

Multiple Myeloma

Maryam Fayyaz

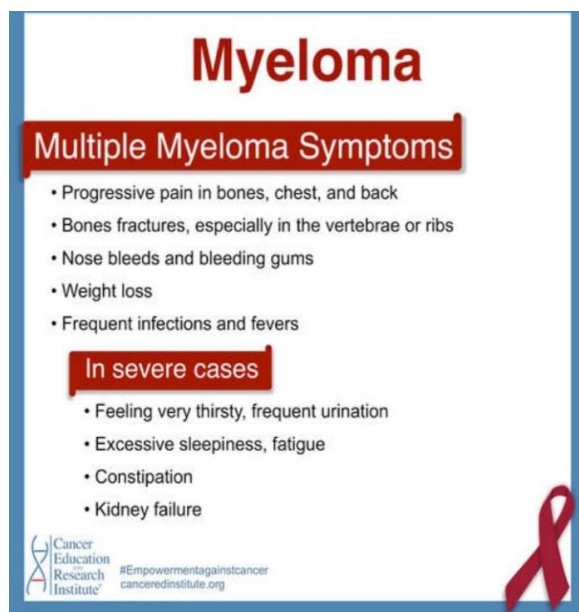
1st Year MBBS, Islamabad Medical and Dental College, Islamabad Pakistan

Key Points

- Overview of multiple myeloma
- Early diagnosis and treatment
- Immunosuppression in MM
- Vaccination in MM patients
- Autologous stem cell transplantation

Overview of multiple myeloma:

Multiple myeloma is a type of blood cancer in which abnormal clonal plasma cells are present in bone marrow that undergo uncontrolled division. It can cause anemia, kidney injury hypercalcemia and destructive bone lesions. There is high ratio of multiple myeloma in US. 34920 people are diagnosed with multiple myeloma in US every year.



Approximately 588161 people suffer from multiple myeloma annually worldwide.¹

Early diagnosis and treatment

It is very important to diagnose and treat multiple myeloma in early stages because delay in its treatment can result in dialysis dependent renal failure, painful bone fractures and life threatening

infections.

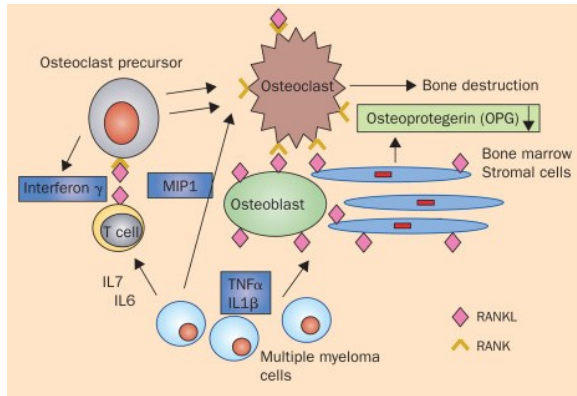
Various tests are performed to diagnose this deadly disease. Bone marrow biopsy, imaging of skeleton, blood tests and serum free light chain (sFLC) assay are some of them.²

Drugs

Different drugs are used to treat Multiple myeloma. These drugs may have some side effects which can vary from person to person. Bortezomib can cause peripheral neuropathy, thalidomide cause fatigue. People taking carfilzomib suffer from cardiovascular problems. Ixazomib may cause gastrointestinal problems and lenalidomide may have haemolytic side effects. Ingestion of Corticosteroids may result in bone loss, fluid retention effects eye complications and insomnia.³

Immunosuppression

One of the common feature of multiple myeloma patients is immunosuppression. (immune system weakens or destroy) and it is associated with disease progression from its early stages. Immunosuppressive effects are promoted by Multiple myeloma cells because soluble factors are secreted and they block the function of immune effector cells. Expression of surface molecules is altered which is also responsible for suppression of immune system.⁴



Source: <https://www.google.com>

Vaccination

One of the most successful inventions of mankind is vaccine. Lives of millions of people are saved by vaccination. Patients of multiple myeloma have increased risk of infections because their immune system is weak as compared to normal people due to their disease-inherent immune suppression so Vaccination is particularly important for them. Special attention should be given in this matter and all appropriate measures should be taken. Even some common pathogens like influenza, varicella zoster virus, pneumococci, meningococci and various viruses like hepatitis can cause death of MM patient.⁵

Novel treatments

Multiple myeloma is a medical condition in which there is bone marrow neoplasia. No permanent cure of this disease has been developed till now but still there are some novel treatments that can give relief for months to several years such as proteasome inhibitors and bone marrow transplant. These treatments tend to increase the lifespan of affected people.⁶

Autologous stemcell transplantation

Multiple myeloma is being treated by Autologous stem cell transplantation (ASCT) for more than 30 years. This procedure is normally performed in people younger than 65 years of age. Here are some outcomes of patients older than 75 years who have

undergone ASCT. Between 2005 and 2020, several patients approximately 50 who were older than 75 years of age received an ASCT at Mayo Clinic, Rochester. Half of the patients were given reduced intensity conditioning with melphalan 140mg/m². 48% MM patients didn't get hospitalized during ASCT. Whereas 52% got hospitalized during treatment, these people suffered from various infections, fever, cardiac arrhythmia and dehydration. Autologous stem cell transplant is quite safe and should be performed carefully in Multiple myeloma patients aged 75.⁷

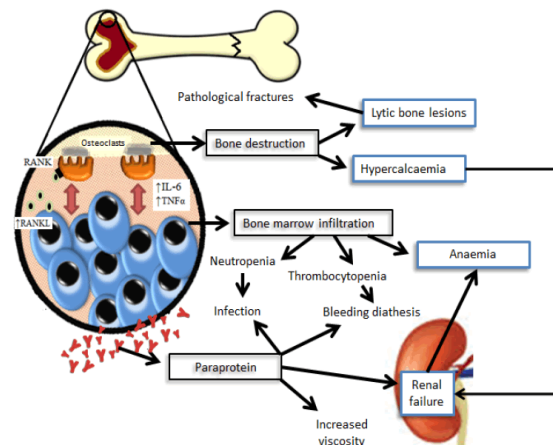


Figure 2: The main pathophysiological processes in MM.

Source: <https://www.goole.com>

Reference

1. Cowan AJ, Green DJ, Kwok M, Lee S, Coffey DG, Holmberg LA, Tuazon S, Gopal AK, Libby EN. Diagnosis and management of multiple myeloma: a review. JAMA. 2022 Feb 1;327(5):464-77.
2. Szabo AG, Klausen TW, Abildgaard N, Gregersen H, Silkjær T, Pedersen PT, Pedersen RS, Helleberg C, Hermansen E, Schnack BI, Vangsted AJ. Incidence and clinical characteristics of multiple myeloma with low M-protein levels and normal values of hemoglobin, creatinine, calcium, and serum free light chain ratio. Blood cancer journal. 2021 Apr 7;11(4):1-4.
3. Terpos E, Mikhael J, Hajek R, Chari A, Zweegman S, Lee HC, Mateos MV, Larocca A, Ramasamy K, Kaiser M, Cook G. Management of patients with multiple myeloma beyond the clinical-trial setting: understanding the balance between efficacy, safety and tolerability, and quality of life. Blood cancer journal. 2021 Feb 18;11(2):1-3

4. Díaz-Tejedor A, Lorenzo-Mohamed M, Puig N, García-Sanz R, Mateos MV, Garayoa M, Paino T. Immune system alterations in multiple myeloma: Molecular mechanisms and therapeutic strategies to reverse immunosuppression. *Cancers*. 2021 Jan;13(6):1353.
5. Ludwig H, Boccadoro M, Moreau P, San-Miguel J, Cavo M, Pawlyn C, Zweegman S, Facon T, Driessen C, Hajek R, Dimopoulos MA. Recommendations for vaccination in multiple myeloma: a consensus of the European Myeloma Network. *Leukemia*. 2021 Jan;35(1):31-44.
6. Diaz-delCastillo M, Chantry AD, Lawson MA, Heegaard AM. Multiple myeloma—a painful disease of the bone marrow. In *Seminars in Cell & Developmental Biology* 2021 Apr 1 (Vol. 112, pp. 49-58). Academic Press.
7. Vaxman I, Visram A, Kumar S, Dispenzieri A, Buadi F, Dingli D, Lacy M, Muchtar E, Kapoor P, Hogan W, Hayman S. Autologous stem cell transplantation for multiple myeloma patients aged ≥ 75 treated with novel agents. *Bone Marrow Transplantation*. 2021 May;56(5):1144-50.