Specific immunoglobulin G4 inhibits Th2 cytokine production in allergic asthmatics with Dermatophagoides pteronyssinus subcutaneous immunotherapy

Qiujuan Su[1], Nina Ren[1], Xueni Zeng[1], Yan Dong[1], Mo Xian[1], Xu Shi[1], Tian Luo[1], Gang Liu[2], Mulin Feng[1], and Jing Li[1]

[1]Department of Allergy and Clinical Immunology
[2]Clinical Research Center

August 7, 2020

Abstract

Background: The modulations of subcutaneous allergen immunotherapy (SCIT) on lymphocyte subsets and cytokine productions are not fully clarified. Objective: We investigated the changes of T-lymphocyte subsets and serum Dermatophagoides pteronyssinus specific immunoglobulin G4 (Der-p-sIgG4), and cytokine productions in allergic asthmatics during Der-p SCIT. Methods: This study involved 20 allergic asthmatics receiving 156-week Der-p SCIT, 20 patients without SCIT (non-SCIT). Symptom and medication scores (SMS), serum Der-p-sIgG4 levels, CD4+CD25+Foxp3+ T regulatory (Treg), CD4+IL-4-IFN-γ+ T-helper (Th) 1, CD4+IL-4+IFN-γ- Th2 lymphocyte percentage in peripheral blood mononuclear cells (PBMCs) with/without Der-p extract stimulation at weeks 0, 4, 12, 16, 52, 104, and 156 were measured. Serum from SCIT and non-SCIT patients were incubated with Der-p allergen and Der-p sensitized PBMCs. Levels of interleukin (IL) -4, IL-5, IL-10, IL-13, IL-17, interferon (IFN) -γ, tumor necrosis factor (TNF) -α and transfer growth factor (TGF) -β1 in supernatant were detected. Results: SCIT patients had significantly lower SMS after week 52. Der-p-sIgG4 levels in SCIT patients significantly increased at week 16 compared to non-SCIT subjects. CD4+IL-4+IFN-γ- Th2 percentage in SCIT patients showed a significant decrease from week 104 to 156 comparing to week 0, while no change was observed in CD4+CD25+Foxp3+ Treg and CD4+IL-4-IFN-γ+ Th1 percentage. IL-5, IL-13, IL-4, IL-17, and TNF-α levels in supernatant of Der-p-sensitized PBMCs, cultured with serum of SCIT patients after 16 weeks decreased significantly compared with non-SCIT patients, and showed significant reverse associations with Der-p-sIgG4 levels. Conclusion: SCIT down-regulated Th2 cytokine productions associated reversely with Dep-p-sIgG4 levels in Der-p allergic asthma patients.

Hosted file

`Manuscript with figures-20200807.pdf` available at https://authorea.com/users/349420/articles/474445-specific-immunoglobulin-g4-inhibits-th2-cytokine-production-in-allergic-asthmatics-with-dermatophagoides-pteronyssinus-subcutaneous-immunotherapy