Bleomycin Toxicity — Findings on FDG PET CT

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Abstract
Bleomycin, an antitumour antibiotic, is an essential part of treatment for multiple curable cancers, most commonly Hodgkin Lymphoma (HL) and germ cell tumours. Major limitation of its use is lung toxicity. Early diagnosis and treatment of bleomycin lung toxicity (BLT) is crucial, as the changes are reversible during early inflammatory phase only. 18F Fluorodeoxyglucose (FDG) PET-CT can predict BLT early in the course of illness. It is important to pay attention to lung parenchymal uptake on interim and end of treatment scans, as this may predict lung toxicity even in the absence of morphological lung abnormalities and clinical symptoms.

Keywords: Bleomycin toxicity, Bleomycin induced pneumonitis, FDG PET/CT.

Discussion
A 37-years old patient with HL received combination chemotherapy containing Bleomycin. Initial PET-CT showed no abnormal lung findings (Figure-1). Re-evaluation scan revealed new onset ground-glass changes in bilateral lungs with increased uptake (Figure-2). Patient was symptomatic at that time requiring supplemental oxygen. After excluding other causes, diagnosis of BLT was made. Bleomycin was omitted from chemotherapy regimen and managed with steroids with complete resolution of symptoms.

Bleomycin induced lung injury may manifest as multiple distinct syndromes; Interstitial Pneumonitis being the most common variant with an incidence of 10% and mortality rates up to 10-20%. Diagnosis is challenging and based upon clinical symptoms, radiological patterns, histology and pulmonary function tests; provided other disorders have been excluded. Radiological findings can be misleading, as chest X-ray may appear normal in early phase. CT findings may vary from non-specific airspace consolidation to ground-glass opacities.1 Diffuse FDG uptake can be seen in lung parenchymal changes secondary to BLT, predominantly in basal and subpleural areas prior to clinical presentation.2,3 Falay O. et al. showed abnormal lung uptake of FDG in 13 out of 77 patients treated for HL, suggesting Bleomycin induced pneumonitis on interim scan. All were successfully treated with steroids and omitting Bleomycin.4 BLT is thought to resolve in majority of patients if diagnosed timely. Delayed diagnosis may lead to lung fibrosis which leads to acute respiratory compromise, an irreversible condition. FDG-PET/CT plays an important role in the early detection of BLT before clinical and radiological finding, instigating the clinicians to treat timely.

Figure-1: Maximum intensity projection image (a), trans-axial sections of CT (b) and fused PET-CT (c) of initial scan show unremarkable lung fields.
References


Figure 2: PET-CT Maximum intensity projection image (a) showing abnormal increased FDG uptake [SUV 8.3] in bilateral lung fields; more marked on left side. Axial sections of CT (b, d) with corresponding fused PET-CT (c, e) showing diffuse ground glass, hypermetabolic changes bilaterally.