Analysis Of Hemoglobin Levels And Erythrocyte Sedimentation Rate In Diabetes Mellitus Patients In Santa Elisabeth Hospital Laboratory Medan In 2022

Seri Rayani Bangun[1], Barce Inel Crevis Gulo[2], David Sumanto Napitupulu[3]
[1,2,3] STIKES Santa Elisabeth Medan, Indonesia

ARTICLE INFO	ABSTRACT
Keywords: Hemoglobin, erythrocyte sedimentation rate, Diabetes Mellitus	Hemoglobin Levels and erythrocyte sedimentation rate in people with diabetes mellitus often experience a decrease and increase due to uncontrolled eating patterns, drinking medicine is not routine, exercise is not regular. This can cause the patient to experience anemia due to decreased hemoglobin and inflammation due to increased erythrocyte sedimentation rate. Santa Elisabeth Hospital Medan in 2022 This study used a descriptive analytic design. The population in this study 46 people sample 31 with the technique of purposive sampling. Data collection is done using a checktool hemoglobin levels, namely hematology analyzer pentra ABX 60 and for erythrocyte sedimentation rate using the Westergreen method. The results showed that the minimum value of hemoglobin level was 1 and the maximum value of hemoglobin was 4, the average value of hemoglobin was 2.58 with a standard deviation of 0.848. Results The minimum value for the erythrocyte sedimentation rate is 2 and the maximum value of the erythrocyte sedimentation rate is 4, the average value of the erythrocyte sedimentation rate is 2.74 with a standard deviation of 0.930. So, the results of the study there was a decrease in hemoglobin levels and an increase in the level of erythrocyte sedimentation rate. Suggestions in conducting research on hemoglobin examination and erythrocyte sedimentation rate follow the procedure according to the SOP and use complete personal protective equipment.
E-mail: serirayani2009@gmail.com barceinel02@gmail.com davidnapitupulu380@gmail.com	

1. INTRODUCTION

Laboratory examination examination to help enforce disease diagnosis. One of the checks What is done is the hemoglobin test and erythrocyte sedimentation rate in diabetic patients mellitus (Sunita, 2021). Hemoglobin (Hb) is the main component of red blood cells (erythrocytes), which function for transport oxygen and carbon dioxide. (Kiswari R.2014). While the erythrocyte sedimentation rate is for determine the rate at which erythrocytes settle in blood. (Nugraha & Badawi, 2018). Hemoglobin levels and erythrocyte sedimentation rate in people with diabetes mellitus often experience a decrease and increase due to uncontrolled eating patterns, taking medication regularly, and exercising regularly. This can cause the patient to experience anemia due to decreased hemoglobin and inflammation due to increased erythrocyte sedimentation rate. Patients with diabetes mellitus experience a decrease in hemoglobin levels, this is because patients experiencing increased ROS will cause oxidative stress. Oxidative stress will cause lipid peroxidation of cell membranes. Cell membrane lipid peroxidation will

facilitate erythrocytes to undergo hemolysis so that hemoglobin levels will decrease. (Setyaningrum, 2020).

The erythrocyte sedimentation rate in patients with diabetes mellitus will increase due to an increase in fibrinogen levels, so the formation of rouleaux will be faster and the erythrocyte sedimentation rate value will increase. (Masito, 2020). Based on the description above, the author is interested in researching the analysis of hemoglobin levels and erythrocyte sedimentation rate in Diabetes Mellitus patients in the Santa Elisabeth Hospital laboratory in Medan.

2.   METHOD

This research is analytical descriptive with purposive sampling technique. This research was conducted from January 2022 to April 2022 at the Santa Elisabeth Hospital Laboratory Medan. The sample in this study amounted to 31 people who met the inclusion criteria, namely people with diabetes mellitus who were hospitalized in a hospital willing to participate in the study by filling out and signing an informed consent.

Examination of hemoglobin levels and erythrocyte sedimentation rate was taken through venous blood. The blood samples obtained were taken to the Santa Elisabeth Hospital Medan laboratory and examined using a hematology analyzer pentra ABX 60 for hemoglobin examination and the Westergreen method for blood sedimentation rate examination.data was processed using a computerized method using the SPSS 25 application.

3.   RESULT AND DISCUSSION

Based on the research that has been done for patients with diabetes mellitus who Perform hemoglobin and rate checks Blood sediment obtained samples of 31 people, 18 men, and 13 women with age range 40-80 year.

Table 1 Distribution of Samples Based on Hemoglobin Levels in Diabetes Mellitus Patients at Santa Elisabeth Hospital Medan in 2022

No.	Hemoglobin levels	(f)	(%)
1	Normal Male 13,5-17 g/dL	4	12,9
2	Male Abnormal < 13,5 g/dl	14	45,2
3	Normal female 12-15 g/dL	7	22,6
4	female Abnormal < 12 g/dL	6	19,4
	Total	**31**	**100**

Based on table 1 above shows that normal male hemoglobin is 13.5-17 g/dl as many as 4 people (12.9%) and abnormal male hemoglobin < 13.5 g/dl as much as 14 people (45.2%). While normal hemoglobin women 12-15 g/dL as many as 7 people (22.6%) and abnormal female hemoglobin < 12 g/dL as many as 6 people (19.4%).

Table 2 Statistics Based on Hemoglobin Levels in Diabetes Mellitus Patients at Santa Elisabeth Hospital Medan in 2022

Category	N	Min-Max	Mean	Std. Deviation
Hemoglobin	31	1-4	2,48	0,962

Table 2 shows the average statistical data hemoglobin level2.48 with standard deviation 0.962 and the lowest value 1 and highest score 4.

Table 3 Distribution of Samples Based on Blood Sedimentation Rate of Diabetes Mellitus Patients at Santa Elisabeth Hospital Medan in 2022

No	Erythrocyte Sedimentation Rate	f	%
1	Normal Male 0-15 mm/jam	0	0
2	Male Laki-Laki >15 mm/jam	18	58,1
3	Normal Female 0-20 mm/jam	3	9,7
4	Female wanita > 20 mm/jam	10	32,3
	Total	**31**	**100**

Table 3 shows that Blood Sedimentation Rate Abnormal Male > 0-15 mm/hr 18 people (58.1%). Meanwhile, Normal Blood Sedimentation Rate Women 0-20 mm/hour 3 people (9.7%) and Female LED abnormal > 0-20 mm/hr 10 people (32.3%).

Table 4 Statistics Based on Blood Sedimentation Rate in Diabetes Mellitus Patients at Santa Elisabeth Hospital Medan in 2022

Category	N	Min-Max	Mean	Std. Deviation
Laju Endap Darah	31	2-4	2,74	0,930

Table 4 is the result of statistical levels of The erythrocyte sedimentation rate obtained the average value, namely 2.74 with a standard deviation of 0.930. Score the lowest is 2 and the highest value is 4.

Hemoglobin levels in diabetic patients mellitus which To do inspection hemoglobin in santa hospital laboratory Elisabeth Medan in 2022 as many as 31 people respondents with male gender 18 people and women 13 people. This research It was found that there was a decrease in hemoglobin levels in diabetic patients mellitus. Where to get abnormal results male hemoglobin <13.5 g/dl as much as 14 people (45.2%) and abnormal hemoglobin women < 12 g/dL as many as 6 people (19.4%). The occurrence of a decrease in hemoglobin in the patient Diabetes mellitus is caused by factors caused by the erythrocyte life cycle shortened, impaired bone marrow function and impaired iron metabolisme. (Setyaningrum, 2020). Diabetic patient routine mellitus in taking the drug is very important role in controlling blood sugar levels to stay within limits normal so it has a hemoglobin level within normal limits. (Nuari, 2021).

This decrease in hemoglobin levels is cause the older the patient, the more changes in blood hemoglobin levels large and advanced age causes the patient have impaired cognitive function is impaired supply of oxygen, glucose, and basic nutrients, vitamin deficiency (especially thiamine), malnutrition and others so that naturally in the elderly begin to experience functional changes in the body (Firdaus, 2020). There are several other factors that are also more affect hemoglobin levels decreased, i.e basic factors (social economy, knowledge, education and culture) and direct factors such as consumption patterns of Fe tablets, disease infection and bleeding (Priyanto, 2018).

Examination of the erythrocyte sedimentation rate in patients with diabetes mellitus showed an increase in the abnormal erythrocyte sedimentation rate for men > 15 mm/hour as many as 18 people (58.1%) and abnormal erythrocyte sedimentation rate for women > 20 mm/hour in 10 people (32 ,2%). The erythrocyte sedimentation rate increases due to an increase in fibrinogen levels in people with diabetes mellitus, so the formation of rouleaux will be faster which will increase the erythrocyte sedimentation rate (Masito, 2020).

Age is one of the factors that affect the value of the erythrocyte sedimentation rate. Along with age, the rate of erythrocyte sedimentation will continue to increase. Overall, the erythrocyte sedimentation rate will increase by 0.85 mm/hour for every 5 years of increasing age. (Nabilah, s. P. 2021). The increase in the erythrocyte sedimentation rate is due to the fact that older patients have decreased mitochondrial activity in muscle cells, which is associated with an increase in muscle fat levels and triggers insulin resistance, resulting in Diabetes Mellitus. This study also obtained normal results from the examination of hemoglobin levels and erythrocyte sedimentation rate this is because patients with diabetes mellitus apply a regular and healthy diet, change the modern style to traditional, limit the consumption of alcoholic beverages and stop smoking, good erythrocyte life cycle, does not occur. Impaired bone marrow function and iron metabolism perform activities, take medication regularly and check blood sugar regularly.

4.   CONCLUSION

It is concluded that patients with diabetes mellitus have decreased hemoglobin levels. Abnormal male <13.5 g/dl as many as 14 people (45.2%) and abnormal female <12 g/dL as many as 6 people (19.4%). Meanwhile, the erythrocyte sedimentation rate of patients with diabetes mellitus has increased. Abnormal Male > 15 mm/hour as many as 18 people (58.1%) and Abnormal female > 20 mm/hour as many as 10 people (32.2%).

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