CD25 expression status improves prognostic risk classification in AML independent of established biomarkers: ECOG phase 3 trial, E1900.

Abstract

We determined the prognostic relevance of CD25 (IL-2 receptor-α) expression in 657 patients (≤ 60 years) with de novo acute myeloid leukemia (AML) treated in the Eastern Cooperative Oncology Group trial, E1900. We identified CD25(POS) myeloblasts in 87 patients (13%), of whom 92% had intermediate-risk cytogenetics. CD25 expression correlated with expression of stem cell antigen CD123. In multivariate analysis, controlled for prognostic baseline characteristics and daunorubicin dose, CD25(POS) patients had inferior complete remission rates ($P = .0005$) and overall survival ($P < .0001$) compared with CD25(NEG) cases. In a subset of 396 patients, we integrated CD25 expression with somatic mutation status to determine whether CD25 impacted outcome independent of prognostic mutations. CD25 was positively correlated with internal tandem duplications in FLT3 (FLT3-ITD), DNMT3A, and NPM1 mutations. The adverse prognostic impact of FLT3-ITD(POS) AML was restricted to CD25(POS) patients. CD25 expression improved AML prognostication independent of integrated, cytogenetic and mutational data, such that it reallocated 11% of patients with intermediate-risk disease to the unfavorable-risk group. Gene expression analysis revealed that CD25(POS) status correlated with the expression of previously reported leukemia stem cell signatures. We conclude that CD25(POS) status provides prognostic relevance in AML independent of known biomarkers and is correlated with stem cell gene-expression signatures associated with adverse outcome in AML