ORIGINAL RESEARCH PAPER

Internal Medicine

# TUBERCULOSIS-IMMUNE RECONSTITUTION INFLAMMATORY SYNDROME (TB-IRIS) IN AN HIV-POSITIVE PATIENT: A RARE CASE REPORT

**KEY WORDS:** TB-IRIS, HIV, Antiretroviral therapy, Immune reconstitution, Corticosteroids

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**ABSTRACT**

**Background:** Tuberculosis-immune reconstitution inflammatory syndrome (TB-IRIS) is a paradoxical worsening of tuberculosis symptoms after initiation of antiretroviral therapy (ART) in HIV patients. Early identification is crucial for management. **Case Presentation:** We present the case of a 45-year-old male, Gulla Ram, recently diagnosed with HIV infection and pulmonary tuberculosis, who developed TB-IRIS two weeks after starting ART. **Investigations and Management:** Diagnosis was clinical, supported by laboratory and imaging findings. Management involved continuation of antitubercular therapy (ATT) and ART with the addition of corticosteroids. **Conclusion:** TB-IRIS remains an underdiagnosed and underreported complication in HIV-tuberculosis co-infection. Prompt recognition and appropriate therapy are essential to prevent morbidity.

## BACKGROUND

Tuberculosis (TB) is the most common opportunistic infection among HIV-infected individuals. Initiation of ART can unmask or exacerbate underlying infections, resulting in immune reconstitution inflammatory syndrome (IRIS). TB-IRIS, although known, remains under-recognized in resource-limited settings.

## INTRODUCTION

The restoration of immune function following ART initiation can lead to an exaggerated inflammatory response against existing pathogens, notably Mycobacterium tuberculosis. TB-IRIS presents clinically as worsening respiratory symptoms, lymphadenopathy, fever, or new radiological lesions. Differentiating TB-IRIS from treatment failure or drug resistance is critical, as management strategies differ.

## Case Presentation

### Patient Information:

- **Name:** Gulla Ram
- **Age:** 45 years
- **Gender:** Male
- **Occupation:** Farmer
- **Residence:** Rural Rajasthan, India

### Presenting Complaints:

- Fever for 2 months
- Cough with expectoration for 1.5 months
- Weight loss (~8 kg) over 2 months

### History:

- No history of diabetes, hypertension, or previous tuberculosis treatment.
- No history of intravenous drug use.

### Diagnosis Before Presentation:

- HIV diagnosed one month prior (HIV-1 positive by ELISA and Western blot confirmation).
- Sputum-positive pulmonary tuberculosis diagnosed by GeneXpert (Mycobacterium tuberculosis detected, rifampicin sensitive).

### Treatment History:

- Started on standard Category I ATT (rifampicin, isoniazid, pyrazinamide, ethambutol) as per RNTCP guidelines.
- ART initiated after 2 weeks (Tenofovir + Lamivudine + Dolutegravir).

### Clinical Course:

- Two weeks post-ART initiation, patient developed worsening fever, cough, new cervical lymphadenopathy, and malaise.

### Investigations

| Test | Result | Reference Range |
|---|---|---|
| Hemoglobin | 10.2 g/dL | 13–17 g/dL |
| Total WBC count | 8,500 /mm³ | 4,000–11,000 /mm³ |
| ESR | 60 mm/hr | <20 mm/hr |
| CD4 count | 80 cells/mm³ | 500–1500 cells/mm³ |
| Chest X-ray | New right upper lobe consolidation | Normal |
| Sputum AFB | Negative after ATT initiation | - |
| Blood cultures | Sterile | - |
| FNAC (lymph node) | Granulomatous inflammation consistent with TB | - |

### Management

- Continued ATT without modification.
- Continued ART without interruption.
- Prednisolone initiated at 1 mg/kg/day.
- Supportive care: antipyretics, nutritional support.

### Outcome:

Patient showed clinical improvement over 4 weeks with resolution of fever and lymphadenopathy.

### Imaging

Name: Gulla Ram Age: 45 years

Chest X-ray (Posteroanterior View):

**Figure 1:** Chest X-ray showing right upper lobe consolidation and cavitation.

## DISCUSSION

TB-IRIS is a clinical deterioration seen after ART initiation due to an exaggerated immune response against existing mycobacterial antigens. Risk factors include low baseline CD4 counts (<100 cells/mm³), high mycobacterial burden, and early ART initiation after TB treatment.

Differential diagnoses include TB treatment failure, drug-resistant TB, new opportunistic infections, and malignancies. Diagnosis is primarily clinical, supported by laboratory and radiological findings.

Management involves continuation of both ATT and ART. Corticosteroids have proven beneficial in moderate to severe TB-IRIS cases by reducing inflammatory responses.

### Flowchart: Diagnosis And Management Of TB-IRIS

Presentation with worsening symptoms ➔ Rule out ATT failure / drug resistance / new infections ➔ Confirm TB-IRIS clinically ➔ Continue ATT and ART ➔ Initiate corticosteroids if moderate to severe symptoms

## CONCLUSION

TB-IRIS should be suspected in HIV patients with recent ART initiation who exhibit clinical worsening despite effective ATT. Early diagnosis and timely corticosteroid therapy are critical in improving outcomes. Increased awareness among physicians is essential, particularly in high TB-HIV burden regions.

## REFERENCES

1. Meintjes G, Lawn SD, Scano F, Maartens G, French MA, Worodria W, et al. Tuberculosis-associated immune reconstitution inflammatory syndrome: case definitions for use in resource-limited settings. Lancet Infect Dis. 2008;8(8):516–23.
2. Haddow LJ, Colebunders R, Meintjes G, Lawn SD, Elliott JH, Manabe YC, et al. Cryptococcal immune reconstitution inflammatory syndrome in HIV-1-infected individuals: proposed clinical case definitions. Lancet Infect Dis. 2010;10(11):791–802.
3. Müller M, Wandel S, Colebunders R, Attia S, Furrer H, Egger M. Immune reconstitution inflammatory syndrome in patients starting antiretroviral therapy for HIV infection: a systematic review and meta-analysis. Lancet Infect Dis. 2010;10(4):251–61.
4. Narendran G, Swaminathan S, Menon PA, Bhaskar R, Kumaraswami V, Narayanan PR. Paradoxical worsening of tuberculosis following antiretroviral therapy in patients with HIV and tuberculosis. Natl Med J India. 2003;16(4):227–31.
5. WHO Consolidated Guidelines on Tuberculosis. Geneva: World Health Organization; 2021.