

Potential influence of MIR-204-3P on ETS-1 protein expression in papillary thyroid carcinoma

Abstract

Objectives: ETS-1 (E26 transformation-specific) is a transcription factor associated with the progression of carcinomas of various origins. Its expression in PTC is poorly described, and the findings are controversial. This study aimed to describe ETS-1 protein expression in papillary thyroid carcinoma (PTC) and to evaluate the potential influence of miR-204-3p on the ETS-1 protein expression in PTC since the bioinformatic analysis revealed that miR-204-3p shares a seed sequence with the 3'-untranslated region (3'UTR) of ETS-1 mRNA.

Methods: Immunohistochemistry was performed to evaluate ETS-1 protein expression in 77 routinely prepared archival tissue sections of PTC, of which 55 had surrounding nonmalignant thyroid tissue (NMT). Quantitative RT-PCR (qPCR) was utilized to quantify ETS-1 mRNA and miR-204-3p levels of expression in matched snap-frozen PTC and adjacent NMT.

Results: In the immunohistochemical examination, 76 out of 77 PTC samples displayed positive staining for ETS-1 protein, observed in either the nucleus or the cytoplasm, or in both. Conversely, among 55 NMT, ETS-1 protein exhibited positive staining in 39 samples, found predominantly in the nucleus. Considering the total IHC score, there was an increase in ETS-1 protein expression in PTC compared to the surrounding tissue ($P < 0.05$). However, there was no difference in its mRNA levels between PTC and matched NMT ($P > 0.05$). The levels of miR-204-3p expression showed lower values in PTC compared to their levels in paired NMT ($P < 0.05$). Furthermore, the complementary binding between miR-204-3p and ETS-1 mRNA was predicted by bioinformatic analysis and model prediction. Therefore, decreased levels of miR-204-3p in PTC may be the cause of elevated levels of ETS-1 protein, contributing to PTC progression.

Conclusions: ETS-1 mRNA may have been complementarily bound by miR-204-3p in thyroid tissue, which may result in down-regulated ETS-1 protein levels.