

## MOLECULAR-GENETICAL TUMOR PARAMETERS AT PATIENTS WITH LUNG CANCER TAKING INTO ACCOUNT A SMOKING FACTOR

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**Introduction:** In Kazakhstan lung cancer takes the first place in the cancer morbidity and cancer mortality structure. Tobacco smoking (TS) remains the most established cause of lung carcinogenesis and other disease processes. Identification of the molecular-genetical features of tumors in smokers may enable individualized treatment and reduce mortality.

**Methods:** morphological, histological, molecular genetics, immunohistochemical. The slides of 286 patients (204 smokers and 82 nonsmokers) with lung cancer were studied. Tumor blocks of 47 patients (27 smokers and 20 nonsmokers) were used for molecular genetic studies.

**Results:** Strong correlation was found between regions with a high incidence of lung cancer and regions with high medium-high levels of smoking ( $p < 0,05$ ) when comparing the age-specific incidence, especially among men older than 50 years.

There were differences in the histotype structure of lung cancer among smokers and nonsmokers. Squamous cell carcinoma prevails among men as adenocarcinoma among women. It was found that smokers had squamous cell carcinoma histotype predominant, which share above 1.4 times ( $p < 0.01$ ), and small cell carcinoma 2.0 times ( $p < 0.05$ ). Adenocarcinoma is 3.5 times ( $p < 0.001$ ) more likely to develop in the group of non-smokers. Activating EGFR mutations were detected in 21.3% of the patients with non-small cell lung cancer. KRAS mutations were detected in 5% of smoking patients with squamous cell carcinoma. The samples containing both KRAS and EGFR mutation were not detected. Mutations occur most often among women (70%) than among men (30%) and most among non-smokers than among smokers (90% and 10% respectively). Immunohistochemical studies of lung cancer tumor have shown that smokers have a higher proliferative activity of tumor cells, indicating that the adverse effects of smoking on the course of lung cancer.

**Conclusions:** The data obtained allow to individualize the treatment scheme of postoperative radiation therapy and adjuvant chemotherapy to improve the efficiency of treatment of lung cancer in the Republic of Kazakhstan. Considering that the presence of activating EGFR mutations associated with the possibility of targeted therapy and with a positive result, lung cancer treatment prognosis in smokers less favorable than that of nonsmokers.