

The characteristics of anemia patients in End Stage Renal Disease (ESRD) based on age and gender

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Abstract

Anemia is one of the complications of Chronic Kidney Disease and is often associated with a decrease in the patient's quality of life, an increase in patient morbidity and mortality, and an accelerated rate of progression of CKD. In terminal stage CKD patients, it is commonly referred to as End Stage Renal Disease. To describe the characteristics of anemia patients in ESRD based on age and gender at Hemodialysis Installation in Dr. Soetomo General Hospital Surabaya. This study was a descriptive observational study with the cross sectional method using secondary data from patient medical records at Hemodialysis Installation Dr. Soetomo General Hospital Surabaya. Data from 80 research subjects, the average age is 48.08 ± 10.598 , an average of gender in male is 9.46 ± 1.592 and in females is 9.04 ± 1.329 . From 80 patients, there were 17 people aged $\geq 18 - 40$ (21.3%), aged 41 - 60 people with a total of 53 people (66.3%), > 60 years as many as 10 people (12.5%). Regarding gender in males there are 39 people (48.8%), and in females are 41 people (51.2%). Most anemia patients were aged 41 - 60 years as many as 53 people (66.3%). There are more females subjects than males, namely 41 people (51.2%) in females and 39 people (48.8%) in males.

Keywords: Anemia; Chronic Kidney Disease; End Stage Renal Disease; Hemodialysis

1. Introduction

Based on data from the Indonesian Nephrology Association (PERNEFRI) in 2012, it shows 433 per 1 million population of CKD patients continue to be ESRD [1]. End Stage Renal Disease has an impact on decreasing the quality of life, finances and mental health of the patient [2].

According to data from the Indonesian Health Research and Development Institution (Balitbangkes) in 2018, ESRD is the cause of death in Indonesia with amount about to 59% of the incidents of Non - Communicable Diseases (NCD) in Indonesia [3].

ESRD is defined as the stage of irreversible decline in kidney function that is severe enough to require Renal Replacement Therapy (RRT) such as hemodialysis, continuous ambulatory peritoneal dialysis, or transplantation. According to the National Kidney Foundation, ESRD has an estimated glomerular filtration rate of < 15 mL per minute per 1.73 m^2 [4]. Anemia is a complication in ESRD and is often associated with a decrease in the quality of life of the patients, an increase in patient morbidity and mortality and accelerates the progression rate of CKD [5]. Anemia is defined as hemoglobin (Hb) less than 13.0 g/dL in men and less than 12.0 g/dL in premenopausal women [6].

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Based on the problems that occurred, the researchers were interested in conducting research to study the characteristics of the patients in ESRD based on age and gender at Hemodialysis Installation Dr. Soetomo General Hospital Surabaya.

2. Material and methods

This study was a descriptive observational study that involved data from the medical records of anemia patients at Hemodialysis Installation Dr. Soetomo General Hospital Surabaya in December 22nd 2020 – February 10th 2021. The variables observed were age and gender of patients. Medical record data were collected and grouped based on the criteria to be studied, then described qualitatively and quantitatively.

80 patients' medical records were obtained. The data were recorded in the form of percentage and tabular form. This research has been reviewed and approved by the Health Research Ethics Committee, Dr. Soetomo General Hospital Surabaya (No. 0164/LOE/301.4.2/X/2020)

3. Results and discussion

From a total of 80 patients, data from medical records were collected and we took data in the form of age and gender of the research subject.

3.1. Age of Research Subject

Table 1 Average of Age

N	Mean ± SD	Median	Minimum	Maximum
80 people	48.08 ± 10.598	50	21	77

Table 2 Average of Hemoglobin by Age

Age Group	Number (n)	%	Mean ± SD	Median	Minimum	Maximum
≥ 18 - 40 years	17 people	21.3%	9.23 ± 1.372	8.90	6.90	11.50
41 - 60 years	53 people	66.3%	9.23 ± 1.554	9.40	4.90	11.90
> 60 years	10 people	12.5%	9.37 ± 1.274	9.15	7.20	11.50
Total	80 people	100%				

Data from 80 research subjects, average age is 48.08 ± 10.598, there were 17 people aged ≥ 18 - 40 (21.3%), aged 41 - 60 people with a total of 53 people (66.3%), > 60 years as many as 10 people (12.5%).

Age is one of the factors that can affect an individual's health status. Degenerative processes that occur after the age of 40 years will result in changes in anatomy, physiology, and biochemistry, causing a decreased function of the kidney and a decrease in quality of life by 1% every year. At the age of 40 - 70 years, the Glomerular Filtration Rate (GFR) will decrease progressively to 50% of normal, there is a decrease in the ability of the kidney tubules to reabsorb and concentrate urine, there is a decrease in the ability to empty the bladder completely thereby increasing the risk infection and obstruction, as well as a decrease in fluid intake which is a risk factor for kidney damage [7].

However, it is not only the aging process that causes a decrease in kidney function, this can also occur at a young age caused by other factors that are risk factors for CKD, namely lifestyle, kidney disease, family history of diseases such as diabetes mellitus, hypertension. And other comorbid diseases [8].

In this study, it was found that subjects with an age interval of 41 - 60 years had the most anemia in ESRD patients as many as 53 people (66.3%) with a mean age of 48.08. The results of this study are not much different from the results of a study conducted by Sukandar E in 2013 which stated that patients who experienced CKD were mostly patients with an age range of 50 - 59 years as many as 20 people (33.3%)[8]. The results of this study are also in line with the results of research by Putri in 2014 conducted at Al - Ihsan Hospital Bandung that the most ESRD patients undergoing hemodialysis are those of productive age (age 45 - 54 years) with a percentage of 31.7% [9].

3.2. Gender of Research Subject

Table 3 Distribution of Research Subject by Gender

Gender	Number (n)	%
Male	39 people	48.8%
Female	41 people	51.2%

Table 4 Average of Hemoglobin by Gender

Gender	Mean \pm SD	Median	Minimum	Maximum
Male	9.46 \pm 1.592	9.70	4.90	11.70
Female	9.04 \pm 1.329	9.10	5.90	11.90

Data from 80 research subjects, average of gender in male is 9.46 ± 1.592 and in female is 9.04 ± 1.329 . Regarding gender in males there are 39 people (48.8%), and in females are 41 people (51.2%).

In this study, it was found that the most subjects were 41 females (51.2%) and 39 males (48.8%). The average Hb in female research subjects was 9.04 g/dL while in males it was 9.46 g/dL. The results of this study are the same as the results of a study conducted by Garini in the period June - December 2016 at Siti Khodijah Hospital Palembang which in this study the male sex had higher Hb levels than the female. The average Hb for males is 8.213 g/dL and 7.794 g/dL for females. This is in accordance with the theory which states that women of reproductive age often experience anemia, due to blood loss during menstruation and an increased need for iron during pregnancy. With this menstrual cycle, women need more iron as a constituent of Hb than men [10]. This is also supported based on the theory from the results of research by Guyton in 2006, which is where low Hb levels in women can be caused by the monthly menstrual process. In addition, there are hormonal differences that dominate women and men. In men, the dominant sex hormone is testosterone, while the sex hormone in women is dominated by estrogen. Testosterone can increase the speed of metabolism so that the rate of formation of Hb also increases [11]

4. Conclusion

Most anemia patients were aged 41 - 60 years as many as 53 people (66.3%). There are more female subjects than males, namely 41 people (51.2%) in females and 39 people (48.8%) in men.

Compliance with ethical standards

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Disclosure of conflict of interest

There is no conflict of interest in this study.

Statement of ethical approval

This research had an ethical clearance that was approved by the Health Research Ethics Committee, Dr. Soetomo General Academic Surabaya (No. 0164/LOE/301.4.2/X/2020).

Statement of informed consent

This study uses secondary data attained from medical records, hence no direct inform consent from the patients are required.

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