

Molecular Biological Management of Thyroid Cancer

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The most common misunderstanding about “thyroid cancer” is that every thyroid cancer is a good cancer. However, small portion of well differentiated thyroid carcinomas behaves aggressively. Furthermore, most poorly differentiated carcinomas and anaplastic carcinomas are lethal.

In this clinical situation, the most challenging question for endocrine oncologists is to distinguish “bad cancers” from most “good cancers”. Recent molecular biological advances gave us some clues for possibility of molecular classification of well differentiated carcinomas. BRAF mutation in papillary thyroid carcinoma (PTC) is strong candidate of poor prognosis in PTC.¹⁾ Once BRAF mutation presents, MAPK pathways are activated constitutively.²⁾ Molecular and clinical evidences suggested that constitutive activation of MAPK pathways proceeded to cancer development, invasion, poor iodine uptake and metastasis. However, especially in Korea, this hypothesis cannot be applied because of high prevalence of BRAF mutation (60–80% in Korean PTCs).³⁾ Therefore, certain molecular events may be involved in BRAF mutation inducing MAPK pathway signal transduction. To investigate the regulating mechanism of MAPK pathway signal transduction could play key role in tailored management of PTC. Otherwise, genomic and proteomic researches to find new molecular prognostic markers of thyroid carcinomas are under investigation.⁴⁾

The other challenging problem is management of refractory thyroid carcinomas. Refractory thyroid carcinomas lost their abilities to uptake iodine and radioactive iodine treatment is not useful in these carcinomas. Because dedifferentiation is the main mechanism of poor iodine uptake, many investigators have tried to redifferentiate thyroid carcinomas and to re-induce iodine uptake.⁵⁾ Another approach to refractory thyroid carcinomas is application of molecular targeting agents. Recent clinical trials applying tyrosine kinase inhibitors, histone deacetylase inhibitors (HDACI), antiangiogenesis agents and growth factor receptor inhibitors showed promising re-

sults.⁶⁾

Personal or tailored management of thyroid carcinoma is not a highlighted area until now even in developed country. Most thyroid carcinomas can be managed by conventional paradigms. However, as described above, there is an urgent area that we need tailored management. It could be a chance for us to explore new area because only few researchers are interested in. Multimodal, multicenter researches are mandatory to achieve successful tailored management of thyroid carcinomas.

References

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