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Suppression of natural killer-cell and dendritic-cell apoptotic tumoricidal activity in patients with head and neck cancer

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Abstract

Background—Natural killer (NK) cells and dendritic cells (DCs) mediate tumor cell apoptosis using tumor necrosis factor superfamily ligands (TNFSFLs). This cytotoxicity is an important anticancer immune defense mechanism.

Methods—We examined TNFSFL expression and apoptotic tumoricidal activity (ATA) of purified NK cells and DCs, and peripheral blood mononuclear leukocytes (PBMLs) of healthy individuals and patients with head and neck cancer (HNC) before and after cancer ablation.

Results—PBMLs, NK cells and DCs, but not NK-cell/DC-depleted PBMLs, expressed multiple TNFSFLs and mediated ATA. Both TNFSFL expression and ATA were suppressed in tumor-bearing, and restored in tumor-ablated patients with (HNC) Soluble TNF superfamily receptors (solTNFSFRs) were increasingly bound by PBNLs of tumor-bearing HNC patients. Dissociation of solTNFSFR led to more pronounced increases in TNFSFL expression and ATA of PBMLs of patients with HNC than healthy individuals.

Conclusion—NK-cell and DC TNFSFL expression and ATA are suppressed in patients with HNC. This suppression is tumor-dependent and possibly mediated by solTNFSFRs.

Keywords

TNF superfamily ligands; TNF superfamily receptors; innate immunity; cancer immunosuppression

INTRODUCTION

Natural killer (NK) cells and dendritic cells (DCs) are major effector cells of the innate immune system that rapidly recognize and eliminate microbial pathogens and abnormal

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