Anaplastic Thyroid Carcinoma and β2 Microglobulin

Mini Review

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Anaplastic thyroid carcinoma (ATC) is the most aggressive and lethal thyroid malignancy. The median survival time following diagnosis is typically 6 months or less. Peak onset of ATC is age 65 years old and older. ATC is more common in males than females by a 2:1 ratio. Patients with ATC commonly present with an unexpectedly growing neck mass. Neurologic deficits may accompany metastases. Patients with metastases may additionally notice bone pain, weakness and cough. Unexpectedly developing neck mass might also produce the following signs: Neck pain, dyspnea, dysphagia, cough [1-3]. ATC arises as anaplastic transformation of follicular papillary or Hurthle cell carcinoma; most cases have a core of mutations in well differentiated and anaplastic areas. ATC often originates in an abnormal thyroid gland; a history of goiter is reported in > 80% of cases. Microscopic histopathologic findings of anaplastic thyroid carcinoma are large, pleomorphic giant cells, cavernous blood filled sinuses, spindle cells, focal keratinization, vascular invasion and common mitotic figures and rarely rhabdoid inclusions [4,5]. Nowadays, a determinant serum marker value is not known in ATC. However, a study by Yilmaz et al. indicated that β2 microglobulin (β2-MG) could be used as a marker in cases with ATC [6]. β2-MG is a component of MHC class I molecules, which exists in all nucleated cells except red blood cells and placental trophoblast cells. Levels of beta-2 microglobulin can be elevated in multiple myeloma, lymphoma and amyloidosis. β2MG passes through the glomeruli, and is then almost completely reabsorbed by the proximal tubules. In few studies on anaplastic thyroid cancer, β2-MG levels were found to be elevated especially in the subjects with lymph node metastasis. Serum β2-MG is often measured to assess the severity and to monitor the effectiveness of treatment of multiple myeloma and Waldenström’s macroglobulinemia. Elevated levels of β2MG are associated with a poorer prognosis. β2MG levels are to help determine stage of leukemia or lymphoma and independent predict progression-free survival. β2MG levels also rise during cytomegalovirus and human immunodeficiency virus infection, chronic kidney disease and drugs such as lithium, cyclosporine, cisplatin, carboplatin, and aminoglycoside antibiotics [7-14].

There’s an increased expression of B2M gene in white blood cells, because of the higher exposition of MHC class 1 molecules on this cell population. Moreover the expanded expression in small intestine and colon cells might be related to the feature of iron absorption of these organs. Increased expression in the thyroid may be caused by activation in the autoimmune zone [15] (Figure 1).

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In conclusion, further studies are needed to investigate the existence of Hashimoto thyroiditis in the presence of anaplastic thyroid cancer. Further studies are required to confirm whether β2-MG can be used as a specific marker for thyroid cancer.

**Bibliography**


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