Effects of Transforming Growth Factor β on Proliferation and Invasion of Human Oral Squamous Cell Carcinoma Cell Lines

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Abstract

Objective: This study aimed to elucidate the effects of TGF-β on oral carcinomas.

Study design: In this in vitro study, three human oral squamous cell carcinoma (OSCC) cell lines SAS, Ca9-22 and HSC-3 were treated with TGF-β1 or TGF-β signaling inhibitors, and assayed for proliferation and invasion. Expressions of epithelial-mesenchymal transition (EMT) factors and matrix metalloproteinases (MMPs) were examined.

Results: TGF-β1 treatment induced morphological change in SAS, and significantly enhanced proliferation and invasion. Inhibition of TGF-β signaling significantly suppressed proliferation. TGF-β1 upregulated Snail and N-cadherin and downregulated E-cadherin in SAS (primary OSCC), while TGF-β1 downregulated Slug and N-cadherin and upregulated E-cadherin in HSC-3 (lymph node metastatic OSCC). MMPs were upregulated in both OSCC.

Conclusion: TGF-β1 increases proliferation and invasion of OSCC, while TGF-β signaling inhibition suppresses proliferation. TGF-β1 may induce EMT in primary OSCC, but induce mesenchymal-epithelial transition in metastatic OSCC. TGF-β1-induced MMPs upregulation may be associated with augmented invasiveness.