

*Candida Albicans*

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## **ABSTRACT:**

**Objective:** The purpose of this paper is to provide information on the potentially life-threatening effects of *Candida albicans*, provide clinical signs and symptoms, and treatment options. It will be shown in this review that the diagnosis, treatment and management of *Candida albicans* is difficult and can be a life long process for both the patient and their families. The paper is intended to be a comprehensive overview of the literature available on the condition of Candidiasis.

**Data Source:** The scope of this study will include journal articles and books that have explored treatment, diagnosis, clinical signs and symptoms, and complications of *Candida albicans*. The limiting factors of this study will be the broad areas of study within the subject that show when and why Candidiasis takes place, as well as treatment and manifestations of this condition.

**Key Indexing:** Candida, Candida Albicans, Candidiasis, Candidiasis Hypersensitivity Syndrome, Candidosis, Chronic Infections, Monilia, Moniliasis, Polysystematic Candidiasis, Systemic Candidiasis, Thrush, and Yeast Infection.

**Selection of Data Sources and Data Findings:** Based on Relevance to topic. Incorporation of standard texts as well as recent empirical and research information.

**Conclusion:** A lack of awareness and education on the part of the health care profession can lead to a misdiagnosis, or delay in diagnosis for those suffering from the

symptoms of *Candida albicans*. Proper diagnosis, treatment and lifestyle changes are necessary to heal the body and prevent future attacks of candidiasis.

This literature review will further investigate the allopathic and conservative literature, which discusses the etiology, manifestations, differential diagnosis, and treatment protocols for *Candida albicans*.

## **INTRODUCTION:**

The overgrowth of the usually benign yeast *Candida albicans* is now becoming a recognized medical syndrome known as chronic candidiasis or the yeast syndrome. This syndrome is increasingly being seen in the health care community. The overgrowth of *Candida* is credited with causing a wide variety of symptoms in virtually every organ in the body. The most susceptible systems are the gastrourinary, gastrointestinal, endocrine, nervous, and immune systems, but it is truly a poly-symptomatic syndrome.

*Candida albicans* is a fungus that is very similar to the yeasts that cause bread to rise and fruit to ferment into wine. In fact, no one is sure what purpose it serves, if any. It is well known that *Candida albicans* helps the body decompose after death, but it should not start doing its job while one's alive.

In a sense, there is a territorial war between *Candida* and the friendly bacteria being fought in our intestines. *Candida albicans* resides in the digestive tract and is found in a concentration of one *Candida* cell to millions of friendly bacteria. As long as the friendly bacteria are healthy, they keep in check by taking up space and producing anti-*Candida* chemicals. It's only when friendly bacteria are destroyed that yeast takes over and causes trouble.

Systemic *Candida* overgrowth occurs when *Candida* breaks the intestinal lining and enters the bloodstream. From there, it can travel to various parts of your body, take up residence and then multiply. The symptoms of systemic *Candida* overgrowth are as follows: muscle aches, sore/stiff joints, fatigue, problems with particular organs, recurrent urinary tract infections, and serious illnesses such as Asthma, ADHD, Diabetes, MS, Arthritis, CFS, or Fibromyalgia.

## **MATERIALS AND METHODS:**

Seven journal articles and eleven textbooks were reviewed each of which contained information on *Candida albicans*.

## **RESULTS:**

*Candida albicans* proliferates in the intestines because of several factors, including stress, lowered immune system, antibiotic overuse, oral contraceptives, and use of cortisone or prednisone. Any of these factors can cause overgrowth and change *Candida* from the harmless non-invasive, sugar fermenting yeast like organism to the mycelial, or fungal, form that has long, root-like structures, which penetrate and become entrenched in the membrane lining of the digestive tract.

Once the organism attaches itself to the intestinal cells, it competes with that cell, and ultimately the entire body for nutrition. *Candida albicans* can break down the mucosal lining between the bloodstream and the gastrointestinal tract, and breakdown may facilitate passage of harmful toxins secreted by the fungus into the bloodstream (14).

*Candida albicans* is referred to as a “polyantigenic” organism because over seventy-nine distinct antigens have been identified as being secreted from it. Once in the bloodstream, these toxins are free to travel to all parts of the body, where they produce a host of adverse symptoms and further weaken the immune system (15). Ethanol, acetaldehyde and formaldehyde are only a few of the toxins released. Ethanol is produced when *Candida albicans* has lots of food and excess amounts can cause symptoms of alcohol intoxication. Acetaldehyde can damage organs, disrupt fatty acid oxidation and production of callagen, cause abnormal behavior, memory loss, disoriented thinking, mood swings, depression, impaired intellectual functioning and emotional disturbances.

The typical patient with candidiasis is a female aged 15 to 50. Women are eight times more likely to experience candidiasis than men. This is due to the effects of estrogen, birth-control pills, and the higher number of prescription antibiotics (14).

Fungi from genus *Candida* cannot be airborne. Therefore, *Candida* cannot be transmitted by air. Sexual intercourse, deep kissing, and oral sex can transmit *Candida* either to or from genital parts, or the mouth of one person to another. If the other person is healthy, his immune system will destroy the *Candida* to prevent infection. If his immune system is compromised or he eats a lot of sugar and carbohydrates, the *Candida* can proliferate. (3)

The best method for diagnosing candidiasis is clinical evaluation by a physician knowledgeable about yeast related illness. The manner in which the doctor will diagnose the yeast syndrome will be based on clinical judgment from a detailed medical history and patient questionnaire. The doctor may also employ laboratory techniques, such as stool cultures, and measurement of antibody levels to *Candida albicans* or *Candida* antigens in

the blood. The stool sample will give in depth information on digestion, intestinal function, intestinal environment and absorption by carefully examining the stool. These laboratory tests are useful in confirming the diagnosis of *Candida albicans*, but should not be the only source for diagnosis. A proper diagnosis is made on the basis of the patient's thorough history and complete clinical picture. (3)

The symptoms a patient may have, when presenting with candidiasis can vary. Candidiasis is a serious condition and has, due to the vast number of diseases it may cause, the potential to present with numerous symptoms that may manifest physically or emotionally. A sample of the most common symptoms follows (3):

- skin infections such as acne, rashes, psoriasis, eczema, hives, boils or athlete's foot
- headaches, migraines, sinus trouble, sore throats
- frequent upper respiratory tract infections, colds, post nasal drip
- recurrent bladder, prostate, and vaginal infections
- extreme and/or increasing sensitivity to chemical fumes, tobacco smoke, perfumes
- multiple allergic symptoms, including food allergy's
- asthma
- arthritis
- swollen or aching joints, muscle aches for no reason
- abdominal bloating, distention, gas, diarrhea, constipation, anal itching, hemorrhoids
- PMS

- fatigue, lethargy, forgetfulness, foggy thinking, inability to concentrate
- depression, anxiety, hyperactivity, irritability, insomnia, mood swings, low self-esteem
- weight gain or loss
- cravings for sweets, alcohol, and bread
- Irritable Bowel Syndrome
- migraine headaches

Recent literature shows unusual occurrences of vertebral Osteomyelitis and Endocarditis due to *Candida albicans* (5,12), as well as having an association with causing common iliac artery aneurysms (20). Candidiasis can also be due to stress or certain foods that allow it to overgrow.

## **DISCUSSION:**

Candidiasis is an opportunistic infection due to a decrease in the good bacteria that naturally fight off *Candida albicans* or an overwhelming increase in *Candida albicans*. Specific causes for overgrowth were mentioned earlier, but candidiasis can also stem from iatrogenic problems, meaning that medical intervention, antibiotics, steroids, or other drugs may have caused it. Because candidiasis can be iatrogenic, the first step to correcting it is to determine and remove the cause. Therefore, candidiasis can be treated as an imbalance using antifungals, probiotics, and diet.

The most common prescription medications used to treat candidiasis are Nystatin, Ketoconazol, and Diflucan (15). However, because *Candida* cells are almost identical to human cells, the medications tend to kill off human cells with the harmful fungal cells. In

addition to this loss of healthy cells, when one destroys a bunch of *Candida* at once, all of the toxins that are currently stored in the *Candida* are released into the persons system. As there are usually a significant amount of toxins stored in *Candida* cells, these toxins, when released, will causes a temporary increase in yeast symptoms (often including new symptoms as new toxins are released), followed by a considerable lessening of symptoms. The technical name for this experience is the *Herxheimer Reaction*, and is more commonly referred to as "die-off" or "flare-up". The experience is similar to the experience when *Candida albicans* is growing, such as when you have eaten a "forbidden" food, described later in this paper. In both cases, *Candida* releases toxins and it is often hard to differentiate whether you are killing or feeding the infection. In order to tell the difference among die-off symptoms, food reactions, and general yeast symptoms, it is wise to keep a journal of what the patient eats and what anti-fungal medications they take. Therefore, when change is noticed, long term dietary advise can be made by the doctor. (10)

Die-off is caused from anti-fungal medications and will usually last from a few days to two weeks, depending on what prescription you use. As *Candida* is killed, the die-off effect will subside. If die-off does not occur, it might not mean that *Candida* was not eradicated from the body, as it is possible the amount of *Candida* killed (toxins released) was too small to produce massive die-off effects. At this point, the patient should either complete the same course of anti-fungal medication or change to a new anti-fungal regiment. The dosing of anti-fungal medications, as well as their effectiveness, can be established by observing die-off effects, which should be felt but not intolerable. If the effect is too strong, the dose of medication should be decreased. To additionally minimize the effects, the doctor can reduce anti-fungal dosage (or even discontinue it), and advise



the patient to drink lots of water or use hydrotherapies (i.e. enemas) to flush away dead yeast toxins. (10)

For a more natural approach, there are several nonprescription, yeast-killing products available over-the-counter of most health food stores. The most effective is Capricin, but others include Caprinex, Caprostatin, Kaprycidin-A, Candistat, Tanalbit, Cantrol, Garlic, Pau d'Arco, and Mycocidin. Additional antifungal supplements include garlic, grapefruit seed extract, and extra virgin olive oil. Always use cold-pressed oils and be sure to avoid hydrogenated oils such as margarine. (16)

When treating candidiasis, the primary foods to avoid are sugar and yeast (15). Additionally, there are a number of other foods to avoid, such as anything that has been fermented or is moldy (i.e. cheese, alcohol, vinegar, soy sauce, mushrooms, bottled fruit juice) anything that sits in jars (i.e. nut butters, canned fruit, tomatoes, preserves), or most processed foods as they may contain large amounts of sugar. Also, the patient should be instructed to avoid refined grains and caffeine (16).

Leafy greens are alkaline and as such balance the acidosis of candidiasis. Therefore, a diet high in fresh, cooked vegetables is highly recommended. Any meat, eggs, poultry, or dairy products should be organic and antibiotic-free. If the patient eats out, fish and lamb are safe if raised without antibiotics or hormones. Also, anything labeled free range is most likely antibiotic-free. The following food substitutes are alternatives to traditional favorites for a candida smart diet:

- beans are a good source of protein, especially if the patient is a vegetarian
- honey and maple syrup can be used sparingly for sugar
- Spelt bread and Wasa crackers for yeasted bread

Research has proven that a rotation diet and knowledge of food combining is very important in the treatment of *Candida albicans*. Food combining is based on the theory that different food groups require different times and chemical environments for proper digestion. For example, fruits are digested in twenty to thirty minutes, where proteins require four hours. If one combines fruits with proteins, the fruits will have to stay in the stomach until the proteins are digested and fermentation occurs. The solution? Fruits should be eaten alone. Proteins and starches are a second example. Once a protein (i.e. meat, fish or eggs) enters the stomach, an acid-based digestive secretion is produced for digestion. Once a starch enters the stomach (i.e. bread, rice or potatoes) an alkaline-based digestive juice is produced. If proteins and starches are eaten together, both acid- and alkaline-based secretions will be produced allowing for stomach acid neutralization to occur. As digestion continues and more acid- and alkaline-based juices are produced and then neutralized, the food will stay in the stomach leading to fermentation and resulting in the production of gas, indigestion and heartburn. The digestion of a poorly combined meal will consume more energy than some sports (i.e. running) and is why one feels very tired after certain meals. Neutral foods (i.e. raw vegetables) will break down in medium, acid, or alkaline juices and can, therefore, be combined with either proteins or starches. For people suffering from *Candida albicans*, proper digestion is very important.

A rotation diet is based on the concept that if the patient rotates food, they are less likely to develop allergies to the foods that they eat. When the patient rotates food, they reduce the load on the immune system, and will be able to detect unknown food allergies that were previously masked. *Candida albicans* is a very flexible organism in that it can adapt to survive on almost any food via mutation. The utilization of food rotation

undermines its adaptive survival mechanisms, as *Candida* simply cannot mutate quickly enough to keep up with exposure to constantly changing arrays of substances.

The *Candida* control diet is imperative to ridding the body of *Candida albicans* overgrowth and to keep it from returning. The following charts summarize the *Candida* control diet.

ALLOWED FOODS: (16)

FOOD	COMMENT
Filtered Water	Filtered water is the only drink that is always recommended. Drinking increased quantities helps the liver to detoxify the body and can help cure many diseases, including candidiasis.
Stevia	Recommended sweetener.
Vegetables	Broccoli, cauliflower, parsley, sprouts, spinach, celery, cucumbers green pepper, peas, tomatoes, beans, yellow, cabbage, onion, radishes, kale, lettuce, spinach and turnips. Avoid vegetables containing simple carbohydrates, like potatoes.
Meat	Beef, duck, eggs, quail, chicken, fish, oyster, rabbit, clam, tuna, turkey, crab, shrimp, goose, pheasant, lobster, hen, lamb, pork, or veal.

FOODS TO EAT IN MODERATION OR AVOID COMPLETELY: (16)

FOOD	COMMENT
Eggs	Raw eggs contain a substance called Avidin that interferes with the absorption of biotin, which is needed for vitamin B12 absorption. Boiled eggs do not have this problem. Overall, eggs are common allergen.
Yogurt	Sometimes contains additional sugar
Fruits	Avoid on a strict diet. Eat maximum of one or two pieces of fruit a day, preferably less sweet ones such as kiwi or dates.
Wheat	Hard to digest and feeds the yeast.
Nuts	Usually contain mold, which feeds <i>Candida</i> . If roasted, some of the mold will be eliminated and roasted nuts can be used in less strict anti- <i>Candida</i> diets.

FOODS TO AVOID COMPLETELY: (16)

FOOD	COMMENT
Artificial Sweeteners	Aspartame (NutraSweet), saccharin, equal, etc. In general, they are bad for your health. Stevia is a safe substitute.
Fruit Juices	Usually contain a lot of sugar. Freshly prepared juice is the exception.
Caffeine	Any kind of coffee, tea and soft drinks. Decaffeinated coffee should be avoided as well.
Sugar	Feeds the yeasts. Elimination of all sugars, including white sugar, brown sugar, honey, dextrin, maple sugar, beet sugar, etc. Use Stevia instead.
Left-overs, Yeast, Mold	It is highly likely that if you have <i>Candida</i> overgrowth you are also allergic to mold. Additionally, food that can grow mold, can feed <i>Candida</i> . Avoid anything containing yeast such as brewer's yeast, baker's yeast, or vitamins derived from yeast. Mold tends to grow on left-overs. Refrigerate your food, or better yet, freeze it and try to eat it within 24 hours of preparation.
Alcohol	All alcohol is made by fermentation and is forbidden in strict <i>Candida</i> diets. If you must have something to drink, vodka is recommended as the least harmful.
Melons	Too sweet.
Vinegar	Avoid vinegar and all foods that contain it, i.e. mayonnaise, and mustard. Fresh lemon juice can be used instead of vinegar.
Fermented Products	Soy sauce, soda bread, cheese, yogurt, sauerkraut, green olives and pickled vegetables.
Bread	Contains yeast and refined flour. It is best to avoid bread completely. Others recommend toasting it well. If you are sensitive to bread, you might also be allergic to other grains.
Diary	All kinds of milk and milk products (cheese, buttermilk, etc.) should be avoided if you have problems digesting dairy. It is very common allergen in general.
Tap Water	The chlorine found in most tap water kills the good bacteria living in your intestines.

Edible Fungi	I.e. mushrooms, truffles, etc. They can feed <i>Candida</i> and/or you could be allergic to them.
Processed Food	I.e. bacon, hot dogs, sausages, meat loafs, etc. Processed foods usually contain yeast, refined sugar, and chemicals.
Starch	Starch transfers into carbohydrates. Avoid food containing high levels of starch, i.e. corn and potatoes.
Dried/Candied Fruits	These contain mold, sugar and other toxins.
Animal Fat	Toxins are stored in fat. Therefore, eating animal fat increases toxic overload.

If the patient cheats on the diet while taking anti-fungal medications, it can make yeast more resistant to that prescription. Anti-fungal medications kill off weaker strains of yeasts but allow hardier strains to remain. If the patient cheats on the diet, they feed the yeast and give the hardier strains an opportunity to proliferate. In order to get rid of the remaining yeast, the patient will require different, stronger, anti-fungal medication.

*Candida albicans* can cause many diseases and dysfunctions in the human body. The treatment for many of these conditions is often the prescription of steroids, antibiotics, or other drugs that can weaken the immune system and allow *Candida albicans* to propagate further (3,4). This propagation will only cause the patients condition to get worse or become recurrent. Therefore, the cause and resulting conventional treatment effects becomes a self-propagating chain.

Treatment for patients with *Candida albicans* comes with many problems. The first is diagnosing *Candida albicans* as the root of their problem. However, diagnosis is difficult because the clinical signs and symptoms are so vast and many times will point to another syndrome or condition. The second difficulty in the treatment of *Candida albicans* is that the yeast is becoming more resistant to anti-fungal medications. *Candida albicans*

The current trend is showing an increase in Candidiasis due to the increasing number of steroids and antibiotics being prescribed today. The result is that people suffer from a decreased immune system, leaving them susceptible to multiple disuses and illnesses. Because of the risks involved with *Candida albicans* proliferation, it is imperative that the public and physicians understand how to recognize the symptoms and effects of *Candida albicans* so that it can be diagnosed and treated effectively and quickly.

The public and many physicians became aware of the magnitude of the problem (15). The Missing Diagnosis and William Crook published his best seller The Yeast Connection, time, yet few people really knew what they were. It was not until Orion Truss published *Candida albicans* and chronic Candidiasis have been clinically defined for a long

## **CONCLUSION:**

include lifestyle and dietary changes. and yeast containing foods (14). These factors require treatment of *Candida albicans* to certain dietary habits. As discussed before, *Candida albicans* will feed on sugars, molds will flourish in any condition that weakens immune-function, as well as in the presence of

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