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ORIGINAL ARTICLE

Correlation Between Early Age Pregnancy with Low Body Weight (LBW) Newborn at Universitas Airlangga Academic Hospital, Surabaya, Indonesia

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ABSTRACT

Introduction: Birth weight is often used to evaluate a newborn baby's health. Low birth weight (LBW) is one of the leading causes of neonatal mortality. Mothers under the age of 20 (early pregnancy) are at a greater risk of affecting the weight and nutritional status of the unborn child. This research aimed to determine the relationship between early pregnancy and LBW.
Methods: This was a cross-sectional study of women and newborns at Airlangga University academic hospital from January through December of 2017. Data on characteristics such as maternal age and LBW were collected. The correlation between early pregnancy and infant weight was determined using the Chi-square test, with a significance level of $p<0.05$.
Results: We conducted research on 210 pairs of mothers and their infants. 64 (30.48%) of the pregnancies occurred in women under the age of 20; 61 (29.55%) were born LBW (weighing less than 2,500 grams). Early age pregnancy was linked to a higher proportion of LBW infants ($p=0.001$). Research indicated that the risk of LBW was more significant in the early groups of pregnancy.
Conclusion: This research establishes a relationship between early age pregnancy and LBW. The findings may aid in identifying vulnerable mothers in need of further assistance and personalized treatments.

Introduction

Birth weight is often used to assess newborn health. Low birth weight (LBW) in newborns is the leading cause of infant mortality. When a newborn weighs less than 2.5 kg, which often happens in preterm births or before to entering gestational age, the newborn is considered LBW.[1] This may occur for various reasons, one of which is the mother's age and nutritional status when pregnant. A proportion of moms under the age of 20 are experiencing a risky pregnancy, which will have an influence on the baby's weight and nutritional status following birth.[2]

LBW is more prevalent among babies born to young mothers under the age of 20. Teenagers are more likely than not to deliver LBW newborns.[3,4] This is because they have not attained maturity and hence lack an effective placental transfer mechanism comparable to that of adult females 5. In addition, the reproductive organs of people in their 20s and younger are not in the best shape for having a baby.[6] However, as women aging, their bodies and health decline, potentially affecting the intrauterine fetus and resulting in LBW in the newborn. LBW is often diagnosed in women between the ages of 20 and 30.[7–9]

Newborn babies with LBW often face a negative long-term life process. If they do not die after delivery, LBW newborns have a higher chance of growing and developing more slowly than normal-weight newborns.[10,11] Along with developmental disabilities, those with a history of LBW have an increased chance of developing hypertension, heart disease, and diabetes beyond the age of 40.[10]

The factors that contribute to LBW in newborns are projected to be highly connected to the mother's age. The prevalence of early marriage and babies born with LBW

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is high around the world, including in Indonesia. The purpose of this research is to determine the relationship between LBW and maternal age in a single-center study in Surabaya.

Methods

A cross-sectional study was conducted from January to December 2017 at the academic hospital of Universitas Airlangga Surabaya, through a birth cohort of hospital deliveries of newborns. The WHO defines adolescent mother as women under the age of 20 who are more likely to have LBW babies, as well as preterm deliveries and severe neonatal disorders.[2] The research data was collected from medical records of LBW patients at the Department of Obstetrics and Gynecology, Universitas Airlangga Hospital Surabaya. The study population were all normal pregnancies and deliveries, which were divided into 2 groups, namely the group of severe infant cases born <2500 g, which occurred at the Department of Obstetrics and Gynecology, Universitas Airlangga Hospital Surabaya. The total sampling approach was employed.

The study sample consisted of 37-week-old normal pregnancy patients divided into two groups in January 2017 and 2018. Some patients with normal births a 37 weeks and giving birth with a normal delivery, met the inclusion criteria. The criteria for exclusion were patients who had eclampsia, hypertension, diabetes mellitus, postdate, abortion, amelioration, amnion, anemia cases, and pregnant women > 35 years old. The variables in this study were differentiated into 2 groups, independent and dependent variables, as follows: independent variables: age (early age pregnancy and non-early age pregnancy), history of previous pregnancy (primigravida and multigravida). The dependent variable is the baby's weight (LBW and non-LBW). The chi-square test was used to see if early-age pregnancy influenced newborn weight, with $p<0.05$ considered statistically significant using SPSS version 17.0 (SPSS Inc., Chicago, IL, USA). The ethical committee of Universitas Airlangga Hospital approved this study with ethical number: 172/KEH/2018.

Results

There was 210 participants included in the study, with all subjects having a normal delivery over the study period. Most responses showed that they had become pregnant later (Table 1). The non-early age pregnancy group was nine years older age than the early age pregnancy (15.77±1.34 vs. 24.42±1.99). Primigravida was becoming the majority in early-age pregnancy (27.6%) and the non-early-age pregnancy group (44.3%). The incidence of LBW was more frequent in early age pregnancy group (21.43% vs. 7.62%).

There was a significant correlation between early age pregnancy group and the incidence of LBW (p=0.001; Table 2). The earlier the mother ages at giving birth, the higher the tendency of babies born to experience LBW. This study also had a relatively high prevalence ratio (PR=19.243), which showed that the early pregnancy group was at risk of 19.243 times higher in incidence of LBW than the group with pregnancy at an early age (Table 2).

Table 1. Distribution of characteristics of respondents based on maternal age at Airlangga University Hospital Surabaya period January 2017-December 2017

Characteristics	Early age pregnancy	Non-early age pregnancy
Age (mean ± SD) year	64 (30.48%)	146 (69.52%)
	15.77±1.34	24.42±1.99
Newborn birth-weight (mean ± SD) gram	2400.94±418.36	2923.29±372.84
Pregnancy		
Primigravida	58 (27.60%)	93 (44.30%)
Multigravida	6 (2.90%)	53 (25.20%)
Birth weight		
LBW (%)	45 (21.43%)	16 (7.62%)
Non-LBW (%)	19 (9.05%)	130 (61.90%)

Table 2. Relationship between maternal age and birth weight at Universitas Airlangga Hospital

	P value	PR	CI
Maternal age - LBW	0.0001	19.243	9,122-40,594

PR = prevalence ratio

Discussion

The findings of this research reveal a significant association between early pregnancy (under the age of 20 years) and low birth weight (LBW) incidence. According to the newest Surabaya study, 30.48 % were categorized early age pregnancy, which is much higher than the rates in developed countries (1.8%-2.1%).12–14 Mothers aged 14-19 years did not have fully developed reproductive organs. Nutritional demands were also not fulfilled optimally due to the competition for nourishment between the mother and the developing baby, which might affect fetal growth and development in the form of LBW.[14,15] The WHO recommended that women between the ages of 20 and 35 years old experience pregnancy and delivery. In 2010, Indonesia had a female mean marriage age of fewer than 25 years (22.17-year-old on average), which increased from 19.28-year-old in 1971.[15] In Indonesia, despite their physical and mental immaturity, child marriage is mainly controlled by social and economic aspects inside and around the girls.[15]

Early pregnancy between the ages of 14- and 19-years effect on pregnancy and childbirth problems.[17] Early-age pregnancy also increased the chance of LBW incidence by 4.1 times compared to pregnant women over 20 years. In general, children born to young mothers with LBW had congenital anomalies and physical problems, including epilepsy, mental retardation, blindness, and deafness.[18] Furthermore, even if the infant survives, he or she may be impaired, causing significant issues and experiencing delayed development.[19]

Parity is the number of children born alive and born dead by a mother. When a woman becomes pregnant for the first time and her parity exceeds four, she is at risk of giving birth to LBW. Since the mother's uterus has not healed, if she becomes pregnant again, the second pregnancy may be affected.[8] Because the causes of LBW

are often complex, it was sometimes difficult to establish a preventative intervention. Premature deliv[14] was the most prevalent cause of LBW newborns, and the younger the gestational age, the greater the risk of short- and long-term complications.[20–22] Generally, maternal variables such as pregnancy disease, maternal age, labor distance, gestational age, parity, environmental factors, fetal factors, and placental factors are connected with LBW.[8,9] However, the precise mechanism behind premature pregnancy and LBW remains un[13]own.

A systematic review and meta-analysis discovered that adolescent pregnancy is associated with low socioeconomic status, but that after controlling for high socioeconomic status (SES), adolescents were not at increased risk for LBW.[8,23] This finding implies that SES had a significant influence on LBW.[24] Low SES is a complicated issue that necessitates the implementation of government legislation.[25] We recommend that the government provide access to high-quality prenatal care for teenage mothers from poor socioeconomic backgrounds to lower the frequency of LBW births.

The research has a limitation in that variable such as calorie consumption, weight gain during pregnancy, and the high socioeconomic level was not included since they may be associated with LBW. Additionally, the outcomes of this research were not compared to those of adolescents who did not receive antenatal or prenatal care or those of any external comparator. We obtained data primarily from single-center academic hospital, and hence cannot generalize to other hospitals.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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