Prognostic model developed for MDS related to prior cancer therapy

December 13 2011

A large-scale analysis of patients whose myelodysplastic syndrome is related to earlier cancer treatment overturns the notion that all of them have a poor prognosis, researchers from The University of Texas MD Anderson Cancer Center report at the 53rd Annual Meeting of the American Society of Hematology.

"MDS patients whose disease springs from earlier radiation, chemotherapy or both treatments are usually told that they have a poor prognosis. But by analyzing survival risk factors in a large patient population, we've found these patients fall into good, intermediate and poor prognostic groups," said study leader Guillermo Garcia-Manero, M.D., Ph.D., professor in MD Anderson's Department of Leukemia.

Understanding their differing characteristics will better inform treatment decisions for these patients, Garcia-Manero said.

Myelodysplastic syndrome consists of a group of diseases in which the bone marrow progenitor cells that normally morph into red and white blood cells and platelets fail to respond to normal growth controls. That results in too many progenitor cells (also known as blasts) and too few mature blood cells, and in about 30 percent of patients, the disease progresses to acute myeloid leukemia (AML).

Treatment-related MDS is often more resistant to therapy

Therapy-related MDS generally differs from other MDS cases by having more chromosomal abnormalities, a higher rate of conversions to acute myeloid leukemia and high resistance to standard MDS therapy. Even so, Garcia-Manero notes, a one-size-fits-all poor prognosis is not accurate.

The research team analyzed 1,950 MD Anderson patients treated between 1998 and 2007. It found 438 had a history of one or more previous cancers that were treated before their MDS diagnosis. Of these, 279 cases who had received chemotherapy, radiotherapy or both were analyzed.

A first round of analysis identified at least 15 factors associated with overall survival when considered as isolated, single variables.

Next, the researchers conducted a multi-variable analysis that narrowed factors reducing overall survival to seven:

- Age 65 or older.
- ECOG performance status scores of 2-4. (Eastern Cooperative Oncology Group criteria range from 0, which means fully active, to 4, signifying complete disability).
- Cytogenetics. Having at least seven chromosomal alterations and/or complex cytogenetics.
- Two MDS subgroups as determined by World Health Organization Criteria. RARS and RAEB-1/2.
- Serum hemoglobin levels of less than 11g/dL.
- Platelet levels of less than 50.
- Dependency on blood transfusions.

Prognostic model sorts patients into three risk groups

Garcia-Manero and colleagues created a novel prognostic model that

incorporated these multivariate factors and divided patients into three categories:

- Good prognosis - 57 patients fell into this group by having 0-2 of the multivariate risk characteristics. Their median survival was 34 months.
- Intermediate prognosis - 154 patients in this category had 3-4 risk factors and a median survival of 12 months.
- Poor prognosis - 61 patients had 5-7 risk factors and a median survival of only five months.

The model also predicted one-year leukemia-free survival of 96 percent in the good category, 84 percent for intermediate, and 72 percent for the poor.

Model validated in a test group of patients

The researchers validated the model by applying it to an additional 189 treatment-related cases diagnosed between 2008 and 2010. Median survival rates in the test group were:

- Good - 26 months
- Intermediate - 13 months
- Poor - 7 months.

"We believe this model will facilitate development of risk-adapted treatment strategies for patients with treatment-related myelodysplastic syndromes," Garcia-Manero said.

Provided by University of Texas M. D. Anderson Cancer Center