Immune reconstitution inflammatory syndrome in a patient with Pneumocystis pneumonia: a case report of a unique syndrome during highly active antiretroviral therapy.

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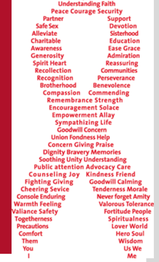
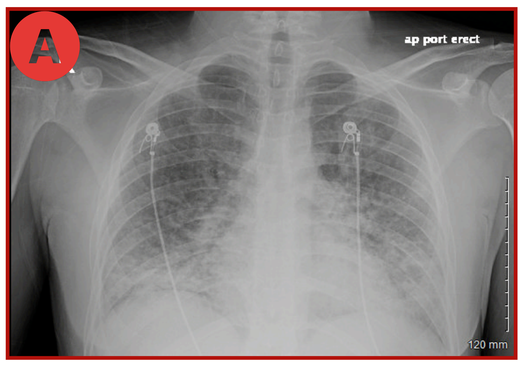


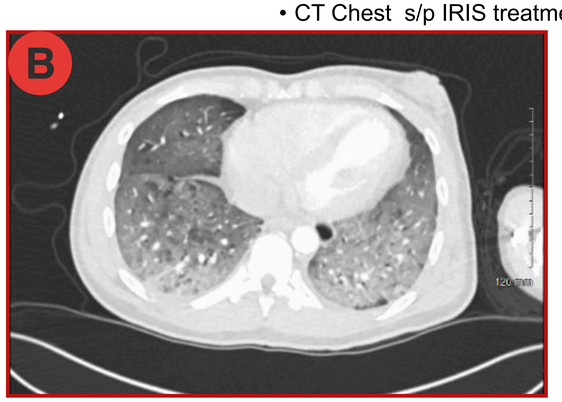
Background

- HIV remains a persistent public health problem in the United Sates.
- Approximately1.2million people were living with HIV in the United States at the end of 2021.
- In 2021, 36,136 people received an HIV diagnosis in the United States and dependent areas, of which 913 were from Pennsylvania.
- The annual number of new diagnosis decreased 7% from 2017 to 2021. [1]
- Human immunodeficiency virus (HIV) predisposes patients to an increased risk of opportunistic infections targeting the immune system by depleting CD4+ T lymphocytes. While the average CD4 count at diagnosis has been rising some patients still present with advanced disease.
- Combination antiretroviral therapy (ART) leads to the restoration of CD4+ T lymphocytes and substantially improves healthcare outcomes and quality of life in HIV patients (Figure 1).
- However, inflammatory responses triggered by the rapid resolution of immunosuppression can lead to localized and systemic reactions in patient with CD4+T cell counts less than 100 cells/ml and increased antigen burden of a pre-existing opportunistic infection (OI) [e.g. PCP Pneumonitis], termed immune reconstitution syndrome (IRS), which can occur in up to a third of cases of HIV patients initiated on HAART. [2-6]
- We report a case of IRIS-associated *Pneumocystis jirovecii* pneumonia.

Case Description

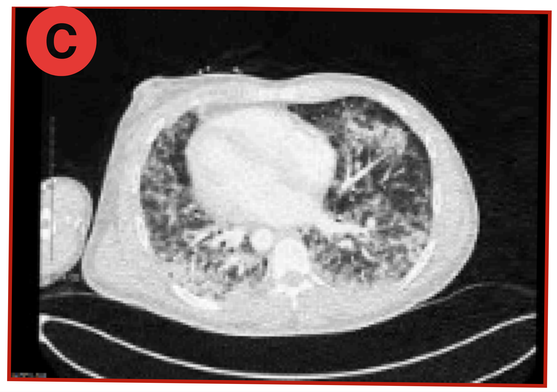
- A 35 year old transgender female admitted to CMMC due to progressive diffuse interstitial pneumonitis and increasing hypoxemia over one month, worse in the two weeks.
- Subsequently found to have newly diagnosed Advanced AIDs Stage III with CD4 count of 22, CD4% 5, CD4/8 ratio 0.1, HIV viral load of 167,000.
- Empiric evidence of PCP Pneumonitis was evident with diffuse reticular/ granular opacities on CXR **(A)** and diffuse bilateral interstitial infiltrates noted on CT Chest **(B)**.





Case Description

- BAL PCP PCR is as yet in progress at reference lab.
- Treated with IV Bactrim (sulfamethoxazole/trimethoprim) 15mg/kg/day, oral Biktarvy (bictegravir/emtricitabine/tenofovir alafenamide) and "California protocol steroids" with Prednisone 80mg daily, the ladder to prevent IRIS.
- Discharged on PO Prednisone 20mg QD to complete the remaining 11 days of a planned 21 day taper and oral Bactrim DS 2 tabs TID.
- She was compliant with the oral Bactrim and daily Biktarvy, but failed to continue oral Prednisone taper (20 mg daily) as planned. Patient reported issues filling her prescription at her Pharmacy.
- She was seen in HIV clinic, where it was discovered she had not been compliant with her oral prednisone taper. IRIS was felt a concern at that time.
- Readmitted due to increasing dyspnea, fevers, nonproductive cough, and generalized malaise. Temp: 104F, BP: 97/51 mm Hg, HR: 135, RR: 28, and SpO2: 95% on 4L.
- Laboratories remarkable for elevated procalcitonin to 4.5, elevated CRP to 27.2, LDH down to 353 from > 500 from 2 weeks ago, ESR< 140, and initial ABG was notable for acute respiratory acidosis.
- CT PE Angio [IRIS] noted improvement in multilobar interstitial pneumonitis, but commented upon new diffuse ground-glass opacities s/o early ARDS **(C)**.
- Started on IV Bactrim at 15mg/kg/day every 8 hours and resumed daily Biktarvy.
- Clinical picture c/w IRIS (immune reconstitution following ART) as a result of lack of steroids concomitant with PCP PNA.
- Discharged home on oral Biktarvy daily, prednisone taper, and Bactrim DS 2 tabs TID to complete 28 days then, resume oral Bactrim DS 1 tab daily for PCP and Toxoplasmosis prophylaxis until CD4 > 200 for 3 months and she achieves viral suppression for that period of time.
- CT Chest s/p IRIS treatment **(D)**.



Discusion

- Immune reconstitution inflammatory syndrome (IRIS) is a dysregulated, hyperinflammatory response against opportunistic infections, frequently observed in adults with nontuberculous mycobacteria, PJP, and cryptococcal infections[2].
- Diagnosis of IRIS can be challenging as its clinical manifestations are nonspecific can and mainly consist of fever and progression of existing opportunistic infections.
- Timely identification of IRIS can lead to avoidance of complications, which, in the case of severe CNS-IRIS or pulmonary IRIS, can be life-threatening. [3-5]
- Therefore, the prevention of IRIS depends largely on optimal screening for OIs before commencing HAART.

Conclusion

- Patients who are at high risk of having severe IRIS, e.g., HIV patients with a known Pneumocystis jirovecii infection, can be started on steroids empirically before or during the initiation of HAART to minimize the risk and severity of IRIS.

References

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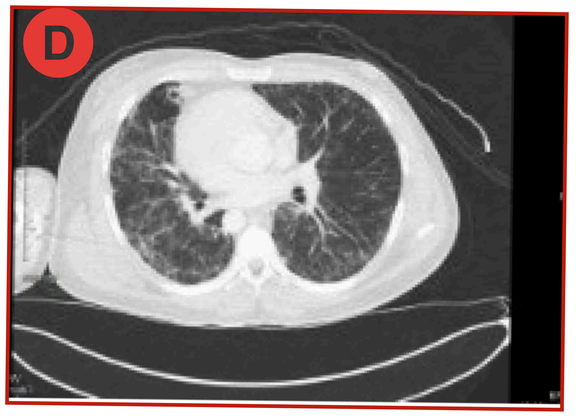

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