Nasal eosinophilia and eosinophil peroxidase in children and adolescents with rhinitis

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Eosinophilic inflammation of nasal mucosa is a characteristic feature of allergic rhinitis.¹) Large quantities of eosinophils, neutrophils, mononuclear cells, and basophils migrate into the nasal mucosa during a late-phase nasal allergic reaction, which peaks 6 to 12 h after a nasal allergen challenge.¹) This response is considered important for establishing disease chronicity.²) Measurement of nasal eosinophil level was proposed as a useful strategy for evaluating eosinophilic inflammation in patients with allergic rhinitis.³,⁴) However, measurement of nasal eosinophils may vary depending on the investigator's experience and skills.⁵)

Eosinophils release oxygen radicals and proteins including eosinophil major basic protein, eosinophil cation protein (ECP), eosinophil-derived neurotoxin (EDN), and eosinophil peroxides (EPO). These proteins are reportedly related to nasal epithelium damage, subepithelial fibrosis, and hyper-responsiveness.⁶) ECP and EDN are secreted by neutrophils and eosinophils.⁷) Contrastingly, EPO, the most abundant cationic protein in toxic granules, is a toxic protein secreted only by eosinophils and used as an eosinophil-specific marker.⁸) A more important consideration than the simple presence of eosinophilia is whether eosinophils degranulate in the target tissue. Instead of measuring the eosinophil count, researchers have attempted to identify eosinophilic inflammation by measuring eosinophil-specific toxic granules released into lesions. However, an optimal method for EPO measurement is currently lacking, and little is known about the relationship between nasal EPO and eosinophilia in children. In addition, the diagnostic cut-off values of EPO level indicating eosinophilic inflammation have not yet been established. Therefore, the study conducted by Choi et al., which is published in the current issue, reveals the relationship between eosinophil and EPO and provides cut-off values of EPO levels that indicate eosinophilic inflammation.
This study showed a statistically significant correlation between the eosinophil count and percentage. EPO values showed a stronger correlation with nasal eosinophil counts than with percentage. Two eosinophil counts on nasal eosinophil count test showed the largest area under the curve value obtained from the receiver operating characteristic curve. The EPO cut-off value was 17.57 ng/μg. This study also revealed that nasal eosinophil count and percentage were higher in the allergic rhinitis group. However, EPO was not significantly higher in the allergic rhinitis group than non-allergic rhinitis group. The authors have explained that even if the number of eosinophils increases during allergic rhinitis, it is not an indication of the activation of eosinophilic inflammation.

Some previous studies have evaluated the association between eosinophils and EPO in sputum. However, evaluation of this association in nasal secretion is rare, especially in children, which is the strength of this study.

This study has some limitations because of the small number of subjects. Considerations for sensitized allergens and status of exposure to these allergens would have made the study even more superior. Further large-scale studies are needed to confirm clinical implication and the cut-off value of EPO in children with allergic rhinitis.

Although nasal eosinophil count measurement is not routinely recommended for patients with rhinitis, it could reflect the current status of nasal eosinophilic inflammation and can be useful for differentiating nonallergic rhinitis with eosinophilia syndrome (NARES) from nonallergic rhinitis. Universal use of this test can enable us to provide an optimal treatment to these patients. Introduction of the nasal EPO test into clinical settings could help us to gain information regarding active nasal eosinophilic inflammation.
Conflict of interest

No potential conflict of interest relevant to this article was reported.

References


