

Circulating tumor cells (CTC) as a prognostic and predictive factor in Lung Cancer Patients ...a pilot study in PUMCH

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Abstract:

Background: We explored the clinical value of circulating tumor cells (CTCs) in prognosis and the assessment of treatment effects for patients with lung cancer.

Methods: In a prospective, single center and small sampling study, we tested the levels of CTC at baseline in 100 patients with emerging or recurring lung cancer and followed up 60 with CTC numbers after each cycle of chemotherapy. We then did correlation analysis between CTC variation and treatment-response evaluation based on RECIST criteria. We used AVIVABio Cancer Cell Isolating Technology, an immunomagnetic beads-based rare cell enrichment system using leucocyte depletion mechanism, to count the identified CK+/EGFR+/CD45- CTCs in 7.5ml venous blood of the lung cancer patients under fluorescence microscopy.

Results: 100 blood samples were collected from newly diagnosed or recurrent lung cancer patients who had been treatment-naive for at least 2 months before hospitalization. Benign respiratory diseases and tuberculosis and healthy control samples were collected, 20 for each group, during the same study period. The AVIVABio Technology is easy to manage and repeatable with a sensitivity of 92.5% and specificity of 68.4% in lung cancer patients. The patients with TNM stage IIIA or below had a CTC positive rate of 31.8% (7/22), and those of IIIB or above had a statistically high rate of 87.2% (68/78) (P<0.001). 60 patients were followed up with CTC after each cycle of chemotherapy. After one chemo cycle, 93.3% (56/60) patients' CTC were negative with the remaining persistent or turning positive. Correlation analysis showed the variation of CTC was coincident with RECIST criteria by CT scan after two chemo cycles.

Conclusions: The above-mentioned method is highly sensitive and specific in detecting CTC of the patients with advanced lung cancer. The initial level of CTC identified using this method has prognostic value. The variation of CTC in the course of chemotherapy might be a useful predictor of the chemo-response or disease-progression.

Factors	Sub-Group	Number of Sampled Patients	Number of CTC Positive Patients	CTC Positive Rate(%)	P value
TNM staging	Operable	22	7	31.8	<0.001
	UnOperable	78	68	87.2	
Pathology	Adenocarcinoma	69	57	82.6	<0.05
	Squamous Carcinoma	16	10	62.5	not
	Small Cell	15	8	53.3	not