



Mini Review

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# Clinical Cytology and Thyroid Pathology



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## Mini Review

This review is dedicated to the results of implementation of new methods in thyroid pathology in our country. Clinical Cytology (cytopathology) is a safe, painless and simple method of morphological diagnostics for detecting various pathological conditions. In Russia, fine needle aspiration (FNA) was used during many years for many sites of a human body including thyroid [1-3]. Cytopathology is a widely known method, being close to histology to detect abnormal conditions and to choose the treatment by studying individual cells, structures and clusters of cells, their surroundings, transformation etc. The accuracy of cytological diagnosis by FNA in the most cases is identical to histological. In thyroid pathology it is highly important to access not only cytological picture, but hormonal and biochemical status [4]. Nowadays, that molecular and cytogenetic studies are gradually developing it's possible to detect and to identify correctly various molecular targets especially in neoplastic lesions. The implementation of liquid based cytology of FNA showed that the gap between histology, cytology and molecular studies can be filled. Morphological, molecular and genetic properties of cells are retained in preserve fluid. Combination of conventional smears (air-dried and MGG stained) and LBS (Papanicolaou stained) showed that both methods can and must be used together in clinical practice [5]. In differential diagnostics of papillary carcinoma thyroglobulin, TTF-1, HBME 1, galectin 3 are useful, in cases of benign lesions - CK19, p53, HBME [6]. Statistically significant difference between benign and molecular lesions has been obtained in the usage of Ki-67 ( $p < 0,001$ ) and  $\beta$ -catenin ( $p < 0,05$ ) and the combination of them allowed to tell definitely in doubtful cases about carcinoma in 45.5% [7]. Scrapes from cytological slides, liquid-based cytology and cytoblocks (Cell blocks) can be used for molecular studies. Immunocytochemistry, flow cytometry, in situ hybridization on cytological slides (FISH, CISH, SISH), sequencing, PCR, RT-PCR (qRT-PCR), mRNA expression and other molecular studies are available nowadays [8-10]. Thus, multidisciplinary approach seems to be important, especially in difficult cases. In routine clinical practice the most often (up to 85% cases of FNA) thyroid pathology is non-toxic diffuse nodular goiter [11]. FNA and intraoperative cytology can also be useful in autoimmune thyroiditis, Graves disease and other non-neoplastic lesions [12-14].

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