

Diagnostic Value of Cytokeratin Expression Profile in Primary Non-small Cell Lung Carcinomas

*Agita Jukna¹, Ilze Štrumfa¹, Andrejs Vanags²,
Jānis Gardovskis²*

Rīga Stradiņš University, Latvia

¹Department of Pathology

²Department of Surgery

Introduction. The histological type of lung cancer is among key parameters to be considered for treatment selection. Although many cases can be reliably diagnosed in haematoxylin-eosin stained slides, experience with ancillary methods can occasionally be mandatory, especially in patients with metastatic disease. Establishing the primary site of metastasis origin may be challenging and have a major impact on prognosis and therapy. Cytokeratins are intermediate filament proteins commonly used in pathologist's practice. They are expressed in a tissue-specific manner in epithelial cells of normal organs and the tumours that arise from them.

Aim, Materials and Methods. The aim of the study was to evaluate expression and diagnostic value of commonly used cytokeratin (CK) 7, 20 and high-molecular weight cytokeratin (CKH) in primary non-small cell lung carcinomas (NSCLC). The retrospective study included 236 consecutive patients' biopsy or operation material of lung carcinoma. Histological subtyping was performed in accordance to lung tumour classification by the World Health Organisation, 2015. Expression of CK7, CK20 and CKH was detected by immunohistochemistry and evaluated as positive versus negative using cut-off level at 5% of positive tumour cells. Descriptive statistical analysis was performed, including calculation of 95% confidence interval (CI).

Results. The study group included 236 primary NSCLC of which 50.8% (95% confidence interval (CI) = 44.5–57.2) were squamous cell carcinomas, 39.4% (33.4–45.8) adenocarcinomas, 6.4% (3.9–10.2) non-small cell carcinomas, not otherwise specified (NOS) and 3.4% (1.7–6.6) large cell carcinomas.

CK7 positive cases comprised 32.5% (33.4–45.8) of squamous cell carcinomas and 94.6% (88.0–97.7) of adenocarcinomas; however, negative cases included only poorly-differentiated adenocarcinomas. Among NSCLC, NOS, 60.0% (35.8–80.2) of carcinomas were CK7 positive, while large cell carcinomas showed expression in half of the cases: 50.0% (21.5–78.5).

The CK20 assessment included few positive cases of squamous cell carcinomas, adenocarcinomas and NSCLC, NOS as follows: 2.5% (0.9–7.1), 7.5% (3.7–14.7), 6.7% (1.2–29.8), with no positive cases among large cell carcinomas.

CKH expression was observed in 97.5% (92.9–99.2) of squamous cell carcinomas, 65.2% (55.1–74.2) of adenocarcinomas, as well as among 53.3% (30.1–75.2) NSCLC, NOS and 37.5% (13.7–69.4) large cell carcinomas.

Conclusions. Expression of CK7 and CKH in non-small cell carcinomas is not helpful for distinguishing among different histological subtypes of lung carcinomas, as these markers show broad distribution among lung tumours, while CK20 is expressed in minority of lung carcinoma cases and could be valuable in identifying metastatic cancer cases.