The Role of Cigarette Smoking in the Development of Primary Lung Adenocarcinoma : Concurrent Evaluation of Histological Grade and Prognosis of Each Histological Grade for Tumors Measuring Less than 20 mm in Diameter

Tatsu MIYOSHI[a], Yuichi ISHIKAWA[b] and Takayuki SHIRAKUSA[a]

[a] *Second Department of Surgery, School of Medicine, Fukuoka University, Fukuoka, Japan*
[b] *Department of Pathology, The Cancer Institute, Japanese Foundation for Cancer Research (JFCR), 3-10-6 Ariake, Koto-ku, Tokyo 135-8550, Japan*

Abstract: Adenocarcinomas of the lung are observed in both cigarette smokers and non-smokers, and no or little association between cigarette smoking and the development of these tumors has previously been found. Recent studies, however, have reported that cigarette smoking increases the risk of adenocarcinoma, particularly that of less differentiated tumors. However, no studies have concurrently investigated the role of smoking in the development of primary lung adenocarcinoma in relation to the histological grade, and the prognosis of each histological grade. This is the first report to concurrently evaluate both of these areas. The study population consisted of 88 patients with small (less than 20-mm diameter) primary lung adenocarcinomas surgically resected at the Second Department of Surgery of Fukuoka University, Fukuoka, Japan. The patients ranged between 29 and 85 years of age, with an average age of 64. They were classified as either cigarette smokers (N=47) or non-smokers (N=41). Pathologically, the patients were categorized as having well-, moderately, or poorly differentiated adenocarcinoma (N=53, 25, and 10, respectively). The smoking status correlated with the pathological differentiation of tumors: cigarette smoking was associated with less differentiated tumors ($p=0.09$). Cigarette smoking was significantly more frequent in men (N=41) than women (N=47; $p<0.001$), and a statistical trend was apparent between gender and histological grade less differentiated adenocarcinoma was diagnosed more frequently among men ($p=0.07$). Within the cigarette-smoking group, cumulative smoking was correlated with the development of poorly differentiated adenocarcinoma ($p<0.05$), particularly when the smoking index was≧1,000 ($p=0.004$). Furthermore, among cigarette smokers, poorly differentiated adenocarcinoma was associated with poorer prognosis than well- or moderately differentiated adenocarcinoma ($p=0.001$). Our study indicated a correlation between cigarette smoking and the histological grade of primary adenocarcinomas of the lung as well as a correlation between the histological grade and the prognosis.

Key words: Cigarette smoking, Lung cancer, Adenocarcinoma, Histological grading, Prognosis