

Overview of Haemoglobin Levels Before and After Menstruation in Female Students of STIKes Muhammadiyah Ciamis

Undang Ruhimat^{1*}, Irma Mir'atul Hasanah¹, Endang Octaviana Wilujeng², Rosmiati³

¹ Diploma Medical Laboratory Technology, STIKes Muhammadiyah Ciamis, West Jawa, Indonesia

² Clinical Pathology Laboratory of RSUD Ciamis, West Jawa, Indonesia

³ Bachelor of Science in Nursing Study Program, STIKes Muhammadiyah Ciamis, West Jawa, Indonesia

*Corresponding author : ruhimatundang4@gmail.com

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ABSTRACT

Background & Objective: Menstruation is the periodic discharge of blood and body cells from the uterine wall of the vagina. The effect of menstruation is the risk of anemia in adolescents. The appearance of menstrual anemia will hurt the growth and development of adolescent girls, such as decreased concentration and learning ability, impaired growth, resulting in unsatisfactory height, decreased physical strength, and pale skin. This study aimed to determine the difference in Haemoglobin levels before and after menstruation in female students of STIKes Muhammadiyah Ciamis DIII Health Analyst Study Program.

Method: This research is a descriptive study with a purposive sampling technique conducted from January to June 2021. Respondents in this study were level 2 female students year students of the D-III Health Analyst Study Program at STIKes Muhammadiyah Ciamis as many as 31 respondents—were measured using the CyanmetHaemoglobin method with the instrument used, namely the Photometer tool. The examination results were processed manually and displayed in table format for narration.

Result: The examination results of Haemoglobin levels before menstruation averaged 13.1 g/dL and Haemoglobin levels after menstruation averaged 11.9 g/dL.

Conclusion: It can be concluded that the average results show a decrease in Haemoglobin levels when experiencing menstruation.

Keywords: Adolescent Girls; Anemia; Haemoglobin Level; Menstruation.

Introduction

Laboratory examinations play an important role in helping to establish the diagnosis of a particular disease, and there are times when they even determine the diagnosis (Asfaraini et al., 2017). Laboratory examinations are not only carried out for sick individuals, healthy individuals who routinely carry out laboratory examinations will get many benefits. Laboratory examination can be a periodic Medical check-up so that individuals can continue to monitor their health. Laboratory examinations include hematology, urinalysis, clinical chemistry, and other examinations.

One of the examinations in the laboratory is the hematology examination, which includes examinations related to blood specimens, including examination of Haemoglobin levels in the blood. Haemoglobin is a conjugated protein found in red blood cells that contains iron and functions as the transportation of oxygen from the lungs to all body tissue cells (Asfaraini et al., 2017).

Adolescence is the transition from childhood to adulthood (Lestarina et al., 2017). As they get older, teenagers will experience physical and mental changes. Physical changes are characterized by the maturity of reproductive organs caused by hormones, mental changes are attracted to the opposite sex (Jannah, 2017). When entering adolescence, women usually enter puberty. Puberty in women is characterized by menstruation, which is blood that comes out and is dirty (Khamidah, 2021).

Blood loss during menstruation shows a rapid loss of iron stores according to the amount of blood that comes out, while the longer a woman has menstruation, the more blood that comes out and the more iron stores are lost (Hasnawati & Hafid, 2019). Therefore, menstruation is a group that tends to experience iron deficiency. Women who lose 60 mL or more of blood will experience

a decrease in the amount of iron stores. This will cause symptoms of anemia.

Anemia is a medical condition where the number of red blood cells or Haemoglobin is less than normal (Lantu et al., 2016). The normal Haemoglobin level of adolescent girls is not less than 12.0 g/100 mL (Hasnawati & Hafid, 2019). The impact of menstruation comes out continuously and a lot will result in iron deficiency anemia. One indicator of iron deficiency anemia is Hb levels that are less than normal.

Based on WHO data, the latest estimates for 2016 show that anemia affects 33% of women of childbearing age globally (approximately 613 million women aged between 15 and 49 years). According to the 2012 Indonesian Demographic Health Survey, the prevalence of anemia in adolescent girls was 75.9%, while the prevalence of anemia in West Java Province was 51.7%. The prevalence of anemia in women is relatively higher (23.9%) than in men (18.4%) (Asmin & Abdullah, 2021).

In general, anemia status is influenced by four main variables: infection, food consumption, physiological state, and iron expenditure by the body. In addition, other factors influence the incidence of anemia, including education, gender, region, breakfast habits, health status, and BMI (Body Mass Index) in the thin category (Ambarwati & Pangesti, 2017). Based on this case, the research team was interested in conducting research on Haemoglobin levels in women before and after menstruation in Level II students of the Stikes Muhammadiyah Ciamis Health Analyst Study Program.

Objective

This study aimed to determine the description of Haemoglobin levels in adolescent women before and after menstruation.

Method

This study is a descriptive study that aims to determine the description of Haemoglobin levels before and after menstruation in female students of STIKes Muhammadiyah Ciamis. The technique used was the purposive sampling technique. The research was conducted from January to June 2021 and the examination took place at the Hematology Laboratory of STIKes Muhammadiyah Ciamis.

Respondents in this study were level 2 female students of the D-III Health Analyst Study Program of STIKes Muhammadiyah Ciamis as many as 31 respondents. Measurements in this study used the CyanmetHaemoglobin method with the instrument used, namely the Photometer tool.

Data obtained from the examination of Haemoglobin levels in women 1-5 days before menstruation and 1-5 days after menstruation using the cyanmetHaemoglobin method were analyzed descriptively. The examination results were processed manually and displayed in table format for narration.

Results

The data used in this study are primary data from the examination of Haemoglobin levels before and after menstruation in female students of STIKes Muhammadiyah Ciamis. The examination results are presented in Table 1.

TABLE 1 Haemoglobin Level Examination Results Before and After Menstruation in Female Students of STIKes Muhammadiyah Ciamis

No	Sample Code	Haemoglobin Level (g/dL)				Difference
		1-5 days before Menstruation	Category	1-5 days after Menstruation	Category	
1	AD01	11,8	Low	12,4	Normal	-0,6
2	AN02	13,7	Normal	12,0	Normal	1,7
3	DN03	13,3	Normal	12,3	Normal	1
4	ES04	13,0	Normal	10,5	Low	2,5
5	GK05	11,2	Low	9,4	Low	1,8
6	ITS06	15,3	Normal	14,5	Normal	0,8
7	IPS07	13,0	Normal	13,2	Normal	-0,2
8	K08	12,4	Normal	11,3	Low	1,1
9	LAM09	15,3	Normal	12,4	Normal	2,9
10	NIS010	12,0	Normal	11,5	Low	0,5
11	PTR011	13,6	Normal	12,0	Normal	1,6
12	RSP012	12,1	Normal	11,2	Low	0,9
13	SH013	13,7	Normal	12,6	Normal	1,1
14	VH014	12,3	Normal	11,5	Low	0,8
15	YS015	12,1	Normal	10,0	Low	2,1
16	ZSA016	13,8	Normal	12,0	Normal	1,8
17	AHZ017	13,1	Normal	12,2	Normal	0,9

No	Sample Code	Haemoglobin Level (g/dL)				Difference
		1-5 days before Menstruation	Category	1-5 days after Menstruation	Category	
18	DNM018	14,1	Normal	13,4	Normal	0,7
19	DA019	14,0	Normal	12,1	Normal	1,9
20	EAM020	12,2	Normal	11,0	Low	1,2
21	FAA021	15,1	Normal	13,0	Normal	2,1
22	GDU022	14,3	Normal	13,3	Normal	1
23	HK023	12,0	Normal	10,2	Low	1,8
24	IH024	16,4	High	12,9	Normal	3,5
25	LA025	12,2	Normal	10,7	Low	1,5
26	MEL026	14,4	Normal	12,6	Normal	1,8
27	NR027	14,0	Normal	12,8	Normal	1,2
28	PAM028	12,3	Normal	11,5	Low	0,8
29	RY029	10,1	Low	10,7	Low	-0,6
30	SN030	13,2	Normal	11,6	Low	1,6
31	SN031	13,1	Normal	12,3	Normal	0,8
Average		13		11		1

Based on table 1, shows that there are differences in changes in Haemoglobin levels 1-5 days before menstruation and 1-5 days after menstruation in second-year students of the Health Analyst Study Program of STIKes Muhammadiyah Ciamis. The results of Haemoglobin levels 1-5 days before menstruation obtained a high Haemoglobin level value of 1 respondent, low 3 respondents, and normal 27 respondents. The lowest level was 10.1 g/dL and the highest level was 16.4 g/dL with an average of 13.1 g/dL. The results of Haemoglobin levels 1-5 days after menstruation obtained low Haemoglobin levels in as many as 13 respondents and normal 18 respondents. The lowest level was 9.4 g/dL, the highest level was 14.5 g/dL, with an average of 11.9 g/dL, and the average difference between before and after menstruation was 1.3 g/dL.

The results of the study are presented in the form of diagrams, which can be seen in Figure 1 and Figure 2.

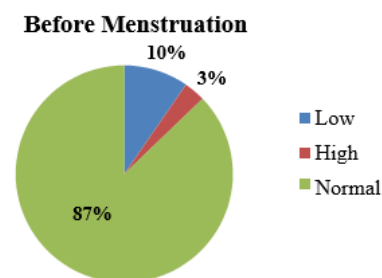


FIGURE 1 Pre-menstrual Haemoglobin Level Chart

Based on the diagram above, data on Haemoglobin levels before menstruation obtained low Haemoglobin levels (<12 g/dL) as many as 3 respondents (10%), who have normal levels (12-16 g/dL) as many as 27 respondents (87%), and who have high levels (>16 g/dL) as many as 1 respondent (3%).

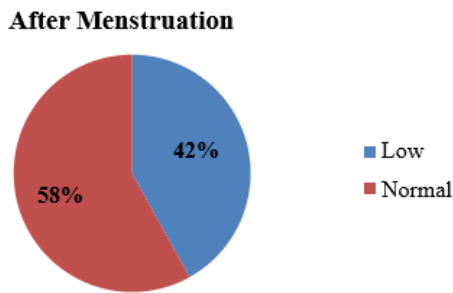


FIGURE 2 Diagram of Haemoglobin Level after Menstruation

Based on the diagram above, the value of Haemoglobin levels after menstruation was low (<12 g/dL) in as many as 13 respondents (42%), who had normal levels (12-16 g/dL) as many as 18 respondents (58%), and there were no respondents who had high levels (>16 g/dL).

Discussion

Hemoglobin examination with a photometer using the CyanmetHaemoglobin method. In this study, there is no special preparation that must be done by the patient. Before the study, the researcher explained the purpose and benefits of the study. Then conduct interviews, analyze data related to the respondent's menstrual time, and sign the respondent's consent sheet. In the examination of Haemoglobin levels before and after menstruation, three stages were carried out, namely pre-analytical, analytical, and post-analytical. In the pre-analytic stage, sampling preparation was carried out, providing patient identity. At the analytical stage, blood Haemoglobin levels were checked as much as 20 μ L added with Drabkin's reagent as much as 5 mL. In the post-analytic stage, reporting and documentation of results expressed in g/dL units were carried out.

The study used EDTA samples with a total of 31 samples because, at the time of data processing, 3 respondents did not meet the inclusion criteria, namely female patients of adolescent age with regular menstrual cycles,

so these respondents could not be examined, because the respondents did not experience regular menstruation every month.

The examination was conducted twice, namely 1-5 days before menstruation and 1-5 days after menstruation. Based on the results of the study, the average Haemoglobin level before menstruation was 13.1 g/dL and the Haemoglobin level after menstruation was 11.9 g/dL. The average difference between Haemoglobin levels before and after menstruation is 1.3. In the research results, one respondent experienced a decrease in levels reaching 3.5 g/dL. Based on the average Haemoglobin levels of respondents, it is concluded that there is a decrease in Haemoglobin levels in female students when experiencing menstruation.

Low Haemoglobin levels in adolescents can be caused by several factors, namely age, age ranging from 18-21 years is a period where adolescents experience physiological and biological changes, one of which is menstruation, then gender. Gender affects the value of Haemoglobin levels, women experience menstruation every month (Marfuah & Kusudaryati, 2021). In this study, the respondents' diet affected the value of Haemoglobin levels, due to poor food intake, then bleeding disorders. Diseases caused by bleeding disorders include hemophilia, thrombocytopenia, ITP (Idiopathic Thrombocytopenic Purpura), liver disorders, etc. In this study, none of the respondents had bleeding disorders so the samples could be examined properly. In this study, none of the respondents had bleeding disorders so the samples could be examined properly.

Lack of Haemoglobin can cause the body's metabolism and nerve cells to not work optimally, causing a decrease in nerve impulses, and disrupting the dopamine receptor system (Hastuty, 2020). In addition, Hb levels are influenced by several factors

including bone marrow response factors, body weight factors, food consumption intake factors, and menstrual factors that are faster than those experiencing a decrease in Haemoglobin levels (Nurjanna RS, 2018). Excessive menstruation is a cause of iron deficiency in women. One of them is caused by a decrease in appetite so that the intake of substances needed by the body is reduced, such as iron, and amino acids, therefore nutritious food is needed every day (Suhanda & Suyatini, 2016). The longer the menstrual period, the more blood that comes out, and the more iron loss.

In this study, the average length of menstruation of respondents ranged from 5 to 7 days. The results of this study are by Hasnawati & Hafid (2019) with the title Effect of Menstrual Period on Haemoglobin Levels and Erythrocyte Morphology. This study concluded that women in the menstrual period generally have Haemoglobin levels that are less than normal values so the menstrual period affects Haemoglobin levels. The decrease in Haemoglobin levels is due to decreased nutritional status, the amount of iron consumed does not match the amount needed (Indartanti & Kartini, 2014). People who experience severe anemia with various factors that cause anemia, such as lack of sleep due to work status, lack of iron nutrition when they are menstruating, hormonal disorders, women who are experiencing depression, and many other factors that can cause women during menstruation to experience a decrease in Haemoglobin levels (Hasnawati & Hafid, 2019).

Conclusion

From the above research, it can be concluded that the average results of the examination show a decrease in Haemoglobin levels during menstruation. For further research, it is expected to conduct a Haemoglobin

examination before and after menstruation in women > 45 years or towards menopause and with a larger number of samples so that the results are easier to see the comparison.

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Conflict of Interest

There is no conflict of interest in this research.

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