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Multiple Myeloma: Examining the Condition's Symptoms, Causes, and Pharmacological Treatment

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ABSTRACT
Myelomaaffects the plasma cells in the body causing multiple myeloma cancer. In this paper way to reduce the cancer causing factor is studied and came to a conclusion that prophylactic antimicrobials is given to prevent infection and to increase immunity.

KEYWORDS : Myeloma, antimicrobials.

INTRODUCTION

Emerging as one of the leading types of cancer, multiple myeloma, a malignant condition, affects plasma cells. Globally, Attal, Lauwers-Cances and Marit et al. (2012) documented about six to seven in every 100,000 persons are likely to be diagnosed with this condition. From the perspective of clinical features, McCarthy, Owzar and Hofmeister et al. (2012) stated that patients with multiple myeloma exhibit non-specific symptoms (Palumbo, Bringhen&Mateos et al., 2015); with some likely to have been presented for an extended period. As avowed by Palumbo, Cavallo and Gay et al. (2014), some of the symptoms with which the condition is associated include impaired renal function, fatigue (reported in about 32% of cases), bone pain (reported in about 58% of cases), and anemia of unknown origin (reported in about 73% of cases of multiple myeloma) (Pulte, Jansen and Castro et al., 2016)). Some of the procedures undertaken to detect bone changes include radiological investigation, the cytogenetic analysis of bone marrow, clinical chemistry, and diagnostic workup involving a physical examination and history taking (Attal, Lauwers-Cances and Marit et al., 2012). For initial diagnoses, clarifications can be done through the application of FDH positron emission tomography and magnetic resonance imaging. Due to sensitivity reasons, McCarthy, Owzar and Hofmeister et al. (2012) stated that low-dose whole-body computed tomography has been preferred in the place of the Paris scheme, which entails a conventional whole-body radiographic bone survey.

Box 1

Diagnosis of multiple myeloma

- **Laboratory parameters in serum**
  - Differential blood count, electrolytes, creatinine, LDH, CrP, β2-microglobulin
  - Plasma coagulation, total protein, albumin
  - Serum electrophoresis with densitometric determination of M protein
  - Quantitative determination of immunoglobulins (IgG, IgA, IgM, IgD)
  - Determination of free light chains (including FLC ratio), immunofixation electrophoresis
- **Laboratory parameters in urine**
  - 24-h urine collection, determination of free light chains
  - Immunofixation electrophoresis, albumin
- **Bone marrow diagnosis**
  - Cytology and/or histology, cytogenetic investigation (chromosome analysis and FISH) to detect unfavorable cytogenetic aberrations
- **Diagnostic imaging**
  - Low-dose whole-body computed tomography
  - Supportive magnetic resonance imaging, positron emission tomography if needed

Source: Pulte, Jansen and Castro et al. (2016)

Indeed, multiple myeloma forms a notable malignant systemic hematological disease linked to monoclonal plasma cells. According to Palumbo, Bringhen and Mateos et al. (2015), the condition is prevalent in older patients. In the patients' urine or serum, the major characteristic of multiple myeloma entails the presence of monoclonal immunoproteins. Relative to the indication for the treatment of multiple myeloma, the two main features of consideration include recently defined biomarkers and the demonstration of organ damage. As indicated by Palumbo, Cavallo and Gay et al. (2014), another notable aspect involves the diagnostic work-up for multiple myeloma, which is achieved through imaging procedures, bone marrow evaluation, and the mandatory analysis of urine and blood samples. From a treatment perspective, some of the supportive measures observed to yield improvements in patients with multiple myeloma include the antineoplastic treatment, accompanied by processes such as the irradiation of extramedullary or skeletal lesions, the administration of bisphosphonates, and pain therapy. In situations involving older patients, Pulte, Jansen and Castro et al. (2016) documented that multiple myeloma could be treated and managed through autologous stem-cell transplantation and age-adjusted high-dose treatment. On the other hand, the study by Attal, Lauwers-Cances and Marit et al. (2012) highlighted that individuals under 70 years of age could have their condition (multiple myeloma) addressed through induction treatment, which needs to precede autologous stem-cell transplantation – with high-dose treatment; especially if comorbidities are absent. In relation to refractory or recurrent multiple myeloma, some of the factors that determine treatment modalities include histories of previous treatment, comorbidities, and age. Should there be a rapid increase in paraprotein or the presence of new myeloma-related organ damage, many studies advocate for the immediate initiation of treatment (McCarthy, Owzar and Hofmeister et al., 2012). However, Palumbo, Bringhen and Mateos et al. (2015) stated that a slower increase in paraprotein calls for the need to delay the initiation of treatment. For the recurrent multiple myeloma, some of the treatment approaches that are worth implementing include the use of classical chemotherapy agents, immunomodulatory substances, and proteasome inhibitors (Palumbo, Cavallo and Gay et al., 2014). From the outcomes of clinical trials, bortezomib is efficacious in treating recurrent multiple myeloma;

including situations where patients have been treated previously (and successfully) with the same substance. Immunomodulatory drugs that have been recommended include pomalidomide and lenalidomide. Other treatments that continue to be used in combination with corticosteroids include melphalan, cyclophosphamide, doxorubicin, and bendamustine. With deaths in patients with multiple myeloma often attributed to infections, this paper concludes that there is a need to administer prophylactic antimicrobials to the patients, especially due to the prevalence of infections in the initial phases of treatment using immunomodulatory substances.

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