

Eosinophil Granule Major Basic Protein in Tissues

TEST FOR EOSINOPHIL INFILTRATION AND DEGRANULATION IN TISSUE

Clinical Background

- Eosinophils are important cells in inflammation, especially that associated with allergic diseases. They contain cytoplasmic granules, which are composed of toxic cationic proteins. The eosinophil major basic protein (eMBP), as its name implies, is a main constituent of the granule and is toxic to mammalian cells and tissues. When attracted into tissues and activated, eosinophils disrupt and deposit their toxic proteins. The cells are not morphologically identifiable, but detection of eMBP provides a means of determining eosinophil participation in the pathogenic process. Eosinophil involvement is observed in several inflammatory skin diseases. It is also often found in diseases affecting other epithelial tissues, including the respiratory tract, the gastrointestinal tract, and the urinary tract. Detection of eMBP in tissues demonstrates eosinophil activity in the presence or absence of intact eosinophils.
- Eosinophil-associated diseases occur in all epithelial organs. In addition to skin, the upper and lower respiratory tract, the entire gastrointestinal tract, and the urinary tract may be affected. The heart may be affected in hypereosinophilic syndrome. Some eosinophil-associated disorders are being reported with greatly increasing incidence and prevalence, especially eosinophilic gastrointestinal disease. Detection of eosinophil granule protein deposition provides evidence of eosinophil activation in tissues and implicates the eosinophil in the pathophysiology of the disease. In turn, this information supports the use of treatments that suppress eosinophilia and eosinophil activation.

Indications for Ordering

- Testing for eMBP is appropriate in patient's tissues in which eosinophil involvement is suspected. It is useful for enumeration of eosinophils in tissue biopsies and for identification of eosinophil granule protein deposition. Because clinical diseases can be associated with striking eosinophil degranulation in the virtual absence of intact eosinophils, this test provides the opportunity to identify these situations. It is particularly helpful in inflamed tissues in which eosinophils are disrupted and are no longer morphologically identifiable with routine tissue stains.

Interpretation

- Tissue sections stained for eMBP are examined and graded for the extent and intensity of both cellular and extracellular eMBP staining based on a visual analog scale of 0–4 established with reference images. Staining patterns and distribution in tissue are also recorded.
- Normal tissue, with the exception of tissue found in the stomach, intestine, lymph nodes, spleen, and thymus, shows no or trace eMBP staining. Grade 1 or greater cellular and/or extracellular staining is abnormal and indicates eosinophil activity in the pathologic process.

Methodology

- Eosinophil major basic protein is detected in tissues by indirect immunofluorescence.
- Affinity purified polyclonal rabbit anti-eosinophil granule major basic protein is used as the first-stage antibody on five micron tissue sections and detected by application of fluoresceinated anti-rabbit IgG secondary antibody.
- A negative control stained tissue section using normal rabbit IgG is included in each test.
- Formalin-fixed, paraffin-embedded tissues are preferred.

References

- Filley WV, et al. Identification by immunofluorescence of eosinophil granule major basic protein in lung tissues of patients with bronchial asthma. *Lancet* 1982;2:6–11.
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- Leiferman KM, et al. Extracellular deposition of eosinophil and neutrophil granule proteins in the IgE-mediated cutaneous late phase reaction. *Lab Invest* 1990;62:579–89.
- Leiferman KM, et al. Eosinophils in Cutaneous Diseases. In *Fitzpatrick's Dermatology in General Medicine*, 6th ed. Freedberg IM, et al, eds. 2003; New York: McGraw Hill, Inc., 959–66

Test Information

0090648 **Eosinophil Granule Major Basic Protein in Tissues**

For specific collection, transport, and testing information, refer to the ARUP Web site at www.aruplab.com.

For information on test selection, ordering, and interpretation, refer to ARUP Consult® at www.arupconsult.com.