

DOI: <http://dx.doi.org/10.33846/hn30707>
<http://heanoti.com/index.php/hn>



RESEARCH ARTICLE

URL of this article: <http://heanoti.com/index.php/hn/article/view/hn30707>

Effectiveness of Honey in Increasing Hemoglobin Levels of Mothers Post Sectio Caesarea

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ABSTRACT

The prevalence of surgical delivery assistance (Sectio caesarea) is increasing. During the intrapartum procedure, the mother is at risk of excessive bleeding and has an impact on decreasing hemoglobin levels. The purpose of the study is to prove the effectiveness of honey in increasing the initial hemoglobin levels of mothers Post Sectio Caesarea. The samples of the study were 50 postpartum mothers, who met the criteria of the research. Respondents were taken by random sampling, divided into 24 people in control group and 26 people in experimental group. The dependent variables were HB level and the administration of honey as an independent variable. HB was measured using electric HB and medical record. Data were analyzed by Mann-Whitney test, Wilcoxon Sign Rank test, and Wilcoxon-Mann-Whitney. The results of the showed mean pre-post control and experiment group: 10.36 ± 0.87 vs 10.82 ± 0.35 ; p value = 0.473; 11.53 ± 0.45 vs 12.87 ± 0.76 ; p value = 0.028, meaning that the administration of honey was effective in increasing the HB levels of mothers post Sectio caesarea. Honey contains iron (Fe), which is an important micromineral in the body because it can function to form red blood cells. Iron content can synthesize heme formation which increases Hemoglobin levels.

Keywords: hemoglobin level; honey; post sectio caesarea

INTRODUCTION

Background

Delivery process is not always easy; various pathological conditions cause the mothers to under go operative delivery. Sectio caesarea (SC) is a surgery incising the abdominal wall and uterus in order to take out the baby. This is done if normal delivery is impossible to carry out due to abnormalities that occur in both the mother and the baby to be born. Nevertheless, delivery with section caesarea has considerable risks⁽¹⁾. One of the risks is that during the surgery a mother will lose a lot of blood. If the secreted blood exceeds the normal limit allowed, it will have an impact on the decrease in the hemoglobin levels.

WHO set the average standard of SC in a country up to 10-15%, although there is always an increase in the number of section caesareas each year both in developed and in developing countries⁽²⁾. According to the data of national survey, in 2016 Indonesia had the prevalence of section caesareas of 921,000 out of 4,039,000 deliveries or about 22.8% of all deliveries. In East Java, the prevalence of section caesareas in 2016 was 3,401 operations out of 170,000 deliveries or around 20% of all deliveries⁽³⁾. The results of the 2013 basic health research (Riskesdas) showed that the sectio caesarean delivery was 9.8%, with the highest proportion in DKI Jakarta (19.9%), and the lowest in Southeast Sulawesi (3.3%)⁽²⁾.

Based on the results of the study by Muhammad (2017), the average decrease in Hb levels in sectio caesarea was 2.14 ± 0.09 , the Hb values in the pre-sectio caesarea had an average value of 11.52 ± 0.86 , and the Hb values in the post sectio caesarea gave an average value of 9.38 ± 0.97 . The decrease in the hemoglobin level was caused by bleeding during the section caesarea action with 500 - 1000 milliliters of secreted blood.

The results of the preliminary study on several respondents in some hospitals in Mojokerto Region obtained that the results of Hb levels before operative action (medical record data) averaged 12 gr%. Post operation of section caesarea on the first day obtained an average Hb levels of 10.52 ± 0.76 g / dl, on the second day the average Hb levels of 9.58 ± 0.87 g / dl, and on the third day the average Hb level 10.82 ± 0.45 g / dl. The condition of the mothers after the Post operation of section caesarea also showed the signs of a decrease in hemoglobin levels, some of who complained of feeling dizzy, looked pale and weak.

The occurrence of a decrease in hemoglobin levels in cases of section caesareas is caused by post partum bleeding which is not treated immediately. After the delivery process has been completed, the minimum hemoglobin value should be at least 10g / dl, and if it is less than this amount it will result in hemodilution (blood dilution) which causes the oxygen circulation to be disturbed, so that this disturbs the cell regeneration during the wound healing⁽⁴⁾.

An effort which can be done to overcome the problem of the lack of hemoglobin in the body can be done in two ways, namely pharmacology and non-pharmacology. Pharmacological method is carried out by consuming Fe tablets as much as once a day for 40 days after the delivery. Meanwhile, the non-pharmacological method intervened in this study was the administration of honey. In general, honey is effective in producing energy, increasing body endurance, and increasing stamina. Honey contains magnesium and iron. The magnesium mineral content in honey turns out to be the same as the magnesium content in blood serum. In addition, the iron content in honey can increase the number of erythrocytes which increase hemoglobin levels respectively.

Purpose

The purpose of the study is to prove the effectiveness of honey in increasing the initial hemoglobin levels of mothers Post Sectio Caesarea.

METHODS

The design of the research used in this study was quasy experimental, pre test-post test with control group. The samples of this study were 50 postpartum mothers in RS A and RS B [January to May 2019] , who met the research criteria: aged 20-35 years, primipara or multipara, aterm, general good condition, SC delivery without vascular complications, no pathological bleeding. Respondents were taken by simple random sampling, divided into 24 people in the control group and 26 in the experimental group. The research variables were divided into HB levels as the dependent variable and the administration of honey as an independent variable. As the working procedure, each respondent who fulfills the criteria, was drawn to determine the control group or experiment. All respondents prior to conducting the study agreed to informed consent. The pre test Hb level data was taken from the laboratory results of the first day of post operation (which was a hospital procedure). The experimental group was given a bottle of real honey taken from Pacet's honey farm (200 cc). The first day post SC until the third day, respondents were given 1 tablespoon of honey every morning and evening.. While the control group was given a standardized procedure treatment for post operation. The posttest Hb levels was taken on the third day of post operation respectively, using electric HB. Data analysis was carried out step by step, the initial homogeneity of Hb between the two groups was analyzed using the Mann-Whitney test, the pre-post test analysis of each group was tested with the Wilcoxon Sign Rank test, post test analysis between groups was tested by Wilcoxon-Mann-Whitney.

RESULTS

Table 1 shows the distribution of the respondents based on age, parity, Fe consumption, body weight increase during pregnancy, and amount of bleeding during intranatal in control group and experimental group. The table shows the condition of both groups at the characteristic of the respondents, having equal amount.

Table 1. The distribution of age, parity, Fe consumption, body weight increase during pregnancy, and amount of bleeding during intranatal in control group and experimental group

No	Variable	Control group		Experiment group	
		Frequency	Percentage	Frequency	Percentage
1.	Age				
	20-25	4	0.17	6	0.23
	26-30	15	0.63	13	0.50
	31-35	4	0.20	7	0.27
	Total	24	100	26	100
2.	Parity				
	Primipara	17	0.71	8	0.27
	Multipara	7	0.29	22	0.73
	Total	24	100	26	100
3.	Consumption of Fe				
	Routine	17	0.71	16	0.62
	Not a routine	7	0.29	10	0.38
	Total	24	100	26	100
4.	Gain weight during pregnancy				
	<12 kg	8	0.33	8	0.33
	12-16 kg	15	0.63	14	0.54
	>16 kg	1	0.04	4	0.13
	Total	24	100	26	100
5.	Bleeding during labor				
	<500 cc	3	0.12	3	0.12
	500 cc	21	0.88	23	0.88
	>500 cc	0	0	0	0
	Total	24	100	26	100

Table 2. The initial Hb level on the first day of post SC of the control group and experimental group

Group	Hemoglobin levels			Total n (%)
	Less f (%)	Normal f (%)	More f (%)	
Control	11 (0.46)	11 (0.46)	2 (0.08)	24 (100)
Experiment	13 (0.50)	9 (0.35)	4 (0.15)	26 (100)

Table 2 Shows the initial Hb level on the first day of post SC of the control group and experimental group. It can be concluded that the initial condition at the pre test of the two groups was the same. Using Mann-Whitney test, it was obtained the value of $p = 0.473$, meaning there is no difference in the initial condition of both groups.

Table 3. Hb level after treatment (post test) on the control group and experimental group

Group	Hemoglobin levels			Total n (%)
	Less f (%)	Normal f (%)	More f (%)	
Control	7 (0.29)	15 (0.63)	2 (0.08)	24 (100)
Experiment	3 (0.12)	14 (0.54)	9 (0.34)	26 (100)

Table 3, Hb level after treatment (post test) on the control group and experimental group. From it can be concluded that there is a difference in condition after the treatment on both groups, proved from results of Wilcoxon- Mann-Whitney test which obtained the value of $p < 0.03$, meaning that there is an effectiveness of honey in the increase of Hb post SC.

Table 4. Results showing the difference in Hb levels of pretest and posttest of the control group and experimental group

Group	Hemoglobin levels						Total n (%)
	Less		Normal		More		
	Pretest f (%)	Posttest f (%)	Pretest f (%)	Posttest f (%)	Pretest f (%)	Posttest f (%)	
Control	11 (0.46)	7 (0.29)	11 (0.46)	15 (0.63)	2 (0.08)	2 (0.08)	24 (100)
Experiment	13 (0.50)	3 (0.12)	9 (0.35)	14 (0.54)	4 (0.15)	9 (0.34)	26 (100)

Table 4 Results showing the difference in Hb levels of pretest and posttest of the control group and experimental group. There is a difference in Hb levels of pretest and posttest, of which the control group showed a change in the category of normal, while the experimental group showed a change of Hb levels in the category of high and normal. This was proved by the Wilcoxon Sign Rank test which obtained the value $p = .0028$.

Table 5. The average hemoglobin level in both groups, before and after being given honey

Group	Hemoglobin levels	
	Pretest	Posttest
	Mean±SD	Mean±SD
Control	10.36±0.87	11.53±0.45
Experiment	10.82±0.35	12.87±0.76
p-value	0.473	0.028

Table 5 The results of the showed mean pre-post control and experiment group: 10.36±0.87 vs 10.82±0.35; 11.53±0.45 vs 12.87±0.76, meaning that the administration of honey was effective in increasing the HB levels of mothers post Sectio caesarea.

DISCUSSION

During the process of delivery with SC, there are some risk factors potentially causing bleeding during the operative action. The bleeding can be caused by the large number of broken and open blood vessels during surgery, uterine atony, and bleeding where the placenta is attached⁽⁵⁾⁽⁶⁾.

Any condition that causes a decrease in the transportation of a certain amount of oxygen to the tissues will usually increase the speed of red blood cells. Erythrocytes are one component of cells contained in the blood functioning mainly as a carrier of hemoglobin which will carry oxygen from the lungs to the tissues. When the tissues undergo hypoxia due to the failure of oxygen delivery to the tissues, the blood-forming organs will automatically produce a large number of additional erythrocytes⁽⁶⁾.

The main stimulus that can stimulate erythrocyte production in low oxygen conditions is the erythropoietin hormone. In the absence of erythropoietin, hypoxic conditions in a person have very little effect in increasing erythrocyte production, but if the erythropoietin system functions properly, hypoxia condition will bring about an increase in erythropoietin production and increase erythrocyte production until hypoxia subsides, in which condition, too, it can be helped by the intake of nutrients such as iron, vitamin B12, and folic acid which are needed in the maturation and speed of erythrocyte production. Therefore, the erythropoietin mechanism in regulating erythrocyte production is a mechanism that plays an important role in increasing hemoglobin levels⁽⁵⁾.

Honey could be a good choice in improving the Hb levels. Honey contains various important nutrition needed in the improvement of erythropoietin. Honey is a supernatant sugar liquid. Honey contains sugar in the form of fructose and glucose which is a monosaccharide sugar that is easily absorbed by the intestine. Moreover, honey contains vitamins, minerals, amino acids, hormones, antibiotics and aromatic ingredients. In general honey is composed of 17.1% of water, 82.4% of total carbohydrates, 0.5% of protein, amino acids, vitamins and minerals. In addition to nonessential amino acids, there are also essential amino acids including lysine, histadine, tryptophan, etc⁽⁷⁾.

Carbohydrate contained in honey is the type of simple carbohydrate which mainly consists of 38.5% fructose and 31% glucose. The rest, 12.9% carbohydrate is composed of maltose, sucrose and other types of sugar. Organic acid content in honey includes glycolic acid, formic acid, lactic acid, citric acid, acetic acid, oxalic acid, malic acid, and tartaric acid⁽⁸⁾

Some mineral contents in honey are Sulfur (S), Calcium (Ca), Copper (Cu), Manganese (Mn), Iron (Fe), Phosphorus (P), Chlorine (Cl), Potassium (K), Magnesium (Mg), Iodine (I), Zinc (Zn), Silicon (Si), Sodium (Na), Molybdenum (Mo), and Aluminum (Al). Honey also contains some vitamins, especially from the B

complex group, namely vitamin B1, vitamin B2, vitamin B3, vitamin B6, and vitamin B12 whose composition varies in accordance to the quality of nectar and pollen which is rich in vitamin A, vitamin C, antibiotics, riboflavin, biotin, folic acid, pantothenic acid, pyro-dioxin and nicotinic acid⁽⁹⁾

Honey contains iron (Fe), which is a very important micromineral in the body because it can function to help form red blood cells. Iron content can synthesize heme formation which can increase Hemoglobin levels⁽¹⁰⁾.

Another content of honey which plays an important role in dissolving iron is vitamin C. Iron with vitamin C forms soluble ascorbate iron complex and is easily absorbed by organs in the human body. The change of non-heme iron in the form of Ferric metabolic compounds into Ferro will be even greater if the pH in the stomach becomes more acidic. Vitamin C adds the acidity so as to help increase iron absorption by 30%.⁽⁹⁾⁽¹²⁾

Moreover, folic acid is also essential in the formation of new cells, so that it can affect Fe in the blood and is expected to increase hemoglobin. Honey also contains riboflavin. This vitamin serves to help speed up the breakdown of food and absorption of glucose in the intestine, improve vision, prevent from diseases, prevent from blood deficiency (anemia), fight various types of microbes, and stop the release of blood⁽¹¹⁾⁽¹²⁾.

Copper is very important for human beings because it is related to hemoglobin, the lack of which causes a lack of body resistance and triggers increased cholesterol levels. Zinc also plays an important role in body health. The lack of zinc usually causes health to decline, infection to occur easily, and skin problems to often occur, both severe and mild, such as acne. Calcium and phosphorus are very useful for the growth of bones and teeth, while iron (Fe) functions to help the formation of red blood cells. Magnesium, phosphorus, and sulfur play an important role in the body metabolism. Magnesium is very useful for the prevention from anemia and functions as an antidote⁽⁹⁾⁽¹²⁾.

The results of the study also proved that the administration of honey for 3 days can increase Hb levels by 3 gr%, if not experiencing excessive bleeding. And for mothers with 500 cc bleeding with adequate food, this can give an increase of 1.8 gr%⁽¹³⁾.

CONCLUSION

The results of the study showed that the administration of honey was effective in increasing hemoglobin levels in mothers post SC. The implications of the results of this study are that honey is a safe alternative for improving Hb levels, as a consequence of intranatal bleeding. Rapid improvement in HB levels has an impact on reducing the risk of post partum complications and accelerating the recovery of the mother's condition.

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