

THE CLINICAL VALUE OF CELL-FREE DNA LEVELS AND INTEGRITY ANALYSIS IN DIFFERENTIAL DIAGNOSIS OF PATIENTS WITH CHEST RADIOLOGICAL FINDINGS: NSCLC VERSUS BENIGN LUNG NODULES

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Objective: Effective discrimination between malignant and benign lung tumors is a major clinical problem in the differential diagnosis of solitary pulmonary nodules. The analysis of cell-free DNA (cfDNA) in blood may greatly aid the early detection of lung cancer by detecting cancer-related alterations.

Methods: The plasma cfDNA levels and integrity were analysed in 65 non-small cell lung cancer (NSCLC) patients, 28 subjects with benign lung tumors, and 16 healthy controls using real-time PCR.

Results: The NSCLC patients demonstrated significantly higher mean plasma cfDNA levels compared with those with benign tumors ($P = 0.0009$) and healthy controls ($P < 0.0001$). The plasma cfDNA integrity in healthy individuals was significantly different than found in patients with NSCLC or benign lung tumours ($P < 0.0003$). In ROC curve analysis, plasma cfDNA levels > 2.8 ng/ml provided 86.4% sensitivity and 61.4% specificity in discriminating NSCLC from benign lung pathologies and healthy controls. cfDNA integrity showed better discriminatory power (91% sensitivity, 68.2% specificity).

Conclusion: Our data demonstrate that plasma cfDNA concentration and integrity analyses significantly differentiate between NSCLC and benign lung tumors. The diagnostic capacity of the quantitative cfDNA assay is comparable to conventional imaging (computer tomography) used in clinical practice.