Special Article

Myelodysplastic Syndrome: Nursing Approach and Challenges for Providing Quality Nursing Care

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Abstract

Myelodysplastic Syndrome (MDS) is a serious, long-term condition that affects the hematopoietic system. The disease affects the production and function of blood cells, leading to a variety of symptoms, including anemia, easy fatigue, bruising, and bleeding.

Management and care of MDS requires a comprehensive approach from health professionals. Doctors, nurses, and other professionals work together to provide tailored care by identifying and treating the symptoms and complications of the disease. Assessment of oxidative stress is an important part of clinical monitoring, as high production of oxidants is associated with disease complications. Patient education by nursing staff is essential. Patients should be educated about the nature of MDS, its health implications, and practical management strategies, including advice on diet, exercise, and symptom management. This completes a holistic quality care that supports patient information and their involvement in their care helping to improve their quality of life and disease management. Prevention of nutritional depletion is important, as patients with MDS are susceptible due to the hypermetabolic nature of the disease and intensive treatment regimens. Adjusting their diet can help maintain their health and well-being.

Overall, the quality of care of MDS requires a comprehensive approach, including information, care delivery, and prevention of complications, to improve patients' quality of life and effective disease management.

Keywords: Myelodysplastic Syndrome, hematopoietic system, symptoms, management, tailored, care, patient education, oxidative stress, nutritional depletion, prevention, quality of care, quality of life.

Introduction

Myelodysplastic Syndrome is a long-term condition that has a significant impact on both patients and their caregivers. Patients face various problems due to dysfunctions in the production and development of hematopoietic cells in the bone marrow (Platzbecker et al, 2021). Common symptoms include anemia with fatigue, weakness, shortness of breath, bruising, and bleeding due to low platelet levels, low white blood cell levels with increased risk of infections, enlarged spleen which can cause pain, and problems with heart function and thermoregulation of the body (Brownstein et al., 2020).

The abnormality in the production and development of hematopoietic cells in the bone marrow can have significant effects on the organisms of these patients. During this process, increased levels of oxidants may be produced. This can have negative effects on many tissues, cause damage to cells, DNA, and body organs, and contribute to the development of various pathologies. These lesions can worsen the condition of MDS patients and contribute to disease progression (Ghaffari & Saghi,2008). In addition, it can affect the function of the immune system, increasing the risk of infections and other complications. So, this condition requires careful monitoring and management by doctors and nursing staff (Ghaffari & Saghi, 2008).

Oxidative stress negatively affects overall human health, and assessment of oxidative stress and antioxidant levels in the body contributes to understanding its effects (Pizzino et al,2017). Measuring levels of oxidative stress and antioxidants in the body helps facilitate research, allowing researchers to gain additional certainty about how it affects the body. In addition, genetic predisposition is taken into account, adding another factor to the understanding of the parameters that influence this process.

Management of these problems requires the creation of a customized care plan for patients with MDS and high levels of oxidative stress. This involves holistic quality care with the collaboration among physicians, nurses, and other skilled health professionals to improve the patient's quality of life and manage the disease (Vaseghi et al., 2022). The care plan includes general guidelines that help shape integrated quality care. Below are some general guidelines for such a plan.

Assessment of the patient's Health Status

Assessing the health status of a patient with MDS requires a detailed medical and nursing history to fully understand their clinical condition and determine optimal management of the condition. During this process, healthcare professionals gather important information about the patient's medical history, any current or past medical illness, previous treatments and operations, and any medication use (Ghaffari & Saghi, 2008).

Specifically for patients with MDS, history analysis focuses on disease-related aspects such as duration of symptoms, degree of anemia, presence of bleeding, weakness, and any symptoms related to disease progression. In addition, the evaluation includes an assessment of the level of hematopoietic cells in the blood, indications of possible complications of MDS (such as conversion to leukemia), and an assessment of accompanying risk factors, such as previous radiotherapy or chemotherapy (Kelly et al., 2015).

Gathering this information allows healthcare professionals to recognize the patient's particular needs and tailor the care plan accordingly. In addition, performing this detailed assessment allows for monitoring the patient's progress during treatment and adjusting the treatment plan according to disease progression (Tammy et al., 2023).

The role of quality nursing care in the patient's quality of life.

The role of nursing care in the quality of life of people with MDS is vital. The goal is not just survival, but survival with a good quality of life. Through the provision of specialized care, the enhancement of autonomy, and psychosocial support, the nurse helps patients face the challenges they face every day due to their disease, accept their condition, and focus on achieving life satisfaction. Through this approach, nurses can support their patients in achieving a high quality of life during the treatment of the disease (Thomas et al., 2012).

The nurse plays a critical role in preparing the patient to successfully manage life's

challenges. One aspect of this role is encouraging patients to follow the treatment regimen correctly and consistently, without gaps. This will help ensure that unnecessary complications do not occur and thus maintain a better quality of life in the long term (Jimmy & Jose, 2011). Another aspect of preparing the patient for life's challenges is making the patient able to follow a treatment regimen as easily as possible. This means administering treatment at convenient times, thereby minimizing interference with work. Patients who feel socially or professionally isolated, who do not feel integrated or recognized as valuable members of society, become frustrated and demoralized, thus losing motivation to live up to the demands of managing their illness (Cornwell & Waite, 2009).

With awareness and support, the nurse creates an environment that enhances the psychological and physical well-being of patients and contributes to ensuring a better quality of life for them (Lyu et al., 2024).

The Importance of measuring biomarkers in the assessment of oxidative stress in patients with MDS

Assessing the level of oxidative stress through biomarkers in patients with MDS is an important part of the clinical evaluation, as increased production of oxidants is usually associated with the pathogenesis of the disease and its resulting complications (Gonçalves et al., 2021).

Oxidative stress biomarkers are substances that can be measured in blood, serum, or other biological samples and provide information about the level of oxidative stress in the body. Some of these biomarkers include the measurement of free radicals, antioxidant enzymes, and antioxidant molecules (Frijhoff et al., 2015).

Measuring these biomarkers can provide doctors and nurses with valuable information about the level of oxidative stress the MDS patient is experiencing. This can help predict potential complications, assess treatment efficacy, and design tailored treatment approaches (Gonçalves et al., 2021).

The role of nurses in patient education for the management of MDS

Patient education by nursing staff on how to maintain a healthy lifestyle is a critical part of quality care, particularly in the case of MDS. This education includes information about the nature of the syndrome, its impact on health and lifestyle, as well as advice on diet, exercise, and symptom management. Nursing staff explain to patients the importance of following healthy habits such as a balanced diet, maintaining personal hygiene, following medication instructions, and monitoring symptoms that may appear (Kelly et al., 2015).

The goal of this education is to equip patients with the knowledge and skills they need to effectively manage their condition and maintain a healthy lifestyle that will contribute to improving their quality of life and coping with the syndrome (Kelly et al., 2015).

Benefits of Dietary Therapy for MDS

Initially, patients with nutritional issues who are at risk should be assessed to prevent deterioration of their nutritional status, maintain nutritional status, and improve their response to treatment. The sources of nutritional problems in patients with MDS are closely related to treatments such as radiation, chemotherapy, immunotherapy, and bone marrow transplantation. Side effects of these treatments may include irritation and inflammation of the mouth, tongue, and throat, diarrhea, constipation, nausea, vomiting, taste distortion, changes in appetite, changes in weight, etc. Nutritionists should adjust the dietary program according to the stage of the disease, age, and overall health status of the patient (Nutrition and MDS).

MDS patients are particularly prone to nutritional depletion due to the combined effects of the hypermetabolic nature of the disease and the intensive and high-dose regimens (Maziarz & Slater, 2021). In practice, malnutrition is often associated with prognostic outcomes such as increased morbidity and mortality in hematological cancer patients (Ryan et al., 2016).

Therefore, there is a need for accurate nutritional assessment to help identify patients most suitable for early intervention.

General dietary guidelines include eating reasonable portions of minimally processed foods such as fruits, vegetables, whole grains, and legumes at each meal while emphasizing the consumption of foods rich in vitamins, minerals, protein, energy, and fiber. It is recommended to eat at least 5 servings of non-starchy vegetables and fruits daily, as well as drinking enough water for hydration. Also, the general dietary guidelines state that patients with MDS may feel better by avoiding certain drinks and foods (Chen et al., 2023).

Adhering to a balanced and healthy diet is a critical factor in improving general well-being and restoring health, especially in cases such as MDS patients. Such a diet can boost energy levels and reduce fatigue associated with illness and treatments. This can lead to faster recovery during and after treatment. In addition, it may contribute to maintaining a healthy body mass index and weight because some patients may experience cachexia, which is an involuntary and severe loss of muscle and adipose tissue (fat) due to chronic inflammation and increased metabolic processes (Chen et al., 2023).

A balanced diet can strengthen the immune system, helping to prevent and fight infections that may occur and promote faster healing of wounds and tissue damage that may be caused by treatment (Cena & Calder, 2020).

Nurses provide comprehensive care, contributing to patients' daily activities and monitoring their condition. They seek to promote healthy eating to prevent disease and help patients recover from illness. At the same time, they teach patients how to optimally manage chronic diseases with healthy food choices. Through education, nurses provide patients with the tools to maintain their health by encouraging preventive measures (Kelly et al., 2015). Recognizing potential nutritional deficits, nurses offer support in cases where nutrition may be affected by disease or living conditions. In addition, they are responsible for observing potential risks that may endanger their nutritional status and taking appropriate actions to improve them (Kesari & Noel., 2023).

Some people with MDS who have neutropenia, or a low white blood cell count may benefit from a diet designed to keep neutrophil levels in a safe range. In MDS, neutropenia can be caused either by the disease itself or as a side effect of chemotherapy and other treatments, particularly after a stem cell transplant, which affects the immune system. These individuals are more vulnerable to bacterial, fungal, and viral infections. It is recommended that they follow a neutropenic diet to limit exposure to fungi or bacteria commonly found in certain foods to reduce the risk of acquiring foodborne contamination or illness (Chen et al., 2023; National Institute of Diabetes and Digestive and Kidney Diseases, 2020).

Nurses have daily responsibilities for patient monitoring and care, including recording important information in the medical record. This includes taking vital signs, checking blood sugars, recording observations, and monitoring for signs and symptoms (Nursing guidelines). Establish goals to improve the patient's nutrition during hospitalization and teach the patient and relatives about the nutritional guidelines to follow. Communication with the patient and relatives is an essential part of care, to provide information, guidance, and psychological support regarding the patient's nutrition and care, as well as to communicate any complications or symptoms that they should monitor (King & Hoppe, 2013).

Benefits of symptom management in patients

Managing symptoms has multiple benefits, which positively impact their quality of life and overall well-being.

One of the main symptoms that often appear in MDS patients is infection. Patients are vulnerable to infections due to low production of healthy white blood cells in their bone marrow, which is part of the disease's disease profile. This means that their immunodeficiency is increased, and they have a reduced ability to fight infections (Leone & Pagano, 2018).

Infections can be serious and require immediate medical attention. Nursing care has an important role in the monitoring, detection, and management of infections in MDS patients. This includes monitoring for

symptoms of infection, obtaining samples for culture, assessing the severity of the infection, and applying appropriate treatment, including giving antibiotics or other antimicrobial drugs. Also, nurses promote hygiene and infection prevention practices to reduce the risk of infection in patients (Leone & Pagano, 2018).

Bone pain is a common symptom in MDS patients. This pain can be the result of various factors, including anemia, cancer cells attacking the bones (osteolytic metastases), or inflammation of the bone marrow. Bone pain may be most noticeable in the long bones of the limbs, ribs, and sternum, but it can also affect other areas of the body. Management of this pain is important to improve patients' comfort and quality of life and to cope with the consequences of disease and treatment (Wei et al., 2019).

Nursing quality of care includes also assessing pain, recording symptoms, and providing tailored care. First, they must assess the patient's pain using clinical pain rating scales and work with the patient to record their perceptions of pain. They then provide medically directed drug therapy for pain control, taking into account the patient's individual needs and preferences. This may involve the administration of analgesic drugs by various routes of administration, such as peripheral or central intravenous or seropositive doses, depending on the type and severity of pain. In addition, nurses offer support to patients through non-pharmacological methods of pain management, such as the use of pain relief techniques, psychological support, and planning activities that can distract from pain (Alghamdi et al., 2024).

Fatigue is a common symptom for patients with MDS and significantly affects their quality of life. This fatigue is multidimensional, affecting both their physical psychological, and emotional state (Thomas et al., 2012). Therefore, its management is an important part of care, with nurses exploring practical interventions that can help minimize the effects. It is also important that nurses have realistic discussions with patients about how they can manage their fatigue in their daily lives.

Patients suffering from MDS are often elderly and require careful assessment of their ability to perform daily activities (Kurtin, & Demakos, 2010). In addition, nurses need to be aware of additional stressors for caregivers of older patients with MDD and provide them with guidance on where to find support.

Benefits of exercise in patients with MDS

Although it may seem counterintuitive to the fatigue and weakness that the disease can cause, regular exercise can help improve one's physical condition and quality of life. Exercise can help increase patients' stamina and energy, improving their general fitness and endurance (Schuler et al,2016). In addition, it can help improve patients' respiratory function and aerobic capacity (Ludwig & Strasser, 2001).

Nurses play an important role in encouraging and supporting patients to participate in exercise programs and incorporate them into their daily lives. Depending on the condition and needs of each patient, nurses can formulate customized exercise programs and provide appropriate guidance and support. They monitor progress, celebrate successes, and provide feedback for improvement (Avancini et al., 2021).

Benefits of drug therapy management

Treatment options can be different, so it is important to stay informed and understand new treatment approaches and their potential effects. Nurses can provide education to patients about the importance of drug therapy in the management of MDS. This education may include information about the types of medications they are taking, potential side effects, and how treatment can help manage symptoms (Rieger & Yarbro, 2003).

They monitor the patient's response to drug therapy daily and evaluate its effectiveness. This includes measuring drug levels in the blood, monitoring potential side effects, and adjusting treatment according to the patient's needs (Kelly et al., 2015).

In addition, they encourage patients to comply with drug therapy, explaining the importance of following the dosage schedule and physician's instructions (Haynes et al,2002).

They monitor and manage the potential side effects of drug therapy, providing advice and support to manage them. Patient safety and the avoidance of medication errors require multidisciplinary collaboration with effective communication between healthcare professionals (Mardani et al., 2020).

Nurses work closely with doctors and other specialists to improve and adapt drug therapy to each patient's needs. This may include adjusting the dosage, changing medications, or addressing possible side effects. Through this collaboration, the optimal management of drug therapy for the benefit of the patient is sought (Kelly et al,2015).

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