Pneumocystis jirovecii

Pneumocystis jirovecii is an opportunistic fungal infection which is more common in immunocompromised patients such as those with HIV or AIDS. It causes a severe pneumonia leading to fever and hypoxia. Definitive diagnosis can be made using bronchoalveolar lavage or lung biopsy, where the organism can be identified by methenamine silver stain. Microscopy will reveal saucer or cup-shaped yeast forms. The infection usually presents with chest X-ray findings of diffuse interstitial infiltrates bilaterally. Trimethoprim/sulfamethoxazole (TMP-SMX) is an antibiotic used for treatment. It can also be used prophylactically in high risk patients, like those HIV and CD4+ counts below 200.



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Fungi
Fun-guy
The organism was long thought of as a protozoan but has been reclassified as a yeast.

AIDS/Immunocompromised
Band-AIDS
Pneumocystis infection is an opportunistic infection and so is generally only seen in patients who are immunosuppressed, such as those with HIV/AIDS or on chemotherapy.

Fever
Fever-beaver
Fever is a classic initial presentation of the disease.

Hypoxemia
Hippo-blood-O2
Hypoxemia is a common symptom of the disease. Pneumocystis invades the lungs causing a severe pneumonia with bilateral infiltrates. This leads to decreased O2 saturations.

Bronchoalveolar Lavage
Lung Lava
Bronchoalveolar lavage is a medical procedure in which a bronchoscope is used to squirt fluid into a small part of the lung which is then recollected for examination. This allows Pneumocystis organisms from the lung to be collected for definitive diagnosis.

Biopsy
Biopsy needle
Biopsy is one of the ways to make a definitive diagnosis of this infection. Pneumocystis can be stained by methenamine silver, so using this stain on the biopsied tissue can reveal the infection.

Methenamine Silver Stain
Moth-mine Silver
Methenamine silver stain is used to stain Pneumocystis. Samples of affected tissue, such as lung tissue from a biopsy, can be stained to reveal the pathogen.

Saucer/cup shaped yeast forms
Cup and Saucer
On microscopy, saucer or cup-shaped forms are the classic description of the yeast form of Pneumocystis jirovecii.

Diffuse interstitial pneumonia CXR
Nude-Mona with X ray sheets showing diffuse interstitial pattern
Pneumocystis pneumonia characteristically appears on chest X-ray (CXR) as a diffuse interstitial pneumonia. Patients have diffuse infiltrates throughout both lung fields in an interstitial pattern. A ground glass pattern is often seen especially on CT scans. Pneumatoceles can also occur.

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TMP-SMX

Tampon on SMX-snowmobile

Trimethoprim/sulfamethoxazole (TMP-SMX) is a sulfonamide antibiotic that disturbs folate metabolism in microorganisms. It is used both as treatment for Pneumocystis as well as for prophylaxis against the disease. Prophylaxis is indicated for example in HIV patients with CD4+ count below 200.

Start prophylaxis when CD4 drops under 200

Purple-axes Dropping CD (4) Fork (200) Tooth-fairy

HIV patients should begin taking TMP-SMX prophylactically to prevent this disease when CD4+ cell counts drop below 200. This is because CD4+ cells (helper T cells) are crucial to normal immune system functioning, so when their numbers are depleted, patients are susceptible to opportunistic infections.

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