

Circulating deoxyribonucleic Acid as prognostic marker in non-small-cell lung cancer patients undergoing chemotherapy

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PURPOSE: Circulating cell-free DNA is present in increased amounts in the blood of cancer patients, but the clinical relevance of this phenomenon remains unclear. We conducted a clinical study to assess the value of circulating DNA as a prognostic marker in patients with non-small-cell lung cancer (NSCLC). **PATIENTS AND METHODS:** A standard protocol for the quantification of circulating DNA by real-time polymerase chain reaction was set up and validated at two oncology units. One hundred eighty-five informed patients with NSCLC and 46 healthy controls were included in the study. DNA concentrations were determined in paired plasma and serum samples and analyzed for a relationship with leukocyte counts and lactate dehydrogenase (LDH) levels. DNA concentrations in healthy controls and in patients were compared, and cutoff levels for plasma and serum DNA were determined. Patient survival was analyzed relative to baseline DNA concentrations, and the relationship between tumor responses and changes in DNA concentrations was assessed in patients receiving chemotherapy. **RESULTS:** We found a significant correlation between increased plasma DNA concentrations and elevated LDH levels ($P = .009$), advanced tumor stage ($P < .003$), and poor survival ($P < .001$). Tumor progression after chemotherapy was significantly ($P = .006$) associated with increasing plasma DNA concentrations. Serum DNA concentrations strongly correlated ($P < .001$) with leukocyte counts. **CONCLUSION:** Our data demonstrate that quantification of plasma DNA is an accurate technique amenable to standardization, which might complement current methods for the prediction of patient survival. This approach might be considered for evaluation in large prospective studies.

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