

Please read this bit first

The HPCSA and the Med Tech Society have confirmed that this clinical case study, plus your routine review of your EQA reports from Thistle QA, should be documented as a "Journal Club" activity. This means that you must record those attending for CEU purposes. Thistle will **not** issue a certificate to cover these activities, nor send out "correct" answers to the CEU questions at the end of this case study.

The Thistle QA CEU No is: **MT00025**.

Each attendee should claim **THREE** CEU points for completing this Quality Control Journal Club exercise, and retain a copy of the relevant Thistle QA Participation Certificate as proof of registration on a Thistle QA EQA.

Cycle 21 Organism 5:

Cryptococcus neoformans

C. neoformans is an encapsulated heterobasidiomycetous fungus that has progressed from being a rare human pathogen as reported in the literature, to a common worldwide opportunistic pathogen, due the fact that immunocompromised human populations have increased dramatically over the last number of years¹. During the early years of clinical cryptococcosis, the names of this yeast have changed a number of times and included Saccharomyces neoformans, Cryptococcus hominis and Torula histolytica. In 1976, Kwon-Chung discovered and characterized the sexual stage of C. neoformans, and the teleomorph was named Filobasidiella neoformans².

The genus Cryptococcus comprises 19 species of encapsulated yeasts. There have been occasional reports of human infections with non-neoformans species, such as C. albidus and C. laurentii³. C. neoformans strains are usually grouped into two varieties that include 5 serotypes based on capsule structure. C. neoformans var. neoformans includes strains with serotypes A, D, and AD, and C. neoformans var. gattii with serotypes B and C⁴.

C. neoformans grows on routine laboratory agar media (Sabouraud dextrose agar, blood agar, chocolate agar). The organism produces white-to-cream-coloured colonies within 48 – 72 hours. C. neoformans can readily be differentiated from other yeasts on the basis of its morphology and biochemical reactions. There are some rapid tests that may be employed to presumptuously

identify the yeast as *C. neoformans*, namely, India ink preparation to demonstrate the capsule, and the urease test. Capsular antigen tests may also be performed on body fluid such as CSF.

Initial cryptococcal infection begins by inhalation of the yeast into the lungs; and usually followed by the haematogenous spread to the brain and meninges. Involvement is also seen in skin, eye, genitourinary tract, bone and joints, muscle, heart and blood vessels, gastrointestinal tract, as well as the head and neck. Cryptococcosis is one of the defining diseases associated with AIDS. Patients with cryptococcosis and serologic evidence of HIV infection are considered to have AIDS⁵.

References

1. Perfect JR, Casadevall A. 2002. Cryptococcosis. *Infect Dis Clin North Am.* 16: 837-874.
2. Kwon- Chung KJ. 1976. Morphogenesis of *Filobasidiell neoformans*, the sexual state of *Cryptococcus neoformans*. *Mycologia.* 68: 821-833.
3. Luna T. 1973. *Cryptococcus albidus* meningitis. *South Med J.* 66: 1230.
4. Ikeda R., et al. 1982. Antigenic characterization of *Cryptococcus neoformans* serotypes and its application to serotyping of clinical isolates. *J Clin Microbiol.* 36: 22-29.
5. Chuck S., Sande MA. 1989. Infection with *Cryptococcus neoformans* in the acquired immunodeficiency syndrome. *N Engl J Med.* 321: 794-799.

Questions

1. What methods would you use to isolate and identify *C. neoformans*?
2. Why is *C. neoformans* called a teleomorph?
3. What characteristics are used to group or classify *C. neoformans* into two varieties?
4. What types of infections are caused by *C. neoformans*?