Candidiasis
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Candidiasis (yeast infection)
The etiologic agent is of the genus Candida, most commonly Candida albicans

Transmission:

Candida species normally inhabit the mouth, throat, and gastrointestinal tract. When disruption of one’s normal flora occurs, Candida has the opportunity to overpopulate and symptoms develop. Overgrowth commonly occurs after the immune system has been weakened by an infection and/or following treatment with antibiotics (1). Candidiasis can be transmitted via sexual contact with an infected person or via nosocomial means via the food we eat or poor hygiene. Many other factors such as HIV/AIDS, cancer treatment, steroid usage, pregnancy, stress, diabetes and nutrient deficiency also increase the risk of acquiring candidiasis.

Reservoirs:

Most cases of Candida originate from a person’s own Candida organisms that happen to overpopulate due to immunosuppression. This yeast usually lives harmoniously with other microorganisms on the epidermal and mucosal surfaces of the skin, mouth/throat, gastrointestinal tract, and vagina (2).

General Characteristics:

Candidiasis is an opportunistic fungal infection caused by yeasts of the genus Candida. The genus Candida includes roughly 154 species; 20 of which cause human infections. Candida are thin-walled, relatively small, spore forming, yeast that reproduce by budding. Candida colonies are able to grow rapidly, reaching maturation in 3 days (2, 3). As mentioned previously, Candida yeasts normally live on the skin and mucous membranes without causing harm to the host; symptoms only develop when overgrowth of these organisms occurs. Symptoms of candidiasis vary depending on the area of infection. There are three common types of candidiasis (2):

1. “Thrush” – oropharyngeal/esophageal candidiasis
2. “Yeast Infection” – genital/vulvovaginal candidiasis
3. Invasive Candidiasis – Candida species enter the bloodstream and spread throughout the body

Taxonomy:

Domain, Phylum, Class, Order, Family, Genus:
Eukarya, Ascomycota, Saccharomycetes, Saccharomycetales, Saccharomycetaceae, Candida (4)
Key Tests for Identification:

Diagnosis is based on a combination of signs, symptoms and scrapings or swabs from the infected area. Sample is viewed under a microscope to look for a proliferating infection characteristic of pseudohyphae and budding yeast cells in potassium hydroxide wet mounts. The presence of *Candida* alone is not enough to diagnose a yeast infection (5).

Signs and Symptoms of Disease:

Infection of the skin is indicated by rash, patches that ooze clear fluid, pimples, itching and burning

Infection of the vagina is indicated by itching, burning, redness of the labia, white/yellow discharge

Infection of the penis is indicated by redness, scaling, or rash on the underside of the penis

Infection of the mouth/throat is indicated by white patches on the tongue and gums, redness, soreness, cracks at the corners of the mouth, and/or difficulty swallowing

Infection throughout the body presents with symptoms similar to other illnesses and is somewhat difficult to diagnose. Examples include irritability, muscle pain, joint pain, dizziness, fatigue, bloat, foul breath, flatulence, food allergies, and depression (6)

Historical Information:

*Candida albicans* was named by Christine Marie Berkhout, a mycologist at the University of Utrecht in the Netherlands in 1923. This yeast was named after the *toga candida*, the white robe worn by Roman senators (7).

Virulence Factors:

*Candida* is a polymorphic yeast that can exist as and transition between unicellular yeast cells, fungal hyphae or fungal pseudohyphae. Germ tube production may also occur within *Candida*. These morphological options of *Candida* contribute to its pathogenicity. In addition, phenotypic switching provides cells with durability and flexibility when adapting to potentially hostile conditions. A pathogenic infection of *Candida* is initiated by adherence, colonization, and release of acid proteases and phospholipases on skin and mucosal surfaces. These enzymes irritate and break through membranes, allowing entry into the body (8).

Control/Treatment:
Candidiasis is treated with antifungal medications topically, by mouth, via suppositories, or through IV methodology. Suppositories are inserted into the vagina and usually contain boric acid or some form of miconazole nitrate. Common antifungals administered orally or intravenously include fluconazole, itraconazole, and orichinocandins (1).

Natural ways to combat a yeast infection include consumption of cranberries, garlic, and unsweetened yogurt. All of which are associated with antifungal properties.

Prevention/Vaccination Information/New Trials:

Yeast infections can be prevented by:
- Using proper oral hygiene to help prevent thrush
- Wearing dry, cotton underwear
- Wiping from front to back after a bowel movement to prevent bacteria from entering the vagina or urethra
- Keeping genital area clean and dry
- Practicing healthy eating and probiotic supplementation (6)

Local & Global Cases or Outbreaks:

Oral candidiasis is not very common among the general population. It is estimated that nearly 20% of cancer patients and between 9% and 31% of AIDS patients will have oral candidiasis (2).

Genital/vulvovaginal candidiasis is relatively common in the general population. Roughly 75% of all women will have had a yeast infection at least once in their lifetime (2).

Approximately 46,000 cases of healthcare-associated invasive candidiasis occur each year within the United States. Most cases of invasive candidiasis are not associated with outbreaks. However, there have been a few hospital-associated incidences linked to common sources including the outbreak of invasive candidiasis in neonatal intensive care units. Candida parapsilosis in these units is most likely transmitted by healthcare worker’s hand hygiene shortcomings (2).

The incidence of disease causing Candida varies vastly based on geographic location and patient population. Approximately 14 in 100,000 people in the Baltimore area and 10 in 100,000 in the Atlanta area are affected by candidemia (candida in the blood stream) (2).

The Candida species, Candida glabrata, has become more of a global concern due to its increased resistance and decreased susceptibility to antifungal treatments (1).

Candida glabrata is another etiologic agent of candidiasis, but more so of a global concern recently due to its increased resistance and decreased susceptibility to antifungal treatments. [1]
References:


