

The Influence of Consuming Iron Tablet Toward Hemoglobin Levels on Pregnant Woman in Trisemester III

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Abstract

Hemoglobin is a protein molecule in erythrocyte that has function as oxygen transport media from lungs to all of the body tissues and carries carbon dioxide from body tissues to the lungs. However, it depends on the consumption of iron supplementation, bone marrow problems, chronic bleeding, and malnutrition. Consuming iron tablets regularly is very important, particularly for pregnant women in order to prevent anemia. Moreover, this study aimed at determining the correlation between the consumption of iron tablets and hemoglobin on third trimester of pregnant women in DKT hospital, Sidoarjo, East Java-Indonesia. The research was a correlational research that was conducted in March by utilizing quota sampling technique to the third trimester of pregnant women and the respondents were 48 pregnant women. This research utilized Spearman Rho test and it obtained a value of 0.010 ρ which was less than $\alpha = 0.05$. Therefore, there was a correlation between the consumption of iron tablets and hemoglobin. The conclusion of this research was the consumption of iron tablets correlated with hemoglobin. In addition, it was much better for pregnant woman, who did not want her hemoglobin getting low and wanted to stay in health, to consume iron tablets regularly every day, at least 90 tablets during pregnancy

Keywords: Consumption of iron tablet, hemoglobin, pregnant woman

I. INTRODUCTION

Anemia in pregnancy was a pregnant women's condition with hemoglobin levels below 11 g% in trimester II and III or hemoglobin levels below 10.5 g% in trimester I (Rofiqahmad, 2011). Basically, anemia in pregnant women was a phenomenon that needed immediate attention, because this situation could cause bad influence either for their pregnancy or for their fetus. For pregnancy, anemia could cause abortion, premature birth, antepartum bleeding, and premature rupture of fetus membranes. Meanwhile, for fetus, anemia would cause the disturbance of fetus's growth and development, intrauterine death, and the baby would suffer infection easily (IBG, Manuaba, 2008, 32-31). Hemoglobin (Hb) was protein in erythrocytes that had a function as oxygen transportation media from lungs to all body tissues and carried carbon dioxide from body tissues to lungs. The factors that affected hemoglobin levels in blood were bleeding, lack of iron intake, bone marrow problems, and malnutrition (Bloktdokter, 2009). Low levels of hemoglobin was known as anemia. Iron supplement or iron tablets administration was one effort in preventing and combating the decrease of hemoglobin or anemia (Pusdiknakes, 2009). Iron had a function to form erythrocytes, while erythrocytes had a function to carry oxygen and nutrients throughout the body to produce energy. If iron intake reduced, protein in human resources had function as oxygen transportation which was known as hemoglobin. If hemoglobin reduced, the body would lack of oxygen and consequently, the person would suffer anemia symptom (Yasir, 2009). Compliance in consuming iron tablets for pregnant women could be measured by the accuracy of consuming the tablets, frequency of consumption per day, iron tablets types, and how to consume (Pusdiknakes, 2009). Based on the survey at DKT hospital-Sidoarjo, it was found that the numbers of pregnant women in 2013 were 637 people and in 2014 were 665 people. Anemia was not a major problem for pregnant women but it should soon be overcome in order to avoid prolonged problem. Initial survey in DKT hospital-Sidoarjo on 11st January 2014, it was found that 50% or 5 out of 10 third trimester pregnant women had hemoglobin levels that was less than 11 g%, 3 of them did not regularly consume the iron tablets, and 2 of them regularly consumed iron tablets. Therefore, the researcher was interested to investigate about the influence of consuming iron tablets toward hemoglobin levels on the third trimester of pregnant women in DKT hospital-Sidoarjo.

II. METHODS

This analytic survey research approach was cross sectional to analyze the effect of iron consumption on hemoglobin levels. The research was conducted in DKT hospital-Sidoarjo on March 2014. The population was all of the third trimester of pregnant women in DKT hospital- Sidoarjo, Indonesia; with population was 55 people. The sample size was 48 people who were selected by using *quota sampling technique*. Data were analyzed by using *Spearman Rho* with a reliance level of 95%. If the correlation coefficient of *Spearman Rho* was greater than the degree of error that had been adjusted by the number of n, hence, the results which were obtained that the correlation between the consumption of iron tablets and hemoglobin levels. For the calculation, researcher utilized

computerization techniques.

III. RESULTS

Tabel 1. Distribution of Consuming iron tablets by pregnant women in DKT hospital-Sidoarjo

Consumption	Frequency	Percentage
Reguler	17	35
Irreguler	31	65
Total	48	100%

Based on Table 1, among 48 pregnant women in trimester III of DKT hospital-Sidoarjo, almost half of them consumed iron tablets regularly who were 17 pregnant women (35%), and most of them did not regularly consume iron tablets who were 31 pregnant women (65 %). Besides, it was found that most of pregnant women did not regularly consume the iron tablets.

Tabel 2. Distribution of Hemoglobin levels on trimester III of pregnant women in DKT hospital- Sidoarjo

Hemoglobin levels	Frequency	Percentage
Normal (11-14 gr/dL)	22	46
Low (<11 gr/dL)	26	54
Total	48	100%

Based on Table 2, among 48 third trimester of pregnant women in DKT hospital-Sidoarjo, it was found that nearly half of them had normal hemoglobin levels which were 22 pregnant women (46%), and most of them had low hemoglobin levels which were 26 pregnant women (54%). It was found that most of the third trimester of pregnant women had low levels of hemoglobin (anemia).

Tabel 3. Correlation between iron tablets consumption and hemoglobin levels on third trimester of pregnant women in DKT hospital- Sidoarjo

		Hemoglobin levels		Total
		Normal	Low	
Consumption	Reguler	12(70,59%)	5(29,41%)	17(100%)
	Irreguler	10 (32,26%)	21 (67,74%)	31(100%)
Total		22 (45%)	26 (55%)	48(100%)

Table 3 showed that the group of the third trimester of pregnant women who regularly consumed iron tablets, had normal hemoglobin levels (70.59%); meanwhile, the group of pregnant women who did not regularly consume iron tablets was only in small percentage (32.26%) who had normal hemoglobin levels. Based on Spearman Rho Test results, it showed that $\rho = 0.010 (<0.05)$. It was concluded that there was a correlation between iron tablets consumption and hemoglobin levels on the third trimester of pregnant women in DKT hospital-Sidoarjo, with a coefficient correlation of 0.368 (correlation in low levels).

IV. DISCUSSION

A. Iron Tablet Consumption

During pregnancy, iron was needed by the body more than woman who was not pregnant. Iron tablet was needed by pregnant women in order to replace iron loss through sweat, nails, urine and hair, and also to form as much as erythrocytes for mother, fetus and placenta. The iron requirement for each trimester was different. In the first trimester, the need for iron instead in period which was before pregnancy because pregnant women did not menstruate and the fetus had not needed much iron. In second and third trimester, pregnant women needed iron in large amounts that could not be obtained only from the food. Therefore, pregnant women should receive iron supplements in iron tablets, even though the food that was consumed had already had a lot of iron.

Iron had a function to form erythrocytes, while erythrocytes had a function to carry oxygen and nutrients throughout body and to assist metabolism to produce energy. If the intake of iron into body decreased, erythrocytes would also be reduced, thus, the body would lack of oxygen that caused symptoms of anemia. Pregnant women needed more iron as much as in 580-1340 mg and 440-1050 mg. This was in order to fill the needs of fetus's growth and development. If the increase of need was not balanced by adequate intake, there was an imbalance or deficiency of iron (Yasir, 2009).

The research showed that most of the third trimester of pregnant women did not regularly consume iron tablets. This might be caused by the education level of pregnant women which were almost entirely (77%) below the senior high school, and almost half of pregnant women (48%) were afraid of the effect in consuming iron tablets. Possibility, pregnant women did not understand the importance in consuming iron tablets, especially in the third trimester of pregnancy and fear of the effects, however, it was also because of their work that most of them (63%) worked or earned money, so they gave less attention to their pregnancy which could cause the irregularity in consuming iron tablets. Moreover, it was advised for pregnant women, who did not regularly consume iron tablets, should consume iron tablets regularly for one tablet in a day.

B. Hemoglobin levels

During pregnancy, erythrocyte would increase until the third trimester. Increasing erythrocyte cells was caused by an increase of oxygen needs for fetus. Thus, the greater the fetus or the older the age of the pregnancy, the increase the oxygen needs. Therefore, hemoglobin levels must be normal because hemoglobin had function to bind oxygen throughout body's tissues and fetus whose needs also increased more. Because of the increase of oxygen needs, hemoglobin levels should not be low.

It was known that the function of hemoglobin was to bind and carry oxygen from lungs to all body tissues, bind and bring CO₂ of all body tissues to lungs, give red color to the blood, maintain acid-base balance of body (Soewoto, Hafiz, et al, 2001). Due to low hemoglobin levels on pregnancy, it would be occurred abortion, antepartum bleeding, anemia, preeclampsia, etc. Hemoglobin levels in each trimester pregnancy was different; in the first trimester, normal hemoglobin levels was > 10.5 g / dL, and the second and third trimester were same > 11 g / dL (Saifuddin, 2002).

It could be concluded that most of the third trimester of pregnant women had low hemoglobin levels who were 26 pregnant women (54%). This was caused by lack understanding regarding the consequence of low hemoglobin levels and less regularity to check their hemoglobin levels so that they did not know and understand its own hemoglobin and they also assumed that it was not important. However, checking-up during pregnancy was very important for pregnant women in order to know how the development of their own conditions and their fetus.

It was suggested that pregnant women especially in the third trimester to regularly check their pregnancy to healthcare, especially to check their hemoglobin levels in order to know their hemoglobin levels so they could keep hemoglobin levels in normal position and if the hemoglobin was low, pregnant women were expected to increase the hemoglobin and to consume foods that could increase hemoglobin, or to consume high iron food, such as spinach, cabbage, beans, etc.

C. The Correlation between Iron Tablets Consumption and Hemoglobin levels on the Third Trimester of Pregnant Women

Groups of pregnant women who regularly consumed iron tablets mostly had normal hemoglobin, meanwhile, a group of pregnant women who did not regularly consume iron tablets mostly had abnormal hemoglobin. The result of hypothesis test indicated that there was a correlation between iron tablets consumption and hemoglobin levels.

Consuming iron tablets regularly and effectively were needed by pregnant women because in pregnancy, women relatively suffered anemia due to blood hemodilution. In order to increase the supply of iron during pregnancy, pregnant women should consume iron tablet that was 1x1 tablet in a day or a minimum of 90 tablets during pregnancy in order to keep the hemoglobin was in normal as long as the increase of erythrocytes in each trimester. Iron was an important element in metabolism, especially in the formation of red blood cells (erythropoiesis system). The concentration of erythrocytes in the body was affected by testosterone formed in long bone marrow. The process of erythropoiesis was stimulated by erythropoietin (formed in kidneys), then it would form proeritoblas (youngest erythrocytes). Then, these cells entered blood stream as reticulocytes from the bone marrow. Reticulocytes was the last stage of erythrocytes which was immature. Tasks of iron was to help reticulocyte to form hemoglobin (24-48 hours). Then, reticulocytes dissolved and formed a mature erythrocytes, until erythrocytes could carry oxygen throughout the body through the bonding oxyhemoglobin. Erythrocytes that were aging would be broken, and then, going out and difagocytosis in spleen, liver, and bone marrow. Iron would be transported by transferrin to the bone marrow for erythropoiesis (90%) and the rest was stored in the liver and spleen (Soeparman, et al, 1998).

There were certain factors that could affect hemoglobin levels in the blood, those were: the consumption of iron tablets, bone marrow problems, chronic bleeding, and malnutrition. Low hemoglobin could have negative consequences, those were: abortion, antepartum haemorrhage, anemia, low birth weight, etc. Therefore, it needed necessary treatment and prevention regularly. One effort that could do was providing iron preparations and also consuming foods that contained iron. Providing 250 mg of iron could fill the needs for each gram of hemoglobin deficiency (Gan Gunawan, Sulistia, 2001).

V. CONCLUSION AND SUGGESTION

Based on the results of research and discussion above, it could be concluded that:

1. Most of pregnant women in trimester III in DKT hospital- Sidoarjo did not regularly consume iron tablets who were 31 (65%) pregnant women.
2. 26 (54%) of pregnant women had low hemoglobin levels and almost half of them, 22 (46%) had normal hemoglobin.
3. There was a correlation between the consumption of iron tablets and hemoglobin levels.

It is suggested for pregnant women to: 1) consume iron tablet regularly as being recommended by health care and consume foods which contained iron and rich nutrients, 2) regularly check their pregnancy especially their hemoglobin to health service in order to identify and prevent anemia or other diseases of pregnancy, and 3) for the family should always support and motivate them to regularly consume iron tablets and check their pregnancy.

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