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Effect of Carica Papaya Linn on Changes in Ferritin Levels of Anemia Pregnant Women Who Consume Iron Tablets

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Abstract: ***Introduction: Anemia is a decrease in the number of red blood cells or hemoglobin content of the blood. The largest group who can experience anemia is pregnant women. Existing research has suggested that the administration of concurrent Fe tablets of Vitamin C contained in plants and food ingredients can help iron absorption four times. In this study, Papaya (Carica Papaya L.) became an alternative as a non-pharmacological therapy. Method: quasi-experiment with non-randomized pretest and post-test design with control group design. The sample was 26 respondents. Data analysis used independent paired t-test and t-test. Results: there were a significant increase in the intervention group and the control group with a value of 0.001. In the intervention group, there was just an average increase in ferritin levels 12.31ng / ml and in the control group 9.03ng / ml. Conclusion: there is a significant increase in ferritin levels in anemic pregnant women who consumes Fe tablets after being given papaya (Carica papaya.L)***

Keywords: Anemic pregnant women, papaya (Carica papaya.l), ferritin levels

1. Introduction

The relevance of this study relates to the status of anemia in pregnant women. Anemia is a requirement of decreased hemoglobin level, hematocrit, ferritin and the number of erythrocytes below normal values. Ferritin levels of anemic pregnant women can be monitored by ELISA laboratory examination. Most anemic pregnant women are caused due to iron deficiency.

2. Literature Survey

Pregnancy anemia is a condition in which red blood cells decrease or decrease hemoglobin so that the capacity of oxygen-carrying capacity for the needs of the vital organs of the mother and fetus is reduced. During pregnancy, the indication of anemia is if the hemoglobin concentration is less than 10.50 to 11.00 gr%.[1]

Iron deficiency anemia in pregnancy that is sustainable and not treated immediately can cause many serious problems both in the mother and the fetus. Risks that may occur in infants are the incidence of preterm birth (fewer months) and the incidence of low birth weight babies. Whereas the mother can increase the likelihood of bleeding during childbirth and trauma after childbirth.[2]

Efforts to overcome the problem of anemia in pregnant women who consume Fe tablets can be given pharmacological or non-pharmacological therapy. One of non-pharmacological efforts is papaya (Carica Papaya L) as a companion to Fe.

Papaya is an herbal fruit plant from the Caricaceae family that originates from Central America and the West Indies and even the area around Mexico and Coasta Rica. [3] The content in papaya fruit consists of water, calories, protein, fat, carbohydrates, Ca, P, Fe, Vitamin A, Vitamin B1, Vitamin C and Vitamin B9.[4]

Based on Saidin's research that by giving vitamin C in tablet form or in the form of papaya fruit food ingredients (Carica Papaya L.) can increase iron absorption of pregnant women. Giving Vitamin C 100 mg increases iron absorption 37.5% - 46.0% in pregnant women with staple foods of rice, corn, and tiwul while with the provision of vitamin C in the form of food (250 grams of papaya fruit) can increase absorption of 42-54.2 %.[5]

3. Methods/Approach

This type of research uses a quasi-experimental research design with non-randomized pretest and post test design with control group design. The number of samples of 26 respondents who were divided into intervention groups by giving Fe and papaya tablets (Carica papaya.l) 110 grams, and the control group by giving Fe tablets for 14 days.

4. Results and discussion

4.1 Characteristics of respondents

Table 1: Description the characteristics of age, education, employment, parity, gestational age

Variable	Group		p- value
	Intervention	Control	
Age mean±SD min±max	 26.92±6.44 20±33	 29.39±7.60 21±34	0.361
Level of Education Basic Middle High	 23% 53% 23%	 30% 61% 7%	0.946
Employment Work	 61%	 53%	0.153

Does not work	38%	46%	
Parity Primigravida Multigravida	 38% 61%	 23% 76%	0,952
Gestasional age mean±SD min±max	 21.31±4.42 14±28	 22.54±4.46 15±29	0,496

Table 1 illustrates the vulnerable age of this study is 20-34 years. In the intervention group, the average age of respondents was 26 years, while in the control group the average age of respondents was 29 years. After testing the homogeneity of the two groups obtained p-value 0.316, meaning that there was no significant difference in the age of respondents in the intervention and control groups. Age 20-35 years is the safest age to get pregnant. At this age, the reproductive organs are ready or mature to undertake the pregnancy process. Besides that, it is also supported by psychological and mental maturity. The level of education in the intervention group was 23%, a medium was 53%, and the high was 23%. Whereas in the control group, primary education was 30%, medium 61%, and the high 7%. After testing the homogeneity of the two groups obtained p-value 0.946, meaning that there were no significant differences in the level of education of respondents in the intervention and control groups. The level of education can influence a person including the behavior he will adhere to in motivating him to participate in health development, through the level of education a person will be more receptive to information so that more knowledge is possessed, whereas education that is less will inhibit one's attitude towards understanding healthy life. Respondents' work in the intervention group as much as 61% of respondents worked and the control group showed that 53% of respondents worked. After homogeneity testing was carried out on both groups, a p-value was 0.153, meaning that there were no significant differences in the work of respondents in the intervention and control groups. Pregnant women who work need more energy than pregnant women who do not work and in the work environment of pregnant women do not pay attention to the food intake they consume because it is caused by work. Parity in the intervention group was Multigravida 61% and in the control group 76%. After testing the homogeneity of the two groups, it was obtained a p-value of 0.952, meaning that there were no significant differences in the respondents' party in the intervention and control groups. The more often a woman becomes pregnant and gives birth, the greater the risk of anemia because pregnancy drains iron reserves in the body.

The gestational age in the intervention group was 21 weeks and in the control group for 22 weeks. After testing the homogeneity of the two groups, the p-value was 0.496, meaning that there were no significant differences in gestational age of respondents in the intervention and control groups. The higher the gestational age, the lower the maternal hemoglobin level due to hemodilution.

4.2 Levels of ferritin

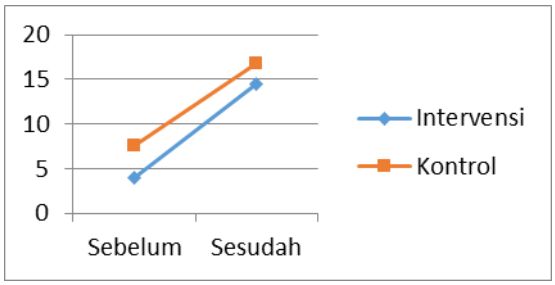

Figure 1: Effect of Carica papaya.l on ferritin levels

It can be concluded that there are significant differences in the mean difference in the increase in ferritin levels between the intervention group and the group.

During the pregnancy process, there are several things that can be done to reduce the incidence of anemia, especially in pregnant women are to provide nutrients rich in iron. Vitamin C can increase absorption of non-hem iron up to four times. Vitamin C with iron has a complex iron ascorbate compound which is soluble and easily absorbed. Therefore fresh vegetables and fruits that contain lots of vitamin C are good to eat to prevent anemia.[6]

The role of vitamin C in the process of iron absorption is by reducing Ferric iron (Fe3 +) to Ferro (Fe2 +) in the intestine so that it is easily absorbed. The reduction process will become even greater if the pH in the stomach needs to be more acidic. Vitamin C can cause acid in the stomach to increase so that it can increase iron absorption by up to 30%. Vitamin C inhibits the formation of hemosiderin which is sometimes difficult to mobilize to free iron when needed. While the inhibition factor of iron absorption is ingredients that contain polyphenol compounds such as tannin contained in tea which can reduce up to 80%.[7]

Research conducted by S Mehnaz, S Afzal, S. Khali, Z. Khan found that non-pregnant women who experienced anemia when given vitamin C, folic acid and iron experienced a very good increase in iron. [8]

This is in accordance with the results of the study said, explained that by giving vitamin C in the form of tablets or in the form of food ingredients such as papaya can increase iron absorption of pregnant women. Giving Vitamin C 100 mg tablets increases iron absorption 37.5% -46.0% in pregnant women with staple foods of rice, corn, and tiwul while with the provision of vitamin C in the form of food (250 grams of papaya fruit) can increase absorption of 42-54, 2%.[5]

The results of research conducted by women in 2014 showed that there was an effect of consumption of guava on changes in hemoglobin levels in pregnant women who received Fe tablet supplementation. A positive response to treatment can be seen from an increase in hemoglobin levels of 0.1g / dl a day from the fifth day onwards. Giving 30g of iron for 3 times per day will increase hemoglobin by at least 0.3g / dl per week or for 10 days. [9]

The role of vitamin C in the process of iron absorption is by reducing iron Ferri (Fe3 +) to Ferro (Fe2 +) in the intestine so that it is easily absorbed, the reduction process will become even greater if the pH in the stomach increases so that it can increase iron absorption by up to 30%. Vitamin C inhibits the formation of hemosiderin which is sometimes difficult to mobilize to free iron when needed. Whereas iron absorption inhibitors are materials that are from nature. The strongest inhibitors are food ingredients that contain polyphenol compounds such as tannins. [10] The process of iron absorption in the intestine is that iron is absorbed in the duodenum and the upper jejenum becomes a very complex process. Iron contained in food that is good in the form of Fe3 + or Fe2 + first undergoes the digestive process. In the stomach FE3 + dissolves in stomach acid, then becomes Fe2 + in the presence of ascorbic acid (Vitamin C). In the intestine Fe2 + is oxidized to FE3 +, which in turn is related to apophyrein which is then transformed into ferritin, freeing Fe2 + into the blood plasma. In plasma, Fe2 + is oxidized to Fe3 + and is associated with transferitin. Transferitin transports Fe2 + into the bone marrow to join to form hemoglobin. Transferrin transports Fe2 + into iron stores in the body (liver, bone marrow, spleen, and reticuloendothelial system) then oxidizes to Fe3 +. This Fe3 + will combine with apoferritin to form ferritin which will then be stored. [11]

5. Conclusion

Papaya (Carica Papaya.L) is effective for increasing ferritin levels of anemia pregnant women who consume iron tablets with an increase of 30%.

6. Future Scope

Researchers cannot control the factors that influence iron absorption in the body, for example the way the respondent drinks iron tablets by using tea or other drinks that can inhibit the absorption of iron.

7. Other recommendations

For researchers, they can further research by conducting research on the optimum dose of papaya (Carica Papaya.L) to increase ferritin levels of pregnant women who consume iron tablets.

Reference

[1] Varney H. *Jan. M. Kreb; Carolyn L Gregor. 2002*. Buku Saku Bidan.
[2] Mansjoer A. *Kapita Selekta Kedokteran Edisi 3, Jilid 2*. Jakarta: Media Aesculapius; 2000. 370-1 P.
[3] Pramita. *Kebutuhan Gizi Pada Ibu Hamil Dan Menyusui* Jakarta: Pramita Lab; 2010.
[4] Taufiq S. *Uji Aktivitas Antibakteri Ekstrak Etanol Buah Pepaya (Carica Papaya L.) Terhadap Escherichia Coli Dan Salmonella Typhi*. 2015.
[5] Saidin M, Saidin S. *Pengaruh Pemberian Pil Besi Dengan Penambahan Vitamin Terhadap Perubahan Kadar Hb Dan Feritin Serum Pada Wanita Remaja*. Penelitian Gizi Dan Makanan (The Journal Of Nutrition And Food Research). 2010.
[6] Andarwulan N, Faradilla Rf. *Senyawa Fenolik Pada Beberapa Sayuran Indigenous Dari Indonesia*. South East Asian Food And Agricultural Science And Technology (Seafast) Center, Institut Pertanian Bogor. 2012.
[7] Almatsier S. *Pengenalan Ilmu Gizi*. Dalam: Prinsip Dasar Ilmu Gizi Jakarta: Pt Gramedia Pustaka Utama. 2002:8-10.
[8] Mehnaz S, Afzal S, Khalil S, Khan Z. *Impact Of Iron, Folate, And Vitamin C Supplementation On The Prevalence Of Iron Deficiency Anemia In Non-Pregnant Females Of Peri-Urban Areas Of Aligarh*. Indian Journal Of Community Medicine. 2006;31(3):30-2.
[9] Putri An, Isnaeni Y. *Pengaruh Jus Jambu Biji Terhadap Perubahan Kadar Hemoglobin Ibu Hamil Trimester Iii Yang Mengkonsumsi Tablet Fe Di Puskesmas Pakualaman Yogyakarta*. Journal Pendidikan Kesehatan. 2017.
[10] Almatsier S. *Prinsip Dasar Ilmu Gizi*: Gramedia Pustaka Utama; 2002.
[11] Walters G, Miller F, Worwood M. *Serum Ferritin Concentration And Iron Stores In Normal Subjects*. Journal Of Clinical Pathology. 1973;26(10):770-2.

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