Regulatory T-Cell Detection by Flow Cytometry and Systemic Sclerosis

Re: Risbano MG et al. Altered Immune Phenotype in Peripheral Blood Cells of Patients with Scleroderma-Associated Pulmonary Hypertension. *Clin Trans Sci* 2010; Volume 3: 210–218.

Dear Editor,

The article by Michael G. Risbano and colleagues showed significantly decreased percentage of memory CD4+T cells expressing interleukin-7 receptor (IL-7R) in patients with systemic sclerosis-pulmonary artery hypertension (SSc-PAH) as compared to SSc subjects without PAH,¹ but the significance of this was not discussed. Decreased expression of IL-7R or CD127 on a subset of CD4+CD25+T cells are markers of T regulatory cells (Tregs) and their immunosuppressive activity (via the cytokines IL-10, transforming growth factor [TGF]- β) is important to maintain tolerance and prevention of autoimmunity.^{2,3} Various markers to detect Tregs in circulation by multiparameter flow cytometry are available but the most common markers employed are combination of CD4+CD25brightFoxP3+ (increased expression of CD25 and positive for FoxP3 [forkhead/winged helix transcription factor]). However, as there are thymic-derived and peripheral Tregs in circulation, caution is recommended when using either FoxP3(+) or CD127(low/–) on its own to determine the Treg cell population.³

A recent study found fewer CD4+CD25brightFoxP3+ cells, TGF- β +, and IL-10+ cells in the skin of scleroderma patients than in controls. The study also found fewer circulating CD4+CD25brightFoxP3+ cells in patients with SSc or morphea, than in controls, including reduced TGF- β and IL-10 serum levels.⁴ Thymic-derived CD4+CD25+FoxP3+ Tregs play an important role in peripheral tolerance of autoreactive T cells, and the functional role of IL-7 in enrichment and differentiation of thymic Tregs population (through expression of IL-7R) was recently described in a mouse model.⁵ The role of the thymus in controlling autoimmunity is probably only beginning to be understood.

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