The Role of Plasma-derived Circulating microRNAs as Biomarkers of Papillary Thyroid Cancer: Preliminary Study

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ABSTRACT

Objectives
MicroRNAs can function either as tumor suppressors or oncogenes, and some microRNAs are associated with PTC, such as miR-146b, miR-155, miR-221, and miR-222. We tried to detect microRNAs in serum and analyzed correlation between expression level.

Methods
Serum was obtained from patients who underwent thyroidectomy with or without neck dissection from 2010 to 2011. Patients with benign nodule and PTC were divided. In PTC, patients were divided into 3 groups according to N stage. We investigated microRNA expression level by reverse transcription / quantitative PCR kit. It was expressed by log_{2}\Delta\DeltaCT, and mean value was compared.

Results
We obtained serum from 89 patients comprised of 19 benign nodules and 70 PTC. There were no differences between age or gender. MicroRNA expression levels showed significantly different from that of N0 and N1. miR-155 expression of N0 group was not significantly different from that of N1, and microRNA levels were significantly lower than that of N0. Although microRNA levels were significantly lower than that of N1.

Aim of study
• Predicting role of circulating microRNAs in PTC
  - Benign / PTC
  - PTC without lymph node metastasis / with lymph node metastasis
  - Benign / PTC with lymph node metastasis

METHODS AND MATERIALS

• Patients
  - March 2010 – December 2011
  - Histologically confirmed PTC
  - N = 89
  - Male: Female = 15 : 74
  - Median age = 51 years old (17-79)
  - Preoperative blood sampling upon patient’s agreement
  - Stored serum samples at -80°C
  - Approval by Institutional Review Board (04-2012-016)

Methods
Blood sample before operation
Sample processing and RNA/DNA extraction

MicroRNA

- miR-146b
- miR-221
- miR-222
- miR-155

MicroRNA analysis

- Diagnostic application:
  - miR-146b
  - miR-221
  - miR-222
  - miR-155
- Prognostic application:
  - miR-146b
  - miR-221
  - miR-222
  - miR-155

Quantitative PCR: ABI 7500 Fast Real-Time PCR system

REFERENCES