Abstract to Ph.D. Thesis

Molecular-genetic Analysis of Thyroid Carcinomas by V. Sýkorová

Introduction: Thyroid cancer represents more than 90% of endocrine tumors and its incidence, predominantly of papillary thyroid carcinoma (PTC), is still increasing in the Czech Republic. Several genetic changes are known, but their impact to phenotype is still controversial.

Aims: To study of the genetic causes (*RET/PTC, BRAF* and *RAS* alterations) and the role of *RET* polymorphisms in thyroid cancer (predominantly PTC), and to correlate genotype with phenotype.

Subjects and Methods: Overall 234 PTC tissues, 8 poorly differentiated carcinomas, 3 anaplastic carcinomas, 23 medullary carcinomas, 6 follicular carcinomas and one follicular adenoma were analyzed. Samples of fresh frozen thyroid tissues, fine-needle aspiration biopsies and paraffin-embedded formalin-fixed tissue sections of patients with thyroid cancer and blood samples of healthy controls were used for analysis. The expression of *RET/PTC* rearrangements was detected on agarose gel. Five *RET* polymorphisms were analyzed using specific TaqMan probes. Detection of mutations in the *BRAF* gene and three *RAS* genes was performed by direct sequencing. Presence of alteration was correlated with clinicopathological parameters.

Results: We found out that some *RET* polymophisms are associated with development of *RET/PTC* rearrangements in PTC and proved, that the *BRAF* mutation is correlated with more agressive tumor behaviour. Several various genetic alterations in the *RAS* genes were detected.

Conclusions: The study brought important outcomes that could improve diagnosis and prediction of the disease in future.

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