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# Expression and correlation of sodium/iodide symporter and thyroid stimulating hormone receptor in human thyroid carcinoma

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ABSTRACT

**Aims.** To investigate the expression of sodium/iodide symporter (NIS) and thyroid stimulating hormone receptor (TSHR) in human thyroid cancer.

**Patients and methods.** *NIS* and *TSHR* mRNA levels quantified by real-time PCR as well as NIS and TSHR proteins evaluated by immunohistochemistry were examined in surgical specimens including 38 benign nodules, 32 thyroid carcinomas and 36 normal thyroid samples.

**Results.** *NIS* and *TSHR* mRNA levels in thyroid carcinomas were significantly lower than in benign nodules and normal thyroid samples ($P$ <0.001). Interestingly, we found that *NIS* and *TSHR* mRNA expression in benign nodules had similar levels to those in normal thyroid tissues. However, *NIS* and *TSHR* protein expression in benign nodules and thyroid carcinomas was stronger than in normal thyroid samples ($P$ <0.05) but mainly located in cytoplasm. In addition, there was a significant positive correlation between *NIS* and *TSHR* in benign nodules and normal thyroid samples ($r$ = 0.551 and 0.667, respectively, $P$ = 0.001 and 0.000, respectively) but there was no such correlation in thyroid carcinomas ($r$ = 0.222, $P$ = 0.376).

**Conclusions.** In thyroid carcinomas, *NIS* and *TSHR* mRNA levels were lower but the proteins were overexpressed. The NIS protein mainly locates in the cytoplasm, which therefore lacks the ability of transporting and absorbing iodine in patients with thyroid carcinoma. In addition, there was no correlation between *NIS* and *TSHR* in thyroid cancer, which may explain why, even after TSH stimulation, 10-20% of these malignant tumors are unable to concentrate enough radioiodine for effective therapy.

***Key words:*** sodium/iodide symporter, thyroid stimulating hormone receptor, thyroid carcinoma.

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