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Development and validation of a prognostic model in patients with metastatic renal cell carcinoma treated with sunitinib: a European collaboration.

Bamias A, Tzannis K, Beuselinck B, Oudard S, Escudier B, Diosynopoulos D, Papazisis K, Lang H, Wolter P, de Guillebon E, Stravodimos K, Chrisofos M, Fountzilas G, Elaidi RT, Dimopoulos MA, Bamia C.

Source

Department of Clinical Therapeutics, University of Athens, Athens, Greece. abamias@med.uoa.gr

Abstract

BACKGROUND:

Accurate prediction of outcome for metastatic renal cell carcinoma (mRCC) patients receiving targeted therapy is essential. Most of the available models have been developed in patients treated with cytokines, while most of them are fairly complex, including at least five factors. We developed and externally validated a simple model for overall survival (OS) in mRCC. We also studied the recently validated International Database Consortium (IDC) model in our data sets.

METHODS:

The development cohort included 170 mRCC patients treated with sunitinib. The final prognostic model was selected by uni- and multivariate Cox regression analyses. Risk groups were defined by the number of risk factors and by the 25th and 75th percentiles of the model's prognostic index distribution. The model was validated using an independent data set of 266 mRCC patients (validation cohort) treated with the same agent.

RESULTS:

Eastern Co-operative Oncology Group (ECOG) performance status (PS), time from diagnosis of RCC and number of metastatic sites were included in the final model. Median OS of patients with 1, 2 and 3 risk factors were: 24.7, 12.8 and 5.9 months, respectively, whereas median OS was not reached for patients with 0 risk factors. Concordance (C) index for internal validation was 0.712, whereas C-index for external validation was 0.634, due to differences in survival especially in poor-risk populations between the two cohorts. Predictive performance of the model was improved after recalibration. Application of the mRCC International Database Consortium (IDC) model resulted in a C-index of 0.574 in the development and 0.576 in the validation cohorts (lower than those recently reported for this model). Predictive ability was also improved after recalibration in this analysis. Risk stratification according to IDC model showed more similar outcomes across the development and validation cohorts compared with our model.

CONCLUSION:

Our model provides a simple prognostic tool in mRCC patients treated with a targeted agent. It had similar performance with the IDC model, which, however, produced more consistent survival results across the development and validation cohorts. The predictive ability of both models was lower than that suggested by internal validation (our model) or recent published data (IDC model), due to differences between observed and predicted survival among intermediate and poor-risk patients. Our results highlight the importance of external validation and the need for further refinement of existing prognostic models.