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The involvement of sex-related functions of dendritic cells in female-predominant allergic inflammation in asthma**Chiaki Masuda**

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Statement of the Problem: Prevalence and severity of asthma symptoms after puberty are higher in women than in men. The numbers of IL-13-producing peripheral blood T cells are significantly higher in female than in male patients of atopic asthma. These T cells accelerate the female-predominated Th2-oriented immune response in asthma. The uptake and processing of inhaled allergens by dendritic cells (DCs) are fundamental for sensitization and subsequent elicitation of allergic airway responses. Observational data have suggested that DCs rapidly accumulate in the lamina propria in patients with allergic asthma after allergen challenge. However, the mechanism of DC involvement in the female-predominant Th2 immune responses in asthma is unclear.

Methodology & Theoretical Orientation: Male and female wild-type (WT) mice were sensitized using two intraperitoneal injections of ovalbumin (OVA) and aluminum hydroxide, followed by exposure to OVA aerosol challenges for 1 h on two occasions 4 h apart or administration of OVA intra-tracheal challenge. Here, we investigated the role of two major subsets of DCs in mice, CD11bhi and CD103+, in the orientation of T cells toward a Th2 phenotype observed predominantly in female patients of asthma.

Results: CD11bhi and CD103+ DC numbers in bronchial lymph nodes in female mice present a significant increase, measured 16 h after OVA challenge, compared to those in male mice. Additionally, CD103+ DCs in females expressed higher CD86 levels and had a higher potential of driving antigen uptake and Th2-cell differentiation compared to those in males. In contrast, such differences between the sexes were not observed for CD11b+ DCs.

Conclusion & Significance: These results suggest that the increased number of DCs and specific properties of CD103+ DCs may be involved in the Th2 immune response observed predominantly in female patients of allergic asthma.

Biography

Chiaki Masuda is a licensed Pharmacist and pursuing her Doctoral degree at Tohoku Medical and Pharmaceutical University, Japan. She has been working on "Analyzing differences in the pathophysiology of allergic asthma between sexes, focusing on the molecular mechanisms underlying the sex-specific effects of dendritic cells". Her focus is primarily on translational research such as conducting basic immunological studies using mouse models and applying the results obtained in studies of the etiology of asthma in humans.

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