

The Awarding of Tea Red Amaranthus to Change in Levels of Hemoglobin in Woman Pregnant Second- Trimester with Anemia

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Abstract: ***Background:** Anemia can be corrected with the use of non pharmacological therapy that is granting the Red Amaranthus. contains calcium, vitamin A, vitamin E, vitamin C, betakaroten and Fe can increase level of Hemoglobin in second-trimester anemia of pregnant women get ferrous sulfate tablets. **Research Method:** This type of research is quasi-experimental non randomized with control group pretest and posttest with the Intervention of Red Amarahthus tea with a dose of 1.4 gram for 10 days. The total samples of 26 respondents. Data analysis using a paired test and independent t-test. **Results:** Intervention of Red Amarahthus tea with dose of 1.4 grams for 10 days to pregnant women second-trimester get ferrous sulfate tablets affects level of Hemoglobin with the p-value of 0.004. the mean value of the intervention group was 10.7154 and in the control group was 11.9154. **Conclusion:** Intervention of Red Amarahthus tea with a dose of 1.4 grams for 10 days to increased levels of Hemoglobin Anemia in pregnancy 2nd Trimester.*

Keywords: Red Amaranthus, Level of Hemoglobin, Anemia in Prenancy

1. Introduction

Second trimester pregnant women susceptible to anemia due to the occurrence of hemodilusi process that occurs increases blood volume to almost 50% thereafter until the impending birth, increased blood volume almost did not happen.[1] Pregnant women suffering from anemia can affect the fetus as a baby is born prematurely, the risk of a baby of low birth weight (LBW), fetal abnormalities, as well as increasing the risk of critical fetus.[2]

2. Literature Survey

Blood volume during pregnancy has increased its different for each trimester. Start of first-trimester pregnancy increased 20%, 40% second-trimester up to the mid third-trimester blood volume increase occurred almost 50%. Afterwards towards the birth, increased blood volume almost does not happen, the average increase in blood volume was 42%. [3]

Eritropoiesis increased in pregnant women this has resulted in the number of erythrocytes increase, an increase in the number of erythrocytes in each age pregnancy is different. On the First-Trimester increased erythrocytes production slow and second-trimester to third-trimester with increased more sharply. Hemodilusi process (going addition of blood volume) and an increase in the number of erythrocytes not parallel and differently at each stage of age.[4] Pregnancy in early pregnancy normal hemoglobin levels still then decline with the lowest point at the end of the second-trimester pregnancy and increased again in the time ahead of labor. Changes in the levels of hemoglobin first-trimester have yet so real, but the more real especially in the second-trimester.[5],[6]

Changes in blood volume, in circumstances not pregnant 70% is the intracellular fluid and the rest is interstitial fluid. In pregnancy, the intracellular fluid does not change but an increase in blood volume and liquid interstitial. The increase in plasma volume is greater than the increase in red blood cells so anemia and increased levels of protein so that viscosity (viscosity) of the blood decreases. Change the value of the inspection results such as blood hemoglobin value is the result of a pregnancy affected by an increase in plasma volume. An increase in erythrocytes of 18% and an increase in plasma volume of 45% decline thus count the erythrocytes per milliliter from 4.5 million to 3.8 million. With the increasing age of pregnancy the plasma volume, declining and count the erythrocytes to be slightly increased so the levels decreased during pregnancy hematokrit but slightly increasing towards the term. Changes in the levels of hemoglobin that occurs in parallel with erythrocytes. The mean Cell Haemoglobin Concentration on the State of the non pregnant is 34% which means that every 100 ml erythrocytes contain 34 grams of haemoglobin.

This value during pregnancy does not change thereby, the value of the total volume of erythrocytes and haemoglobin total increased during pregnancy. Changes in total blood volume, plasma volume and the volume of red blood cells during pregnancy and childbirth. The increase in plasma volume causes a decrease in levels of haemoglobin. During pregnancy haemoglobin levels went down to 36 weeks. This decline began to appear in week 12 and minimum values seen in week 32. Seen from the above data that no one normal value which can be found during pregnancy. This fact is crucial in enforcing the diagnosis of anaemia in pregnancy. In week 30 of haemoglobin levels, 105g/dl is normal, but the value in week 20 showed the presence of anemia. The cause of anemia in pregnancy is iron deficiency and of acute bleeding or even the interaction of the two. Pregnant at the time, the body will experience a significant change, the

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amount of blood in the body is increased by approximately 20-30%, this requiring an increasing supply of iron and vitamins needs to make hemoglobin.[7] When pregnant, the mother's body will make more blood to share with her baby. The body requires blood up to 30% more than before pregnancy.[8],[3]

The increase in plasma volume reached a peak at the 24th week of pregnancy. Changes in Hemoglobin followed the age of pregnancy. In the first trimester, the concentration of Hemoglobin decreased, except for a woman who has had low Hemoglobin levels (<11 g/dL). Most low Hemoglobin decline is found in the second trimester, namely its peak at about 30 weeks gestational age. In the third trimester going slightly increased Hemoglobin, except in women who already have high Hemoglobin levels (14.6 g/dL) in the examination of the first pregnancy. Changes in Hemoglobin followed the age of pregnancy. In the first trimester, Most low Hemoglobin decline is found in the second trimester, namely its peak at about 30 weeks gestational age. In the third trimester Hemoglobin increase occurred in women who already have high Hemoglobin levels (14.6 g/dL) on first inspection.

The cause of anemia most is due to a deficiency of nutrients. Nutritional deficiency is multiple, the clinic symptoms accompanied with infections, malnutrition or hereditary abnormalities such as hemoglobinopati. The fundamental cause of anemia due to deficiency of nutrients include intake of nutrients is lacking, the absorption of nutrients is not adekuat, and need the nutrients by the body. Approximately 75% of anemia due to deficiency of nutrition on pregnant women caused by iron deficiency with an overview on the erythrocytes mikrositik blood banks. The cause of anemia due to defisiensi nutrition megaloblastik anemia is the most that can be caused by a deficiency of folic acid and vitamin B12 deficiency. The process of formation of hemoglobin synthesis or it takes 7 -10 days to be mature and ready to miss out throughout the body along with red blood cells. Because hemoglobin is inside the red blood cells, then his lifetime which is about 120 days.

Erythrocytes are the components of the blood that gives the red colour by means of binding hemoglobin red blood cells by oxygen so often called red blood cells. In the blood of human erythrocytes have the function as transporters hemoglobin that carries oxygen from the lungs to the tissues towards peripheral organs and take out carbon dioxide from the tissues/organs towards peripheral lung exhaled. One of the factors that affects hemoglobin is the adequacy of iron in the body. According to Parakkasi, iron is required for the production of hemoglobin, the iron-deficiency anemia so that it will lead to the formation of red blood cells are smaller and a low hemoglobin content. Iron is also an Mikronutrient Essensial in producing a functioning haemoglobin deliver oxygen from the lungs to the tissues of the body, for in ekscreation into the air breathing, and other kompoen on cytochrome enzyme systems such as respiratory cytochrome oxidase, catalase, and peroxidase. Iron plays a role in the synthesis of hemoglobin in red blood cells and Myoglobin in the muscle cells. [9]

Content of $\pm 0.0004\%$ of body weight (60-70%) contained in hemoglobin that is stored as ferritin within the liver, hemosiderin in the lipa and the bone marrow. pregnant women suffering from anaemia affect a fetus, such as baby is born prematurely, the risk of a baby of low birth weight (LBW), fetal abnormalities, as well as the increased risk of fetal critical.[3] Therapy used for anemia in pregnant women can use pharmacological and non pharmacological therapy. Pharmacological therapy, namely the granting of Fe tablet that has a lot of drawbacks, namely pregnant women uncomfortable, drug resistance is high. In addition to pharmacological therapy as for non pharmacological therapy i.e. consume plants, vegetables.[10] Source of iron can be obtained from the good food from animal or vegetable. The highest iron content derived from the animal's just cost quite expensive.[11] Red amaranth (*Amaranthus Tricolor* L.) is a plant that is able to bind carbon dioxide gas efficiently so it has a high adaptation power in diverse ecosystems. Red amaranthus has a relatively short life cycle, this plant harvested age 3-4 Sunday. Red amaranthus plants reproduction generally done in a generative through seeds. Red amaranthus is a type of plant that is commonly grown for consumption leaves as green vegetables. Red amaranthus contain lots of vitamins A, B and c. Additionally red amaranthus contain lots of mineral salts such as calcium, phosphorus and iron. Red amaranthus contains high-mineral substances, namely iron to encourage the growth of the body and maintain health. Iron content contained by the red amaranthus is beneficial to our body so that red amaranthus is good for consumption. Red amaranthus is a lot of favorable community Indonesia because it feels good, tender and can facilitate digestion. In addition, the red amaranthus is also easily obtained dipasar-pasar relative prices cheap. The usual red amaranthus we consume comes from a type of red amaranthus red amaranthus where IE unplug unplug consists of 2 types of red amaranthus that is red and green red amaranthus red amaranthus. In the red and the Green red amaranthus red amaranthus contained mineral content among others and calcium (Ca) iron (Fe).

Where the Ca levels in red amaranthus green lower than red red amaranthus green red amaranthus in i.e. of 267 ppm and red amaranthus red amounted to 368 ppm. Red Amaranthus high to prevent anemia in pregnant women second-Trimester.[12] Red Amaranth (*Amaranthus Tricolor* L.) have weaknesses, namely pregnant women who consume red amaranthus red in excess will cause poisoning in blood.[13] therefore red amaranthus consumption for 10 days with a dose of 1.4 grams in the form of tea.

3. Methods/Approach

This type of research is quasy-experiment with pretest and posttest with control group design.[14] The sample in this research is the second trimester anaemia of pregnant women received supplementation of Fe. Sample of 26 respondents consisting of 13 respondents in group Intervention Read Amaranthus tea with a dose of 1.4 grams and the Supplementation Fe consumption for 10 days. The control group 13 respondents given supplementation Fe for 10 days. examination of the levels of hemoglobin in 11 days to

measure using hematology analyzer.

4. Results and Discussion

4.1 Dependen Analysis Hemoglobin Level

Table 1: Dependen Analysis Hemoglobin Level

Variable	Group		p- value
	Intervention	Control	
Hemoglobin Mean ± SD	11,9154± 0,5273	10,7154± 0,9642	0.000
Min ± Max	11,2± 12,80	9,00± 12,40	

The value of post mean and Std Deviation in the levels of Hemoglobin the intervention group higher than control group.

4.2 Dependent t-test Levels of Hemoglobin

Table 2: The difference in the levels of Hemoglobin the Intervention group

Group	Mean ± SD	Mean ±SD Paired Difference	p-value
Pre	10,0154±0,7197	1,9000±0,3162	0,000
Post	11,9154±0,5273		

*paired t test

Hemoglobin levels in the measure before and after Intervention for 10 days. Data distribution levels of hemoglobin in the intervention group and the control group using paired t- test. Based on table 2 results obtained by the levels of Hb in Pre intervention, the mean value of the difference between pre and post intervention obtained the value of $p = 0.000$ this shows by giving tablets Fe along with red Amaranthus tea for 10 days a can increase the levels of Hemoglobin Pre and Post Intervention.

Table 3: The difference in the levels of Hemoglobin the control group

Group	Mean±SD	Mean ±SD Paired Difference	Sig
Pre	9,9769±0,7131	-0,73846 ±	0,001
Post	10,7154±0,9642	0,58244	

*paired – test

Based on table 2 results obtained by the levels of Hemoglobin at the control group value of the mean difference between the pre and post control is with the standard deviation, results obtained by statistical values $p = 0.001$.

Table 3: The difference in the levels of Hemoglobin the intervention and control group

Group	Mean	Std. Deviation	Sig
Control	10.7154	0.9642	0,004
Intervensi	11.9154	0.5273	

*Independen t-test

Based on table 3 results of the test t test Independent p-values in the get value $000 < 0.05$. Then it can be inferred Red Amaranthus tea with Fe Supplementation for 10 days on a

regular basis very influential significantly to changes in the levels of Hemoglobin that is amounted to 8.27% higher compared with the control group. The results can be explained that giving red red amaranthus Extract on pregnant women with anemia can increase the levels of Hemoglobin. In addition to its high iron content, there are other substances in red red amaranthus content plays a role in the formation of hemoglobin and erythrocytes. Folic acid and vitamin B12 is a staple in the formation of cell nucleus. [15] Amino acids and vitamin B6 as well as lysine on red red amaranthus was instrumental in the initial reaction to the formation of heme. Vitamin B6 and B12 are necessary in the process of formation of globin synthesis. [16]

Vitamin C on red red amaranthus is high in iron absorption process is helpful non heme by changing the shape of the ferry be fero making it easier for the body in the process of absorption of iron. The content of iron and vitamin C are high on red red amaranthus causes iron is more easily absorbed by the body 4 times faster than Vit c. [17] iron is an essential element for humans as the Central ion from the hem (heme) which is a component of the non-protein of hemoglobin, Myoglobin and cytochrome. Iron deficiency causes failure of the synthesis of hem, and because the hemoglobin needed to transport oxygen to the tissues, this deficiency causes anemia and hypoxia tissue. [3] This iron plays an important role in the process of Physiology of the body. Functionally there is iron in the body diperan by hemoglobin, Myoglobin, the enzyme bound iron (iron dependent enzymes), and respiratory chain protein. [11] Hemoglobin is the iron-bound protein in red blood cells that function binds oxygen from the lungs and channel it to the cellular level. the iron is bound to Myoglobin protein in muscle cells that serve as binding of oxygen to preparation of oxygen in muscle contraction. [18] Where as transferin is a protein involved in the transport of iron in blood circulation. Iron plays a role in the synthesis of hemoglobin in red blood cells and Myoglobin in the muscle cells. Content of $\pm 0.0004\%$ of body weight (60-70%) contained in hemoglobin that is stored as ferritin within the liver, hemosiderin in the lipa and the bone marrow. [19]

Research by Astuti mentions that there is an increase in Fe on pregnant women, the difference between the mean value of the measurement before and after that is -0.45, meaning there is influence the consumption of red amaranthus and honey against the increase of iron in pregnant women. [20] This research proved that by consuming additional red red amaranthus extract for 10 days with Tablet therapy Fe from Clinics can increase the levels of Haemoglobin in pregnant women.

5. Conclusion

Based on data processing and analysis, it was concluded giving of tea Red Red Amaranthus with a dose of 1.4 grams for 10 days on second-trimester anemia of pregnant women who received Supplementation of Fe tablets can be helpful increasing the levels of Hemoglobin.

6. Future Scope

Researcher does not monitor other factors that affect the absorption of iron in the body and food consumption patterns of pregnant women everyday.

7. Other Recommendation

For further research needs to be researched more about substances contained in red amaranthus red in addition to the iron that can increase the levels of hemoglobin and detonated the Favorites or hedonisas on tea red amaranthus red before it is given to the respondents.

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