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The effects of SOCS-2 expression on the prognosis of chronic myeloid leukemia

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Chronic myeloid leukemia (CML) remains to be a fatal disease for patients with resistance to tyrosine kinase inhibition (TKI) treatment who eventually develop blast crisis. The prognosis of CML can be estimated by scoring systems such as Sokal, Hasford and EUTOS derived from differential blood count and spleen size parameters. More recently a number of genetic markers has been associated with outcome but a more precise identification of patients at risk of disease progression remains desirable. Several studies described a correlation of CML progression with the expression of the *suppressor of cytokine signaling 2 (SOCS-2)* gene which is widely implicated in pathways downstream of BCR-ABL and proliferative activity. The aim of this study was to evaluate the expression of *SOCS-2* gene as a predictor of clinical outcome at diagnosis.

In the first part of this study, three groups of patients (n=118) were formed according to molecular response to imatinib and clinical course, labelled as optimal molecular responders (n=47), patients with resistance to imatinib (n=43) and blast crisis patients (n=28). Peripheral blood samples were taken at diagnosis and SOCS-2 gene expression was measured by quantitative real-time PCR. A significant difference in gene expression was found between optimal responders vs. resistant patients (p=0.03) and vs. blast crisis patients (p=0.012). No difference was observed comparing resistant patients with blast crisis patients (p=0.444).

In the second part SOCS-2 expression at diagnosis of consecutively randomized patients from the imatinib 400 mg arm of the CML-IV study was investigated (n=140). The correlation of SOCS-2 expression with overall survival and progression-free survival, and cumulative incidence of cytogenetic and molecular response was analyzed. In contrast to grouped patients no prognostic significance could be derived from SOCS-2 gene expression in this cohort of newly diagnosed patients.

Altogether, the *SOCS-2* gene has been shown to be differentially expressed in different phases of CML and in patients with different response to imatinib. However it did not prove to have a prognostic impact in newly diagnosed patients.