

ORIGINAL ARTICLE

Expressions of MMP-1, MMP-2, MMP-9 and TIMP-1, TIMP-2 and Its Association with Invasion and Metastasis in Head and Neck Squamous Cell Cancer

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Abstract

Recently, it has been reported that there were correlations between overexpressions of the Matrix metalloproteinases and invasion, metastasis of head and neck squamous cell cancer. And, the tissue inhibitors of MMPs (TIMPs) were thought to regulate the MMP activities. But, the mechanisms of MMPs and TIMPs are still unclear. We examined whether or not MMPs (MMP-1, -2, -9) and TIMPs (TIMP-1, -2) are useful markers for evaluating the prognosis of head and neck cancer. The patients were all mesopharyngeal squamous cell cancer. The expressions of MMP-1, MMP-2, MMP-9 and TIMP-1, TIMP-2 were evaluated immunohistochemically using monoclonal antibodies against epitopes of standard and variant proteins, in paraffin-embedded mesopharyngeal squamous cell cancer tissues from 57 patients who had received curative therapies that were operation, or radiotherapy with chemotherapy. Tumor tissues from 38 (66.7%) patients showed positive immunoreactivity with monoclonal antibody against MMP-1, 34 (60.0%) patients showed positive-expression with MMP-2, and 43 (75.4%) patients showed positive-expression with MMP-9. 32 (56.1%) patients showed positive-expression with TIMP-1, and 47 (82.5%) patients showed positive-expression with TIMP-2. The expressions of MMPs (MMP-1, -2, -9) and TIMPs (TIMP-1, -2) were significantly correlated with tumor volume, and lymph node metastasis and TNM stage classification respectively ($p < 0.05$). However, there were no significant correlations between the expressions of MMPs (MMP-1, -2, -9), TIMPs (TIMP-1, -2) and other clinicopathological characteristics (for example, sex, age, histological type). Concerning about the prognosis, there were no significant correlations between the survival periods of patients with MMPs (MMP-1, -2, -9)-positive tumors and that of patients with MMPs (MMP-1, -2, -9)-negative tumors, respectively ($p > 0.05$). Also, there were no significant correlations between the survival periods of patients with TIMPs (TIMP-1, -2)-positive tumors and that of patients with TIMPs (TIMP-1, -2)-negative tumors, respectively ($p > 0.05$). These results suggest that both overexpressions of MMPs (MMP-1, MMP-2, MMP-9) and that of TIMPs (TIMP-1, TIMP-2) might be related to tumor invasion, to lymph node metastasis and to the high TNM staging of head and neck squamous cell cancer, but not be related to their prognosis.

Key words: MMP-1, MMP-2, MMP-9, TIMP-1, TIMP-2, Head and Neck, Squamous Cell Cancer, Prognosis, Immunohistochemistry