# CLINICAL AND LABORATORY ASPECTS IN MULTIPLE MYELOMA (LITERATURE REVIEW)

**Egamberganova Zulayho**
*Master of the Department of Military Field Therapy and Hematology, Urgench branch of the Tashkent Medical Academy*
**Fazilova Sharifa Mirkhamidovna**
*PhD Senior Lecturer, Department of Military Field Therapy and Hematology, Urgench branch of the Tashkent Medical Academy E-mail: fazilovasharifa@mail.ru*

**Summary:** *With myeloma, clinical manifestations appear, which are explained by the proliferation of myeloma cells in the bone marrow and the action of the immunoglobulins and free light chains produced by them. The updated criteria allow for early diagnosis and treatment prior to the development of end organ damage. As follows from the criteria, the diagnosis of multiple myeloma requires the presence of 10% or more plasma cells on bone marrow examination or the presence of a biopsy-proven plasmacytoma, plus one or more disorders due to the disease.*

**Key words**: *myeloma, diagnosis, plasma cells, disease.*

Relevance. Myeloma (M) is a tumor disease characterized by infiltration of the bone marrow by plasma cells and extensive damage to the bones of the skeleton, which is accompanied by pain and bone fractures. When myeloma is suspected, the screening program should include a variety of tests and review them frequently over time. Patients are recommended to be examined by all available methods, including immunophenotyping of bone marrow plasma cells, treatment of plasma cells with thymidine, immunofixation, isoelectric focusing, flow cytometry, studies of free light chains of immunoglobulins in blood serum, etc. [1]. Myeloma accounts for more than 10% of tumors of the hematopoietic system and is characterized by a variety of forms, variants and clinical manifestations. Among the variants of myeloma, there are forms with the secretion of IgG and IgA, the frequency of which, according to the literature, is 55-65% and 20-25%.[3].

Despite a long period of study and a large number of multicenter studies, the mechanisms of myeloma formation and prognosis remain poorly understood to this day [1]. Myeloma, like many other diseases, is by its nature a pathology with an unclear etiology; a variety of exogenous and endogenous interdependent factors are involved in its pathogenesis [4,5].

The most common manifestations are persistent bone pain (especially in the back or chest), kidney failure, recurrent bacterial infections; however, in most cases, the diagnosis is made by routine laboratory tests that show elevated levels of total blood protein, proteinuria, or unexplained anemia or kidney failure. Pathological fractures are common (i.e., non-traumatic or minimally traumatic fractures), may occur due to

vertebral involvement spinal cord compression with the development of paraplegia. It should be noted that the presence of anemia may be the primary or sole reason for the diagnostic search; in a small number of cases there are manifestations characteristic of the syndrome of hyperviscosity of blood. Typical symptoms are peripheral neuropathy, carpal tunnel syndrome (especially with concomitant amyloidosis), abnormal bleeding, signs of hypercalcemia (eg, polydipsia, dehydration). Renal failure may also develop. Lymphadenopathy and hepatosplenomegaly are uncommon[6].

The introduction of modern research methods has made it possible to increase the level of diagnosis of multiple meloma, by determining the immunochemical variants of the disease, which differ in the characteristics of the clinical course and outcome of the pathological process.

In the vast majority of cases, the diagnosis of multiple myeloma begins after the appearance of characteristic symptoms. The diagnosis of myeloma after the onset of symptoms such as fatigue and back pain in practice is usually delayed by more than 3 months. Although it is not known how this affects the outcome of the disease in general, the frequency of complications and hospitalizations increases during this delay period, which negatively affects the quality of life of patients. Many factors influence the cause of the delay, including the non-specific nature of the complaints and disorders that are common in the elderly and are initially considered benign by them and their relatives. But the persistent nature of pain in the spine and increased fatigue should always alert practitioners. Examination for musculoskeletal pain, anemia,

Lobaratory indicators of M arecomplete blood count (CBC) with platelet count, peripheral blood smear, erythrocyte sedimentation rate (ESR), and biochemical blood test (urea [BUN], creatinine, calcium, uric acid, lactate dehydrogenase [LDH]). Serum and urine protein electrophoresis (daily urine collection) followed by immunofixation; quantitative determination of immunoglobulins; serum free light chain levels. Radiography (skeletal examination) and positron emission tomography (PET)-CT or MRI of the whole body. Bone marrow examination, including conventional cytogenetic studies and fluorescence in situ hybridization (FISH)[2].

Multiple myeloma should be suspected in patients > 40 years of age with persistent unexplained bone pain, especially at night or during rest, other typical symptoms, or unexplained laboratory abnormalities (such as elevated total blood or urine protein, hypercalcemia, signs of renal failure, and anemia) or radiological changes that indicate a pathological fracture or lytic lesions. Laboratory diagnostics includes performing standard blood tests, LDH, serum beta-2 microglobulin, urine and serum immunity and protein electrophoresis, determination of free light chains in serum. Patients should also undergo a skeletal examination, either PET-CT scan or whole-body MRI, as these imaging modalities are more sensitive to bone lesions, than x-ray. Along with traditional cytogenetics and FISH studies, bone marrow analysis is also required[8,9].

Standard blood tests include a complete blood count, determination of the ESR level, biochemical analysis. Anemia is present in 80% of patients, it is usually normocytic-normochromic in nature and is characterized by the formation of "pillars", which are stacks containing from 3 to 12 red blood cells. The content of leukocytes and platelets is usually normal. Often there is an increase in ESR> 100 mm / h; possible increase in the levels of blood urea nitrogen, serum creatinine, LDH, beta-2 microglobulin and serum uric acid. Sometimes the anion gap decreases. Hypercalcemia at the time of diagnosis is present in 10% of patients.

To quantify urine M-protein, immune and protein electrophoresis is performed on a serum sample and a urine sample concentrated from a 24-hour collection. Serum electrophoresis detects the presence of M-protein in approximately 80–90% of patients. In the remaining 10–20% of patients, only free monoclonal light chains (Bence-Jones protein) or IgD are usually present. In such cases, the presence of the M-protein can almost always be detected by urine protein electrophoresis. Electroimmunofixation can help identify the M-protein immunoglobulin class (IgG, IgA, or rarely IgD, IgM, or IgE) and can often detect protein light chains if serum immunoelectrophoresis is false negative; electroimmunofixation is carried out even if the serum test is negative,

Thus, for laboratory diagnosis of multiple myeloma, it is necessary to increase the information content of the diagnostic methods for studying multiple myeloma. Many of the main studies have been immunofixation and immunophenotyping using flow cytometry to assess the biological characteristics of plasma cells; and created algorithms for detecting plasma cells in the bone marrow; to determine the minimum residual disease and evaluate the effectiveness of therapy[5,7,10].

**LITERATURE:**

1. Bessmelsev SS 06/03/2013. Russia
2. James R.Berenson MD Institute for Myeloma and Bone Cancer Research Medical Review Oct 2021.
3. Qo‘zieva GZ, X. Ya. Karimov, AA Qayumov 2019 y.
4. Kurmar SK et al. Multiple Myeloma, Version 3.2017, NCCN Clinical Practice Guidelines in Oncology // J Natl Compr Canc Netw. - 2017. - Vol. 15. No. 2. - P. 230-269.
5. Natural history of t(11,14) multiple myeloma|| Leukemia. -2018.-Vol.32, No.1. -P.131-138.
6. Neri, P. Genomic instability in multiple myeloma: mechanisms and therapeutic implications / P Neri, NJ Bahlis // Expert Opin Biol Ther. -2013, Jun. -V.13. -Suppl #1. -P. 69-82.

7. NiIBet al. Translocation t(11,14) (q13,q32) and genomic imbalances in multi-ethnic multiple myeloma patients. a Malaysian study || Hematol Rep.-2012.-Vol.4, No.3.-P.60-65.

8. Rajkumar SV: Multiple myeloma: 2020 update on diagnosis, risk-stratification and management. Am J Hematol 95:548–567, 2020.

9. Sive J, Cuthill K, Hunter H, Kazmi M, Pratt G, Smith D and on behalf of the British Society of Haematology: Guidelines on the diagnosis, investigation and initial treatment of myeloma: a British Society for Haematology/UK Myeloma Forum Guideline. Brit J Haematol 193:245–268, 2021.

10. Suzuki K., Takahashi H. The epidemiology of multiple myeloma || Nihon Rinsho.- 2015.-Vol.73, No.1.-P.7-12.