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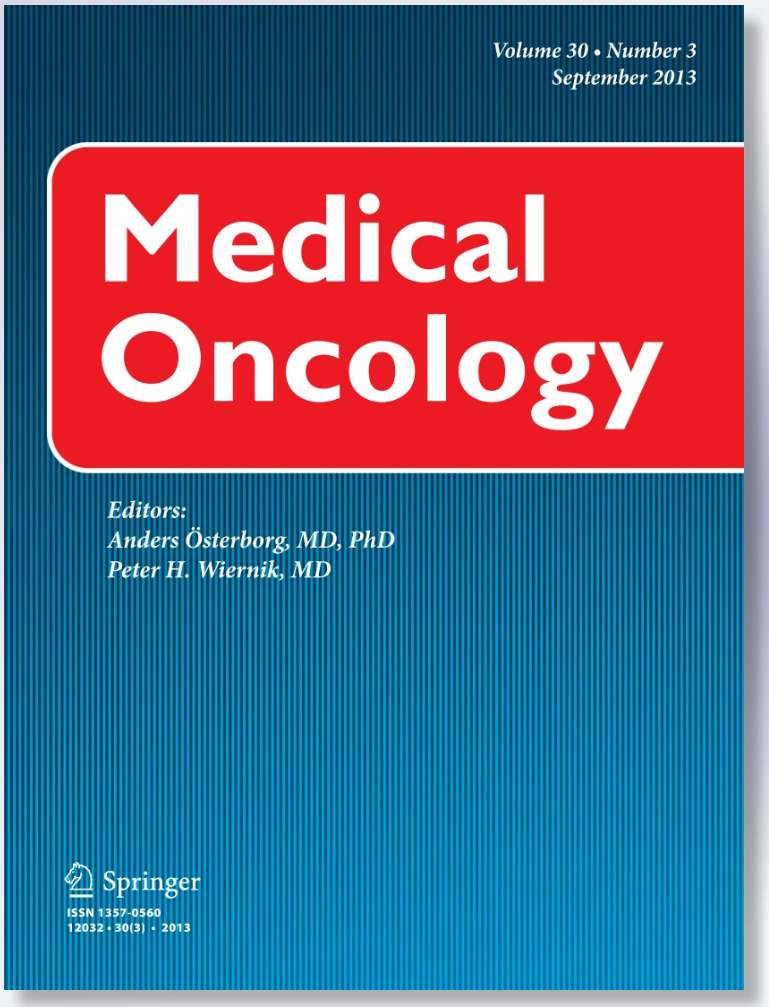

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ORIGINAL PAPER

Soluble ICAM-1 levels in small-cell lung cancer: prognostic value for survival and predictive significance for response during chemotherapy

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Abstract Intercellular adhesion molecule-1 (ICAM-1) is an adhesion molecule, member of the immunoglobulin gene superfamily that seems to participate in the evolution of the metastatic process. We investigated the significance of baseline soluble ICAM-1 levels on the outcome of patients with small-cell lung cancer and whether soluble ICAM-1 is a predictive marker for objective response during and after chemotherapy in patients with small-cell lung cancer. Fifty patients with recently diagnosed small-cell lung cancer, as well as 27 healthy smokers, were enrolled. Blood samples were collected at the time of diagnosis, during and at the end of chemotherapy. Data were correlated with the characteristics of the patients and survival as well as with ICAM-1 predictive role for objective response. Statistical significant values of baseline soluble ICAM between patients and controls ($p < 0.001$) were observed. Multivariate analysis revealed an elevated risk of death of 9 % in the first year after diagnosis for every 10 units of increased soluble ICAM-1 at the baseline ($p = 0.046$). Performance status and disease stage were also independent prognostic factors. Patients with extensive disease who achieved an objective response during chemotherapy showed a significant decrease (25.8 %) in their soluble ICAM-1 levels compared with baseline levels ($p = 0.001$). Alongside performance status and disease stage, baseline soluble ICAM-1 could be evaluated as an additional prognostic factor in patients with small-cell lung cancer. Also, a possible role for soluble ICAM-1 may exist as a predictive marker for objective response during chemotherapy for patients with extensive disease ($p = 0.001$).

Keywords Soluble ICAM-1 · Small-cell lung cancer · Chemotherapy · Response

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Introduction

Small-cell lung cancer (SCLC) with an estimate of 33,900 new cases in the US in 2012 and despite all therapeutic efforts remains an aggressive and incurable disease [1]. Prognosis is determined largely by the disease stage (limited or extensive) and the performance status (PS). Intercellular adhesion molecule-1 (ICAM-1) is a member of the immunoglobulin gene superfamily, a single chain surface membrane glycoprotein expressed on a variety of cells. ICAM-1 is responsible for the contact between leukocytes and endothelial cells during inflammatory processes. As tumor cells may imitate leukocytes on their surfaces, cell adhesion through ICAM-1 could be a key step for disease dissemination [2]. Soluble forms of ICAM-1 can be found as a result of proteolytic cleavage of the membrane adhesions. There is mounting evidence that soluble ICAM-1 (sICAM-1) facilitates angiogenesis, promotes tumor cell growth, and allows tumor cell to bypass immune recognition through binding to circulating lymphocytes [3–5]. Increased sICAM-1 expression has been observed in many types of malignancy including gastrointestinal, breast cancer, and melanoma and is mainly correlated with