(International Print/Online Journal)

SJIF IMPACT FACTOR: 6.829
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 9, Issue 5, Page No: 42-45
September-October 2026

IJMSCR

From Chemotherapy to Critical Care: Drug-Induced Interstitial Lung Disease following Paclitaxel Therapy in a Patient with Breast Carcinoma: A Case Report

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Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Drug-induced interstitial lung disease is a rare yet life-threatening toxicity of paclitaxel. This case highlights the importance of maintaining a high index of suspicion for new-onset respiratory symptoms during chemotherapy to facilitate timely diagnosis and management. Drug-induced interstitial lung disease should be considered in patients presenting with acute respiratory symptoms following chemotherapy. Prompt diagnosis, exclusion of infectious causes, and early corticosteroid therapy can result in favourable clinical outcomes.

Keywords: Paclitaxel, Breast carcinoma, chemotherapy-induced interstitial lung disease, Acute hypoxemic respiratory failure, non-invasive ventilation, Pneumonitis, Interstitial Lung disease

Introduction

Taxane-based chemotherapy remains an integral component of breast cancer treatment. Although generally well tolerated, paclitaxel has been associated with rare pulmonary toxicities, including drug-induced interstitial lung disease. The clinical presentation may mimic infectious pneumonia, making diagnosis challenging. Radiological evidence of bilateral ground-glass opacities together with temporal association with chemotherapy and response to corticosteroids supports the diagnosis. We report a case of paclitaxel-associated interstitial lung disease requiring intensive care management.

Case Report

A 39-year-old female was diagnosed with carcinoma of the right breast. Immunohistochemistry demonstrated ER, PR- positivity, HER2 negativity, and a Ki-67 proliferation index of 61%. She underwent BCS with Axillary lymph node dissection under General Anaesthesia on 13 February 2026. Subsequently, she completed 16 sets of GSCF therapy followed by five cycles of paclitaxel chemotherapy, with the last session being 12 days before the onset of symptoms and remained under routine oncology surveillance.

She presented with high-grade fever, generalized chills, and generalised tiredness of one week's duration. Over the previous three days, she experienced progressively worsening exertional dyspnoea accompanied by paroxysmal nocturnal dyspnoea. On admission, she was dyspnoeic even at

rest ,hypoxemic and was initially managed with High-Flow Nasal Cannula oxygen therapy at an FiO_2 of 60% and a flow rate of 60 L/min.

Despite HFNC support, worsening arterial blood gas analysis and increasing respiratory distress necessitated escalation to non-invasive ventilation. She was admitted to the critical care ICU for further management.

Pulmonology consultation was obtained. High-resolution CT of the chest demonstrated bilateral extensive ground-glass opacities with patchy areas of consolidation. Considering the temporal relationship with paclitaxel therapy, imaging findings, and clinical presentation, a diagnosis of paclitaxel-induced interstitial lung disease with probable infective exacerbation was considered.

LABS

Hb 9.6 mg/dl TC 12680 PLT 2.40L, PCT 1.49 CRP 211

ABG- PH- 7.38 PCO_2- 35 PO_2- 60 Lactate 1.2 HCO_3-20.7 SO2- 90% P/F ratio 100

Blood Culture and Sensitivity -No growth

RSV Flu Panel -Negative

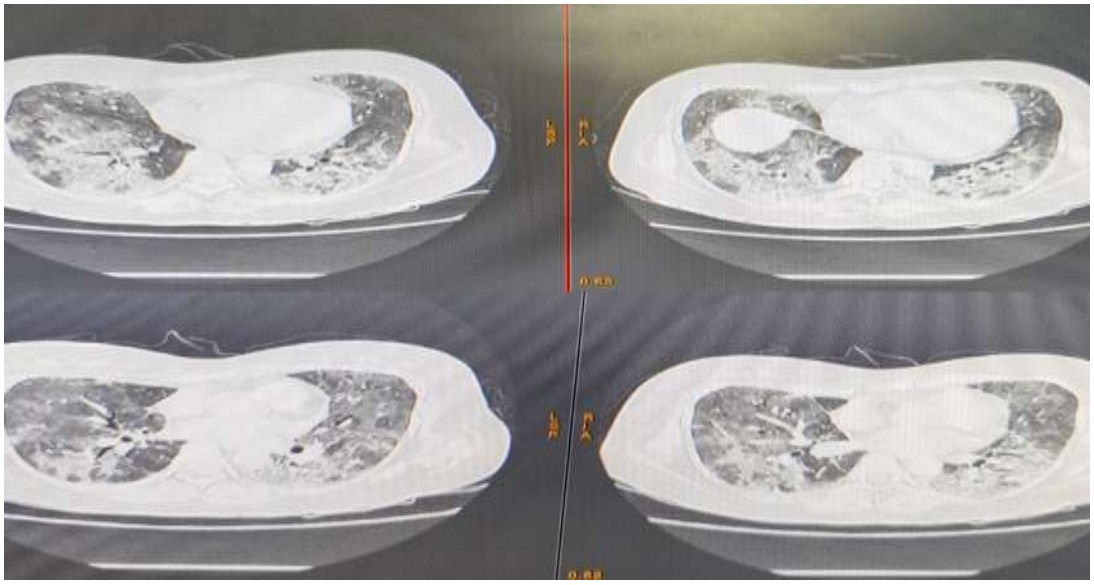
Sputum Culture and Sensitivity -Candida Albicans

Echocardiography -no RWMA, good Ejection Fraction

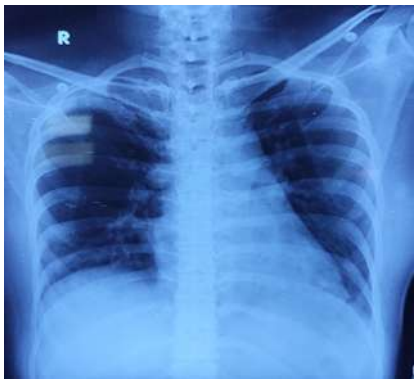
Anti CCP -Negative

RA factor NEGATIVE

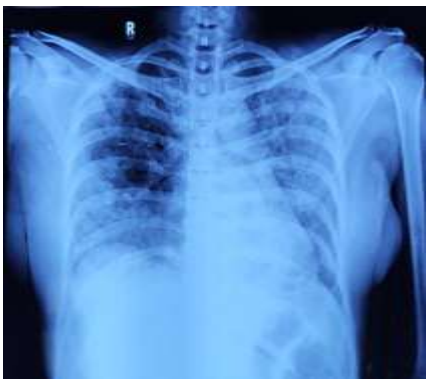
HRCT THORAX -b/l diffuse GGO suggestive of nonspecific interstitial pneumoniae



DAY 5 chest X ray



DAY 1 chest X ray



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The patient received systemic corticosteroids (Inj Methyl Prednisolone 125 mg BD), empirical broad-spectrum antibiotics, Fluconazole, nebulized bronchodilator therapy, chest physiotherapy, and comprehensive supportive ICU care. Respiratory status gradually improved, she demonstrated sustained symptomatic improvement and was discharged from the ICU on the fifth day.

Discussion

Paclitaxel is a cornerstone chemotherapeutic agent in the treatment of both early-stage and advanced breast cancer because of its proven survival benefit and acceptable safety profile. Although haematological toxicity and peripheral neuropathy are common adverse effects, paclitaxel-induced interstitial lung disease (ILD), also referred to as paclitaxel-induced pneumonitis (PIP), remains an uncommon but potentially life-threatening complication (3). The reported incidence ranges from approximately 1% to 5%, although the true frequency may be underestimated due to variable clinical presentation and under-recognition. Early diagnosis is crucial because delayed treatment has been associated with respiratory failure, intensive care admission, and increased mortality.

The pathogenesis of paclitaxel-induced ILD is not completely understood. Current evidence suggests that it is predominantly an immune-mediated hypersensitivity reaction resulting in diffuse alveolar injury, although direct cytotoxic effects on the pulmonary interstitial tissue have also been proposed. (1 ,3)

Most reported cases develop during the first few cycles of weekly paclitaxel, typically within days to weeks after treatment initiation. Patients commonly present with fever, dry cough, progressive dyspnoea, and hypoxemia.

High-resolution computed tomography (HRCT) usually demonstrates bilateral ground-glass opacities, diffuse interstitial infiltrates, reticular changes, or consolidative lesions with an organizing pneumonia pattern (1). However, these imaging findings are nonspecific and overlap with infectious pneumonia, pulmonary edema, pulmonary embolism, radiation pneumonitis, lymphangitic carcinomatosis, and other drug-induced lung injuries. Consequently, paclitaxel-induced ILD remains a diagnosis of exclusion, requiring careful clinical correlation and comprehensive evaluation to eliminate alternative aetiologies.

An extensive diagnostic work-up is therefore essential. Microbiological cultures, viral studies, inflammatory markers, bronchoalveolar lavage when feasible, and echocardiographic assessment help exclude infection and cardiogenic pulmonary oedema. Bronchoscopy with bronchoalveolar lavage is particularly valuable in immunocompromised patients, while lung biopsy is generally reserved for diagnostically challenging cases because of procedural risk. (3)

Immediate discontinuation of paclitaxel remains the cornerstone of management (5). Systemic corticosteroids constitute the primary treatment, with most authors recommending intravenous methylprednisolone in severe cases followed by gradual transition to oral prednisolone and a slow taper over several weeks to months according to clinical and radiological response (2).

Supportive measures including supplemental oxygen, broad-spectrum antimicrobial therapy until infection is excluded, and ventilatory support, when necessary, should be instituted promptly. Published case reports demonstrate that most patients experience substantial clinical improvement following early corticosteroid therapy, whereas delayed recognition may lead to irreversible pulmonary fibrosis or fatal respiratory failure. (4)

Whether patients can be safely rechallenged with taxanes after recovery remains controversial. Most published reports discourage re-exposure following severe pneumonitis because recurrence may occur and can be more severe. Alternative non-taxane chemotherapy regimens should therefore be considered after multidisciplinary discussion involving oncology, pulmonology, and critical care teams. (2)

Conclusion

Paclitaxel-induced interstitial lung disease is a rare but potentially life-threatening adverse effect of taxane chemotherapy that requires a high index of clinical suspicion. In patients receiving paclitaxel who develop new-onset respiratory symptoms, prompt evaluation to exclude infectious and other cardiopulmonary causes is essential. Early recognition, immediate discontinuation of the offending agent, and timely

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initiation of systemic corticosteroids can result in significant clinical improvement and reduce the risk of respiratory failure and mortality.

This case highlights the importance of multidisciplinary collaboration among oncologists, pulmonologists, intensivists, and radiologists in achieving an accurate diagnosis and optimizing patient outcomes. Increased awareness of this uncommon complication may facilitate earlier intervention and improve the safety of taxane-based chemotherapy in patients with breast cancer.

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