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Abstract

Allergen-specific immunotherapy is the only method that can modify the course of allergic diseases.[1] However, how subcutaneous immunotherapy (SCIT) improves allergic rhinitis is not fully understood.[2,3] The involvement of a shift from T_H2 to T_H1 responses in peripheral blood in pollen SCIT has been contentious,[4] partly because of difficulties analyzing antigen-specific T_H cells.[5] We aimed to use recent technical advances[6–8] to establish a more direct and simple method to analyze antigen-specific T_H cells and to clarify the involvement of a T_H2/T_H1 shift in peripheral blood in pollen specific immunotherapy. After short-term (6-hour) antigen stimulation, antigen-specific T_H cells in peripheral blood of Japanese children and young adults with Japanese cedar pollinosis undergoing SCIT were analyzed by multicolor flow cytometry for the presence of the activation marker CD154 and intracellular cytokines. Twenty-eight patients aged between 5 and 22 years were enrolled in the study; 22 had started SCIT after enrolling in the study (SCIT group), and the remaining 6 were planning to start SCIT in the next off-season (control group). The number of Japanese cedar–specific interleukin (IL) 5–, IL-4–, IFN-γ–, IL-17A–, IL-10– and tumor necrosis factor α–producing T_H cells without antigen-driven cell proliferation was determined. The seasonal increase in the number of Japanese cedar–specific IL-5– and IL-4–producing T_H cells seen in the control group was suppressed in the SCIT group ($P < .005$ and $P < .001$, respectively). We report a powerful method for the analysis of antigen-specific T_H cells in peripheral blood. This method will contribute to our understanding of immune mechanisms of immunotherapy and help us develop more sophisticated allergen specific immunotherapy.

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