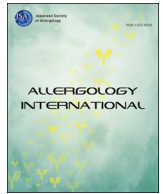




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Editorial

Recent advances in eosinophil-related diseases

In *Allergy International* (AI) vol. 68, Issue 4, we feature a set of review articles entitled “Recent advances in eosinophil-related diseases.” We believe that this issue will greatly contribute to our readers’ understanding of the pathogenesis of eosinophil-related diseases and of strategies for their treatment.

Eosinophils are multifunctional leukocytes implicated in the pathogenesis of a large number of processes, including parasitic helminth infections and allergic diseases.¹ In response to various stimuli — including cytokines, Fc receptors, pattern-recognition receptors, and complements — eosinophils release granules containing cationic proteins, including major basic protein (MBP), eosinophil-derived neurotoxin (EDN), eosinophil cationic protein (ECP), and eosinophil peroxidase (EPX). These serve as major effector cells, inducing tissue damage and dysfunction. In addition, eosinophils secrete an array of proinflammatory cytokines, chemokines, and lipid mediators, modulating immune responses by various mechanisms.^{2,3}

While eosinophils have long been recognized as terminally differentiated cells with cytotoxic and destructive properties, several studies have recently shown that, at steady state, eosinophils reside in organs such as the gastrointestinal tract, lungs, adipose tissue, thymus, uterus, and mammary glands, exerting a variety of homeostatic functions.^{2,3} Eosinophil-derived IL-4 has been shown to be involved in the induction of alternatively activated macrophages (AAMs) in adipose tissue, contributing to the subsequent development of beige adipocytes.⁴ In addition, intestinal eosinophils contribute to IgA production from plasma cells.⁵ Moreover, several studies have highlighted the phenotypic diversity of lung eosinophils in mice.^{6–8} These findings suggest that eosinophils may have some beneficial health effects in certain conditions.

Two types of IL-5–targeting strategies are now available for the treatment of severe asthma with an eosinophilic phenotype, namely anti-IL-5 mAbs (mepolizumab and reslizumab) and anti-IL-5 receptor mAb (benralizumab).⁹ Mepolizumab is also approved for the treatment of eosinophilic granulomatosis with polyangiitis (EGPA) because of its efficiency for relapsing or refractory EGPA.¹⁰ In addition, several clinical trials targeting the IL-5–IL-5R axis are in progress in eosinophil-related diseases, including eosinophilic esophagitis, eosinophilic gastroenteritis, hypereosinophilic syndrome (HES), nasal polyps, chronic rhinosinusitis, eczema, and chronic obstructive pulmonary disease (COPD).

This review series include five articles written by distinguished international researchers on eosinophil-related diseases. Fujieda and colleagues have described epidemiology, diagnostic criteria, pathogenesis, and treatment of eosinophilic chronic rhinosinusitis (ECRS), a subgroup of chronic rhinosinusitis with nasal polyps (CRSwNP).¹¹ In particular, they have focused on the difference and similarity of clinical phenotypes of the disease between Europe/US and Japan, providing new insight into the pathophysiology of ECRS.

Eosinophilic pneumonia (EP) is a rare disorder, primarily comprising acute eosinophilic pneumonia (AEP) and chronic eosinophilic pneumonia (CEP). Although both AEP and CEP are characterized by a marked accumulation of eosinophils in the lung, they are clearly different in many respects, including etiology, clinical manifestations, and the natural course of the disease. Suzuki and Suda have comprehensively reviewed EP, including some of their own clinical data along with data from a number of other groups.¹²

Eosinophilic gastrointestinal diseases (EGIDs) are characterized by dense infiltration of eosinophils in gastrointestinal tissues. EGIDs are separated into eosinophilic esophagitis (EoE) and eosinophilic gastroenteritis (EGE), depending on the organ involved. Although the etiology of EGIDs remains unclear, it is thought that EGIDs are caused by chronic allergic responses to various food and environmental allergens. Kinoshita, Oouchi, and Fujisawa have described recent progress in EoE and EGE, including pathogenesis, diagnosis, and treatment.¹³

EGPA (formerly Churg–Strauss syndrome) is a rare form of anti-neutrophil cytoplasm antibody (ANCA)-associated vasculitis characterized by eosinophil-rich granulomatous inflammation and small to medium-sized vessel vasculitis associated with bronchial asthma and eosinophilia. There is as yet no standard therapy for EGPA based on accumulated clinical trial results; however, the clinical benefits of mepolizumab for EGPA have recently been shown in a randomized controlled trial.¹⁰ Furuta, Iwamoto, and Nakajima have highlighted recent topics in EGPA, especially in the difference and similarity between ANCA-positive EGPA and ANCA-negative EGPA.¹⁴

Eosinophilic fasciitis (also called Shulman syndrome) is an uncommon disorder characterized by symmetrical induration of the skin, somewhat similar to that found in scleroderma-spectrum disorders. The deep fascia and lower subcutis are infiltrated with lymphocytes, plasma cells, histiocytes, and eosinophils, and in the early phase, peripheral eosinophilia is a prominent laboratory finding. Ihn has comprehensively reviewed eosinophilic fasciitis, from its pathophysiology to treatment.¹⁵

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In addition, a number of interesting clinical and basic research papers have been published as original articles or Letters to the Editor in this issue of AI. We offer our appreciation to all the authors for their contributions to the present issue.

Conflict of interest

The author has no conflict of interest to declare.

Hiroshi Nakajima

Department of Allergy and Clinical Immunology, Chiba University, Chiba, Japan
E-mail address: nakajimh@faculty.chiba-u.jp

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