ORIGINAL ARTICLE:

Betroot (*Beta vulgaris*) administration to anemic pregnant women for increasing hemoglobin level

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ABSTRACT

Objective: To identify the effectiveness of beet juice administration on hemoglobin level of anemic pregnant women.
Materials and Methods: This was an experimental quantitative study using pretest-posttest design with a total sample of 30 patients who were divided into 2 groups of treatment groups (beetroot + Fe) and control group (Fe). The treatment was carried out for 14 days. Before and after the treatment, the samples were subjected to hemoglobin examination. Data in this study were the difference between pre-test and post-test values, the results of normality test with Shapiro Wilk, and, to identify the difference between pre-test and post-test, the results of Wilcoxon Test for abnormal data and Paired T-Test for normal data.
Results: Mann Whitney Test results between treatment and control groups revealed p (0.023) < alpha (0.05). There was a significant difference in hemoglobin levels between TM III pregnant women with anemia receiving beets and those receiving Fe tablets only.
Conclusion: Minimum Hb increase before and after the administration of Fe and beetroot juice to pregnant women was 17.7 gr% and the maximum Hb level was 0.8 gr%.

Keywords: Pregnancy; anemia; hemoglobin levels; beets/beetroot.

ABSTRAK

Tujuan: Untuk mengetahui efektivitas pemberian jus bit terhadap kadar hemoglobin ibu hamil yang mengalami anemia.
Bahan dan Metode: Metode yang digunakan adalah penelitian kuantitatif dengan desain penelitian eksperimental dan pretest-posttest design dengan jumlah sampel 30 orang yang dibagi menjadi 2. Terdapat kelompok perlakuan (bit + Fe) dan kelompok kontrol (Fe) selama 14 hari. Sebelum dan sesudah intervensi dilakukan pemeriksaan hemoglobin terhadap sampel. Data dalam penelitian ini adalah perbedaan nilai pre-test dan post-test, hasil uji normalitas dengan Shapiro Wilk, dan untuk mengetahui perbedaan antara nilai pre-test dan post-test, digunakan Uji Wilcoxon untuk data abnormal dan Paired T-Test untuk data normal.
Hasil: Beda hasil uji Mann Whitney pada kelompok perlakuan dan kontrol diperoleh p (0,023) < alpha (0,05). Terdapat perbedaan bermakna antara kadar hemoglobin ibu hamil TM III anemia yang diberi bit dengan kadar hemoglobin ibu hamil TM III anemia yang hanya diberi tablet Fe.
Simpulan: Kenaikan Hb minimum sebelum dan sesudah pemberian Fe dan jus bit pada ibu hamil adalah 17,7 gr% dan kadar Hb maksimal 0,8 gr%.

Kata kunci: Kehamilan; anemia; kadar hemoglobin; bit

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INTRODUCTION

Pregnancy is a period of fetal growth and development toward birth. Thus, nutritional disorders during pregnancy will have a major impact on the health of both the mother and the fetus. One of the most common nutritional problems in pregnant women is anemia. It is the largest and most difficult micronutrient problem to be overcome worldwide.[1] Anemia in pregnancy is known to be a potential danger either for the mother or the child. Iron deficiency, folic acid deficiency, infection and blood disorders cause anemia in pregnant women. Anemia in pregnant women affects during pregnancy, childbirth and the puerperium. It can be defined as a condition of pregnancy with hemoglobin levels of 7-10.5 gr%.[2]

Anemia is an indirect causative factor of women's death because it may cause bleeding, preeclampsia, abortion and infection. World Health Organization (WHO) in 2012 reported that the prevalence of anemia in pregnant women in the world ranged on average 41.8%.[3] Data from Riskesdes (2018) revealed that the incidence of pregnant women with anemia in 2013 was 37.1 while the incidence of pregnant women with anemia in 2018 increased of 48.9.[4] The highest number of pregnant women with anemia aged 15-24 years with a percentage of 84.6%. According to Manuaba (2008), anemia in pregnant women can be classified into 4, normal/no anemia: Hb 11 gr%, mild anemia: Hb 9-10 gr%, moderate anemia: Hb 7-8 gr%, and severe anemia: Hb <7 gr%.[5]

Data from Riskesdas (2018) showed that the incidence of pregnant women with anemia in 2013 in Central Java was 37.1%, mostly occurred in pregnant women aged 15-24 years with a percentage of 84.6%. A study by Neng Kurniawati and Sri Rahayu (2018) revealed that pregnant women with anemia in the working area of the Bangetayu health center in January to May 2018 was as many as 103 (34.3%).[6] According to Manuaba (2008), pregnant women are considered to be anemic if the hemoglobin level is less than 10 gr/dl.[5] Iron deficiency anemia in pregnant women can affect the growth and development of the fetus/infant during pregnancy or thereafter.[7] Therefore, anemia highly requires special attention from health workers.

Complications which may occur due to anemia are premature birth, bleeding, mortality in mother and child and infectious diseases. Deficiency anemia in pregnant women can affect the growth and development of the fetus/infant during pregnancy or afterwards.[7] Anemia of pregnancy can be called a "potential danger to mother and child" therefore anemia requires serious attention from all parties involved in health care. All parties in health care must be able to pay special attention to this problem. Anemia in pregnancy is one of the national problems because it reflects the socioeconomic welfare of the community and greatly influences the quality of human resources.[8]

The pregnant woman with less than 10 g/dl hemoglobin should be given with additional iron, folic acid (400 mcg) in greater amounts than prenatal vitamins immediately.[9] The government has conducted efforts to reduce the incidence of anemia by providing blood boster tablets as many as 90 tablets during pregnancy in a dose of 60 mg and fulfillment of appropriate nutritional intake[7] Thus, iron needs are met to increase the number of red blood cells and form fetal and placental red blood cells.[10]

Non-pharmacological treatment and prevention of anemia is performed by consuming green vegetables, beans, chicken livers, salted fish, beets, dragon fruit and others. As much as 100 grams of beetroot has a high content of folic acid levels of 108 mg and beets recommended by neuropaths as an intestinal cleanser.[11] According to Indonesian Ministry of Health (2016), beets also contain 27.0 mg of calcium, 43.0 m of phosphorus, 43 mg of vitamin C, 23.0 mg of magnesium, 9.6 mg of carbohydrate, and 1.0 mg of iron.[2]

MATERIALS AND METHODS

This was a quantitative study with experimental quasy research design. It used pretest-posttest design which was conducted in 2 groups, the experimental group and the comparison group, both were measured before and after the administration different interventions. The experimental group received an intervention in the form of beetroot juice and Fe tablets, while the comparison group only received Fe tablets.

The beetroots were obtained from for Research and Development Center of Medicinal Plants and Traditional Medicines (B2P2TOOT) Tawangmangu, Central Java, Indonesia. B2P2TOOT had prescribed that by the serving of 100 grams of beet is mixed with 2.5 glasses of water so that the volume became 500 ml in juice (in a blender). This study was conducted at Health Center Bangetayu, Semarang, Indonesia, for 14 days. Before and after the intervention, the groups were subjected to Hb measurement using haemometer.

Data in this study were on the difference between pre-test and post-test values, the results of normality test with Shapiro Wilk test. To determine the difference between pre-test and post-test, Wilcoxon Test was

employed for abnormal data, and paired t-test for normal data.

RESULTS AND DISCUSSION

Table 1. Hb level in pregnant woman tm iii administrated fe and beetroot juice

		Hb before beetroot juice + Fe Tablet administration	Hb after beetroot juice + Fe Tablet administration	The addition of Hb after beetroot juice + Fe Tablet administration
N	Valid	15	15	15
	Missing	0	0	0
Mean		9.7133	10.7000	.9867
Std. Deviation		1.28667	1.10518	.39617
Minimum		6.20	7.90	.50
Maximum		10.90	11.70	1.80

Table 1 shows that the minimum increase Hb before and after receiving Fe and beetroot juice is 17.7 gr and the maximum increase of Hb is 0.8 gr%.

Table 2. Hb level in TM III pregnant woman receiving Fe

		Hb before Fe Tablet Administration	Hb after FE Tablet Administration	Addition of Hb after FE Tablet Administration
N	Valid	15	15	15
	Missing	0	0	0
Mean		10.3000	10.2600	-.0400
Std. Deviation		.58554	.77533	.24727
Minimum		8.80	8.40	-.70
Maximum		10.80	10.80	.20

Table 2 shows that the minimum increase in Hb levels before and after receiving Fe was 0.4 gr%, while the maximum increase in Hb levels was 0.0 gr% or no increase in Hb levels.

Table 3. The results of Mann Whitney test of treatment and control groups

Ranks

	Group	N	Mean Rank	Sum of Ranks
Hb level of pregnant woman	Treatment group	15	19.13	287.00
	Control Group	15	11.87	178.00
	Total	30		

Table 4. Statistical tests

	Hb level of pregnant woman
Mann-Whitney U	58.000
Wilcoxon W	178.000
Z	-2.270
Asymp. Sig. (2-tailed)	.023
Exact Sig. [2*(1-tailed Sig.)]	.023[b]

a. Grouping Variable: Group
b. Not corrected for ties.

Table 3 reveals that Mann Whitney Test in treatment group and control group had p = 0.023) < alpha (0.05), so there is a significant difference between hemoglobin levels in TM III pregnant women with anemia receiving beets and those who only received Fe tablets.

The result of a study by Suryandari (2015) and Wenda (2017) in the working area of Public Health Center, Pekanbaru, Indonesia, showed that the administration of beetroot juice was effective for hemoglobin levels in pregnant women with anemia.[12,13] A study conducted at Public Health Center Purwokerto Selatan, Indonesia, conducted by Suryandari (2015), it was found that there was a difference in the increase of Hb levels after receiving Fe and beets with of p=0.009.

Increased hemoglobin levels in the treatment group with the support of researchers and respondents as well as strong support from the family to drink beet juice and fe tablets every day. Beets are also useful for preventing stroke, lowering cholesterol, preventing heart disease, strengthening the body's resistance, removing toxins from the body, treating infections and inflammation as energy producers for the body and increasing the immune system. Beets are very good for regular consumption. Beet content in the list of food ingredients includes 108 mg of folic acid, 27.0 mg of calcium, 43.0 mg of phosphorus, 43 mg of vitamin C, 23 mg of magnesium, 9.6 mg of carbohydrates, 1.0 mg of substances iron.[2]

CONCLUSION

The minimum Hb increase before and after administration of Fe and Beetroot juice to pregnant women is 17.7 gr% and maximum Hb level is 0.8 gr%.

REFERENCES

1. United States Department of Agriculture. [internet] National Agricultural Statistics Service. 2014. Available from: https://www.nass.usda.gov/ Publications/Ag_Statistics/2014/index.php

2. Kementrian Kesehatan Republik Indonesia. Profil Kesehatan Nasional 2015. Jakarta: 2016.
3. World Health Organization. Blood tranfusion savety. The clinical use of blood in medicine, obstetric, peadiatric, sugery & anasthesia, trauma & burns. 2012.
4. Puslitbangkes Riset Kesehatan Dasar 2013. Jakarta: Kementerian Kesehatan Republik Indonesia. 2013
5. Manuaba IBG, Manuaba IAC, MAnuaba IBGF. Pengantar Kuliah Obstetri. Jakarta: EGC; 2007.
6. Adyani K, Anwar AD, Rohmawaty E. Peningkatan kadar hemoglobin dengan pemberian ektrak daun salam (Syzygium polyanthum (wight) walp) pada tikus model anemia defisiensi besi. Research Article. Bandung, Indonesia: Universitas Padjajaran; 2018.
7. Ministry of Health, Republic of Indonesia. Buku saku pelayanan kesehatan ibu di fasilitas kesehatan dasar dan rujukan. 1st ed. Jakarta: 2013.
8. Pratami E. Evidence based dalam kebidanan: Kehamilan, persalinan, & nifas. Jakarta: EGC; 2016.
9. Thankachan P, Walczyk T, Muthayya S, et al. Iron absorption in young Indian women: the interaction of iron status with the influence of tea and ascorbic acid. Am J ClinNutr. 2008; 87: 881-6.
10. Hudoyono ST. Penyakit Dalam. In: Winjosastro H, Saifuddin AB. eds. Ilmu Kebidanan. 4th edn. Jakarta; Yayasan Bina Pustaka Sarwono Prawiro-hardjo: 2010.
11. Kumar Y. Beetroot: A superfood. International Journal of Engineering Studies and Technical Approach. 2011;1(3):20-6
12. Suryandari AE, Happinasari O. Perbandingan kenaikan kadar Hb pada ibu hamil yang diberi Fe dengan Fe buah bit. [internet] Purwokerto: Akademi Kebidanan YLPP; 2014. [cited 2019 May 5]. Available from: http://www.//journal.stikeseub.ac.id
13. Stephana W et al. Efektifitas pemberian jus buah bit terhadap kadar hemoglobin pada ibu hamil dengan anemia. Publication Paper. Program Studi Ilmu Keperawatan Universitas Riau, Indonesia. 2018.