Case Report

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Does mepolizumab ease intestinal parasitic infections?

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Abstract:

Biological agents targeting interleukin-5 (IL-5) and eosinophils are used in the treatment of severe eosinophilic asthma. Dysfunctions of IL-5 and eosinophils are known to be associated with parasitic infections. However, whether biological agents acting through IL-5 and eosinophils facilitate parasitic infections has not yet been clearly elucidated. A 67-year-old female patient had been followed for eight years with a diagnosis of severe eosinophilic asthma. Mepolizumab treatment was initiated because, despite previous treatments, she experienced asthma exacerbations requiring systemic steroid use twice within one year, and her eosinophil count was 620/μL. Twenty days after the second dose of mepolizumab, the patient began complaining of dry itching. Stool microscopy revealed *Entamoeba histolytica* cysts along with abundant leukocytes and erythrocytes in every field (x400). The infectious diseases clinic started metronidazole treatment. Following treatment, the patient's itching subsided, and stool microscopy was normal at the follow-up visit. To our knowledge, this is the first case in the literature reporting an *Entamoeba histolytica* infection with itching associated with the use of mepolizumab.

Keywords:

Asthma, *Entamoeba histolytica*, eosinophil, interleukin-5 (IL-5), mepolizumab

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Introduction

Asthma is a chronic inflammatory disease of the airways. Various inflammatory pathways are involved in asthma; however, eosinophils play a critical role in the pathogenesis and progression of the disease.[1] Biological agents targeting interleukin-5 (IL-5) and eosinophils are commonly used in the treatment of severe eosinophilic asthma. It is known that dysfunctions of IL-5 and eosinophils can be associated with parasitic infections. However, it remains unclear whether biological agents targeting IL-5 and eosinophils facilitate parasitic infections. Here, we present a case of a patient who developed a parasitic infection while receiving mepolizumab treatment, to contribute to the literature.

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Case Report

A 67-year-old female patient, followed for eight years with a diagnosis of non-atopic eosinophilic asthma, also had nasal polyps, nonsteroidal anti-inflammatory drug (NSAID) hypersensitivity, and beta-lactam group antibiotic allergy. She was being treated with high-dose inhaled corticosteroid-long-acting beta-agonist and oral montelukast. Mepolizumab treatment was initiated after she experienced asthma exacerbations requiring systemic steroid use twice in one year, despite her ongoing treatment, and her eosinophil count was measured at 620/μL. Twenty days after the second dose of mepolizumab, the patient began to complain of dry itching. The dermatology clinic recommended skin moisturizing, suspecting xerosis cutis. However, as the itching persisted despite these recommendations, further examinations were performed after the third dose of mepolizumab. Stool microscopy revealed *Entamoeba histolytica* cysts, along with abundant leukocytes and erythrocytes in every field (x400). Apart from itching, the patient did not report any systemic or gastrointestinal symptoms. The infectious diseases clinic initiated metronidazole treatment. Following the treatment, the patient's itching subsided, and stool microscopy was normal at follow-up. Given that the itching began during mepolizumab therapy and amebiasis was identified, mepolizumab treatment was discontinued during this period.

Discussion

Interleukin-5 is a key cytokine in the eosinophil pathway and plays a central role in inflammatory processes in asthma.[2] IL-5 is involved in eosinophil proliferation, differentiation, maturation, chemotaxis, and the prevention of eosinophil apoptosis.[3,4] Mepolizumab, by inhibiting IL-5 signaling, reduces the production and survival of eosinophils.

Eosinophils are also known to play a role in the host immune response to parasitic infections, particularly helminths.[5] Therefore, it is theoretically expected that the frequency of parasitic and helminthic infections could increase in patients receiving IL-5 antagonist therapy. However, data on this subject is limited. A VigiBase study published in 2023 reported an increased rate of parasitic infections with benralizumab compared to controls and other biologic treatments targeting type 2 inflammation. However, no increased reporting of parasitic infections was observed with omalizumab, dupilumab, and mepolizumab compared to the control group.[6]

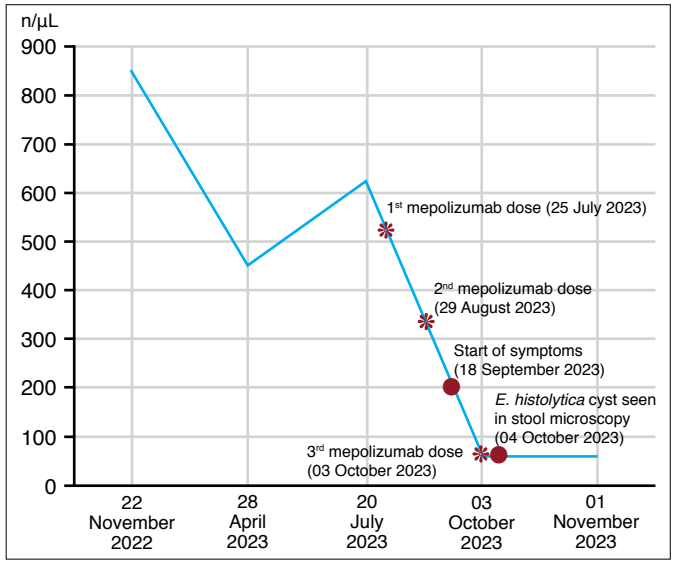

Figure 1: The patient's mepolizumab treatment timeline and the corresponding one-year trend of peripheral blood eosinophil counts

In the present case, the patient had no itching or gastrointestinal symptoms before mepolizumab treatment. However, itching developed after the second dose, and amebiasis was subsequently detected, raising the possibility that the parasitic infection was associated with mepolizumab treatment. The patient's eosinophil levels over the one-year period from the initiation of mepolizumab treatment to the detection of *Entamoeba* cysts are presented in Figure 1. To our knowledge, this is the first case in the literature of an itching complaint due to *Entamoeba histolytica* infestation associated with the use of mepolizumab. While this finding does not warrant restricting the use of mepolizumab, even in *E. Histolytica*-endemic areas, it highlights the importance of informing patients at risk of exposure about potential symptoms during mepolizumab treatment.

Informed Consent

Written consent was obtained from the patient for the case presentation.

Authorship Contributions

Concept – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.; Design – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.; Supervision – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.; Funding – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.; Materials – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.; Data collection &/or processing – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.; Analysis and/or interpretation – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.; Literature search – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.; Writing – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.; Critical review – K.A., H.Ç.T., M.Y., F.D.Ç., Ö.A., O.T.

Conflicts of Interest

There are no conflicts of interest.

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No AI technologies utilized.

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Externally peer-reviewed.

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