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Shimin Hu

The University of Texas MD Anderson Cancer Center, USA

Cytogenetics-based risk prediction of blastic transformation of chronic myeloid leukemia treated with tyrosine kinase inhibitors

The high fatality of patients with blast phase (BP) chronic myeloid leukemia (CML) urges identification of high-risk patients to prevent onset of BP. Here, we investigated the risk of BP based on additional chromosomal abnormality (ACA) profiles in a cohort of 2,326 CML patients treated with tyrosine kinase inhibitors (TKIs). We examined the time intervals from initial diagnosis to ACA emergence (Interval 1), from ACA emergence to BP (Interval 2) and survival after onset of BP (Interval 3). Based on the BP risk associated with each ACA, patients were stratified into intermediate-1, intermediate-2 and high-risk groups, with a median Interval 2 of unreached, 19.2 months and 1.9 months respectively. There was no difference in Interval 1 or Interval 3 among three risk groups. Including patients without ACAs who formed the standard-risk group, the overall 5-year cumulative probability of BP was 9.8%, 28.0%, 41.7% and 67.4% for these four risk groups, respectively. The pre-BP disease course in those who developed BP was similar regardless of cytogenetic alterations and 79.7% of BP patients developed BP within first 4 years of diagnosis. In summary, Interval 2 is the predominant determinant of BP risk and patient outcome. By prolonging the duration of Interval 2, TKI therapy mitigates the BP risk associated with low-risk ACAs but did not alter the natural course of CML with high-risk ACAs. Thus, we have identified a group of patients who have a high risk of rapid BP and may benefit from timely alternative treatment to prevent onset of BP.

Biography

Shimin Hu is currently a Faculty Member at The University of Texas MD Anderson Cancer Center. He has received his MD from Peking University and PhD from University of Michigan. He did his Pathology Residency training at Hartford Hospital, CT and Hematopathology Fellowship training at The University of Texas MD Anderson Cancer Center. He has published about 60 papers during past three years in highly-regarded journals, including many in *Blood* and Leukemia.

shu1@mdanderson.org

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