Th2 cells induce nasal type-1-hypersensitivity-like reaction in mice.

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Background: Allergen-mediated cross-linking of IgE on mast cells and basophils are well-recognized trigger for type-1 allergic diseases such as allergic rhinitis (AR). However, allergens may not be the sole trigger for AR, and several allergic-like reactions are induced in non-IgE-mediated ways. In this study, we examined a non-IgE-mediated, endotoxin-triggered nasal type-1-hypersensitivity-like reaction in mice. **Methods:** To investigate whether endotoxin affect sneezing response, mice were intraperitoneally immunized with ovalbumin (OVA), then nasally challenged with endotoxin-free or endotoxin-containing OVA. Further, to investigate the role of T cells, mice were adoptively transferred with in vitro differentiated OVA-specific Th2 cells, then nasally challenged with endotoxin-free or endotoxin-containing OVA. **Results:** Endotoxin-containing, but not endotoxin-free, OVA elicited sneezing response in OVA-immunized FceRI-deficient mice. An OVA-specific Th2 adoptive transfer model demonstrated that local activation of antigen-specific Th2 cells was required for the response. **Conclusions:** We propose that antigen-specific nasal activation of CD4+ T cells followed by endotoxin exposure induces sneezing response.