CLINICAL VIGNETTE

A Woman with Multiple Pains and Elevated Eosinophils

Loc Duong, MD

Case

A 79-year-old woman established care with a new primary care physician. Past medical history includes breast cancer in remission status post mastectomy and endocrine therapy, asthma, rheumatoid arthritis and hypothyroidism. Over the course of 6 months, she presented with numerous complaints, including new pain on the left side of her face, chest congestion, and worsening fatigue. She also reported chronic abdominal pain in the right lower quadrant for several years and was followed by an outside gastroenterologist whose records had not been transferred. Her labs at the time of transfer of care were notable for WBC 15,600 (4,500-11,000 cells/mm^3), absolute neutrophil count 15.6 (1,500-8,000 cells/mm^3), absolute eosinophil count 810 (0-500 cells/mm^3).

She was advised to follow up with her rheumatologist for evaluation of possible temporal arteritis (giant cell arteritis). Ultrasound of the left temple suggested temporal arteritis but the biopsy was not consistent with arteritis. She was referred to allergy for persistent seasonal allergies and cough. Her allergist reviewed recent labs showing an absolute eosinophil count of 2,860 cells/mm^3, increased from 3 months prior. The allergist also reviewed older labs over 8 years and found prior elevated absolute eosinophil counts, as high as 3,200 cells/mm^3.

Outside records from gastroenterology were obtained and reviewed. Colonoscopy 3 years prior demonstrated eosinophilic colitis for which the patient had declined treatment with Budesonide. To investigate the cause of her eosinophilia, her oncologist performed a bone marrow biopsy, which showed normocellular marrow with multilineage hematopoiesis and increased eosinophils. Further studies including flow cytometry, FISH, BCR-ABL, and a hematologic malignancy sequencing panel showed no significant abnormalities.

She was referred to infectious disease and serology showed positive serum antibodies for Strongyloides and Toxacara. Three stool samples for strongyloides were negative, but she was empirically treated with Ivermectin (200 micrograms/kilogram). Though Toxacara was considered a less likely, she was also treated with 5 days of Albendazole. At follow-up 3 months after treatment, the patient reported that all of her symptoms including abdominal pain, left-sided facial pain, and fatigue had improved. Repeat CBC showed resolution of hypereosinophilia, with an absolute eosinophil count in the normal range at 3, 6, and 12 months after treatment.

Discussion

Hypereosinophilia (HE) is defined as an absolute eosinophil count >1,500 on two examinations at least one month apart.[1] Hypereosinophilic syndrome (HES) is considered when a patient with HE has eosinophil-mediated organ damage or dysfunction, and other causes have been excluded. Primary HES is caused by an underlying stem cell, myeloid, or eosinophilic neoplasm. In secondary HES, eosinophilia is driven by eosinophilopoietic cytokines (such as IL-5) stimulated by parasitic infections, T cell lymphoma, and solid tumors.[1]

In the US, strongyloidiasis is still an important nematode infection with a tendency toward chronic infections involving the lungs, GI tract, and other systems.[2] Strongyloides is caused by a soil-dwelling helminth that resides in the small intestine of human hosts by first penetrating intact skin, traveling to the bloodstream via subcutaneous lymphatics and reaching alveolar membrane to become airbone, then swallowed by the host.[2] The initial (acute) infection can present with an urticarial rash, cough, abdominal cramping, bloating, and watery diarrhea.[3] The chronic form is often asymptomatic, but can present with mild symptoms involving the pulmonary and GI tract including epigastric pain, intermittent vomiting, diarrhea, asthma-like symptoms.[3] Hyperinfection can occur, typically due to immunosuppression from steroids or concurrent illness. Hyperinfection syndrome occurs from enormous multiplication and migration of infective larvae in the setting of immunosuppression.[4]

This patient had subacute presentation with secondary hypereosinophilic syndrome (HES). She presented to her primary care physician with numerous complaints involving multiple systems including ENT, gastrointestinal, and vascular. The vascular system was initially evaluated with temporal artery biopsy. Consulting with allergy accelerated evaluation with documentation of intermittent HES and eosinophilic colitis. Treatment for Strongyloides was based on positive serum antibodies, which have a 74-98% sensitivity and 100% sensitivity on ELISA assay.[5] Stool studies were negative, however, these tests are not sufficiently sensitive due to fluctuation in the rate of larval excretion.[5] This patient highlights the difficulties many primary care physicians encounter when establishing care when patients have years of prior history, and the challenge in evaluating patients with numerous complaints. Through a detailed and extensive review of her history and records in collaboration with specialty consultations, she was finally

diagnosed with hypereosinophilic syndrome caused by chronic Strongyloides infection and successfully treated, with symptom resolution.

REFERENCES

1. **Klion A**. Hypereosinophilic syndrome: current approach to diagnosis and treatment. *Annu Rev Med.* 2009;60:293-306. doi: 10.1146/annurev.med.60.062107.090340. PMID: 19630574.
2. **Siddiqui AA, Berk SL**. Diagnosis of Strongyloides stercoralis infection. *Clin Infect Dis*. 2001 Oct 1;33(7): 1040-7. doi: 10.1086/322707. Epub 2001 Sep 5. PMID: 11528578.
3. **Concha R, Harrington W Jr, Rogers AI**. Intestinal strongyloidiasis: recognition, management, and determinants of outcome. *J Clin Gastroenterol*. 2005 Mar;39(3):203-11. doi: 10.1097/01.mcg.0000152779. 68900.33. PMID: 15718861.
4. **Dreyer G, Fernandes-Silva E, Alves S, Rocha A, Albuquerque R, Addiss D**. Patterns of detection of Strongyloides stercoralis in stool specimens: implications for diagnosis and clinical trials. *J Clin Microbiol*. 1996 Oct;34(10):2569-71. doi: 10.1128/jcm.34.10.2569-2571.1996. PMID: 8880521; PMCID: PMC229319.
5. **Huaman MC, Sato Y, Aguilar JL, Terashima A, Guerra H, Gotuzzo E, Kanbara H**. Gelatin particle indirect agglutination and enzyme-linked immunosorbent assay for diagnosis of strongyloidiasis using Strongyloides venezuelensis antigen. *Trans R Soc Trop Med Hyg*. 2003 Sep-Oct;97(5):535-8. doi: 10.1016/s0035-9203(03)80017-2. PMID: 15307419.