Myeloma prognostic risk signature (MyPRS) test for myeloma

Record Status
This is a bibliographic record of a published health technology assessment. No evaluation of the quality of this assessment has been made for the HTA database.

Citation

Authors' objectives
Multiple myeloma (MM) is an incurable cancer of plasma cells, the white blood cells that produce antibodies as an integral part of the immune system. In the MM disease process, abnormal plasma cells collect in the bone marrow, leading to bone marrow failure and destruction of bone. Hallmark features of MM are highlighted by the acronym CRAB—calcium elevation; renal insufficiency; anemia; and bone disease. The initial diagnostic work-up in all patients typically includes a history and physical examination, baseline blood studies, urine analysis, serum analysis, bone marrow aspiration, and biopsy. The National Comprehensive Cancer Network (NCCN) MM guidelines and the consensus guidelines of the Mayo Stratification of Myeloma and Risk-Adapted Therapy (mSMART) also recommend chromosome analysis and fluorescence in situ hybridization (FISH) performed on plasma cells obtained from bone marrow aspiration to classify MM subtype. Cases of MM may be morphologically similar, but at the molecular level MM is genetically heterogeneous with numerous chromosomal deletions, amplifications, and translocations reported in association with disease. MM is considered an incurable disease; treatment is intended to control the disease and minimize its end-organ effects. Multiple risk stratification/staging systems have been developed for MM, including the Durie-Salmon System (DSS), the International Staging System (ISS), and the mSMART system. Microarray-based gene expression profiling (GEP) analysis estimates the underlying activity of cellular pathways in a tissue sample that control, for example, cell division or proliferation, apoptosis (programmed cell death), metabolism, or other signaling pathways. Relative over- or underexpression of genes in these pathways is considered to mirror disease aggressiveness independent of cytogenetics and other laboratory measures. GEP analysis has been proposed as a means to more accurately stratify MM patients into risk categories, which may then inform therapy selection according to tumor biology.

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