Parity and risk of low birth weight infant in full term pregnancy

Lelly Andayasari, Cicih Opitasari

National Institute of Health Research and Development, Ministry of Health, Republic of Indonesia, Jakarta

Corresponding address: Lelly Andayasari
E-mail: andayasari@gmail.com

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Abstract

Background: Low birth weight infants tend to increase the occurrence of early infant mortality and morbidity. The survey in Indonesia suggested that the prevalence of low birth weight declined from 11.1% in 2010 to 10.2% in 2013. This study aims to identify the risk factors of low birth weight infant in full term pregnancy.

Methods: This was a cross-sectional study using secondary data from two hospitals in Jakarta. The data was obtained from medical records of pregnant women who gave birth during the period of January 1 to December 31, 2011. Multivariate logistic regression model with stepwise method was used to analyze the risks of low birth weight.

Results: The sample size in this study was 4191 subjects. Out of them 2242 subjects met the inclusion criteria. The proportion of low birth weight was 9.5%. Compared with primipara, nullipara had 46% increased risk to have LBW infant (ORa = 1.46; P=0.030), meanwhile primipara and nullipara did not have significant difference for having LBW infants (ORa = 0.90; P=0.614). In term of sex of infants, female infant had 42% higher risk of having LBW infant compared with male infant (ORa = 1.42; P=0.017).

Conclusion: Low birth weight infants in full term pregnancies are more common in nullipara and most of the LBW infants are female. (Health Science Journal of Indonesia 2016;7:13-6)

Keyword: parity, sex of infant, low birth weight infants.
Low birth weight infants tend to increase the occurrence of early infant mortality and morbidity.\textsuperscript{1,2} The low birth weight infants contribute not only health problems but also learning disability and behavioral problems than normal birth weight infants.\textsuperscript{3} The incidence of ischemic heart disease and metabolic syndrome was found higher in adulthood who was born with low weight at birth.\textsuperscript{4}

Low birth weight was estimated 15\% to 20\% of all births in the world or more than 20 million births a year had low weight.\textsuperscript{5} The survey in Indonesia suggested that the prevalence of low birth weight declined from 11.1\% in 2010 to 10.2\% in 2013. There was considerable variation in prevalence of low birth weight across regions from the lowest at 7.2\% in North Sumatera to the highest at 16.9\% in Central Sulawesi.\textsuperscript{6}

Various factors have been known as predictors of low birth weight such as maternal age, history of low birth weight infants, prematurity, hypertension, family history of low birth weight, birth order, health status of mother, maternal anemia, history of antenatal care, socio-economic status, maternal education.\textsuperscript{7,8,9} This study aims to identify the risk factors of low birth weight infants in two hospitals in Jakarta.

\textbf{METHODS}

This was a cross-sectional study using secondary data from two hospitals in Jakarta. The data was obtained from medical records of pregnant women who gave birth during the period of January 1 to December 31, 2011. Pregnant women who gave birth less than 37 weeks of gestation and had incomplete data were excluded. The data that were collected including mother’s age, mother’s education level, mother’s occupations, funding source, antenatal care (ANC), gravidity, parity, (pre-) eclampsia, sex and birth weight of infants.

Low birth weight (LBW) was defined as weight at birth less than 2500g while those with birth weight of 2500g and above were defined as normal weight.\textsuperscript{10}

Mother’s age was divided into three groups: 16-20, 21-35, 36-46 (years). Education level was categorized into three groups: low (uneducated until complete primary school), middle (complete junior high school) and high (complete senior high school or more). Mother’s occupations were divided into 5 categories (military/police/civil servants/state, unemployed/housewife, private employees, entrepreneurs/traders, and laborer). Funding sources was grouped into five categories: civil servants insurance (provided by Askes), company (Jamsostek or other company insurances), private insurance, out of pocket, and social insurance (Jamkesmas, Jamkesda, or Jampersal). ANC was divided into three categories: 4 visits or more, less than 4 visits and no antenatal care. Parity was classified into primipara (first pregnancy), nulligravida (has been pregnant two to four times), grand multiparous (has been pregnant five times or more). Parity was classified into nullipara/nulliparous woman (a woman who has not given birth previously/ never completed a pregnancy beyond 20 weeks’ gestation), primipara/primiparous woman (a woman who has given birth once) and multipara/multiparous woman (a woman who has given birth more than once).\textsuperscript{11} Sex of infant was divided into male and female infant.

The data was tabulated according to various factors included in this study. Multivariate logistic regression analysis with stepwise method was done by using STATA version 9. Ethical approval was obtained from National Institute for Health Research and Development Ethics Committee, Ministry of Health, Republic of Indonesia.

\textbf{RESULTS}

The sample size in this study was 4191 subjects. Out of them 2242 subjects met the inclusion criteria.

Table 1 shows that the proportion of low birth weight was 9.5\% (212/2242). Those who had LBW infants and did not have LBW infants were similarly distributed in respect with mother’s age, privat employees, mothers with privat insurance, and grand multigravida. However, compared to the respective reference group, the risk of having LBW infants were more likely higher for those with lower education, unemployed/housewife, entrepreneur/traders, laborer, those with company insurance, out of pocket, social insurance, also for those who never attended antenatal care and those with (pre-) eclampsia.

\textbf{DISCUSSION}

The limitations of this study were use secondary data which provide only certain data and only well recorded data can be used for analysis. This study also was conducted in two hospitals, the results did not represent general population.
Table 1. Socio demographic, clinical characteristics and risk of low birth weight

| Variable                        | Low birth weight | Crude odds ratio | 95% Confidence interval | P     |
|---------------------------------|------------------|------------------|--------------------------|-------|
|                                 | No (n=2030) | %   | Yes (n=212) | %   |                   |       |
| Mother’s age                    |                 |                 |                          |       |
| 21-35                           | 1585 78.1       | 162 76.4        | 1.00 Reference           |       |
| 16-20                           | 92 4.5          | 12 5.7          | 1.28 0.68-2.38           | 0.443 |
| 36-46                           | 353 17.4        | 38 17.9         | 1.05 0.73-1.53           | 0.784 |
| Mother’s education              |                 |                 |                          |       |
| High                            | 574 28.3        | 39 18.4         | 1.00 Reference           |       |
| Middle                          | 978 48.2        | 97 45.8         | 1.46 0.99-2.15           | 0.055 |
| Low                             | 478 23.5        | 76 35.8         | 2.34 1.56-3.51           | 0.000 |
| Mother’s occupation             |                 |                 |                          |       |
| Military/police/civil servants/state | 110 5.4 | 6 2.8 | 1.00 Reference |       |
| Unemployed/housewife            | 1402 69.2       | 160 75.5        | 2.09 0.91-4.84           | 0.084 |
| Privat employees                | 419 20.7        | 33 15.6         | 1.44 0.59-3.53           | 0.421 |
| Entrepreneur/traders             | 65 3.2          | 8 3.8           | 3.16 0.75-6.79           | 0.148 |
| Laborer                         | 29 1.4          | 5 2.4           | 2.26 0.90-11.09          | 0.072 |
| Funding source                  |                 |                 |                          |       |
| Civil servant insurance         | 175 8.6         | 7 3.3           | 1.00 Reference           |       |
| Privat insurance                | 50 2.5          | 4 1.9           | 2.00 0.56-7.11           | 0.284 |
| Company insurance               | 89 4.4          | 10 4.7          | 2.81 1.03-7.63           | 0.043 |
| Out of pocket                   | 1090 53.7       | 104 49.1        | 2.39 1.09-5.21           | 0.029 |
| Social insurance                | 626 30.8        | 87 41.0         | 3.47 1.58-7.64           | 0.002 |
| Antenatal care                  |                 |                 |                          |       |
| 4 visits or more                | 1754 86.4       | 178 84.0        | 1.00 Reference           |       |
| Less than 4 visits              | 99 4.9          | 10 4.7          | 0.99 0.51-1.94           | 0.989 |
| No antenatal care               | 177 8.7         | 24 11.3         | 1.34 0.85-2.10           | 0.210 |
| Gravidity                       |                 |                 |                          |       |
| primigravida                    | 719 35.4        | 93 43.9         | 1.00 Reference           |       |
| multigravida                    | 1202 59.2       | 106 50.0        | 0.68 0.51-0.91           | 0.011 |
| grandmultigravida               | 109 5.4         | 13 6.1          | 0.92 0.50-1.70           | 0.796 |
| (Pre-)eclampsia                 |                 |                 |                          |       |
| No                              | 1953 96.2       | 187 88.2        | 1.00 Reference           |       |
| Yes                             | 77 3.8          | 25 11.8         | 3.39 2.11-5.46           | 0.000 |

Table 2. Relationship between parity, sex of infant and risk of low birth weight

| Variable                  | Low birth weight | Adjusted odds ratio | 95% Confidence interval | P     |
|---------------------------|------------------|---------------------|-------------------------|-------|
|                           | No (n=2030) | %   | Yes (n=212) | %   |                   |       |
| Parity                    |             |                 |                          |       |
| Primipara                 | 717 35.3    | 63 29.7         | 1.00 Reference           |       |
| Nullipara                 | 791 39.0    | 101 47.6        | 1.46 1.04-2.04           | 0.030 |
| Multipara                 | 522 25.7    | 48 22.6         | 0.90 0.61-1.34           | 0.614 |
| Sex of infant             |             |                 |                          |       |
| Male                      | 1079 53.2   | 95 44.8         | 1.00 Reference           |       |
| Female                    | 951 46.8    | 117 55.2        | 1.42 1.06-1.90           | 0.017 |

*Adjusted each other between variables listed on this table, mother’s education, funding source, and (pre-) eclampsia. The final model demonstrates that compared with primipara, nullipara had 46% increased risk to have LBW infant, meanwhile primipara and multipara did not have significant difference for having LBW infants. In term of sex of infant, female infant had 42% higher risk of having LBW compared with male infant.
This study demonstrated that nulliparous women increased risk of LBW 46% (1.46 times) higher compared to primiparous women. This finding was slightly lower than study done by Stutz in Thailand who stated nulliparous women had 1.95 times greater risk of having LBW. Similarly, a systematic review study done by Shah PS reported that nulliparous women were 1.41 times higher risk for LBW. Sae-tia P in Thai reported that nulliparous were at higher risk 1.7 times for LBW. Nulliparity was related with an increased risk of hypertensive disorders in pregnancy, which in turn was strongly associated to LBW. In this study, nulliparous woman were significantly related with LBW infants may be due to the occurrence of (pre-) eclampsia was more frequent in nulliparous woman.

This study also suggested that female infant had 42% higher risk of having LBW compared to male infant. This result was consistent with other studies. Paneru et al in India found that female infant carried 1.33 times higher risk for LBW than the male infant. Pramono et al also revealed female infant was 1.4 times greater risk for LBW compared to the male. Male infant was strongly associated with higher birth weight, this was apparently due to androgen action which plays a major role in body composition.

In conclusion, low birth weight infants in full term pregnancies are more common in nullipara and most of the infants are female.

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