

When asthma Isn't just asthma: Unmasking occult strongyloidiasis before initiation of biologic therapy

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Abstract

Background: *Strongyloides stercoralis* infection is a frequently overlooked cause of eosinophilia and respiratory symptoms, often mimicking severe asthma. Immunomodulatory therapies, including corticosteroids and anti-IL-5 biologics, may precipitate hyperinfection syndrome if latent infection remains unrecognized.

Case presentation: We report a 32-year-old female with poorly controlled eosinophilic asthma who was evaluated for initiation of benralizumab. Persistent peripheral eosinophilia and incomplete response to optimized therapy prompted further evaluation. Serological testing revealed *Strongyloides* infection despite minimal gastrointestinal symptoms. The patient received ivermectin prior to biologic initiation, resulting in clinical improvement and normalization of eosinophil counts.

Conclusion: This case highlights the importance of screening for *Strongyloides* infection in patients with eosinophilia prior to initiation of biologic therapy. Early diagnosis and treatment can prevent life-threatening complications.

Introduction

Strongyloidiasis is a soil-transmitted helminth infection caused by *Strongyloides stercoralis*, affecting hundreds of millions of individuals worldwide, particularly in tropical and subtropical regions [1,2]. A unique characteristic of this parasite is its ability to complete its lifecycle within the human host through autoinfection, allowing infection to persist for decades without re-exposure [3,4].

Clinical manifestations range from asymptomatic infection to severe disseminated disease. Pulmonary involvement occurs during larval migration through the lungs, leading to symptoms such as cough and wheeze, which can mimic asthma [2,5].

Hyperinfection syndrome represents a severe complication characterized by increased parasite burden and dissemination, most commonly triggered by immunosuppression, and carries significant mortality [6].

The increasing use of biologic therapies such as benralizumab—an anti-IL-5 receptor monoclonal antibody that causes eosinophil depletion—has raised concerns regarding impaired host defense against helminth infections [7]. Current recommendations advise treating helminth infections prior to initiating such therapy [8].

Case Presentation

A 32-year-old female presented with a two-year history of recurrent wheezing, nocturnal cough, and exertional dyspnea. She had been diagnosed with bronchial asthma and was receiving high-dose inhaled corticosteroids and long-acting beta-agonists, with intermittent courses of oral corticosteroids for exacerbations.

Clinical history

There was no prior history of chronic respiratory disease, tuberculosis, or immunodeficiency. The patient had a history of residence in a region endemic for parasitic infections. She denied significant gastrointestinal symptoms including diarrhea, abdominal pain, or weight loss.

Examination

- Oxygen saturation: 97% on room air
- Respiratory system: bilateral expiratory wheeze
- No crackles or focal findings

Investigations

Initial laboratory evaluation demonstrated persistent peripheral eosinophilia, with an absolute eosinophil count of 1,200 cells/ μ L, along with elevated total serum IgE levels, consistent with a type 2 inflammatory profile.

Pulmonary function testing revealed a moderate obstructive ventilatory defect with significant bronchodilator reversibility, supporting the working diagnosis of asthma. Fractional Exhaled Nitric Oxide (FeNO), where measured, was elevated, indicating ongoing eosinophilic airway inflammation.

Chest imaging did not demonstrate any fixed parenchymal abnormality, consolidation, or bronchiectasis. No transient infiltrates were captured at the time of imaging.

Given the persistence of eosinophilia despite optimized asthma therapy and the patient's epidemiological exposure, further evaluation for secondary causes was undertaken.

Serological testing for *Strongyloides stercoralis* returned positive IgG antibodies, confirming exposure and likely chronic infection. Stool microscopy for ova and parasites was negative, recognizing the known limitation of single-sample stool examination in chronic strongyloidiasis due to intermittent larval shedding. Based on these findings, severe eosinophilic asthma was diagnosed, and initiation of benralizumab was planned.

Parameter	Result
Absolute eosinophil count	1,200 cells/ μ L
Serum IgE	Elevated
Spirometry	Obstructive pattern with reversibility
Chest imaging	No persistent abnormalities
FeNO	Elevated

Diagnostic reconsideration

Given persistent eosinophilia, incomplete response to therapy, and epidemiological risk, further evaluation for parasitic infection was undertaken.

- Strongyloides IgG serology: Positive
- Stool examination: Negative

Serology is more sensitive than stool microscopy in chronic infection, where larval shedding may be intermittent [3].

Management and outcome

The patient was treated with ivermectin at a dose of 200 μ g/kg orally for 2 days. Systemic corticosteroids were avoided during treatment.

On follow-up:

- Eosinophil count normalized
- Respiratory symptoms improved significantly
- No evidence of dissemination was observed. Planned biologic therapy was deferred pending reassessment.

Discussion

This case highlights the importance of considering parasitic infection in patients with eosinophilia and respiratory symptoms.

Diagnostic overlap

Pulmonary migration of *Strongyloides* larvae may result in cough and wheezing, mimicking asthma and leading to misdiagnosis [6].

Risk of hyperinfection

Hyperinfection syndrome occurs due to accelerated autoinfection, often triggered by immunosuppressive therapies such as corticosteroids, and is associated with high mortality [3,6].

Implications for biologic therapy

Benralizumab results in near-complete depletion of eosinophils, compromising host defense mechanisms against helminths. Studies suggest a potential increased risk of parasitic infections with anti-type 2 biologics [7]. Regulatory guidance recommends treating pre-existing helminth infections before initiating therapy [8].

Importance of screening

Screening is essential in patients with:

- Persistent eosinophilia
- Exposure to endemic regions
- Planned immunosuppressive therapy

Serological testing remains the preferred diagnostic modality [1,3].

Clinical implications

Early detection and treatment of *Strongyloides* infection can prevent potentially fatal complications. Routine screening should be considered before initiating biologic therapy in at-risk patients.

Conclusion

Strongyloidiasis should be considered in patients presenting with eosinophilia and refractory asthma, particularly in the setting of epidemiological risk. Screening prior to initiation of eosinophil-depleting therapy is critical in preventing hyper infection syndrome.

Learning points

- *Strongyloides* infection can mimic severe asthma
- Persistent eosinophilia requires evaluation for parasitic causes

- Biologic therapies may increase risk of severe infection
- Screening is essential prior to immunomodulatory therapy
- Ivermectin is an effective and potentially life-saving treatment

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