MEDWIN PUBLISHERS
Committed to Create Value for Researchers

Clinical Dermatology Open Access Journal
ISSN: 2574-7800

Pneumocystis Pneumonia after Initiation of Adalimumab in a Patient with Psoriasis and Concomitant Methotrexate-Induced Pancytopenia

Boswell ND[1,2]*, Abdelgaber K[1] and Punna S[1]

[1]Department of Dermatology, Marshall University Joan C. Edwards School of Medicine, USA
[2]Department of Dermatology, University of South Carolina School of Medicine Greenville, USA

***Corresponding author:** Nicole D Boswell, Department of Dermatology, Marshall University Joan C. Edwards School of Medicine, 8125 West Lorraine Place, Milwaukee, WI 53222, USA, Tel: 864-934-0368; Email: nb1@email.sc.edu

Case Report
Volume 8 Issue 3
Received Date: August 02, 2023
Published Date: August 22, 2023
DOI: 10.23880/cdoaj-16000309

Abstract

Pneumocystis jiroveci pneumonia (PCP) can be a fatal infection developing in those with and without HIV with an increased mortality in those without HIV. The development of biologics for autoimmune and dermatologic disease has increased the prevalence of patients who are immunocompromised due to medication. Our case presents a 51-year-old HIV negative male with psoriasis and psoriatic arthritis who developed PCP after initiating adalimumab. He had previously been taking methotrexate as monotherapy with inadequate control of symptoms. PCP can present with or without respiratory symptoms in those who are immunocompetent, which may cause unintentional shedding to those who are immunocompromised. Due to the detrimental effects of the infection, it is important for dermatologists to be aware of this potential risk of PCP with biologics and considerations for screening for PCP prior to initiating biologic therapy.

Keywords: Adalimumab; Immunocompromised; Adalimumab; Ovalocytes

Abbreviations: PCP: Pneumocystis Jirovecii Pneumonia; BAL: Broncho Alveolar Lavage.

Introduction

Pneumocystis jirovecii pneumonia (PCP) is a rare infection in immunocompromised patients, historically being known as a disease of HIV. Immunosuppressant medications are commonly used in the treat of psoriasis and psoriatic arthritis but are not benign medications. An increased number of opportunistic infections have been reported in HIV negative individuals with the increased use of immunosuppressants, including TNF alpha inhibitors [1]. Concomitant use of methotrexate, which can cause pancytopenia, can increase overall risk of infection compared to monotherapy alone. While the safety of immunotherapy agents has been reported in the literature, opportunistic infections, such as Pneumocystis pneumonia, increases mortality of patients who are otherwise healthy, reenforcing the importance for dermatologists to be educated on this potentially fatal adverse outcome of therapy [2]. There have been multiple reports of PCP pneumonia in those who have been treated with immunotherapy for rheumatoid arthritis, but reports in patients with psoriasis are lacking. We present a case of PCP after the initiation of adalimumab in a patient with psoriasis and methotrexate-induced pancytopenia.

Case Presentation

A 51-year-old male with a past medical history of psoriasis complicated by psoriatic arthritis was admitted to the general medical floor with worsening shortness of breath that had been present for a two-week duration. No initial symptoms of infection were present. His current regimen for treatment of psoriasis and psoriatic arthritis included 25 mg oral methotrexate weekly, which he had taken for ten months prior to presentation, and adalimumab, which was added six weeks prior to his hospitalization due to inadequate control of his psoriatic lesions, receiving a total of three doses. There was no dose adjustment in methotrexate after the initiation of adalimumab.

In addition to his shortness of breath, he was found to have profound pancytopenia on admission with a white blood cell count of 2.3. His white blood cell count three months prior to admission was 10.7. Differential diagnosis included methotrexate use, infection, hematologic malignancy, aplastic anemia, multiple myeloma, and deposition disease, including AA amyloidosis. Peripheral smear showed significant anisopoikilocytosis including ovalocytes, teardrop cells, and pancytopenia. Bone marrow biopsy showed erythroid hyperplasia with left shift consistent with medication side effect. His cell counts improved over the course of two weeks with the discontinuation of methotrexate, suggesting methotrexate as the etiology for his pancytopenia.

During his admission, he became febrile, and his breathing acutely worsened, requiring supplemental oxygen. This prompted further evaluation with a CT of his chest, which showed findings consistent with interstitial lung disease and fibrosis. He was treated with antibiotics and did not improve during treatment. Pulmonology was consulted and performed a bronchoscopy with bronchoalveolar lavage (BAL). BAL fluid was clear and bacterial cultures were negative.

Initial autoimmune and infectious workup, including HIV, was negative. Fungi tell blood test, testing for a component of a fungal cell wall, was positive suggesting an underlying fungal infection. Given his history of medication-induced immunosuppression and presenting symptoms, a diagnosis of Pneumocystis pneumonia was favored. Patient was treated with steroid treatment with clindamycin and primaquine for 3 weeks and transitioned to PCP prophylaxis with atovaquone daily. He had a clinical response with treatment, and PCP PCR was positive, confirming the diagnosis.

Discussion

PCP has been well known to afflict patients with HIV, though the treatment of autoimmune disease with immunomodulators have increased the incidence of PCP in those who are HIV negative [3]. The etiology of PCP was initially proposed as reactivation of a latent childhood infection. More recent studies have documented the same genotype of PCP found in those who were living in the same region, suggesting PCP is transmitted from the environment, most likely person-to-person [4]. Asymptomatic or mildly symptomatic immunocompetent individuals can transmit the disease to immunocompromised individuals, increasing risk of fulminant respiratory failure and mortality.

Due to the widespread use of biologics, there have been an increased number of cases of PCP occurring in those with autoimmune and dermatologic disease. PCP associated with TNF alpha inhibitors has been documented in the literature, but the combination of methotrexate and adalimumab can further exacerbate the risk of infection [5]. Methotrexate has been implicated for pancytopenia, as in our patient, further predisposing patients to opportunistic infection. Our case includes a patient who had no other cause of immunosuppression and was a healthy individual who should have cleared PCP easily. The recent initiation of adalimumab along with the existing literature implicates adalimumab as causing our patient to have enhanced immunosuppression, thus resulting in PCP infection.

As seen in our case presentation, treating dermatologic conditions with biologics can cause an immunocompromised state. Due to PCP having an increased mortality rate and chance of fulminant respiratory failure with rapid decline in those who are HIV negative compared to those with HIV, it becomes even more prudent for dermatologists who are treating patients to be aware of the possibility of this opportunistic infection due to significant mortality [3]. Prophylaxis for PCP may be beneficial for those who are initiated on immunosuppressants for dermatologic disease with potential to be screened for PCP prior to the initiation of immunosuppressants.

References

1. Mori S, Sugimoto M (2012) *Pneumocystis jirovecii* infection: an emerging threat to patients with rheumatoid arthritis. Rheumatology (Oxford) 51(12): 2120-2130.

2. Kanderi T, Gomez JC, Puthenpura MM, Yarlagadda K, Gangireddy M (2020) Pancytopenia as a Complication of Low-Dose Methotrexate in a Septuagenarian: A Rare Presentation. Cureus 12(6): e8492.

3. Salzer HJF, Schafer G, Hoenigl M, Gunther G, Hoffmann C, et al. (2018) Clinical, Diagnostic, and Treatment Disparities between HIV-Infected and Non-HIV-Infected Immunocompromised Patients with Pneumocystis

jirovecii Pneumonia. Respiration 96(1): 52-65.

4. Watanabe K, Sakai R, Koike R, Sakai F, Sugiyama H, et al. (2013) Clinical characteristics and risk factors for Pneumocystis jirovecii pneumonia in patients with rheumatoid arthritis receiving adalimumab: a retrospective review and case-control study of 17 patients. Mod Rheumatol 23(6): 1085-93.

5. Ito Y, Hozumi K, Okada Y, Kurimoto S (2017) Adalimumab with Methotrexate in Treatment-Naïve Japanese Patients with Rheumatoid Arthritis at Risk of Progressive Structural Joint Damage: A Postmarketing Observational Study. Rheumatol Ther 4(1): 151-66.