

## **Nurse's duties towards a patient with cancer of the hematopoietic system**

**Bożena Baczewska<sup>1</sup>, Julita Marciniak<sup>1</sup>, Aleksandra Pawlak<sup>1</sup>, Beata Kropornicka<sup>1</sup>,  
Ewa Krzyżanowska<sup>1</sup>, Cecylia Olszak<sup>1</sup>, Elżbieta Nowicka<sup>1</sup>, Robert Jan Łuczyk<sup>1</sup>**

<sup>1</sup>Department of Internal Medicine and Department of Internal Medicine in Nursing, Faculty of Nursing and Health Sciences, Medical University of Lublin

### **SUMMARY**

Cancer diseases are among the most common among society. In Poland, more than 100,000 people suffer from cancer of the hematopoietic system. people, and the diagnosis is made to almost six thousand Poles each year. The disease is associated with a long and tiring treatment process, which, like its essence, affects the patient's well-being. The oncology patient spends a large part of his life in the hospital where he is under the care of a medical team. It stands out as a physician, psychologist and nurse, taking care of the patient in a multidimensional and personalized way. Especially between the patient and the nurse, a trust is established, thanks to which the patient has a sense of security and more willingly succumbs to all therapeutic activities performed by him. The aim of this study was to determine the nurse's tasks towards a patient with cancer of the hematopoietic system. The study was conducted using the individual case study method, and the knowledge of the patient's biopsychosocial status was collected on the basis of a patient data sheet, enriched with appropriately selected scales.

**Key words:** neoplastic disease, nurse's tasks, oncology, care problems, nursing problems, hematopoietic system.

## **ADMISSION**

Cancer is the unrestrained growth of the body's cells that have been altered functionally and morphologically. They are divided into benign ones, which do not give metastases and are malignant (cancer), are characterized by metastasis, resumption and the formation of incisions [6]. Hematopoietic neoplasms are defined as heterogeneous. These include myeloid tumors, including bone marrow cells as well as lymphoid cells related to lymphoid cells. Myeloid are acute myeloid leukemia as well as chronic myeloproliferative syndromes such as essential thrombocythaemia, polycythemia vera and chronic myeloid leukemia. Leukemia is characterized by the growth of tumor cells in the bone marrow, disturbance of their normal function and inhibition of the maturation of normal cells. They are included in malignant tumors. They may have an acute or chronic course. The essential thrombocythemia belongs to the tumor, which is histopathologically benign. It is characterized by the presence of a large number of platelets that may have an impaired function [3]. True sinew is defined as a cancerous excess of erythrocytes, granulocytes and platelets. It is also considered to be benign histopathologically.

In turn, cancers from the lymphoid line include, among others, Hodgkin's Hodgkin's lymphoma, as well as non-Hodgkin's lymphomas [2,3,6,7,9]. Hodgkin's lymphoma is a malignant tumor that includes lymph nodes. Non-Hodgkin's lymphomas are located in the lymphatic system and are derived from B or T lymphocytes. Depending on the degree of their malignancy, among them are those with low malignancy, which include chronic lymphocytic leukemia, intermediate-malignant lymphomas, including multiple myeloma, and also high-grade lymphomas, including acute lymphoblastic leukemia [3,9,11].

It is difficult to identify the direct causes of neoplastic diseases of the hematopoietic system, however, various factors predisposing to their occurrence are given. There are chemical factors that include the influence of benzene on the human body, smoking and pesticides, genetic factors, environmental factors, ionizing radiation, viral infections, as well as the effect of chemotherapy. The majority of hematopoietic neoplastic diseases, including polycythemia vera, originate from the mutant marrow stem cell clone. In addition, in Hodgkin's lymphoma, the Caucasians belong to the risk factor. There is an increased risk of Hodgkin's disease in monozygotic twins, children from single-parent families and premature babies. The risk of non-Hodgkin's lymphoma may be

increased by deficiencies in innate and acquired immunity, and with age [1,5,6,9].

Symptoms of hematopoietic neoplastic disease may result from bone marrow or lymphoid tissue involvement. Common symptoms of cancer include malaise, increased body temperature, weight loss, reduced physical performance, and bone pain in particular characteristic of acute leukemia and multiple myeloma, characterized by the occurrence of compression fractures of the vertebrae and myeloma that causes damage urethra. In addition, acute and chronic leukemia is characterized by high leukocytosis. Among the symptoms is also night sweats, indicating non-Hodgkin's lymphoma or Hodgkin's disease, which draws attention to the itching of the skin, which is also characteristic for polycythemia vera, in addition to visual disturbances and hypertension [6,8,9,11,12 , 13].

Local symptoms suggestive of a malignant disease occurring within the lymphoid tissue include enlarged lymph nodes, spleen and liver. Excessive enlargement of the spleen affects the occurrence of symptoms resulting from bone marrow involvement, which include anemia, neutropenia and thrombocytopenia. Malignant lymph nodes are enlarged asymmetrically. In the mediastinum can give symptoms such as cough, shortness of breath and hoarseness, while in the abdomen obstruct the intestinal passage, which results in constipation. In non-Hodgkin's malignant lymphomas, they cause abdominal pain, vomiting and obstruction accompanied by bleeding and ascites. Among the local symptoms, it is worth mentioning the symptom of bloodshot, red eyeballs characteristic of polycythemia vera [2,4,9,11].

In order to diagnose cancer of the hematopoietic system, a number of tests are performed, including laboratory tests (including blood counts, CRP, biochemistry, urinalysis, and in myeloma, calcium, transaminases, immunoelectrophoresis of proteins are additionally measured) serum and proteinogram), subjective, pathomorphological, imaging (X-ray, MRI, CT, PET, ultrasound, gallium isotope and bone marrow treacherobiopsy), cerebrospinal fluid examination, biopsy of lymph nodes or bone marrow as well as cytogenetic and molecular tests (FISH method in situ hybridization, RT-PCR) [2,3,5,6,8,9,13].

The healing process in neoplastic diseases of the hematopoietic system depends on the results of histopathological examinations. The goal of cancer treatment is to completely heal or survive as long as possible. The most common method of treatment is chemotherapy, in which the use of cytostatics, inhibits cell division, also cells not affected by cancer. The aim of chemotherapy is to reduce leukemic cells, to the level at which the results of hematological tests are regulated (induction treatment), to strengthen remission and to fight the remaining cancer cells (consolidating treatment), subsequent cell proliferation (maintenance treatment). Another method of treatment is radiotherapy, which is rarely used in disseminated tumors, but is used in lymphomas and myelomas. A more modern way of treatment is immunotherapy, which destroys cancer cells by using the

mechanisms of the immune system. It has a selective effect and is less toxic than chemotherapy. In addition, one of the directions of treatment is bone marrow transplantation. It involves intravenous transfusion of donor bone marrow cells after prior administration of high doses of chemotherapeutics and irradiation of the entire host body. It is used in the treatment of acute and chronic myelogenous leukemia and at the recurrence of Hodgkin's granulomatosis. [1,3,5,9,10].

## **OBJECTIVE OF THE WORK**

The aim of this study was to determine the nurse's tasks towards a patient with cancer of the hematopoietic system.

## **MATERIAL AND TEST METHODS**

The study included a female patient aged 49 who was admitted in a planned mode to the Department of Hematooncology in Lublin on 19/01/2018. The patient's stay in the clinic was due to the recurrence of lambda plasmocytic myeloma and aimed at continuing the treatment. In 2015, the patient was treated for low back pain in the lumbar region. However, after a monthly, non-curative treatment, she was referred for diagnostic tests - blood counts and spine x-ray. The first diagnosis of cancer was presented to the patient in 2015 in Zamość. The patient underwent chemotherapy and radiotherapy, which initially was successful, but with complications, among which were habitual constipation and chronic renal failure. In addition, other complications resulting from the disease were observed, such as secondary hyperparathyroidism in the course of chronic renal failure as well as pathological fractures of Th12 and L3. In 2016, the patient underwent bone marrow transplant, which gave the intended effects and allowed the patient to temporarily recover, because already in 2017 diagnosed with recurrence of the disease and resumption of chemotherapy. Both in 2017 and during the patient's period in the hospital (from 19.01.2018), chemotherapy was interrupted due to recurrent inflammation. In addition, the patient had intravenous injection of KKC and KKP, and antibiotics were also used.

On the day of the study, the patient complained about shortness of breath, local swelling of both lower limbs around the ankles and a cough during which she felt severe pain around the sternum. She spent most of her time in bed reading books. The patient was fully aware of her health situation, communicative and willing to make contact. In the analysis of blood counts, a reduced hemoglobin value was found in the patient because the result fluctuated between 8.0-9.4 g / dl at the norm range of 12.0-16.0 g / dl. The platelet count was also reduced because it was less than 25,000, with the norm of 150-400 thousand / mm<sup>2</sup>. There was also an increased concentration of urea:> 10.1 mmol / l, with a norm of 2.0-6.7 mmol / l and an increased value of creatinine - the result

ranged from 1.6-3.25, with the norm 0.5- 1.1 mg / dl.

The research was carried out in the Department of Hematooncology and Marrow Transplant in Lublin. It deals with the treatment of patients with tumors of the hematopoietic system. For research purposes, the case study method was used, which approximated the biopsychosocial state of the patient. This method has been enriched with properly selected research techniques, which were observation, examination of documents, interview and measurements. The interview allowed direct contact with the patient and allowed to gather the necessary information. Completed information was complemented by an analysis of the documents, which were the results of blood counts and general urine tests. Not only the patient, but also her family and her surroundings were treated with the technique of observation, because it is a deliberate action, the subject of which is not only the patient's appearance and behavior, but also the conditions in which he is located. The measurements covered all the scales and instruments used to assess the patient's state of health. The research tools used in this work were a sheet for collecting patient data enriched with the following scales: Barthel, Laitinen scale and VAS indicating the degree of pain, MRC scale defining degree of dyspnoea, Baxter scale evaluating the course of phlebitis, sheet covering the risk related to nutritional status (NRS) ), the patient categorization sheet, the severity of WHO adverse reactions, the myelosuppression scale, the scale of anemia and neutropenia, the scale of neutropenic fever, and the Beck depression scale.

## **RESULTS**

Diagnosis and treatment of cancer is a very difficult situation for both the patient and his family. The disease changes the way we understand ourselves and the world around us, as well as the system of values. The risk of occurrence in people with cancer is very high. The analysis of the patient's tests made it possible to conclude that the patient has a reduced mood and feels anxiety and anxiety resulting from the diagnosis. Nevertheless, her mood is even and stable. According to Beck's depression scale, the patient scored 8 points, which does not indicate depression. However, the test showed the difficulties faced by the patient: decrease in self-esteem and difficulty in accepting dependence on other people, easier fatigue, difficulty sleeping, nightmares, and a decrease in libido.

The woman is fully independent in performing everyday activities, as indicated by the Barthel score, where the patient's condition was described as "light". The patient is also classified in category I. It meets six category I care criteria (physical activity, hygiene, nutrition, excretion, treatment, as well as education and mental support) and one category II criterion of care, such as the measure-

ment of vital signs, because they are performed more often than twice a day, and the weight is controlled.

As a result of the conducted tests, the patient was found to have several care problems, such as dry skin and constipation as a result of chemotherapy, as well as pain. The patient describes constipation as moderate, they are not treated pharmacologically. They occur periodically, most often after eating raw fruits or vegetables, as well as during the limitation of physical activity caused by pain behind the sternum and shortness of breath. Using the VAS scale and the Laitinen scale to assess the intensity of pain, two different results were obtained. According to the Laitinen scale, the patient scored 6 points, and also showed the negative impact of pain on her physical activity. It occurs periodically and despite its high intensity, the patient sporadically takes medication. However, when evaluating pain according to the VAS scale, a score of 7 was obtained, which means average pain.

The patient also suffered from weakness, effort dyspnoea and pain in the area of the sternum appearing during coughing. Using the MRC scale, the patient's dyspnoea was determined in stage II. Due to dyspnoea, the patient walks more slowly than his peers and, while walking at his own pace on flat terrain, he must stop to get his breath.

On the scale to assess the risk related to the nutrition status (NRS), the patient received 2 points, which is why conservative treatment is recommended and the study should be repeated within a week.

According to the assessment scale, the degree of severity of side effects in the patient was observed in stage I symptoms, which include heart rhythm and its efficiency, pericarditis, fever, allergic reactions, hairy head, skin changes, leukocyte and granulocytes level, the presence of bleeding, nausea and diarrhea, oral mucosa, as well as creatinine, bilirubin, the degree of infection and consciousness, and the presence of protein and blood in the urine. The second degree includes the level of hemoglobin, the degree of constipation and the degree of dyspnoea. However, the level of urea and platelets was classified as grade IV. The scale to assess myelosuppression showed that the patient's platelet count is at IV °, hemoglobin and neutrophils at II °, while the level of leukocytes is at I °. Myelosuppression is the result of bone marrow infiltration by cancer cells or bone marrow damage by chemotherapy. According to the scale to assess the severity of anemia, the patient has moderate anemia, which may be the result of both the essence of the disease and treatment. However, on the basis of the scale to assess the severity of neutropenia, its grade was defined as II. Neutropenia is a significant reduction in neutrophil counts. The patient's neutrophil count is within the range of 1.0

thousand /  $\mu\text{l}$  - 1.5 thousand /  $\mu\text{l}$ , with the norm of 1.5-8 thousand /  $\mu\text{l}$ . In the scale to assess the risk of complications of febrile neutropenia according to MASCC, the patient scored 21 points, so there is a small risk of infection (about 6%) and complications of febrile neutropenia.

The edema of the lower limbs became particularly troublesome for the patient. They are caused by the occurrence of chronic renal failure, which in turn is a side effect of the applied chemotherapy. Due to oedemas edema, the patient reported minor difficulties in movement.

## **DISCUSSION**

The occurrence of neoplastic disease of the hematopoietic system is an increasingly frequent phenomenon. The prognosis for the treatment of this disease depends on the type of cancer, its severity and the general state of health of the patient. In connection with the treatment, a sick person spends a large part of his life in the hospital, under the care of a medical team in which a nurse plays a special role, a trust that makes him feel safe and more willing to succumb to any therapeutic activities performed by the nurse. The analysis of the conducted study confirmed and indicated that the oncological patient needs multidimensional nursing care in a holistic approach. The nurse's task is to participate in diagnosing, pharmacological treatment, nursing and prevention, as well as in educating the patient and his family in every sphere of the patient's life. They concern the essence of the disease and the complications resulting from it, as well as how to alleviate them and how to prevent them. In addition, the nurse's task is to support and mobilize the patient to fight cancer, replace and assist him in activities that he can not cope with, as well as in accepting his changed appearance. It is also important to encourage the patient to get in touch with other people. The nurse is one of the closest people to the patient, because he is his lasting support and closeness. In the most difficult moments of life of a person suffering from cancer, he gives him the most help, gives him confidence, a smile on his face, kindness as well as patience and understanding.

## **RESULTS**

1. The examined in the biological sphere is characterized by disorders of respiratory, hematopoietic, bone and alimentary systems as well as changes within skin layers. In the mental and spiritual sphere, the patient suffers from disorders and a decrease in well-being.
2. The patient is fully independent in performing everyday activities, requires only help while moving.
3. The subject requires anti-thrombotic prophylaxis, anti-haemorrhagic prophylaxis and reduces the risk of infection of the organism and infection at the injection site.
4. In the patient, diagnostic activities relate to blood and urine tests, assessment of nutritional status,

degree of pain and dyspnea, as well as fluid balance and measurements of basic vital parameters. In addition, the subject requires pharmacological treatment.

5. The study requires education in the field of diet, measures to reduce the risk of hemorrhage and infection, as well as in the care of dry skin and local edema of lower limbs.

## **BIBLIOGRAPHY**

1. Baczevska B., Pielęgowanie pacjentów w chorobach układu krwiotwórczego. W: Kędziora-Kornatowska K. (i in.) (red. nauk.): Repetytorium z pielęgniarstwa. Wydawnictwo Lekarskie PZWL, Warszawa 2010, s.100-103, 120-125.
2. Bonar J., Chaber R., Chybicka A., Dobaczewski G., Dyla A., (i in.): Od objawu do nowotworu., (red. nauk.) Chybicka A., Copyright by Elsevier Urban ZNAK Partner, Wrocław 2009, s.200-205, 211-220.
3. Foroniewicz B.(red.), Mucha K.(red.), Pączka L.(red.): Choroby wewnętrzne. Podręcznik dla studentów pielęgniarstwa i położnictwa. Wydawnictwo Lekarskie PZWL, Warszawa 2004, s.349-357, 368-371.
4. Hahn J.: Choroby wewnętrzne. ( red. nauk.) Skoczyńska A., MedPharm Polska, Wrocław 2015, s.545, 548.
5. Janicki K.: Hematologia. Wyd. I. Wydawnictwo lekarskie PZWL, Warszawa 2001, s.295-296, 299-301.
6. Jeziorski A., (red.): Onkologia. Podręcznik dla pielęgniarek. Wydawnictwo Lekarskie PZWL, Warszawa 2009, s.44, 89-90, 159-165, 180-205.
7. Juszczynski P., Szydłowski M.: Patogeneza nowotworów układu krwiotwórczego. Hematologia 2013, 4, s.280-282.
8. Koper A.: Pielęgowanie onkologiczne. Podręcznik dla studiów medycznych. Wydawnictwo Lekarskie PZWL, Warszawa 2009, s.71-87, 309-318.
9. Kułakowski A. (red. nauk.), Skowrońska- Gardas A. (red. nauk.): Nowotwory układu krwiotwórczego / w: Onkologia podręcznik dla studentów medycyny. Chmielewska E., Dziukowa J. (i in.), Wydawnictwo Lekarskie PZWL, Warszawa 2003, s.205-223.
10. Malinowska –Lipień J., Fornagiel Sz. (red. nauk.): Pielęgowanie hematologiczne. Wydawnictwo Lekarskie PZWL, Warszawa 2015, s.93-128, 175-178, 181-185, 194-197, 206, 218-223, 229, 264-274.
11. Matysiak M.: Choroby krwi. (red. nauk.) Józwiak S. Wydawnictwo Lekarskie PZWL, Warszawa 2010, s.61-69.

12. Rutkowski B.: Ostra niewydolność nerek w oddziale hematologicznym. *Nefrologia i Dializoterapia Polska* 2005, 4, s.147-149.
13. Szczeklik A.: *Choroby wewnętrzne. Medycyna Praktyczna*, Kraków 2006, s.1492-1493, 1531-1533.