

**CANDIDIASIS: TYPES, SYMPTOMS, DIAGNOSIS AND TREATMENT****Sonawane Shubham A.<sup>\*1</sup>, Bhosale Anuja P.<sup>2</sup> and Shimpi Pooja R.<sup>3</sup>**

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**ABSTRACT**

Candidiasis is an opportunistic infection caused by fungi, which is known as Candida. The incidence of candidiasis and candidaemia has increased dramatically. Amphotericin B and fluconazole are the newer triazoles which are available for the management of candidiasis. This review presents overview of candidiasis disease which includes their symptoms, types, treatment and diagnosis. This review also provides overview on predisposition factors, prevention and highlighting alternative approaches for candidiasis. The aim of this study was to determine antifungal susceptibility pattern of Candida species causing Candidiasis.

**KEYWORDS:** Candidiasis, Fluconazole, Treatment, Candida species, Diagnosis.

**INTRODUCTION**

Candidiasis is an opportunistic infection which is caused by Candida. This infection affect the oral cavity, vagina, penis and other parts of the body. Candida is a type of fungi. Fungi are eukaryotic organisms which is to be found in the form of yeast, molds. When Candidiasis when affecting the mouth, this is known as thrush. It occurs as white patches on tongue, throat and other oral areas. There are many variants of Candida species, which are C.albicans, C.glabrata, C.krusei, C.parapsilosis, C.pseudotropicalis, C.stellatoidea. Candidiasis is to be more prevalent in old age. Candida albicans is a pathogenic yeast-like fungus, that grows partly as yeast. This Candida infections are treated by antifungal medications. This infections are cured by nystatin, clotrimazole, amphotericin B, miconazole.

Candida species can cause vaginal, oral, cutaneous candidiasis, candidemia. The rate of infections is increasing rapidly and the pathogenesis of Candida species is understood poorly. Azoles are the most frequently used drugs for the treatment of infections. Fluconazole is to be

often used in the treatment of candida infections. Fluconazole is used because of its low cost and toxicity. Mainly fungal infections are considered as a serious health problems, specially that people who are suffering from impairment in immune system. Candida species acts as main agent for sepsis and septic shock.

## **TYPES OF CANDIDIASIS**

### **A. ORAL CANDIDIASIS**

It is opportunistic fungal infection of the oral cavity. Oral candidiasis is seen most common infection in human. This infection most common in those patients infected with human immunodeficiency virus (HIV). This candidiasis is caused by genus *Candida*. *C.albicans* is a most important species, which is isolated from the oral cavity and more virulent in humans.

The diagnosis of the oral candidiasis is to be done by the clinically. The isolation of the oral candidiasis is done is done by the direct examination cytological smear, culture and biopsy technique. In the oral hygiene includes buccal cavity, cleaning teeth, and dentures. “Thrush” mainly named as oral candidiasis. One hundred and fifty species have been isolated in oral cavity and 80% isolates corresponds to *candida albicans*. Oral candidiasis is most frequent mucocutaneous mycosis of the oral cavity. In HIV patients *Candida dubliniensis* has been isolated in patients. Pathogenesis of candidiasis includes three factors : host, fungus and oral microenvironmental factors.

### **PRIMARY ORAL CANDIDIASIS**

1. Acute pseudomembranous
2. Acute atrophic
3. Chronic atrophic
4. Chronic hyperplastic
5. Candida-associated

### **B. INVASIVE CANDIDIASIS**

Invasive candidiasis is an important fungal infection that can caused by several *Candida* species. Mainly it is caused by *Candida albicans* but it's considerably depending upon geographical location. The early diagnosis of invasive candidiasis is challenging task. Invasive candidiasis is an emerging infection which is closely linked to medical technology and which recognized major cause of morbidity and mortality. More than 95% of invasive candidiasis disease is caused by 5 most common pathogens.

Invasive infections caused by five pathogens are as follows.

1. *Candida albicans*
2. *Candida glabrata*
3. *Candida tropicalis*
4. *Candida parapsilosis*
5. *Candida krusei*

In that “Invasive Candidiasis” which encompasses invasive disorder which includes candidiasis, endocarditis, endophthalmitis and other organs involvement. It includes esophageal and oropharyngeal candidiasis. There are at least 15 distinct *Candida* species which causes human diseases.

### **C. Vaginal Candidiasis**

Candidiasis in the vagina is known as “Vaginal yeast infection”. This infection is also known as “Vulvovaginal Candidiasis” or “Candidal Vaginitis.” Mostly the vaginal candidiasis is to be mild, some women can develop infections including redness, swelling and cracks in the wall of the vagina.

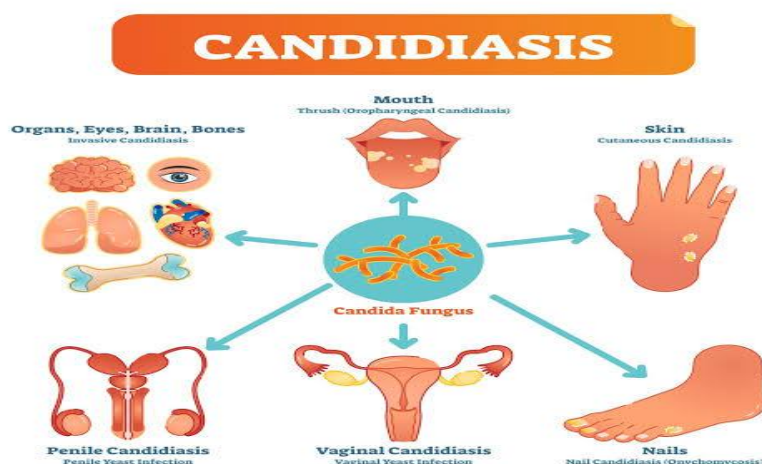
It is an distressing infection for many women. This infection is more common in pregnancy. The vulvovaginal candidiasis is an high incidence disease which seriously affecting the life of women worldwide. Vaginal candidiasis is defined as the isolation of *Candida* species in culture from the study of Vaginal abnormalities.

Most common causes of Vaginitis

1. Vulvovaginal Candidiasis
2. Bacterial vaginosis
3. Trichomoniasis

Vaginal Candidiasis has been identified as one of a global issues. Vaginal Candidiasis (VVC) is the second common vaginal infection which affecting in the women reproductive age, damaging the vulva and vagina.

## SYMPTOMS OF CANDIDIASIS



**Figure 1: Signs and symptoms of Candidiasis.**

Many of the fungi and bacteria are live on the human body. Candida species mainly found in the mouth and intestines and on the skin. The healthy bacteria in your body keeps Candida levels under control.

A few factors which can lead to Candida growth.

1. Consuming antibiotics
2. Taking a diet high in sugar
3. High alcohol intake
4. A weak immune system
5. Consuming oral contraceptives
6. Diabetes
7. Increase stress level

In Vulvovaginal candidiasis includes symptoms like irritation, itching, burning, dyspareunia, abnormal discharge. In patients which having vulvar and vaginal ulceration, also indicates herpes cultures.

Top symptoms of Candida overgrowth.

1. Oral Thrush
2. Tired and fatigue
3. Urinary or genital tract infection
4. Digestive issues

5. Skin and nail infection
6. Joints pain

## DIAGNOSIS OF CANDIDIASIS

In many cases, diagnosis of the candidiasis is to be quite difficult. Complication to establish, some patients shows different symptoms and signals. The symptoms of disease are to be according to age, gender and environmental factors, host resistance. Comprehensive digestive stool analysis (CDSA) and laboratorial techniques are the usefull tools for determination of yeast infection. Candidiasis is associated with morbidity and mortality. Diagnosis of candidiasis is an complicated because of lack of specific clinical signs and syptoms.

In the laboratory diagnosis, contains circulating the antibodies to candida species which resulting into colonization of mucosal surface. Positive cultures from urine or mucosal surfaces do not necessarily indicate in vasive disease although can occur during systemic infection. Furthur differences in virulence and susceptibility of various species antifungal drugs which is important for clinical management. The diagnosis of candidiasis is essentially clinical and its recognition of the lesions, which is confirmed by the microscopic identification by diagnostic methods. A definitive diagnosis of candidiasis is requires the confirmation of tissue invasion by *Candida*, this will helps the clinical diagnosis of the disease. In microbiological study having some diagnostic doubts, which is resistance to antifungal drugs, drug-dose require adjustment in an immune depressed patients. Biopsies are to be essential in hyperplastic candidiasis to discard the epithelial dysplasia.

Identification of yeasts is based on four different criteria.

1. Morphological
2. Immunological
3. Genetic
4. Biochemical

Although, the clinical diagnosis of candidiasis is relatively simple which is made by the microscopic observation. Macroscopic observation is made in culture plates. *C.albicans* is to be determined by germ tube test or filamentation test. Horse serum is most widely used option for the determination of yeast. Hence, the diagnosis of candidiasis is to be done by the various techniques.

## TREATMENT OF CANDIDIASIS

During the past few years, new insights have changed therapeutic strategies. The classes of antifungal agents that are mainly used in candidiasis includes azoles, polyenes and echinocandins. Azole antifungal agents target the demethylase enzyme which converts lanosterol to ergosterol in an fungus wall. Mainly, Fluconazole is used in the treatment of candidemia. Amphotericin B is an antifungal agent which binds ergosterol in the fungal membrane. Pharmacokinetic and dynamic characteristics are poorly known for critically ill patients. Echinocandins anidulafungin, caspofungin and micafungin which are used in management of candidiasis. Also, posaconazole and voriconazole are to be used in last stage development of candidiasis.

The exact duration of treatment of candidiasis is not well established. The recommendation of treatment to be continued for 14 days, when the sign and symptoms of infection have resolved.

Drugs used in treatment of Candidiasis.

1. Fluconazole
2. Clotrimazole
3. Amphotericin B
4. Miconazole
5. Tioconazole
6. Butoconazole
7. Terconazole

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