Nurul Ilmi
Journal of Health Sciences and Midwifery
ISSN 2987-2804
Vol. 01 No. 02 Page. 63-68 ISSN 2987-2804 Prefix DOI: 10.52221/nuri

Tomato Juice to Increase Haemoglobin Levels in Pregnant Women

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Submitted: August 2023
Revised: September 2023
Published: 30 September 2023

ABSTRACT

Introduction: Anemia in pregnancy is a condition of a mother with a hemoglobin level below 11 gr/dl in the first and third trimesters, or a hemoglobin level of less than 10.5 gr/dl in the second trimester. In Indonesia, anemia is generally caused by iron deficiency. Iron deficiency anemia is anemia caused by a deficiency of iron, folic acid, and vitamin B12 due to inadequate intake or low availability of iron. Efforts that can be made to overcome the lack of iron intake in pregnant women are to regularly consume Fe tablets. The presence of side effects from Fe tablets and physiological changes during pregnancy may increase pregnant women's non-compliance in consuming Fe tablets. Non-compliance between pregnant women consuming Fe tablets can cause anemia in pregnant women. The source of iron is not only obtained from consuming iron (Fe) tablets. Pregnant women can get iron from various foods that contain iron, including tomatoes. **Objective:** This literature review aims to examine further about giving tomato juice to increase hemoglobin levels in pregnant women. **Method:** The method used in writing this article is a review of research results related to giving tomato juice to increase hemoglobin levels in pregnant women. **Result:** Based on the articles that have been analyzed, it can be seen that giving tomato juice can increase hemoglobin levels in pregnant women with anemia. **Conclusion:** Tomato juice can accelerate the absorption of iron and increase the production of red blood cells so that hemoglobin levels increase. Referring to these conclusions, pregnant women should consume tomato juice regularly.

Keywords: haemoglobin, pregnant women, tomato juice

Introduction

Anemia in pregnancy is a condition of the mother with a hemoglobin level below 11 gr/dl in the first and third trimesters, or a hemoglobin level of less than 10.5 gr/dl in the second trimester (Cunningham, 2016). In Indonesia, anemia is generally caused by iron deficiency. Therefore it is better known as Iron Nutrition Anemia. Iron deficiency anemia is one of the most common diseases during pregnancy (Lestari et al., 2022). Iron deficiency anemia is anemia caused by a deficiency of iron, folic acid, and vitamin B12 due to inadequate intake or low availability of iron. One of the factors of anemia in pregnant women is the lack of iron intake consumed by the mother every day. The results of the study showed that there was an influence between inadequate intake of iron (Fe) on the incidence of anemia in pregnant women (Sari et al., 2022).

Efforts that can be made to overcome the lack of iron intake in pregnant women include regularly consuming Fe tablets (Wasiah, 2020). The government's strategy to prevent anemia in pregnancy is to provide 90 iron (Fe) and folic acid tablets during pregnancy from the first contact (Kementerian Kesehatan RI, 2014). Fe tablets contain 60 mg of iron and 0.25 folic acid equivalent to 200 mg of ferrous sulfate. The provision of iron for a preventive dose is 1x1 tablet and for a treatment dose (if Hb is less than 11 gr/dl) is 3x1 tablet (Kundaryanti et al., 2019).

The side effects of Fe tablets and physiological changes during pregnancy could increase the non-adherence of pregnant women in consuming Fe tablets (Baharini, 2017). Non-adherence of pregnant women consuming Fe tablets can cause anemia in pregnant women. This is in line with the results of the study that there was a significant relationship between adherence to consumption of FE tablets and the incidence of anemia(Sarwinanti & Permata Sari, 2020).

Sources of iron are not only obtained from consuming iron (Fe) tablets. Pregnant women can get iron from various foods that contain iron, including tomatoes. Tomatoes contain 0.5 mg of iron per 100 grams. Apart from that, tomatoes contain 40 mg of vitamin C which can help the absorption of iron in the blood (Sulung & Beauty, 2018).

Objective

This literature review aims to examine further about giving tomato juice to increase hemoglobin levels in pregnant women.

Method

The research method used is a literature review study that tries to dig up more information about tomato juice to increase hemoglobin levels in pregnant women. The data type used is secondary data. Sources for conducting this literature review include a systematic search study of computerized databases on Google Scholar in the form of research journals totaling 5 articles. Research journal used from 2019 to 2022.

The analytical method used is using content analysis of online research journal documents obtained through searching trusted journal sites with inclusion criteria, namely research journals studying tomato juice to increase hemoglobin levels in pregnant women, spanning the last 5 years, national and international class, having ISSN (International Standard of Serial Number) number in both print and electronic versions and there is a DOI (Digital Object Identifiers) in the journal.

Result

Table 1. Analysis of Literature Review Result

	Author	Title	Method	Purpose	Result
1	(Novyriana & Caesarani, 2019)	Giving Tomato Juice to Increase Hemoglobin Levels in Third Trimester Pregnant Women at Bonorowo Community Health Center, Kebumen	Analytical descriptive with a case study approach	To know the result of midwifery care for anemic pregnant mothers by giving tomato juice to increase hemoglobin level of trimester III pregnant mothers.	From the results of this study, it was found after being given tomato juice for 28 days, there was an increase in hemoglobin level, 10.1 g/dL to 13 g/dL (participant 1), 10.1 g/dL to 13.2 g/dL (participan 2), 9.3 g/dL to 12.4 gr/dL (participant 3), 10.1 g/dL to 11.4 g/dL (participant 4), 10.8 g/dL to 11.5 g/dL (participant 5). This means that tomato juice can increase the participants' hemoglobin levels.
2	(Fitriani et al., 2020)	Giving Tomato Juice to Hemoglobin Levels in Third Trimester Pregnant Women in 2019	Quasi experimental study with one group pretest and posttest design.	This study is known the Effect of Tomato Juice Giving on Increased Hemoglobin Levels in Third trimester pregnant women at BPS Rohanah, STr.Keb.	The study revealed the average value of hemoglobin levels before administration of tomato juice 9.687 and standard deviation 4838. The average value of hemoglobin levels after administration of tomato juice 11.773 and standard deviation of 1.0074. There is the influence of tomato juice on increasing HB levels in pregnant women (p value 0,000 <0,05).
3	(Lestari et al., 2022)	The Effect of Tomato Juice Consumption on the Increase in Hemoglobin Levels in Third Trimester Pregnant Women with	Quasi experimental study with two group pretest and posttest design.	This study aims to determine the effect of tomato juice consumption on the increase in hemoglobin levels in third trimester	The results of the study indicate that the p-value of 0.000 < (0.05) there is a significant effect of consumption of tomato juice on the increase in hemoglobin levels in

	Author	Title	Method	Purpose	Result
		Anemia at Ciawi Regional Hospital in 2022		pregnant women with anemia in Ciawi Hospital.	third trimester pregnant women with anemia.
4	(Wulan et al., 2021)	Effectiveness of Giving Fe Tablets and Tomato Juice Against Increased Hb Levels in Pregnant Women	Quasi experiment one group design with pre and post-design.	The aim this research is to determine the effectiveness of giving Fe tablets and tomato juice to increase hemoglobin levels in pregnant women in the working area of the West Delitua Sub-district Health Center.	A total of 20 pregnant women (100%) experienced mild anemia before giving Fe tablets and tomato juice, and after being given Fe tablets and tomato juice, 15 people (75%) experienced mild anemia. it knows that the p-value of 0.000 < (0.05) there is an effect of giving fe tablets and tomato juice on increasing hemoglobin levels in pregnant women in the Work Area of the West Delitua Sub-district Health Center.
5	(Nurul Azmi & Berliana Irianti, 2022)	Midwifery Care for Anemic Pregnant Women by Giving Tomato Juice at PMB Dince Safrina	Analytical descriptive with a case study approach.	The aim of care is to provide midwifery care to anemic pregnant women by giving tomato juice.	After being given care by giving tomato juice (75 grams of tomatoes) for 7 days, the results obtained were an increase in Hb levels where the initial Hb before the intervention was 8.3 gr/dl and after the intervention there was an increase in Hb of 11.2 gr/dl. It can be concluded that consuming tomatoes or giving tomato juice is effective in increasing Hb levels in pregnant women.

Discussion

Mothers need 800 mg of iron during pregnancy, including 300 mg for the fetus' placenta and 500 mg for the increase in maternal erythrocytes. Thus, mothers need an additional 2-3 mg of iron/day (Arthyka Palifiana et al., 2022). Iron is a mineral needed to transport oxygen throughout the body. Iron is an essential microelement for the body, this substance is needed for hematopoiesis (blood formation), namely the synthesis of hemoglobin. Hemoglobin is a parameter used to determine the prevalence of anemia. Hemoglobin is an oxygen-carrying compound in red blood cells (Nurul Azmi & Berliana Irianti, 2022).

Consuming fruit that contains vitamin C plays an important role in iron absorption by increasing the absorption of non-heme iron up to four times. Iron absorption is strongly influenced by the availability of vitamin (Mahameru Pradanti et al., 2015)C. The role of vitamin C 41 in the iron absorption process is to help reduce ferric iron (Fe3+) to ferrous (Fe2+) in the small intestine so that it is easily absorbed. This reduction process will be greater if the pH in the stomach is more acidic. Vitamin C can increase acidity so that it can increase iron absorption by up to 30% (Ayupir, 2021).

Tomatoes are one of the fruits that contain vitamin C. The content of tomatoes in 180 grams is 24.6 mg of vitamin C, 0.49 mg of iron, and 27 mcg of folic acid. Tomatoes containing vitamin C can speed up the absorption of iron in the body and can increase the production of red blood cells so that hemoglobin levels also increase (Sulung & Beauty, 2018). Guyton's theory (2008) states that vitamin C has the function of absorbing and metabolizing iron, vitamin C reduces iron to iron and becomes iron. in the small intestine for easy absorption. Vitamin C inhibits the formation of hemosiderin which is difficult to be released by iron when needed (Novyriana & Caesarani, 2019).

Tomatoes also contain iron. According to The George Mateljan Foundation (2010), the benefits of iron contained in tomatoes are to increase hemoglobin levels, improve brain function, prevent anemia, and improve the immune (Wulan et al., 2021). Hemoglobin levels increase with the consumption of tomatoes because the iron (fe) contained in tomatoes can function for the formation of blood cells or hemoglobin (Fitriani et al., 2020).

Conclusion

From the results of these studies, it can be concluded that the provision of tomato juice can accelerate the absorption of iron and increase the production of red blood cells so that hemoglobin levels increase. Referring to these conclusions, pregnant women should consume tomato juice regularly.

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