

Please read this section 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: **MT-11/00142**.

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.

MICROBIOLOGY LEGEND

CYCLE 31 ORGANISM 4

CANDIDA ALBICANS

Candida albicans is a diploid fungus that grows both as yeast and filamentous cells and is a causal agent of opportunistic oral and genital infections in humans. Systemic fungal infections (fungemias) including those by *C. albicans* have emerged as important causes of morbidity and mortality in immunocompromised patients (e.g. AIDS, cancer chemotherapy, organ or bone marrow transplantation). *C. albicans* biofilms may form on the surface of implantable medical devices. In addition, hospital-acquired infections by *C. albicans* have become a cause of major health concerns.



On Sabouraud's dextrose agar colonies are white to cream coloured, smooth, glabrous and yeast-like in appearance. Microscopic morphology shows spherical to subspherical budding yeast-like cells or blastoconidia

Pathophysiology

Candida occurs naturally in the human body. Normally it lives in harmony with a variety of other microorganisms and actually performs a couple of important functions. The problem occurs when something upsets the balance of bacteria in the body and this allows the yeast organism to proliferate and take over all the healthy microorganisms. It normally resides in the intestinal tract, mouth, throat and genitals; however it can burrow holes in the intestinal tract, enter the blood stream and then make its way into any organ of the body. To make matters worse it emits over 70 different toxins into the body. Some people may even become allergic to the yeast itself.

Once this hardy organism proliferates in the body, it wrecks havoc in many ways and is the initiator of many common maladies, conditions, syndromes and illnesses in our population. One of the most well known forms of yeast is the vaginal yeast infection. However, it may play a role in just about any mental health condition or chronic illness you can think of. Yeast overgrowth is considered to be a leading contributor in alcoholism, anxiety disorders, asthma, irritable bowel syndrome, Addison's disease, maces - multiple chemical sensitivities, Crohn's, autism, cfs - chronic fatigue syndrome, leaky gut syndrome, pms, endometriosis, fms - fibromyalgia syndrome, prostatitis, attention deficit disorder, multiple sclerosis, asthma, food allergies, muscle and joint pain, clinical depression, repeated urinary tract infections, hormonal imbalances, migraines, digestive disturbances, difficult menopause psoriasis, lupus, chronic pain, Tourette's, vulvodynia, rheumatoid arthritis and many more.

Candida symptoms can vary from one person to another and often move back and forth between systems within the same individual. One day you may experience symptoms in the musculoskeletal system and the next day it could be the digestive system, etc.

Causes and Risk Factors of Candida Albicans

Most of the time, Candida infections of the mouth, skin, or vagina occur for no apparent reason. A common cause of infection may be the use of antibiotics that destroy beneficial, as well as harmful, microorganisms in the body, permitting Candida to multiply in their place. The resulting condition is known as candidiasis moniliasis, or a "yeast" infection. Candidal infection of the penis is more common among uncircumcised than circumcised men and may result from sexual intercourse with an infected partner. In rare instances, when body resistance is low as in leukemia or AIDS, Candida can enter the bloodstream and causes serious infection of vital organs.

Symptoms of Candida albicans

Thrush appears as creamy-white or bluish-white patches on the tongue - which is inflamed and sometimes beefy red - and on the lining of the mouth, or in the throat.
Diaper rash caused by Candida is an inflammation of the skin, usually red and sometimes scaly.
Vaginitis is characterized by a white or yellow discharge. Inflammation of the walls of the vagina and of the vulva (external genital area) causes burning and itching. Infections of the fingernails and toenails appear as red, painful swelling around the nail. Later, pus may develop. Infection of the penis often results in balanitis (inflammation of the head of the penis). An infection in the bloodstream can affect the kidneys, heart, lungs, eyes, or other organs causing high fever, chills, anemia, and sometimes a rash or shock.

Diagnosis of Candida albicans

A medical history, physical exam, and laboratory tests, including blood tests, blood cultures, and wound cultures may be done. Tissue biopsy may be necessary to diagnose invasive systemic disease.

Treatment of Candida Albicans

Most Candida infections can be treated at home with OTC or prescription medication. These include topical administration of antifungal drugs such as clotrimazole (Femizole-7, Gyne-Lotrimin), miconazole (Monistat-Derm, Monistat Vaginal), nystatin, tioconazole (Vagistat Vaginal), or oral administration of drugs such as fluconazole (Diflucan) and amphotericin B. Many women prefer a single, oral dose of fluconazole for vaginal candidiasis, rather than topical creams. More serious infections may need IV medications given at the hospital. Although antifungal drugs usually clear up the trouble, the infection can recur, sometimes as a result of reinfection by a sexual partner. Hence, treatment of both partners is sometimes necessary.

If possible, use of antibiotics should be discontinued during a *Candida* infection. For diaper rashes, use barrier creams and change the diapers frequently. People with a tendency to skin candidiasis should keep their skin dry.

Mortality/Morbidity

Mucocutaneous candidiasis: Most candidal infections are mucocutaneous and, as such, do not cause mortality. However, in patients with advanced immunodeficiency due to HIV infection, these mucosal infections can become refractory to antifungal therapy and may lead to severe oropharyngeal and esophageal candidiasis that initiates a vicious cycle of poor oral intake, malnutrition, wasting, and early death.

Candidemia and disseminated candidiasis: Mortality rates associated with these infections have not improved markedly over the past few years and remain in the range of 30-40%. Systemic candidiasis causes more case fatalities than any other systemic mycosis. More than a decade ago, investigators reported the enormous economic impact of systemic candidiasis in hospitalized patients. Candidemia is associated with considerable prolongation in hospital stays (70 d vs 40 d in comparable patients without fungemia). Although mucocutaneous fungal infections, such as oral thrush and *Candida* esophagitis, are extremely common in patients with AIDS, candidemia and disseminated candidiasis are uncommon.

Sex

Neither sex is predisposed to candidal colonization.

Age

Persons at the extremes of age (neonates and adults >65 y) are most susceptible to candidal colonization. Mucocutaneous candidiasis is also more prevalent in neonates and older adults. Very-low-birth-weight and extremely-low-birth-weight infants are at high risk for blood culture-proven late-onset candidiasis.

References

1. http://en.wikipedia.org/wiki/Candida_albicans
2. <http://www.holistichelp.net/candida.html>
3. <http://www.holistichelp.net/candida.html>

Questions

1. Discuss the morphological characteristics of *Candida albicans*.
 2. Discuss the role of *Candida* in disease.
 3. Discuss the lab diagnosis of *E. coli*.
-