



The Effect Of Honey Administration On Hemoglobin Levels Of Pregnant Women Trimester II

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ABSTRACT

During pregnancy, there are many problems experienced by pregnant women, one of which is anemia in pregnancy which is characterized by low Hb levels. Anemia in pregnant women can cause increased problems in pregnancy and childbirth. Pregnant women who have anemia will be very at risk of the birth of premature babies. Based on the results of a survey at the Chainny Rhamawan clinic, there were 20 anemic second trimester pregnant women. The purpose of this study was to determine the effect of honey administration on increasing Hb levels of pregnant women in the second trimester. Research method using experimental research method with *group pretest-posttest design*. The sampling technique is *Purposive* so that a sample of 10 people is obtained. The instruments used are from documentation and inform concent sheets. The analysis was performed with paired t-tests. The results of the study obtained the effect of honey administration on the Hb levels of mothers in the second trimester with a p-value of 0.002 and this - *value* of <0.05. So giving honey to mothers regularly can increase the Hb levels of pregnant women, therefore midwives can provide information to pregnant women about the benefits of honey in pregnancy.

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1. Introduction

Pregnancy is the period when there is a fetus in the womb of a woman. The gestation period is preceded by fertilization, namely the meeting of male sperm cells with eggs produced by the ovaries. After fertilization, a new life is formed in the form of a fetus and grows in the mother's womb which is a safe and comfortable shelter for the fetus. [1]

In pregnancy the need for oxygen becomes higher, triggering an increase in the production of erythropoetin. As a result, the volume of plasma increases and red blood cells (erythrocytes) increase. In the first trimester of pregnancy, iron is needed a little because menstruation does not occur and fetal growth is still slow. Whereas at the beginning of the second trimester the growth of the fetus is very fast and the fetus moves actively, that is, sucking and swallowing amniotic water so that more oxygen needs are needed. As a result, the need for iron is increasing to compensate for the increased production of erythrocytes and is prone to the occurrence of anemia, especially bes i deficiency anemia. [2]

Anemia in pregnancy is a condition of the mother with hemoglobin values below 11 gr% in the first and third trimesters and hemoglobin levels less than 10.5 gr% in the second trimester. [3] The most

frequent cause of anemia is due to the lack of nutrients for blood formation, for example iron, folic acid and vitamin B12, but what often happens is anemia due to iron deficiency. Iron deficiency can cause disturbances or obstacles to the growth of the fetus, both body cells and brain cells. Abnormal hb levels can result in fetal death in the womb, abortion, congenital defects, and abnormal hb levels in babies born. [2] [4]

A high prevalence of anemia can have negative consequences such as disruptions and barriers to growth, both body cells and brain cells, and a lack of hemoglobin (Hb) in the blood resulting in a lack of oxygen carried/transferred to body cells as well as to the brain. Anemia in pregnant women can have adverse effects on both the mother and the baby being born. Other studies have shown that the risk of low birth weight events, premature birth and prenatal death increases in pregnant women with hemoglobin levels less than 10.4 gr/dl. [5]

Iron deficiency anemia in pregnant women is a health problem experienced by women around the world, especially in developing countries. The *World Health Organization* (WHO) reports that the prevalence of pregnant women with iron deficiency is around 35-75%, and this number is increasing as the gestational age increases according to WHO, 40% of maternal deaths in developing countries are related to anemia during pregnancy, and most of these conditions are caused by iron deficiency and acute bleeding, it is not uncommon for the two to interact. In America the frequency of pregnant women with anemia is relatively high, which is 6% and in Indonesia alone, the frequency of pregnant women with anemia is 63.5%. Malnutrition and minimal attention to pregnant women are predisposing to iron deficiency anemia in pregnant women in Indonesia. [6]

According to Prof. Dr. Said Hammad, in his book entitled *99 Healthy Recipes with honey* states that, honey can help the blood formation process, neutralize acid levels in the blood, and increase hemoglobin in the blood. [6]. Honey has been known since thousands of years ago. Many people know its properties. Honey has a major role in human life. Honey is a liquid that resembles syrup produced by honey bees. Honey has a sweet taste that is not the same as sugar or other sweeteners. The sweet taste comes from the sweet liquid or *nectar* (*nectar*) found in the flowers and armpits of the leaves smoked by bees. Honey is famous in the world of health because it contains many properties. Long before the world of medicine developed rapidly, honey was already believed by many people as an element that can cure various diseases. Medical research also explains that the efficacy of honey is indeed efficacious. [7]

Honey is a thick liquid like a light yellow to red brown syrup collected in honey ingads by *Apis mellifera* bees. The constituent of honey is a mixture of dextrose and fructose with the same amount and is known as invert sugar 50-90% of non-inversion sugar and wate [8]. Honey contains many enzymes, namely very complex protein molecules produced by living cells and functioning as catalysts, namely: substances that change the speed of reaction in chemical processes that occur in the body of every living being. It is composed of several sugar molecules such as fructose, glucose, and sucrose as well as nutrients such as vitamins, acids, and enzymes. Honey also contains minerals such as sulfur, calcium, copper, manganese, iron, phosphorus, chlorine, potassium, magnesium, iodine, zinc, silicon, sodium, and aluminum [7].

The uses of honey that have been tested through scientific trials are as a source of high-value nutrition, easily soluble in the blood, stabilize blood pressure, increase vitality and energy when exercising, do not contain bacteria, strengthen the work of liver and heart, protect the body from diseases, increase endurance, as a mouthwash and cough medicine, relieve stomach and intestine pain 12 fingers overcome disorders in the digestive system, prevents cavities, and lowers harmful cholesterol levels. The substances contained in honey are ammonia acid as a protein builder, fatty acids to help the absorption of some vitamins in the stomach tract, calcium and posfor to help the formation and strengthening of bones and teeth, potassium, sodium, calcium to help regulate nerve and muscle movements, iron plays a role in the formation of blood haemoglobin, the enzyme eliminase is useful for remodeling starch into glucose, The enzyme Lizozyme is used to break the walls of bacteria [6].

Based on the description above that the magnitude of the benefits of honey for the body, one of which contains iron so that it plays a role in the formation of hemoglobin, researchers are interested

in conducting research on the effect of honey administration on hemoglobin levels of pregnant women in the II trimester.

2. Method

This study uses an experimental research method with a group design, this design uses a treatment group, but at least the first observation or pretest has been carried out which allows testing changes that occur after the experiment. The research was conducted at the Chainny Rhamawan Sukaraya clinic which was held on July 7-21, 2022. The sampling technique in this study is Purposively based on a certain consideration made by the researcher himself, based on the characteristics or traits of a previously known population of 10 people. The data collection method carried out is that researchers check the hemoglobin levels of pregnant women in the II trimester. The treatment group will be given real honey as much as 15 mg in 3x a day for 2 consecutive weeks. In the first 1 week the respondent's hemoglobin was checked then I the next week the respondent's hemoglobin was re-examined. The test carried out is with a paired t-test. [9]

3. Results and Analysis

3.1 Univariate Analysis

Table 1
Frequency Distribution of Characteristics By age, gravidarum, and gestational age

No	Characteristic	f	%
1	Age		
	a. 21-25 years	4	40
	b. 26-30 years	6	60
2	Gravidarum		
	a. First child	1	10
	b. Second child	4	40
	c. Third child	4	40
	d. Fourth child	1	10
3	Gestational Age		
	a. 12-20 weeks	7	70
	b. 21-28 weeks	3	30

Based on the table above, the distribution of respondents' characteristics based on the age of 21-25 years was obtained by 4 people (40%), 26-30 years old by 6 people (60%). Based on the gravidarum of the first child as many as 1 person (10%), the second child as many as 4 people (40%), the third child as many as 4 people (40%), and the fourth child as many as 1 person (10%). Meanwhile, based on the gestational age of respondents 12-20 weeks as many as 7 people (70%), and 21-28 weeks as many as 3 people (30%).

Table 2
Frequency Distribution of hemoglobin levels before and after honey administration

No. Resp	Hb levels Before	Hb levels after	Hb range	Mean
1	7,3	9	1,7	
2	7,5	9,8	2,3	
3	8,4	10,2	1,8	
4	10	10	-	
5	8	10,4	2,4	1,68
6	7	10,6	3,6	
7	8	10,8	2,8	
8	9,7	9,5	-0,2	
9	11	12	1	
10	9	10,4	1,4	

Based on the table above, the average increase in Hb levels for 2 weeks after giving honey was 1.68.

3.2 Bivariate Analysis

Table 3
Results of paired t sample hemoglobin level test analysis

	Std. Deviation	Std. Error Mean	p-value
Hb levels before -	1.1905	0.3765	0.002
Hb levels after			

Based on the table above, Std. deviation is 1.1905 and std. The mean error was 0.3765, obtained a p-value of 0.002 And this p-value value is <0.05 (pvalue = 0.002) so it can be said that there is an influence of honey administration on hemoglobin levels of pregnant women in the II trimester and its effect is moderate.

3.3 Discussion

a. Identification of Hemoglobin Levels Before and After Honey Administration

The average increase in hemoglobin levels before and after honey administration was 1.68. Hemoglobin content before honey administration is a minimum of 7gr% and a maximum of 11gr%. Hemoglobin content after honey administration is a minimum of 9gr% and a maximum of 12gr%. The range of increase in hb levels after the study was 1.68. From the results of research that has been carried out, there is an increase in hemoglobin levels because honey contains calories, sugar, nutrients and minerals, in minerals there is iron which helps the process of forming red blood cells in the body.

As for fixed hemoglobin or hemoglobin that does not decrease from the results of the study obtained because this allows other factors that influence the decrease in hemoglobin. For example, factors of food consumed, lifestyle, daily activities and other factors that influence the decrease in hemoglobin. Hemoglobin is an oxygen-transporting metalprotein that contains iron in red blood cells and hemoglobin is useful for transporting oxygen from the lungs throughout the body so it is very important for the body.

In this study, honey was given to pregnant women in the II trimester given for 2 weeks, as much as 3x 15 mg per day. This is in accordance with the opinion of Tarwoto and Betty, that anemia or low hemoglobin levels are common in pregnant women in the II trimester because at this time the growth of the fetus is very fast and the fetus moves actively and in the II trimester pregnancy anemia can be cured by hematological changes in pregnancy by changes in circulation that are increasing in plasma and breasts. The volume of plasma increases by 45-65% in the II trimester of pregnancy, so more oxygen is needed. As a result, the need for iron is increasing to compensate for the increase in erythrocyte production and is prone to the occurrence of anemia, especially iron deficiency anemia. [6] [10]

b. Effect of honey administration on hemoglobin levels of pregnant women in the II trimester

The results of the study using the paired sample test obtained a pvalue value of 0.002 (<0.05), so it is said that honey has a significant influence on hemoglobin levels of pregnant women in the II trimester, and the coefficient correlation value of 0.445. A positive sign indicates an increase or change before and after, and a value of 0.445 indicates a moderate influence. The effect that can significantly increase hemoglobin in pregnant women in the II trimester may be due to honey containing minerals, nutrients, sugars and calories. Minerals in honey contain iron. Iron is a protein contained in hemoglobin that functions to bind oxygen from the lungs throughout the body and as a carrier of carbon dioxide back to the lungs to be exhaled out of the body.

Hemoglobin is useful as a transporter of oxygen from the lungs to all body tissues and also carries carbon dioxide back to the lungs to be exhaled out of the body. Hemoglobin consists of Fe (iron), proporphyrin, and globin. Iron in the body is on average by 3-4 grams. Most (± 2 grams) are present in the form of hemoglobin and a small part (± 130 mg) in the form of myoglobin (a protein that carries oxygen to the muscles). Iron deposits in the body are found in the liver and in plasma, in the liver in the

form of ferritin and hemosiderin while in plasma, iron is transported to the bone marrow for erythropoiesis.

Iron also plays a role in forming collagen (a protein found in bones, cartilage, and connective tissues) as well as helping the formation of enzymes and as the body's defense system. Therefore, iron is needed by the body, most of which need red blood cells (hemoglobin), if a person who is anemic or iron in his body is little and then consumes honey then the iron in a person's body can be fulfilled so as to reduce the symptoms of iron deficiency anemia.

Iron content is found in honey. The honey content is minerals, sugar, nutrients and calories. According to Rabey the mineral in honey by 18%. Some of the mineral elements in honey, one of which is iron which functions to help the process of forming red blood cells (hemoglobin), namely as a binder of oxygen from the lungs to the rest of the body and also as a carrier of carbon dioxide back to the lungs and then exhaled out of the body. [11]

In addition to mineral honey also contains calories, in 1,000 grams of honey contains 3,280 calories serving for body fitness. And honey contains nutrients (vit, acids and enzymes) that are useful for forming proteins, breaking down bacterial walls, remodeling starch into glucose and inhibiting cancer cells. Also in honey contains sugars that are useful for improving the immune system. [12] According to the assumptions of researchers honey exerts an influence on hemoglobin levels. This is due to the content of iron-containing honey. Iron is what the blood needs to be able to bind to oxygen so that hemoglobin levels in the blood become better. In accordance with the concept that the content in honey contains iron which helps blood formation in the body, it can stabilize hemoglobin levels so as to reduce anemia, especially in pregnant women. [13].

So it can be concluded that giving honey affects the increase in Hb levels in pregnant women in the II trimester. So it is recommended that pregnant women in the second trimester who have anemia or low hb levels can consume honey to raise low Hb levels. So that it will be beneficial for the growth and function of the fetal brain and not experiencing premature or BBLR, for mothers there are no disturbances in the delivery process such as bleeding and long partus and there is no puerperal disorder as well as smooth milk production.

4. Conclusion

The hemoglobin level of pregnant women II can be increased by giving honey within two weeks. Giving honey with regular doses and time will affect the increase in hemoglobin levels of pregnant women. Hb has a very big role, especially during labor. High Hb levels must be prepared since the second trimester of pregnancy, not during labor. It is expected of all midwives to always provide information to pregnant women to consume honey regularly with the right amount to increase Hb levels.

References

- Dewi S., *Pregnancy Care for Midwifery*, Jakarta: Salemba Mendika, 2011.
- Rukiyah, *Obstetric Pathology Midwifery Care 4*, Jakarta: Trans Infomedia, 2015.
- Proverawati, *Anemia and anemia of pregnancy*, Jakarta: Nuha Medika, 2011.
- Arisman, *Anemia and Anemia in Pregnancy*, Yogyakarta: Nuha Medika, 2012.
- Depkes RI, *Indonesia Health Profile 2016*, Jakarta: Departemen Kesehatan RI, 2016.
- Mangkuj Betty, *Midwifery Care 7 Steps SOAP*. Jakarta: EGC, 2013.
- Rahman Ayi, *Amazing Madu 147 Amazing Honey 147 Honey Recipes to Eradicate 85 Disease*, Yogyakarta: Seven Books, 2013.
- Al Jamili S, *Benefits of Honey in the Qur'an & Sunnah*, Jakarta: Penerbit Cendekia Sentra Muslim, 2010.
- Nursalam, *Nursing Science Research Methodology Practical Approach 3rd Edition*, Jakarta: Salemba Medika, 2015.
- Tarwoto, *Anemia Pocket Book in Pregnant Women Concept & Management*, Jakarta: Trans Info Media, 2017.
- El Rabey, Al-Seeni, Al-Solamy, *Bee Honey Protects Male Rat Livers from Melamine Poisoning*. Biomed Research International, Biomed Research International, Vol 2013, ID 786051, 2013.
- Islamiyah, *The Effect of Honey on Hemoglobin Levels of Class X Young Girls Experiencing Anemia at SMKN 01 Mempawah Hilir: Journal Untad*, 2017
- SeriAni, Luh, *Pocket Book of Iron Deficiency Anemia in Pre-Pregnancy & Pregnancy*, Jakarta: Buku Kedokteran EGC, 2013.