

DOI: <http://dx.doi.org/10.33846/hn41107>
<http://heanoti.com/index.php/hn>



RESEARCH ARTICLE

URL of this article: <http://heanoti.com/index.php/hn/article/view/hn41107>

The Hemoglobin Levels in Third Trimester Pregnant Women and Body Weight of Newborn

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ABSTRACT

Hemoglobin level is a biochemical indicator that can be used to determine the nutritional status of pregnant women. The World Health Organization (WHO) recommends that the ideal hemoglobin level for pregnant women is >11 g/dl and is not less than 10.5 g/dl in the third trimester of the pregnancy. High and low levels of hemoglobin during pregnancy affect the weight of the baby because it can disrupt fetal growth in the womb. In Indonesia, MMR is still high, amounting to 305 / 100,000 lives birth. In 2017, from 34 provinces in Indonesia, North Sumatra, including 6 provinces with high MMR. In 2017 MMR in North Sumatra amounted to 58.18 / 100,000 lives birth, while in 2018 MMR increased by 62.18 / 100,000 lives birth. Reports from various research study centers showed that the majority of maternal mortality occurs in high-risk groups. The prevalence of anemia in pregnant women in North Sumatra was 70%. This study aims to determine the relationship between hemoglobin levels of pregnant women in the third trimester with birth weight through literature reviews and articles published in indexed national. This study reviewed 18 articles. Of the 18 articles, 12 of them had the same goal, discussing the relationship between hemoglobin levels of pregnant women in the third trimester of newborn body weight, while 6 other journals discussed different matters.

Keywords: hemoglobin levels; pregnant women; baby weight

INTRODUCTION

Background

Indonesia is one of the developing countries with the highest maternal mortality rate (MMR) and infant (IMR). The number of infant mortality cases in 2015 was 33,278 cases, decreased compared to 2015, namely 32,007 cases and in 2017 10,294 cases. One of the causes of infant mortality in Indonesia is the incidence of low birth weight (LBW) ⁽¹⁾.

Measurement of maternal hemoglobin (Hb) levels is a simple test that can be performed to assess the nutritional status of pregnant women. Maternal hemoglobin (Hb) levels will be in line with the mother's nutritional intake during pregnancy. Mothers with low nutritional status will usually show low hemoglobin levels as well ⁽²⁾.

Hemoglobin level is a biochemical indicator to determine the nutritional status of pregnant women. The World Health Organization (WHO) recommends that the ideal hemoglobin level for pregnant women is ≥ 11 g/dl and not below 10.5 g/dl in the second trimester of pregnancy. The high and low levels of hemoglobin during pregnancy affect the weight of the baby because it can disrupt fetal growth in the womb.

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Anemia in pregnant women increases the risk of getting a Low Birth Weight Baby (LBW), the risk of bleeding before and during delivery, and can even cause the death of the pregnant woman to suffer from severe anemia. LBW are babies who have a birth weight of fewer than 2,500 grams who are weighed at birth until the first 24 hours after birth. LBW has a high risk of morbidity and mortality ⁽³⁾.

Birth weight as an indicator of newborn health. Normal birth weight (37-42 weeks' gestation) is 2,500-4,000 grams. Normal birth weight is a very important thing because it will determine the baby's ability to be able to adapt to the new living environment so that the baby's growth and development will take place normally ⁽²⁾.

Lack of Hb levels is one of the health problems that is often experienced by pregnant women. Based on the results of Basic Health Research¹³, the prevalence of anemia in pregnant women in Indonesia is 37.1%. Hb levels are used as a parameter to determine anemia status, and low Hb levels indicate that pregnant women have anemia ⁽⁴⁾.

Anemia in pregnant women increases the risk of giving birth to Low Birth Weight Babies (LBW), the risk of postpartum hemorrhage, it can even cause the death of the mother and her baby if the pregnant woman is suffering from severe anemia. This situation can contribute to the incidence of maternal mortality and infant mortality ⁽⁵⁾.

The relationship between third trimester Hb levels and birth weight has been reported in several studies. Low and high Hb levels of pregnant women in the third trimester can cause the growth of the fetus to be delayed / small for pregnancy ⁽⁶⁾.

The growth of the fetus in the womb is the result of the interaction between the genetic potential of the father and mother and the intrauterine environment. Fetal growth is influenced by factors during pregnancy, namely serious illness, pregnancy complications, malnutrition, and stressful conditions in pregnant women ⁽⁷⁾.

Maternal mortality according to the definition of the World Health Organization (WHO) is death during pregnancy or within 42 days after the end of pregnancy, due to all causes related to or aggravated by the pregnancy or its treatment, but not caused by accident or injury. The World Health Organization (WHO) in 2012 reported that the prevalence of anemia in pregnant women in the world was around 41.8% on average.

Based on Basic Health Research (*Riskesdas*) in 2013, the prevalence of pregnant women with anemia in Indonesia was 37.1%. According to the National Health System (SKN) in 2012 the number of pregnant women with anemia in Indonesia was 40%. Pregnancy is part of a woman's life cycle or developmental challenges that must be faced by all family members, especially for expectant mothers, such as changes in body image, hormonal changes, and even discomfort in various physiological and psychological aspects ⁽⁸⁾.

In pregnant women, there is a decrease in Hb levels due to the addition of body fluids that are not proportional to the mass of red blood cells. This decrease occurred from 8 weeks of gestation to 32 weeks ⁽⁹⁾. Besides, pregnancy anemia can also be caused by reduced iron reserves for fetal needs.

Maternal hemoglobin levels greatly affect the weight of the baby to be born. Pregnant women with low Hb not only endanger the mother's life but also interfere with growth and endanger the fetus. This is due to a lack of supply of nutrients and oxygen to the placenta which will affect the function of the placenta in the fetus. This will increase the risk of getting a Low Birth Weight Baby (LBW), the risk of bleeding before and during delivery, and can even cause the death of the mother and baby, if the pregnant woman is suffering from severe anemia ⁽¹⁰⁾.

METHODS

This type of study was a literature review with a narrative design that tries to explore the results of domestic and foreign research related to the relationship between Hb levels in pregnant women.

A Literature review is a literature review that is often done by students when they are compiling a thesis, thesis, or dissertation. The literature review must be done when we are starting to understand a new research topic, follow new research trends, and understand the state-of-the-art of a research topic ⁽¹¹⁻¹⁶⁾.

The type of data used in this study were secondary data. Secondary data are data obtained not from direct observation. However, these data were obtained from the results of the research that had been conducted by previous researchers. The secondary data sources in question are in the form of books and primary or original scientific reports contained in articles or journals relating to the Relationship between Hemoglobin Levels in Trimester III Pregnant Mothers and Newborn Weight.

RESULTS

The data collection technique used in this research was the documentation study. The documentation study method was a method of data collection by searching or extracting data from the literature related to the

relationship between hemoglobin levels in pregnant women and newborn weight. The literature search was carried out through electronic data and others related to the relationship between hemoglobin levels in pregnant women and newborn weight.

This study reviewed 18 articles. Of the 18 articles, 12 of them had the same goal, discussing the relationship between hemoglobin levels of pregnant women in the third trimester of newborn body weight, while 6 other journals discussed different matters.

The selected literature criteria must meet the following criteria:

1. The maximum period for publishing a journal is 10 years (2015-2020).
2. The journal languages used are Indonesian and English.
3. Subjects were pregnant women.
4. The type of journal is original (not a research review).
5. The theme of the journal content used is the relationship between hemoglobin levels in pregnant women and newborn weight. Articles or journals that match the criteria and themes are then reviewed.

There are four procedures used in this study as follows:

1. Organize, namely organizing literature with existing problems. The stages are looking for ideas, general goals, and conclusions from the literature by reading abstracts, several introductory paragraphs and conclusions, and grouping the journals according to certain categories.
2. Synthesize, namely combining the results of the literature into a summary to find linkages between literature.
3. Identify, namely identifying controversial issues that are considered very important in the literature to be analyzed to obtain interesting writing to read.
4. Formulate, namely formulating questions that require further research.

Based on literature review, there is a relationship between hemoglobin levels in trimester III pregnant women and newborn weight.

DISCUSSION

Based on research conducted by Tri Wahyuni et al, 2017⁽²⁾ stated that hemoglobin levels can affect the weight of newborns. About 61.5% of mothers had normal hemoglobin levels, while mothers who had babies with normal weight were 53.8%.

Measurement of maternal hemoglobin (Hb) levels is a simple test that can be performed to assess the nutritional status of pregnant women. Maternal hemoglobin (Hb) levels will be in line with the mother's nutritional intake during pregnancy. Mothers with low nutritional status will usually show low hemoglobin levels as well.⁽²⁾

Anemia in pregnant women increases the risk of getting a Low Birth Weight Baby (LBW), the risk of bleeding before and during delivery, and can even cause the death of the pregnant woman to suffer from severe anemia. LBW are babies who have a birth weight of fewer than 2,500 grams who are weighed at birth until the first 24 hours after birth. LBW has a high risk of morbidity and mortality.⁽³⁾

Birth weight as an indicator of newborn health. Normal birth weight (37-42 weeks' gestation) is 2,500-4,000 grams. Normal birth weight is a very important thing because it will determine the baby's ability to be able to adapt to the new living environment so that the baby's growth and development will take place normally.⁽²⁾

Lack of Hb levels is one of the health problems that is often experienced by pregnant women. Based on the results of Basic Health Research⁽¹⁰⁾, the prevalence of anemia in pregnant women in Indonesia is 37.1%. Hb levels are used as a parameter to determine anemia status, and low Hb levels indicate that pregnant women have anemia.⁽⁴⁾

Anemia in pregnant women increases the risk of giving birth to Low Birth Weight Babies (LBW), the risk of postpartum hemorrhage, it can even cause the death of the mother and her baby if the pregnant woman is suffering from severe anemia. This situation can contribute to the incidence of maternal mortality and infant mortality.⁽⁵⁾

The relationship between third trimester Hb levels and birth weight has been reported in several studies. Low and high Hb levels of pregnant women in the third trimester can cause the growth of the fetus to be delayed / small for pregnancy.⁽⁶⁾

The growth of the fetus in the womb is the result of the interaction between the genetic potential of the father and mother and the intrauterine environment. Fetal growth is influenced by factors during pregnancy, namely serious illness, pregnancy complications, malnutrition, and stressful conditions in pregnant women.⁽⁷⁾

Maternal mortality according to the definition of the World Health Organization (WHO) is death during pregnancy or within 42 days after the end of pregnancy, due to all causes related to or aggravated by the pregnancy or its treatment, but not caused by accident or injury. The World Health Organization (WHO) in 2012 reported that the prevalence of anemia in pregnant women in the world was around 41.8% on average. Based on Basic Health Research in 2013, the prevalence of pregnant women with anemia in Indonesia was 37.1%.

According to the National Health System (SKN) in 2012, the number of pregnant women with anemia in Indonesia was 40%.⁽¹⁰⁾

Pregnancy is part of a woman's life cycle or developmental challenges that must be faced by all family members, especially for expectant mothers, such as changes in body image, hormonal changes, and even discomfort in various physiological and psychological aspects⁽⁸⁾.

CONCLUSION

Based on the results of kinds of literature that have been reviewed, it can be concluded that there is a correlation between hemoglobin levels in trimester III pregnant women and the bodyweight of newborns.

1. To health service facilities

It is recommended that midwives or other health workers continue to carry out Hb checks during the first pregnancy checks and to continue to monitor the mother's weight gain during pregnancy.

2. Dear pregnant women

It is advisable to keep their pregnancy checked at the health facility or clinic closest to the home environment, and to get early detection of the health of themselves and their children, and to increase creativity in feeding their children.

3. For further researchers

It is hoped that the next researchers can conduct other studies related to the influence of the relationship between hemoglobin levels in third-trimester pregnant women on newborns.

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