Cryptococcosis — Symptoms and Diagnosis

Cryptococcosis is a fungal infection caused by Cryptococcus neoformans and Cryptococcus gandii. The encapsulated organisms are inhaled and survive in the respiratory tract without causing any harm. However, depending upon the immunity of the individual, it may result in several clinical diseases. Cryptococcosis is therefore known as an opportunistic infection. Patients with immune deficiency such as HIV, corticosteroid therapy or reticulo-endothelial malignancy may suffer from the additional debilitating effects of the disease.

Types of Cryptococcosis

Cryptococcosis can be differentiated into three types:

- Cutaneous Cryptococcosis
- Pulmonary Cryptococcosis
- Cryptococcal meningitis
Epidemiology of Cryptococcosis

There are more than 50 species of Cryptococcus, but the above-mentioned species are the only ones reported to be pathogenic in human beings. The two species have five serotypes depending upon the antigenic specificity.

Cryptococcus neoformans has serotypes A, D and AD, while Cryptococcus gandii has serotypes B and C. The former is found in the temperate climatic regions, while the latter is more abundant in the tropical and sub-tropical climates.

Cryptococcus neoformans is found in the droppings of old pigeons, while Cryptococcus gandii grows in the litter surrounding certain species of eucalyptus tree.

Immunocompromised individuals, such as those suffering from AIDS, are frequently infected with Cryptococcus neoformans serotype A. Cryptococcus gandii, for reasons unknown, rarely infects them.

Pathophysiology of Cryptococcosis

Once the organism is inhaled, it reaches the pulmonary alveoli and survives there with the help of an essential factor Glucosylceramide synthase (GCS). Once engulfed by the macrophages, this factor is no longer required.

The encapsulated species are, however, resistant to engulfment by the macrophages. The immune response produced includes both humoral and cell-mediated immunity. An increase in the number of helper T cells is considered a successful response.

A cystic lesion with no inflammatory response or granuloma formation is characteristic of Cryptococcosis. Organ damage and extensive tissue distortion is a feature of end disease. If limited to the airway, these organisms may cause pneumonia. Meningitis occurs as a result of disseminated infection.

Diagnosis and Treatment of Cryptococcosis

History is particularly important in the diagnosis of Cryptococcosis. Immunosuppressive state may point towards it. Investigations such as pan cultures, CT scan brain, bronchoscopy, chest x-ray and CSF analysis are helpful in making a definite diagnosis.

CT scan shows diffuse atrophy of the brain with cerebral edema and focal contrast-enhanced areas. This differentiates Cryptococcus from other mass-occupying lesions of the brain. The CSF leucocyte count may be within normal limits in an AIDS patient whose immune system does not respond appropriately.

Signs and symptoms
Commonly seen are:

- Cough
- Headache
- Altered mental state
- Confusion
- Focal neurological defect
- Skin rashes

**Pulmonary findings are usually nonspecific** to this disease and may not be distinguishable. Similarly, cutaneous lesions do not have any specific findings and may be mistaken for acne, syphilis, tuberculosis, molluscum contagiosum and basal cell carcinoma.

**Treatment**

*Antifungal treatment* is done if there is any **lung lesion** or the disease has spread. Regular follow-ups for almost one year are carried out. **Amphotericin B, Flucytosine** and **Fluconazole** are the drugs of choice in this infection.

**References**

- [Cryptococcosis](https://medlineplus.gov) via medlineplus.gov
- [Cryptococcosis](https://medscape.com) via medscape.com
- [Cryptococcus (Cryptococcosis)](https://medlineplus.gov) via medicinenet.com

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