Increased haematopoietic progenitor cells are associated with poor outcome in patients with metastatic renal cancer treated with sunitinib

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BACKGROUND: Haematopoietic progenitor cells (HPCs) are present in blood in metastatic renal cell cancer (mRCC). We investigate their expression in mRCC patients treated with sunitinib and correlate their expression with plasma growth factor levels [insulin-like growth factor (IGF)-1]. METHODS: Circulating HPCs (CD34(+) /CD45(+)) and plasma IGF-1 levels were measured at specific sequential time points (0, 6, 18 and 28 weeks) in 43 untreated mRCC patients receiving sunitinib (50 mg for 28 days followed by 14-day off treatment). Univariate and multivariate analysis assessed the prognostic significance of HPCs and IGF-1. RESULTS: HPCs levels were raised in 40 of 43 (93%) of patients. IGF-1 levels were raised in 9 of 43 patients (21%). Univariate and multivariate analysis revealed that high HPCs before treatment were associated with a significantly shorter overall survival (hazard ratio 3.3, 95% confidence interval 1.23-8.8, P = 0.01), which was not the case for IGF-1 levels. Both HPC and IGF-1 levels fell with sunitinib (61% and 14% fall, respectively, P < 0.05 for both). A positive correlation between the falls in HPC and IGF-1 occurred (P < 0.001). CONCLUSIONS: HPCs are over expressed in the peripheral blood in the majority of patients with mRCC. Higher levels are associated with poor prognosis. A concurrent fall in HPCs and growth factor expression (IGF-1) with sunitinib occurs.