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Editorial

# Fungal Infections of the Central Nervous System

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**Abstract**

Development of fungal CNS (Central Nervous System) infections is primarily determined by the immune status of the host. They are more frequently encountered in immuno-compromised individuals like recipients of organ transplants, patients on chemotherapy, and human immunodeficiency virus infections. Early diagnosis and prompt initiation of appropriate therapy are crucial in preventing an often fatal outcome.

**Keywords:** Fungal meningitis; Fungal cerebritis; Brain abscess; Cryptococcoma; Vascular cerebral fungal infections

## Introduction

CNS fungal infections are rare. Host's immune system and fungal virulence factors determine the development of these infections. Route of infection may be hematogenous dissemination from a distant focus such as lung, through direct implantation after trauma or secondary to the local extension from sinonasal, orbital, or spinal infections [1]. Anticipation and aggressive diagnostic approach along with timely initiation of antifungal therapy remains the cornerstone in reducing morbidity and mortality.

## Fungal Meningitis

Fungal meningitis is often caused by yeast organisms. Cerebrospinal Fluid (CSF) analysis remains the diagnostic gold standard.

Neuroimaging helps to confirm suspected meningitis and rule out increased intracranial pressure before lumbar puncture [1]. Leptomeningeal enhancement due to a fungal infection may be smooth or thick, nodular and irregular, long and continuous, poorly demarcated or asymmetric, and may extend into the base of the sulci in contrast to the typical thin, symmetric, linear, and discontinuous lepto-meningeal enhancement.

## Fungal Cerebritis

*Cryptococcus* is most frequently identified causative agent, followed by *Aspergillus* and *Candida* [2]. They appear as ill-defined intraparenchymal hypodense lesions on CT imaging. On T1Weighted imaging, fungal cerebritis appears as an iso- or hypo-intense area [3]. T2 Weighted images and FLAIR (Fluid Attenuation Inversion Recovery) sequences show a hyper intense lesion. They typically present with restricted diffusion on diffusion weighted images [3,4].

## Brain Abscess

Fungal brain abscesses are multiple and involves the basal ganglia in contrast to bacterial abscesses, which are often solitary lesions sparing the basal ganglia [5].

Fungal brain abscesses shows a hypo intense core with a surrounding iso- to mildly hyper-intense rim on T1Weighted images, shows increased signal intensity of the core of the lesion with a surrounding rim of hypo intensity on T2Weighted images, shows restricted diffusion in their intracavitary projections and the abscess wall while sparing the core of the lesion on diffusion weighted imaging [6].

MR Spectroscopy visualizes lipids, lactate, alanine, acetate, succinate and choline present in fungal abscesses [3]. Disaccharide trehalose is a distinctive component of the fungal wall, which is a typical feature of fungal infections [5].

## Cryptococcoma

*Cryptococcus* facilitates chronic granulomatous inflammation and localized replication of the pathogen, resulting in cryptococcoma formation. Predominantly involves basal ganglia of immunocompromised individuals often mistaken for metastatic disease [5].

## Vascular Cerebral Fungal Infections

*Aspergillus* species and Zygomycetes are common fungal pathogens resulting in meningeal vasculitis with vessel thrombosis and localized brain infarctions. They disrupt the elastic laminae of the vessel wall leading to its focal dilatation and formation of mycotic aneurysms [5]. Mycotic aneurysms are usually located within the anterior circulation, infecting long segments of proximal portions of the large cerebral vessels [5].

## Conclusion

The Fungal CNS infection remains a diagnostic challenge. Anticipation of fungal CNS infections in immunocompromised individuals, aggressive diagnostic approach and prompt initiation of antifungal therapy helps to reduce the morbidity and mortality due to fungal CNS infections.

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