EPAC-Lung

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TRANSLATIONAL RESEARCH

210 EPAC-Lung: Pooled analysis of circulating tumor cells in advanced non-small cell lung cancer

C.R. Lindsay[1], F.H. Blackhall[2], A. Carmel[3], P. Gazzaniga[4], H.J.M. Groen[5], M.G. Krebs[6], L. Muinelo-Romay[7], K. Pantel[8], E. Rossi[9], L. Terstappen[10], H. Wikman[8], J-C. Soria[11], F.F. Farace[3], A. Renehan[1], C. Dive[12], B. Besse[13], S. Michiels[14]

[1]The Christie NHS Foundation Trust, Manchester, UK, [2]Medical Oncology, The Christie NHS Foundation Trust, Manchester, UK, [3]Institut Gustave Roussy, Villejuif, France, [4]Policlinico Umberto I - Unità di Neonatologia, Patologia e Terapia Intensiva Neonatale, Rome, Italy, [5]University Hospital Groningen (UMCG), Groningen, Netherlands, [6]Division of Cancer Sciences, The University of Manchester and The Christie NHS Foundation Trust, Manchester, UK, [7]Health Research Institute of Santiago de Compostela (IDIS), CIBERONC, Santiago De Compostela, Spain, [8]UKE Universitätsklinikum Hamburg-Eppendorf KMTZ, Hamburg, Germany, [9]Istituto Oncologico Veneto IRCCS, Padua, Italy, [10]Medical Cell Biophysics, Enschede, Netherlands, [11]Medimmune, Gaithersburg, MD, USA, [12]Clinical & Experimental Pharmacology, Cancer Research UK Manchester Institute, Manchester, UK, [13]Department of Cancer Medicine, Gustave Roussy - Cancer Campus, Villejuif, France, [14]Team Oncostat, CESP, Gustave Roussy, Villejuif, France

Background: We assessed the clinical validity of circulating tumor cell (CTC) quantification for prognostication of patients with advanced non-small cell lung cancer (NSCLC) by undertaking a European pooled analysis of individual patient data. This is the largest study of its kind and the first to examine between-centre heterogeneity of CTC identification in NSCLC.

Methods: Nine European NSCLC CTC centers were asked to provide reported/unreported anonymised data for patients with advanced NSCLC who participated in CellSearch CTC studies from January 2003 - March 2017. We used Cox regression models, stratified by centre, to establish the association between CTC count and survival. We assessed the added value of CTCs to prognostic clinico-pathological models using likelihood ratio (LR) statistics and c-indices.

Results: Seven out of nine eligible centers provided data for 550 eligible patients, including 209 patients whose prognostic information was previously unpublished. CTC counts of ≥ 2 and ≥ 5 per 7·5 mL were associated with reduced progression-free survival (≥ 2 CTCs: HR 1.72, $p < 0{\cdot}001$; ≥ 5 CTCs: HR 2.21, $p < 0{\cdot}001$) and overall survival (≥ 2 CTCs: HR 2·18, $p < 0{\cdot}001$; ≥ 5 CTCs: HR 2·75, $p < 0{\cdot}001$), respectively. Survival prediction was significantly improved by addition of baseline CTC count to LR clinico-pathological models (log-transformed CTCs $p < 0{\cdot}0001$; ≥ 2 CTCs $p < 0{\cdot}0001$; ≥ 5 CTCs $p < 0{\cdot}0001$), while more moderate improvements were observed with the use of c-index models. There was minor evidence of between-center heterogeneity in the effect on PFS, but not OS.No difference in CTC profile was observed between key NSCLC molecular subsets such as EGFR, ALK, and KRAS.

Conclusions: These data confirm CTCs as an independent prognostic indicator of progression-free survival and overall survival in advanced NSCLC. CTC count improves prognostication when added to full clinico-pathological predictive models. ≥ 2 CTCs is an appropriate cutoff to move towards establishing clinical utility.

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