemorrhage and infection which significantly causes maternal morbidity and mortality (Roman, 2017). Hypertension in pregnancy can also cause LBW, which it is closely related to preterm birth because of early pregnancy termination and fetal growth disorders (Sibai, 2015; Gebremedhin, 2015). Besides maternal factors, fetal factors can also cause LBW. Congenital abnormalities are one of the causes of LBW, stillbirth, and prematurity (Gandhi, 2016). In this study, hypertension in pregnancy and its complications (38%) are the most common causes of LBW (Picture 2).



Picture 2. Percentage of LBW cases based on indication of pregnancy termination indication in dr. Soetomo General Hospital at January 2014 – December 2017.

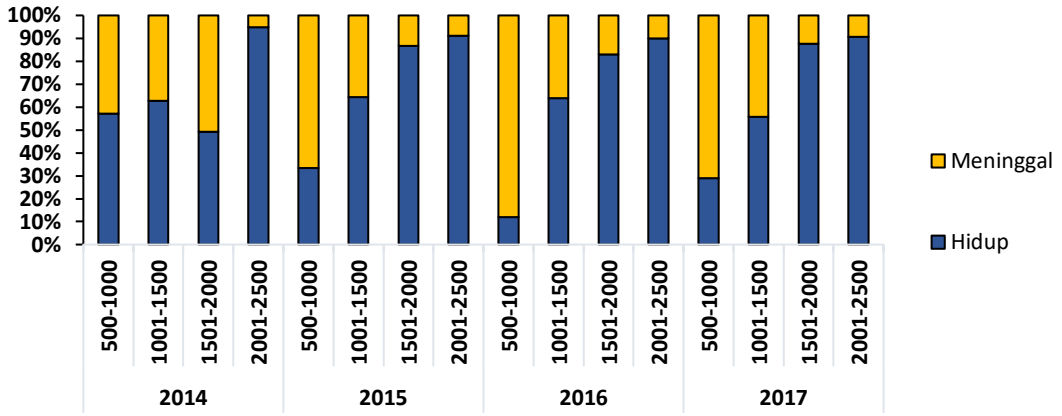
Policy on termination of pregnancy in severe cases of preeclampsia at 34 weeks gestational age is the most related cause of LBW occurrence. While, congenital abnormalities found only by 4% of LBW in dr. Soetomo General Hospital.

LBW infant's outcome is influenced by several factors, including gestational age, five-minute APGAR score, birth weight and congenital abnormalities (Gandhi, 2016). Table 1 shows the LBW outcomes in dr. Soetomo General Hospital based on several parameters. These results had a linear relationship between the five-minute APGAR score and the infant outcomes (survival). The five-minute APGAR score provides information to health workers regarding the survival of infants outside the uterus. APGAR score less than 4 in the five-minute is closely related to intra-ventricular hemorrhage, necrotizing enterocolitis, retinopathy of prematurity and longer hospital stay (Phalen, 2012).

Table 1. LBW infant's outcome in dr. Soetomo General Hospital at January 2014-December 2017

Parameter	Death		Live	
	n	%	n	%
Five-minute APGAR score				
1-4	370	34%	189	66%
5-7	169	24%	545	76%
8-10	79	7%	998	93%
Birth Weight (grams)				
500-1000	173	70%	73	30%
1001-1500	183	38%	298	62%
1501-2000	187	26%	537	74%
2001-2499	75	8%	824	92%
Gestational Age (weeks)				
< 28	285	81%	65	19%
29-34	140	13%	975	87%
35-37	111	17%	544	83%
>37	50	22%	180	78%

Birth weight is an important factor that can be used as a predictor of infant outcomes. The smaller the birth weight, the more closely the infant's growth monitoring after birth, especially related to the problem of food intake and inadequate growth of infants (Ribeiro, 2009). Picture 3 shows that the number of live infants is directly linier to the birth weight. Related to the ability of NICU care in dr. Soetomo General Hospital, there was a positive trend for outcomes of live infants in the range groups of birth weight 1501-2000 grams. Gestational age is also one of important factor that determines the prognosis of LBW outcomes. Preterm infant is infant who born at gestational age less than 37 weeks (WHO, 2011; Cunningham, 2014). Organ immaturity is the most common cause of morbidity in preterm infants compared with term infants (Glass, 2015). Long-term problems that can be arise from premature infants include neurodevelopmental delay, failure to thrive, respiratory distress, and metabolic syndrome (WHO, 2011; Cunningham, 2014). Viability is the gestational age when the number of infants can survive >50% with or without medical care[15]. Limits of LBW care viability in developed countries are mentioned at 23-24 weeks gestational age (Glass, 2015), other literature mentions at 26 weeks Cunningham, 2014). From this study, LBW cases in dr. Soetomo General Hospital with gestational age <28 weeks who could survive was only 19%. As many as 47,45% LBW cases was born in the range of 29-34 weeks of gestational age. One of the reasons was because of high cases of severe preeclampsia in dr. Soetomo General Hospital which the policy for pregnancy termination is at the age of 34 weeks gestation.



Picture 3. LBW infant's outcome based on birth weight (gram) in dr. Soetomo General Hospital at January 2014 – December 2017

Conclusion

The highest number of infants in dr. Soetomo General Hospital was born in the group range of 29-34 weeks of gestational age. The most common cause of LBW cases in dr. Soetomo General Hospital was hypertension in pregnancy. A positive trend of survival in infants with birth weight range of 1501-2000 gram was found in dr. Soetomo General Hospital.

References

Cunningham FG. Hypertensive Disorders. In Cunningham FG. Williams Obstetrics. Texas: Mc Graw-Hill. 2014. p. 1508.

Cunningham FG. Preterm labor. In Cunningham FG. Williams Obstetrics. Texas: Mc Graw-Hill. 2014. p. 17268

Gandhi MK., Chaudhari UR., Thakor N. A study on incidence of congenital anomalies in new borns and their association with fetal factors: a prospective study. International Journal of Research in Medical Sciences. 2016;1200-1203.

Gebremedhin M., & Ambaw F. Maternal associated factors of low birth weight: a hospital based cross-sectional mixed study in Tigray, Northern Ethiopia. BMC Pregnancy and Childbirth. 2015; 15: 222.

Glass HC., Costarino AT., Stayer SA. Outcomes for Extremely Premature Infants. Anesth Analg. 2015; 1337-1351

Kumar BS., Sarmila K., Prasad KS. Prediction of Preeclampsia by Midtrimester Uterine Artery Doppler Velocimetry in High-Risk and Low-Risk Women. The Journal of Obstetrics and Gynecology of India. 2012. 297-300.

Lawn JE, Gravett MG, Nunes TM, Rubens CE, Stanton C, Group tGR. Global report on preterm birth and stillbirth (1 of 7): definitions, description of the burden and opportunities to improve data. BMC Pregnancy and Childbirth. 2010;10(1): S1.Kementerian Kesehatan RI. Profil Kesehatan Indonesia 2014. Jakarta, Indonesia. 2014.

Phalen, A. G., & Kirkby, S. (2012). The 5-minute APGAR score. Journal of Perinatal Neonatal Nursing, 166-171.

Pramono MS., & Paramita A. Pola Kejadian Dan Determinan Bayi Dengan Berat Badan Lahir Rendah (BBLR) Di Indonesia Tahun 2013. Buletin Penelitian Sistem Kesehatan. 2004, 1-10.

Ribeiro, A. M., & Guimaraes, M. J. (2009). Risk factors for neonatal mortality among children with low birth weight. Rev Saude publica, 43.

Roman A. Hypertensive disorders. In V. Berghella, Maternal-Fetal Evidence Based Guiedelines. New York: CRC Press. 2017. p. 1.

Sibai BM. Chronic Hypertension. In J. T. Queenan, Protocols for High-Risk Preganncies. Chichester, UK: Wiley Blackwell. 2015. p 203

World Health Organization. Guidelines on: Optimal Feeding of Low Birth-Weight infants in Low-and Middle-Income Countries. WHO Press. 2011.