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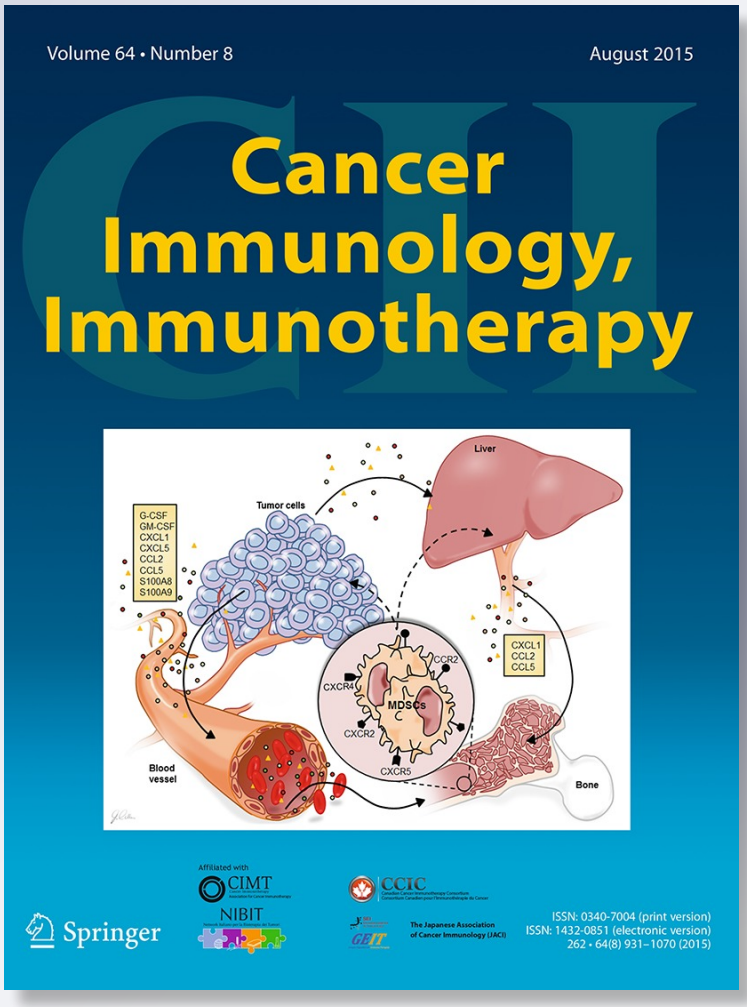

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ORIGINAL ARTICLE

Cytokine production in patients with papillary thyroid cancer and associated autoimmune Hashimoto thyroiditis

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Abstract Hashimoto thyroiditis (HT) is the most frequent thyroid autoimmune disease, while papillary thyroid cancer (PTC) is one of the most common endocrine malignancies. A few patients with HT also develop PTC. The aim of this study was to analyze cytokine profiles in patients with PTC accompanied with autoimmune HT in comparison with those in patients with PTC alone or HT alone and healthy subjects. Cytokine levels were determined in supernatants obtained from phytohemagglutinin (PHA)-stimulated whole blood cultures in vitro. The concentrations of selected cytokines: Th1—interferon gamma (IFN-γ); Th2—interleukin 4 (IL-4), interleukin 5 (IL-5), interleukin 6 (IL-6), interleukin 10 (IL-10) and interleukin 13 (IL-13); Th9—interleukin 9 (IL-9); and Th17—interleukin 17 (IL-17A) were measured using multiplex cytokine detection systems for human Th1/Th2/Th9/Th17/Th22. We found that PTC patients with HT produced significantly higher concentrations of IL-4, IL-6, IL-9, IL-13 and IFN-γ than PTC patients without HT. In conclusion, autoimmune HT affects the cytokine profile of patients with PTC by stimulating secretion of Th1/Th2/Th9 types of cytokines. Th1/Th2 cytokine ratios in PTC patients with associated autoimmune HT indicate a marked shift toward Th2 immunity.

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Keywords Cytokines · Blood cells · Papillary thyroid cancer · Hashimoto thyroiditis

Abbreviations

Abs	Antibodies
HT	Hashimoto thyroiditis
IFN-γ	Interferon gamma
IL	Interleukin
PHA	Phytohemagglutinin
PTC	Papillary thyroid cancer
Tg	Thyroglobulin
Th1	T-helper-1
Th17	T-helper-17
Th2	T-helper-2
Th9	T-helper-9
TPO	Thyroperoxidase

Introduction

As the most common autoimmune thyroid disease, Hashimoto thyroiditis (HT) is characterized by massive infiltration of the thyroid gland by immune cells, leading to destruction of thyroid follicles and hypothyroidism [1]. The majority of patients with HT have autoantibodies to thyroid antigens: thyroglobulin (TgAbs) and thyroperoxidase (TPOAbs). Low-grade chronic inflammation and an imbalance between pro- and anti-inflammatory cytokines have been proposed to play roles in the pathogenesis of HT. A prevalent T-helper-1 (Th1) and T-helper-17 (Th17) [2, 3] type of immune response has been described in patients with HT, while protective roles have been shown for cytokines produced by T-helper-2 (Th2) and regulatory T cells [4, 5].