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**Title:** The declined CD4+ CD25+Treg cells in patients with moderate to severe asthma associated with over-expressed Th2 response

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**Body:** Background Recent studies have showed that Th2 cells can induce the apoptosis of CD4+ CD25+ Treg cells or resist the immunosuppressive effect of Treg cells. We hypothesize that an imbalance of Th2/Treg is presented in patients with allergic asthma. Methods Twenty-two patients with mild asthma, 17 patients with moderate to severe asthma and 20 healthy donors were enrolled. All patients were allergic to house dust mites. The proportions of peripheral blood CD4+CD25+ Treg cells and Th2 cells were determined by flow cytometry. The concentration of IL-10, TGF- $\beta$  and IL-4 in plasma was determined by ELISA. The expression of Foxp3 and GATA-3 mRNA in PBMCs from asthmatic patients and healthy donors was detected by RT-PCR. Results Compared with healthy donors and patients with mild asthma, the frequency of CD4+CD25+ Treg cells and plasma IL-10 levels were decreased in patients with moderate to severe asthma. There was no difference of Foxp3 mRNA expression among three groups. However, the frequency of Th2 cells, IL-4 levels and expression of GATA-3 mRNA was higher in patients with mild and moderate to severe asthma than in the control group. The ratio of Th2/Treg and their cytokines was increased in allergic asthma, especially for moderate to severe asthma. The ratio of GATA-3/Foxp3 mRNA was increased in allergic asthma. In patients with moderate to severe asthma, the frequency of peripheral blood Treg cells was negatively correlated to the percentage of Th2 cells and IL-4 levels. Conclusions The decline of Treg cells in patients with moderate to severe asthma may play an important role in progress of the disease.