

Pneumocystis jiroveci

Clinical Background

Pneumocystis is a fungal organism that causes pneumonia predominantly in immunocompromised patients.

Epidemiology

- Incidence
 - In AIDS patients, <1/100
 - In solid organ transplant patients not taking prophylactic antibiotics – 5-10/100
- Sex – M>F, in AIDS patients
- Transmission – airborne droplet

Organism

- Classified as a fungus because RNA is homologous to fungal RNA
- Four morphological forms – trophozoites, cysts, precysts, sporozoites
- Cyst is diagnostic form and stains with Giemsa and methenamine silver stains
- Formerly known as *Pneumocystis carinii*, sp. *hominis*

Risk Factors

- Immunocompromised patient (particularly solid organ transplant patients)
- AIDS (CD4+ <200 cells/μL)
- Heart/lung transplant patients coinfecting with cytomegalovirus (CMV)

Clinical Presentation

- Subacute to acute onset pneumonia
- Dyspnea, tachypnea, cyanosis, nonproductive cough, fever
 - Hypoxemia
- Coinfection with CMV
- Complications
 - Acute respiratory failure
 - Pneumothorax/pneumomediastinum

Treatment

- Antibiotics
- Glucocorticoids – appear to accelerate recovery
 - Most studied in AIDS patients

Prevention

- Prophylactic use of oral trimethoprim-sulfamethoxazole or inhaled pentamidine significantly reduces the disease rate in at-risk populations

Diagnosis

- Indications for testing – fever, shortness of breath and cough in immunocompromised patients (particularly HIV-at-risk or HIV-positive patients)
- Laboratory testing
 - PCR – more sensitive than direct fluorescent antibody (DFA) staining; may be particularly useful on non-HIV infected immunocompromised host
 - DFA staining using monoclonal antibodies on induced sputum or bronchoalveolar lavage (BAL)

- May also perform Grocott's methenamine silver nitrate stain and/or Giemsa stain on lung tissue biopsies
- Sensitivity of sputum staining – 70-80%
- Cytopathologic examination of Pap-stained BAL fluid
- Imaging studies
 - Chest x-ray – bilateral symmetric ground glass opacities
 - 10% are normal
 - CT (high resolution) – ground glass opacities

Lab Tests

Indications for Laboratory Testing

Tests generally appear in the order most useful for common clinical situations. For test-specific information, refer to the test number in the ARUP Laboratory Test Directory on the ARUP Web site at www.aruplab.com.

Test Name and Number	Recommended Use	Limitations	Follow Up
<i>Pneumocystis jiroveci</i> DFA 0060052 Method: Direct Fluorescent Antibody Stain	Rapid identification of <i>P. jiroveci</i>		
Parasites Smear (Giemsa Stain), Blood 0049025 Method: Stain	Rapid identification of <i>P. jiroveci</i>	Travel history required	
(1,3)-Beta-D-Glucan (Fungitell®) 2002434 Method: Colorimetric Assay	Detect <i>P. jiroveci</i>		
Immunohistochemistry Stain Offering arup005 Method: Immunohistochemistry	Rapid identification of <i>P. jiroveci</i> (Grocott's methenamine silver [GMS] method)		

General References

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Reviewed by

Hanson, Kimberly E., MD, MHS. Assistant Medical Director, Infectious Diseases at ARUP Laboratories; Assistant Professor of Medicine and Pathology, University of Utah

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