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Myelodysplastic Syndrome Overview in the Elderly: Case Report

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Abstract

Background: Myelodysplastic syndrome (MDS) is a hematopoietic disorder characterized by cytopenia, dysplasia, and genetic abnormalities that can transform into acute myeloid leukemia. MDS cases generally occur in children and adults. This case report involves a 75-year-old elderly individual with no history of MDS or family illness. Purpose of the Study: This study serves as a reference for screening the nursing perspective of MDS in the elderly. Methods: This research is a descriptive case report of 1 case. Results: A 75-year-old elderly patient with 1 month of weakness and pallor, blood pressure of 140/90 mmHg with controlled hypertension for 1 year. Laboratory results showed correlation with MDS symptoms: leukopenia (leukocytes 2.85 x 10^3/µl), thrombocytopenia (platelets 1,000/µl), and anemia (Hb 4.3g/dl). Conclusions: Hematological data support the patient experiencing MDS. Additionally, the patient's exposure to pesticides for 40 years also strongly supports the occurrence of MDS as it is a triggering factor for MDS.

Keywords Elderly; Hematological Disorders; Nursing Assessment of Myelodysplastic Syndrome

1. INTRODUCTION

Myelodysplastic syndrome (MDS) is a collection of various clonal disorders of hematopoietic system cells characterized by cytopenia and dysplasia and tends to transform into acute myeloblastic leukemia (AML) (Wijaya, 2022). (Lauritsen et al., 2023) stated that the 100,000 incidence rate of MDS in Asia is 4.15/100,000/year, and the point prevalence per 100,000 people is seven events (0.0007%) /year. It was also found that the incidence and prevalence of MDS is higher in men than women and increases with age. Individuals with this disease feel tired more easily, are more prone to infections, and experience bleeding and bruising more easily (Hasserjian, 2018). Common characteristics seen in MDS (Agustin et al., 2019) include a decrease in hemoglobin or platelet levels or even white blood cells that sometimes exceed the normal amount. Research conducted by (Montoro et al., 2018) on the elderly with a sample of 50 elderly to see the incidence of disorders that occur after being diagnosed with MDS in the elderly. The results found that there were 43 (85%) blood disorders, 5 (10%) with a history of disease (high blood pressure and diabetes), and two elderly (5%) who were not sure (Oktariani et al., 2020).

Research by (Avagyan et al., 2022) shows the results of MDS with the occurrence of blood disorders divided into 2, namely low risk and high risk, where low risk is emphasized in children and high risk in adults, rarely in the elderly. Based on the above research, it can be confirmed that MDS can occur in the elderly, strengthening the data on the occurrence of blood disorders/abnormalities, which are also found in cases found in elderly patients 75 years. The uniqueness that occurs in 75-year-old elderly patients with no history of blood disorders, both family and individual, and who have never undergone blood transfusions, is that patients are often exposed to pesticides for 40 years because of their work as farmers. According to (Fenaux et al., 2020), MDS precipitating factors include chemotherapy or radiotherapy, exposure to chemicals, such as cigarette smoke, pesticides, and benzene, and exposure to heavy metals, such as lead and mercury.

So many precipitating factors, patient exposure to pesticides, and not having a genetic history of blood disorders are of interest to researchers to see how the picture of MDS in the elderly. However, in the case of patients, MDS occurs at the age of 75 years and previously did not have a history of blood disease/disorder problems.

2. METODS

This study employs a descriptive research method to illustrate cases of myelodysplastic syndrome (MDS) in the elderly population. The descriptive approach aims to provide a systematic, factual, and accurate representation of the characteristics of individuals or groups being studied. In this context, the research focuses on elderly patients diagnosed with MDS, highlighting various clinical features, demographic data, as well as common risk factors or comorbidities found in this age group.

Data may be collected from medical records, patient registries, interviews, or direct observations. This study does not involve manipulation of variables; instead, it aims to portray the condition as it naturally occurs. The findings from this method are expected to offer valuable insights for healthcare professionals in recognizing patterns and characteristics of MDS in older adults and may serve as a foundation for further research or for developing more targeted management strategies.

3. FINDINGS AND DISCUSSION

A 75-year-old woman came to the emergency unit at a government teaching hospital on November 9, 2021, with complaints 1 month before being admitted to the hospital; the patient complained of weakness that worsened 2 days before being admitted to the hospital. Complaints were felt to be getting worse. The patient admitted to getting tired quickly and unable to do daily activities as usual. There were complaints of blurred vision and darkening, especially when changing positions from sitting or lying to standing. The patient also complained of decreased appetite since 2 weeks before the hospital. The patient only ate and drank a little and lay in bed more. There was a history of nosebleeds 1 month ago for 1 day, as many as 3 tissues, and bleeding gums for 3 days, as many as two tissues. There was no history of trauma to the nose and gums. Complaints of nosebleeds and bleeding gums appeared suddenly and stopped on their own. There were no complaints of fainting, headaches, blurred vision, slurred speech, weakness of one limb, or decreased consciousness. There were no complaints of black vomit like coffee grounds or black, sticky, runny stools like asphalt.

There was no history of bruising or red bleeding on the skin. There were no complaints of bleeding from the birth canal. There was no history of fever. There was no known history of previous weight loss. The patient had a history of high blood pressure known since 1 year ago, with an average blood pressure of 140/90. Blood pressure was sometimes every day, sometimes high, and the highest was 170/100. The patient sometimes took high blood pressure medication amlodipine 5 mg once a day. There was no history of diabetes. The patient had no history of receiving transfusions due to previous blood problems. The patient had no known history of blood disorders or blood

cancer in the family, chemotherapy or radiotherapy, routine drug use, heart, kidney, or liver disease, or any of these. The patient had previously worked as a rice farmer for 40 years and was often exposed to pesticides.

The patient is currently married and has 10 children. There was no history of bleeding during childbirth. The patient had no history of previous miscarriage. The patient has no family history of high blood pressure, diabetes, blood disorders, or previous blood cancer. General condition is moderate, compos mentis consciousness, GCS 15 (E4 M6 V5), blood pressure 120/70 mmHg, pulse 80 x / minute, respiration 20 x/minute, temperature 36°C, SpO2 98% and oxygen binasal cannula 2-3 L / minute. In the system assessment on 11/9/2021, it was found that the respiratory and oxygenation systems were no airway obstruction and no dyspnea, but the patient felt tired quickly, the patient used binasal cannula oxygen 2-3 L/minute, SpO2 without oxygen 96% and after being given oxygen 99%, no cough, normal vesicular breath sounds, the thorax appeared symmetrical and there was no crepitation. Furthermore, the cardiovascular system has a pulse of 96 x/minute, pale conjunctiva, pale skin, cold temperature at the tips of the extremities, normal heart sounds, CRT extremities > 2 seconds, and no edema. Gastrointestinal system, eating frequency 3 times a day with an amount of 1 portion according to that provided by the hospital, and the patient also ate snacks, namely bread, nausea, vomiting, bowel movements every 2 days with a yellow color and a slightly hard consistency, normal sclera, dry oral mucosa, pink tongue, swallowing reflex present, chewing reflex present, bowel sounds 12x/minute: neurological system, no difficulty speaking and motor weakness.

The urogenital system, normal urination pattern, frequency of urination 4-5 times a day depending on the number of fluids consumed by the patient, clear yellow urine color, no urinary aids installed, the patient urinates spontaneously. Reproductive system: the patient has gone through menopause at the age of 59 years, the patient has 10 children, $G_0P_{10}A_0$ the last age of giving birth to the last child was 54 years, and the patient has never used birth control. Integumentary system, cold in the area of the tip of the extremities. There is a transfusion reaction, namely fever after a platelet transfusion, with a temperature of 37.6 ° C. Then, in the musculoskeletal system, there are no fractures, and the family assists the patient's mobility; fatigue makes it difficult for the patient to do activities. Muscle strength of the right upper extremity 5, left upper extremity 4, and right and left lower extremities 5.

Hematological system: anemic conjunctiva, no enlarged spleen, the tip of the extremities feels cold, no bleeding. In the personal hygiene assessment, daily activities are assisted, and the appearance looks clean. The patient tries to go to the bathroom

every day to clean himself. Family assists in daily living activities. Furthermore, in the psychosocial assessment, a calm facial expression was found, good speaking ability, and the patient uses the local language more often. Regarding coping mechanisms, the patient solves problems himself. Then, in the assessment on 11/15/2021, the patient's general condition was found to be moderate, the patient did not use oxygen, SpO2 was 97%, anemic conjunctiva, no nausea, appetite was better, bowel movements were still every 2 days, the patient could go to the bathroom alone with family supervision, no fever, fatigue had decreased significantly, the patient could do independent activities, the tips of the extremities felt warm, blood pressure 130/70 mmHg, pulse 89 x / minute, breathing 20 x / minute, temperature 36.5 ° C. The following (Table 1) explains the clinical manifestations and system assessments found in patients, which are based on the theory of MDS disease (Mayoclinic, 2020).

Table 1. Clinical Manifestations of MDS

No	Clinical manifestations based on theory	Clinical manifestations found in patients
1	Fatigue	✓
2	Shortness of breath	✓
3	Pallor	✓
4	Easily bruised	-
5	Red spots under the skin/petechiae	-
6	Infection causing decreased white blood cells/leukopenia	✓
7	Bleeding	✓
8	Reduced platelet count/thrombocytopenia	✓
9	Decreased hemoglobin count/anemia	✓
10	Additional symptoms felt:	Blurred vision
11		Loss of appetite
12		Cold extremities
13		Nausea
14		Fever
14		**Fever**

The supporting data obtained on 11/9/2021 when the patient was admitted to the hospital and during the treatment period with abnormal values were colored red (table 2). Furthermore, during hospitalization, the patient was given a platelet transfusion of 9 flasks and packed red cells of 3 flasks. Then, the drugs consumed were KSR tablets 1x1200 mg, amlodipine tablets 1x10 mg, paracetamol tablets 3x500 mg, dexamethasone injection 1x10 mg, leucogen injection 1x300 mg and KCL 25 meq via infusion for two cycles.

Table 2. Compelete Blood Count Dan Blood Chemistry

Parameter	Result	Unit	Reference Value
9/11/2021 (Before hospital admission)			
Hemoglobin	3.7 *	g/dl	12.3-15.3
Leukocytes	5.2 *	10'3/ul	4.4-11.3
Thrombocytes	33 *	Thousand/ul	150-450
9/11/2021 (When entering the hospital)			
Hemoglobin	4.3 *	g/dl	12.3-15.3
Hematocrit	11.5 *	%	36.0-45.0
Erythrocytes	1.44 *	Million/ul	4.5-5.1
Leukocytes	2.85 *	10'3/ul	4.4-11.3
Thrombocytes	1 *	Thousand/ul	150-450
Total neutrophils	0.48 *	10'3/ul	3.82.10-8.89
RBS	145 *	mg/dl	<140
ureum	16.1	mg/dl	15.0-39
creatinine	0.73	mg/dl	0.6-1.2
potassium	3.3 *	meq/L	3.5-5.1
9/11/2021			
Peripheral blood morphology erythrocytes	Normochromic Normocytic.		
Leukocytes	There are a number of suspected blasts with little to moderate cytoplasm, slightly coarse nuclear chromatin, and unclear nucleoli.		
Thrombocytes	Less number, no giant thrombocytes found.		
Impression	Peripheral pancytopenia with suspected blast findings (4%)		
Parameter	**Result**	**Unit**	**Reference Value**
14/11/2021			
Hemoglobin	11.7 *	g/dl	12.3-15.3
Hematocrit	32.7 *	%	36.0-45.0
Erythrocytes	4.01 *	Million /ul	4.5-5.1
Leukocytes	2.11 *	10'3/ul	4.4-11.3
Thrombocytes	21 *	Thousand /ul	150-450

Total neutrophils	0.51 *	10’3/ul	3.82.10-8.89

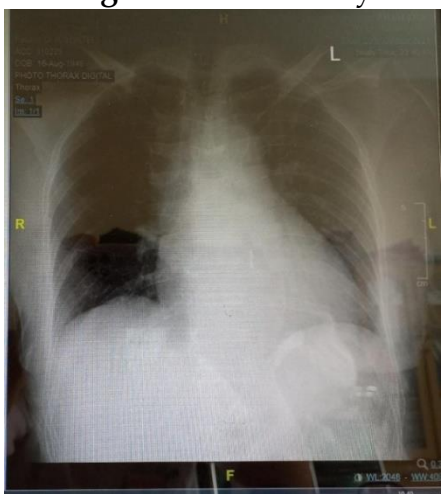
Parameter	Result	Unit	Reference Value
15/11/2021			
Hemoglobin	11.1 *	g/dl	12.3-15.3
Hematocrit	31.6 *	%	36.0-45.0
Erythrocytes	3.80 *	Million/ul	4.5-5.1
Leukocytes	1.58 *	10’3/ul	4.4-11.3
Thrombocytes	21 *	Thousand/ul	150-450
Total neutrophils	0.35 *	10’3/ul	3.82.10-8.89

Parameter	Result	Unit	Reference Value
16/11/2021			
Hemoglobin	11.4 *	g/dl	12.3-15.3
Hematocrit	32.8 *	%	36.0-45.0
Erythrocytes	4.01 *	Million/ul	4.5-5.1
Leukocytes	2.28 *	10’3/ul	4.4-11.3
Thrombocytes	16 *	Thousand/ul	150-450
Total neutrophils	0.43 *	10’3/ul	3.82.10-8.89

16/11/2021	
Bone marrow	
Erythropoietic series	Bone marrow cellularity is low,
Granulopoietic series	Found fat cells clustered.
Thrombopoietic series	quantity is low, quality is normal
	quantity is low, quality is normal, found some plasma cells (,10%)
	no megakaryocytes found
Conclusion	apastic anemia

From the laboratory results, on 11/9/2021, there was a decrease in hemoglobin, leukocyte, erythrocyte, platelet, total neutrophil, and potassium levels. However, after being given drug therapy and transfusion, there was an increase in laboratory results on 11/16/2021, although it was still not within normal values. Furthermore, the patient underwent a chest X-ray (figure 1), where the results showed no bronchopneumonia/pneumonia, cardiomegaly, or aortic atherosclerosis. From the bone marrow results on 11/16/2021, the patient was diagnosed with aplastic anemia.

Figure 1. Chest X-ray



Thorax AP
Asymmetrical photo, poor inspiration
Skeletal and soft tissue visualized within normal limits
The trachea in the middle
Mediastinum not widened
Cor enlarged to the left lateral with apex embedded in the diaphragm. Normal heart waist, aortic calcification (+)
Sinuses and diaphragm within normal limits
Pulmo:
Hill within normal limits
Bronchovascular markings increased
No patchiness/clouding in both lung fields
Cranialization
Impression:
No bronchopneumonia/pneumonia
Cardiomegaly
Aortic atherosclerosis

Myelodysplastic Syndrome (MDS) is a hematopoietic disorder characterized by thrombocytopenia with bleeding manifestations and a risk of leukemia progression. In the reported cases, MDS in the elderly with an average age of 70 years is due to the effects of prolonged leukemogenic agents or secondary effects due to previous radiation or chemotherapy exposure, other factors are work as farmers and industrial workers who are often exposed to chemicals (SITORUS, 2018). Myelodysplastic Syndrome (MDS) in a 72-year-old elderly with deep lung infiltrates (Bizymi et al., 2021) is due to acute or chronic immune system disorders; in contrast, in this case, there was no history of immune disorders. Clinical manifestations of MDS include anemia 80%, fatigue, infection, or bleeding. Signs of bleeding in MDS usually occur on the skin or mucosa due to thrombocytopenia, and not infrequently, patients will also experience fever as a sign of infection (Crawford et al., 2017). Other physical

examinations include 60% pallor, 26% petechiae or purpura, hepatomegaly, or splenomegaly 5-10%. In cases found with clinical manifestations of fever and pallor, patients complain of weakness and bleeding through the nose and mouth without a known cause, CRT <2 seconds. In addition, the results of the patient's laboratory examination showed aplastic anemia with a hemoglobin value of 4.3 gr/dl, platelets 1,000 / μL, peripheral pancytopenia with 4% blasts, less leukocytes, normochromic normocytic erythrocytes. Radiological examination in cases found cardiomegaly.

Treatment of the disease with antibiotics, blood transfusions, and administration of bone marrow stimulants to produce normal blood cells (Brunner et al., 2022). For those already in the advanced stage, MDS is usually given chemotherapy to control the bone marrow to produce normal blood cells (Garcia-Manero et al., 2020). In the case of treatment that was carried out, it was only at the pharmacological treatment stage by administering KSR 600 mg, Amlodipine 10 mg, Paracetamol 500 mg, Dexamethasone 5 mg, GCSF, KCL 25 meq in 500 ml RL, and also PRC and TC transfusions. The patient's condition was continuously monitored during the treatment program, and currently, the patient's general condition is starting to improve, only still experiencing weakness, and there is no bleeding. The results of the last hematology examination, Hemoglobin, was 11.4 g / dL; platelets fluctuated with the last examination at 16,000 / μL, and leukocytes 2.28 10 ^ 3 / μL. In this case, MDS occurred due to risk factors of elderly age and the patient's work as a farmer who had been running for approximately 40 years. When interviewed, the patient said that when spraying pests using herbicides, the patient never used a mask because, in ancient times, there was indeed no information on using herbicides when gardening. The accumulation of chemical substances from herbicides has accumulated in the patient's body and become a risk factor for MDS currently experienced, which is in line with research conducted by (Avgerinou et al., 2017), namely, pesticide exposure is the leading risk factor for MDS in Western Greece. Public health authorities should implement policies to advise and protect farmers from the harmful effects of agricultural chemicals. Emphasis should also be placed on health promotion advice, including healthy eating.

4. CONCLUTION

It can be seen that MDS occurs in individuals of advanced age, although it is common in children and adults. The findings of hematological data corroborate the patient that there are disorders/abnormalities in the patient's blood, such as anemia, thrombocytopenia and leukopenia, without a history of symptoms except hypertension in the last 1 year. Patients exposed to pesticides for 40 years are also

strong support for the occurrence of MDS because it is a precipitating factor for MDS, even though it only occurred at the age of 75 years. This study can illustrate and inform readers that MDS can occur at an advanced age. Avoiding the precipitating factors can reduce the occurrence of MDS itself. Further research can be done to discover other precipitating factors that can cause MDS in older people besides pesticide exposure.

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