

Characteristics of Anemia in Elderly Patients at Siti Rahmah Hospital, Padang, Indonesia

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ABSTRACT

Background: Anemia is a major health problem for the elderly in Indonesia. The ageing process causes physiological changes in almost all body systems in the elderly, causing disruption of various processes absorption of nutrients in the body. Examination of the hematological profile can provide an overview of nutritional status and anemia status that can monitor disease progression of the elderly. **Objective:** to determine characteristics of anemia in elderly patients at Siti Rahmah hospital, Padang. **Methods:** This was a descriptive study and the population of this study was the elderly aged 60 years and over who come for treatment at Siti Rahmah Hospital. The samples of this study were consisted of 52 elderly patients and examined hematology profile. The examination includes hemoglobin, hematocrit, leukocytes, platelets and erythrocyte index using an automatic analyzer. **Result:** This study was conducted on 52 elderly patients, consisting of 26 men and 26 women with the mean age was 68.31 ± 7.385 years old. The results of the examination of hemoglobin levels 12.47 ± 1.84 g/L, with 46.15% anemia patients, hematocrit 34.6 ± 4.96%, leukocyte count 9588 ± 4131.783/mm³ and platelet count 278211 ± 114830/mm³. **Conclusion:** Characteristic anemia from hematology profile in elderly patient was mild anemia with normochromic normocytic features, the leukocyte, hematocrit and platelet counts were within normal limits.

Keywords: Anemia, Elderly, Hematology Profile

1. INTRODUCTION

Elderly according to the Ministry of Health, the Republic of Indonesia is someone who is aged 60 years and over. The number of elderly in Indonesia tends to increase compared to other age groups, estimated that in 2020 Indonesia has 11,34% and more than 50% of these elderly people experience health complaints. Physiologically, the elderly group will experience a decrease in the degree of health both naturally and because of the disease [1].

The elderly have decreased physical activity and changes in diet caused by a decrease in metabolism that affects the absorption of needed nutrients, decreased appetite eating due to illness, swallowing disorders due to reduced saliva, disturbances in the process of chewing food caused by dental disease and the number of teeth which is reduced. These factors can make it easier for the elderly population to be affected nutritional problems, one of which is anemia [2].

Hematological examination can give an idea of the presence or absence of anemia, nutritional status and immunology of the elderly so that it can help in monitoring the progression of the disease. These blood components originate from the haemopoietic stem cell, these occupy the entire capacity of the bones at birth but it is been replaced with fatty marrow with increase in age. Hematological parameters are examinations consisting of hemoglobin, index hemoglobin, erythrocytes, leukocytes and platelets [1][3][4].

A decrease in hemoglobin levels is considered a cause of a decrease in quality of life, morbidity, decreased physical function, and a risk factor for death in the elderly. The leukocyte count is a marker of systemic inflammation, and have received attention as a useful clinical predictor for survival in the elderly. Platelets play an important role in hemostasis and in the development of pathological processes in the elderly [1].

Padang City has an area of 694.96 km² with a population of 950871 people, It has 11 districts and Koto Tengah district is the largest district (232.25 km²).The largest population in Padang City is also located in Koto Tengah District with a total of 197005 inhabitants.This research was conducted at Siti Rahmah Hospital because it is the only type C hospital in Aia Pacahvillage, Koto Tengah district [5]. The current study was designed to have a better understanding and become baseline data on characteristics of anemia in elderly patients at Siti Rahmah hospital, Padang.

2. PROCEDURES AND METHODS

This was a descriptive study and the population of this study was the elderly aged 60 years and over who come for treatment at Siti Rahmah Hospital. The samples of this study were consisted of 52 elderly patients and examined hematology profiles in January- July 2021. The examination includes hemoglobin, hematocrit, leukocytes, platelets and erythrocyte index using an automatic analyzer.

The sample of this study that fulfilled the inclusion criteria includes patients with complete laboratory data based on the diagnosis coding system in the medical records. The study protocol was approved by the Ethical Clinical Research Center, Medical Faculty of Universitas Baiturrahmah

3. RESULT

The sample of this study was the elderly someone who is aged 60 years and over, with a total of 52 people, consisting of 26 women (50%), 26 men(50%) (Diagram 1).

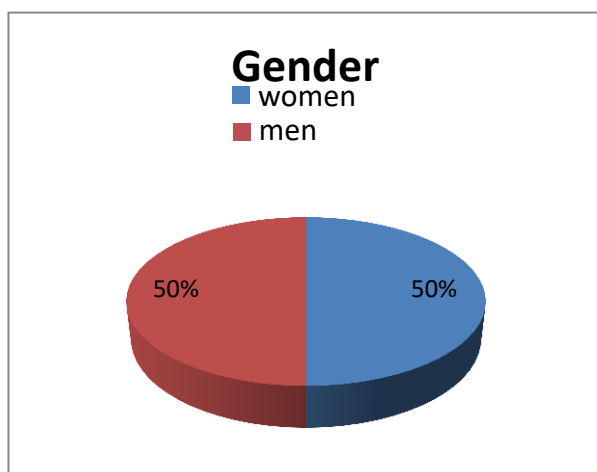


Diagram 1. Proportion of Anemia In Elderly Patients by Gender

This study showed that the mean of age patients was 68.31±7,385 years old, with a minimum age was 60 years old and maximum age was 91 years old. The proportion of anemia in elderly patients was divided by age into three groups, namely elderly aged 60-70 years, elderly aged 71-80 years and elderly over the age of 80 years. The results showed that elderly people aged 60-70 years old 38 people (73%), elderly aged 71-80 years old 9 people (17%), and elderly >80 years old 5 people (10%) (Diagram 2).

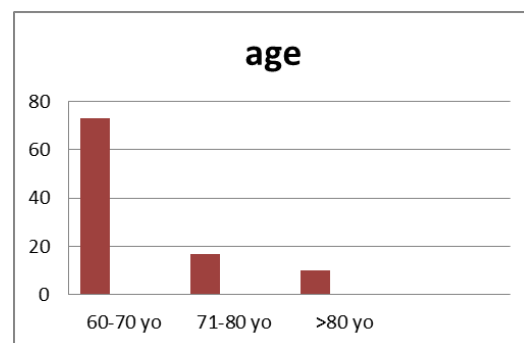


Diagram 2. Proportion of Anemia In Elderly Patients by Age. Figures and Tables

We got hematology profile from medical records and it was examined by using automatic analyzer and used 2 mL blood with EDTA anticoagulant. The mean hemoglobin levels in all elderly patients at Siti Rahmah hospital, Padang was 12.47±1.84 g/L. with mean hemoglobin levels in women were 12.29±1.62 g/dL, and men were 12.65±2.04 g/dL. Hemoglobin level in elderly were classified by age based on World Health Organization (WHO) criteria, we found 46.15% (24 people) anemia in this study. The mean of hematocrit level in elderly patients were 34.6±4.96% with a minimum level was 22%, and a maximum level was 44% (table 1).

Table 1. Hemoglobin and Hematocrit Level in Elderly Patients

Parameter	Level	Min Lvl	Max Lvl
Leucocyte count(mm ³)		3400	21700
Mean ± SD	9588±4131.783		
Leucocytosis	16 (30.8%)		
Normal	33 (63.2%)		
Leucopenia	3(6%)		
Thrombocyte count(mm ³)		121000	783000
Mean ± SD	278211±114830		
Thrombocytosis	2 (4%)		
Normal	44 (84.5%)		
Thrombocytopenia	6 (11.5%)		

Table 2. Leucocyte and Thrombocyte standard in WHO

Parameter	n	Mean ± SD	Normal range (WHO)
Hemoglobin (g/dL)	52	12.47±1.84	Based on gender
Hemoglobin women (g/dL)	26	12.29±1.62	>12
Hemoglobin men(g/dL)	5	12.65±2.04	>13
Anemia in Elderly	24	(46.15%)	
Hematocrit (%)	52	34.6±4.96%	36-42%

The mean leucocyte count in elderly patients was 9588±4131.783/mm³, with a minimum level was 3400 /mm³, and a maximum level was 21700/mm³. In this study, we found 30.8% leukocytosis, 63.2 % in normal levels and 6% leucopenia. The mean thrombocyte count in elderly patients was 278211±114830/mm³, with a minimum level was 121000 /mm³, and a maximum level was 783000/mm³. In this study, we found 4% thrombocytosis, 84.5 % in normal levels and 11.5% thrombocytopenia. (Table 2) The total number of leukocytes and thrombocyte based on WHO criteria is 5000-10000 / mm³ and 150.000- 400.000 / mm³ [5][7].

In this study 24 people (46.15%) of the elderly suffered from anemia that classification consisted of moderate anemia 6 people (25%), mild anemia 18 people (75%) and all of anemia patients had normocytic normochrome features based on peripheral blood smear.

4. DISSCUSION

The sample of this study was the elderly someone who is aged 60 years and over, with a total of 52 people, consisting of 26 women (50%), 26 men (50%), this is different from Prasetya et al's study in Yogyakarta where women were more than men, where women were 87%. [6].

In this study, the proportion of anemia in elderly patients was divided by age into three groups, namely elderly aged 60-70 years, elderly aged 71-80 years and elderly over the age of 80 years. The results showed that elderly people aged 60-70 years old 38 people (73%), elderly aged 71- 80 years old 9 people (17%), and elderly >80 yearsold 5 people (10%) this study was almost the same as the Anggraini and Sjaff 2019 research which also examined anemia in the elderly which showed that elderly people aged 60-70 years old 22 people (73%), elderly aged 71-80 years old 6 people (22%), and elderly >80 years old 2 people (7%)[1]. Humaney et al's study, the population of patients ranged from 60 to 80 years with an average age of 71.51 years, the maximum number of patients at that age group was 60-69 years (61% men & 39% women)[3]. The prevalence of anemia increases rapidly after the age of 50, approaching a level greater than 20% in people aged 85 years or more [7]. Guralnik et al's study showed 33% of anemic persons aged 70 years, 23% in persons aged 75 years, and 36% in persons aged 81 years [8]. Increasing age, thus affecting blood parameters, anemia is a significant problem in elderly patients, anemia can be caused due to malnutrition, chronic inflammatory anemia or other comorbidities [7].

The mean hemoglobin levels in all elderly patients in this study were 12.47±1.84 g/L. with mean hemoglobin levels in women were 12.29±1.62 g/dL and men were 12.65±2.04 g/dL. Hemoglobin levels in the elderly were classified by age based on World Health Organization (WHO) criteria, we found 46.15% (24 people) anemia in this study. The mean of hematocrit level in elderly patient was 34,6 ±4,96% with minimum level was 22%, and a maximum level was 44%. Some cases of anemia with unidentifiable causes reflecting initial myelodysplasia, others are anemic due to chronic diseases, and others are anemic mildrenal insufficiency[8][9].

Anemia is a condition in which the red blood cell count or oxygen-carrying capacity is lower than the body's physiological requirements [5].

Anemia is an indicator of poor nutrition and poor health. Anemia in TB caused by suppression

of erythropoiesis by inflammatory mediators is the most common pathogenesis of anemia in TB. 6, IL-1 β and Interferon- γ have an effect on decreasing erythroid progenitor. 7 This decrease in erythroid progenitor directly inhibits erythrocyte differentiation and proliferation. Retention of iron in the reticuloendothelial system is one of the body's defense mechanisms. Disruption of iron hemostasis results in the transfer of iron from the circulation to the reticuloendothelial system storage area and is followed by a limited supply of iron for progenitor erythroid cells. This causes the limitation of the erythrocyte formation process[4][5][10].

The mean leucocyte count in elderly patients were $9588 \pm 4131.783/\text{mm}^3$ The mean thrombocyte count in elderly patients were $278211 \pm 114830/\text{mm}^3$, with a minimum level was $121000/\text{mm}^3$, and a maximum level was $783000/\text{mm}^3$. Although there are as yet no data to explain this, we hypothesize that non-nutritional anemia in the elderly is all related to inflammatory signaling, either as the anemia of inflammation mediated through IL-6 pathways or as iron independent anemia mediated through TNF and NF κ B [9][11].

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