Histologic Diversity of Thymic Epithelial Tumors in Patients with Myasthenia Gravis

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Background and Objective:

Thymic epithelial tumors (TETs) include thymic carcinomas and thymomas, the latter of which can be further categorized by the World Health Organization (WHO) histologic classification based on the morphology of epithelial cells and the ratio of lymphocyte to epithelial cells. TETs are rare malignancies with an incidence of 0.15 per 100,000 in the United States. While their etiologies remain unknown, these tumors are associated with distinctly high rates of autoimmune disorders and paraneoplastic syndromes. Approximately 30% of patients with thymoma also carry a diagnosis of myasthenia gravis (MG). For the present retrospective study, we created a database of patients with TETs and examined prevalence of each histologic subtype in patients with MG.

Methods:

Drs. Patrick Loehrer, Kenneth Kesler, and colleagues have collaborated at the Indiana University Simon Comprehensive Cancer Center to care for over 1000 patients with TETs. The electronic health records of these patients were accessed via Cerner and used to input demographic, diagnostic, and histologic data into a REDCap database. These tumors were further categorized by WHO classification, and those comprising multiple histologic types were included separately in each subgroup.

Results:

Of 626 patients deemed to have sufficient documented histologic and diagnostic data, 110 had both MG and a TET diagnosis confirmed by pathology report. The greatest prevalence of WHO histologic type in patients with thymoma and MG was Type B2 (47), followed by Type B3 (34), Type B1 (22), Type A (9), Type AB (7), and unspecified thymoma (7). Notably, only 3 of 159 (1.87%) total patients with thymic carcinoma had comorbid MG in contrast to 107 of 467 (22.91%) patients with thymoma and MG; this suggests a uniquely favorable microenvironment of thymoma in patients with MG.

Clinical Impact and Implications:

Future work will aim to determine whether histologic classification has a predictive value for tumor prognosis in patients with and without MG. Furthermore, patterns of gene expression associated with thymoma in patients with and without MG may elucidate the etiologic mechanisms for the development of this autoimmune disorder.