Analysis of Galectin-3 Localization by Immunocytochemical Staining on Aspiration Biopsies From Patients With Thyroid Pathology

S.A. Alexandrova¹, L.B. Ginkul¹, M.E. Boriskova²

¹Institute of Cytology, St. Petersburg, Russia, ju2005@rambler.ru
²Pavlov State Medical University, St. Petersburg, Russia

Growth of thyroid pathology has become especially actual in Russia and neighbor countries after the Chernobyl AES accident. A very important task now is to differentiate preoperatively the type of pathology in thyroid nodules (thyroiditis, benign or malignant proliferation), that will allow ruling out undesirable surgeries. Solution of this problem and a fast and effective diagnostic approach can become a combination of fine needle aspiration with detection of specific marker proteins of thyroid tumor growth by means of immunocytochemical staining. Galectin-3 belongs to the lectin family, participates in interactions between cells and cell matrix, and is considered as a perspective diagnostic marker for detection of neoplastic processes. This protein predominantly locates in the cytoplasm, but also may transfer to the perinuclear membrane, nucleus and get secreted from the cytoplasm.

The goal of the present work was to study of galectin-3 localization on specimens of fine needle aspiration biopsies from patients with thyroid pathology. The protein stained with FITC was revealed by means of indirect immunofluorescence with use of laser-scanning confocal microscopy. Using this approach, we studied a group of patients (n = 46) with detected thyroid nodules. Morphological assay revealed cases of non-tumor pathology (mainly nontoxic nodular goiter) and tumor pathology (mainly papillary carcinoma and follicular adenoma).

The character of fluorescence was different in studied samples. Usually we could observe individual fluorescent cells or focal clusters of such cells. We have revealed fluorescence of studied proteins in 57% of the patients with diagnosed tumor pathology and in 30% of the patients with non-tumor pathology. Among patients with non-tumor pathology galectin-3 fluorescence was localized mainly in the cytoplasm, on the membranes and extra cells. Among patients with tumor pathology its localization was usually cytoplasmic. It is important to note that patients from the second group with detected protein expression demonstrated of poor prognosis (big size of tumor nodule, lymphatic tumor spread, early age of patients).

Our results demonstrated that not only expression of galectin-3 but cell localization have to be taken into account during thyroid pathology diagnostics.