A novel systemic inflammation response index (SIRI) for predicting the response of pancreatic cancer to chemotherapy

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ABSTRACT

Prediction of chemotherapy response is uniquely difficult in pancreatic cancer. Here, we developed a systemic inflammation response index (SIRI) based on peripheral pretreatment neutrophil, monocyte and lymphocyte counts and evaluated its ability to predict responses of patients with pancreatic cancer to gemcitabine. The SIRI was developed in a training set of 177 patients with advanced pancreatic cancer who received palliative gemcitabine. The ability of SIRI to predict patient response to chemotherapy was validated in two independent cohorts (n=321 and n=76, respectively). ROC analysis indicated an optimum cut-off value of 1.8 in the training cohort, among whom the objective response rate to chemotherapy was 2.4% for SIRI ≥1.8 and 14.0% for SIRI <1.8 (P=0.005), and the disease control rate was 16.7% for SIRI ≥1.8 and 57.0% for SIRI <1.8 (P<0.001). SIRI <1.8 was also significantly correlated with increased time-to-progression (TTP) and longer overall survival (OS) after chemotherapy. These observations were further validated in the two independent cohorts. Multivariate analysis confirmed that SIRI was an independent prognostic factor for both TTP and OS; high SIRI values were correlated with higher serum levels of IL-10, CCL17, CCL18 and CCL22, and shorter TTP. Therefore, the SIRI can be used to predict the response of pancreatic adenocarcinomas to gemcitabine, which could potentially allow clinicians to improve treatment outcomes by identifying candidates for aggressive therapy.