

Unveiling the clinical relevance of circulating tumour cells in lung cancer patients

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Abstract

Lung cancer remains one of the most prevalent malignancies and the leading cause of cancer-related mortality worldwide. This is primarily due to late-stage diagnosis and the lack of effective therapeutic strategies.

In recent years, liquid biopsies have been the focus of extensive research, as their various cellular components can provide valuable insights into tumour dynamics. Among these, Circulating Tumour Cells (CTCs) are particularly relevant, as they play a key role in tumour dissemination and metastasis while also serving as potential biomarkers for monitoring disease progression and therapeutic response. Indeed, CTCs have demonstrated prognostic value in metastatic breast, colorectal and prostate cancers; however, their role in lung cancer remains to be fully defined. Therefore, this study investigates the putative clinical value of CTCs in lung cancer patients.

For this purpose, liquid biopsies from patients with non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC) were collected, with or without prior therapeutic interventions. CTCs were isolated and enumerated using the CellSearch (Menarini Silicon Biosystems) and the results correlated with clinical and molecular features. In parallel, paired blood samples were also collected for cell-free DNA (cfDNA) molecular profiling.

Our results demonstrate that CTCs can be identified in distinct lung cancer types, including NSCLC and SCLC, and at various disease stages. In particular, we were able to detect CTCs in stage III and IV lung cancer patients, with counts ranging from just a few CTCs to over 50. Moreover, CTCs were present in patients with diverse clinical features regarding metastatic status, molecular alterations, PD-L1 expression levels and therapeutic interventions. Notably, a high number of CTCs was observed in a stage III lung cancer patient who had previously undergone therapeutic intervention, further supporting the potential of CTCs as biomarkers for disease monitoring and therapeutic strategies.

Overall, this study highlights the clinical relevance of CTCs in lung cancer patients. Their detection could facilitate early diagnosis, real-time disease monitoring, and therapeutic stratification, ultimately enabling personalized treatments and improving patient outcomes.

Do you have any conflicts of interest?

No, I do not have a conflict of interest.