Braza et al. Clinical and Translational Allergy 2013, 3(Suppl 1):P21
http://www.ctajournal.com/content/3/S1/P21

Clinical and Translational Allergy

POSTER PRESENTATION Open Access

Deficiency of regulatory B cells in a house dust mite model of asthma

Faouzi Braza[1*], Julie Chesne[2], Guillaume Mahay[3], Marie-Aude Cheminant[3], David Lair[3], Antoine Magnan[3], Sophie Brouard[4]

From EAACI International Severe Asthma Forum (ISAF 2012)
Gothenburg, Sweden. 11-13 October 2012

Background

Asthma is a chronic disorder leading to bronchial obstruction in response to inhaled allergen. It is associated with immune deregulation with specific expansion of Th2 and Th17 CD4+ T cells. Both T cell populations support B cells response by stimulating their proliferation, survival and IgE secretion. B cells are described for their effector functions but recent reports have described their regulatory role in autoimmune and inflammatory disorders. However, definitive identification has been challenging because regulatory B cells (Breg) are rare, do not have a specific marker, and express detectable IL-10 or TGF-B only upon ex vivo stimulation. In asthma models local inhalation tolerance and helminth infection induce the generation of regulatory B cells. But no physiological role of this population in the development of asthma has been described yet.

Methods

Mice were sensitized on days 0, 7, 14 and 21 by percutaneous administration of HDM onto the ears. Intra-nasal challenges were performed on day 27 and 34 with 250 µg HDM. One day after each challenge, we realized by flow cytometry a complete B cell phenotyping in spleen and lungs. Splenocytes and lung cells were isolated and stimulated ex vivo with LPS and PMA, ionomycin to induce IL-10 secretion by B cells.

Results

No differential frequency was observed for all B cell populations in the spleen of HDM allergic mice, suggesting a normal B cell development. In contrast, HDM allergic mice exhibit a strong infiltration of CD19+ B cells in lungs and broncho-alveolar lavage after the second challenge. We found an increase of CD19 IgDhi IgMlow B2 mature and CD19 IgD- IgM- switched memory B cells in the lung of HDM allergic compared to control mice. We looked at CD19+ IL-10+ CD1dhi CD5+ CD21+ CD24hi IgMhi B cell population that has been shown to display regulatory properties in other situations. Whereas this population is present in spleen and lungs of HDM allergic mice, it produce less IL-10 than control after the first (vs control, $p<0.001$) and the second challenge (vs control, $p<0.05$) both in lung and spleen (vs control, $p<0.05$).

Conclusion

These results suggest a potential defect of B cell regulation in asthma. Future investigations will focus on their regulatory capacities *in vitro* and *in vivo*.

Author details
[1]Université de Nantes, UMR_S1084, UMR_S 1087, Institut du Thorax, France. [2]Université de Nantes, UMR_S 1087, Hopital Laënec, Institut du Thorax, L'institut du Thorax, France. [3]UMR_S 1087, Institut du Thorax, France. [4]UMR_S1084, CHU Hotel Dieu, ITUN, France.

Published: 3 May 2013

doi:10.1186/2045-7022-3-S1-P21
Cite this article as: Braza *et al.*: Deficiency of regulatory B cells in a house dust mite model of asthma. *Clinical and Translational Allergy* 2013 **3**(Suppl 1):P21.

[1]Université de Nantes, UMR_S1084, UMR_S 1087, Institut du Thorax, France
Full list of author information is available at the end of the article