

Senior Research Project

Understanding Systemic Candidiasis

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Abstract: Many Doctors have studied candida's affects on the human body and have provided much insight into who suffers from it and how to help them. Compiling these works into a short reference guide is the intent of this paper. Candida as a yeast can affect patients in a variety of ways and the signs and symptoms are often misdiagnosed. Understanding the systemic effects of candida will afford proper treatment with the least likelihood of further complications. Medications can help cure the patient from systemic candida but often the side effects can be worse than the disease. Alternative solutions to curing this problem can include herbs, vitamins and other natural products which are not harmful to your patient and will provide them with a more complete treatment. This article will dwell on how systemic candidiasis relates to the patients of Doctors of Chiropractic and how they can be helped to enjoy a better life.

History: The clinical manifestations of candidiasis have been recognized since ancient times and were discussed in the writings of Hippocrates, Galen, and Pepys. (1) The organism was first discovered in a lesion of thrush by Langenbeck in 1839. There was much confusion on its taxonomy until 1923 when the genus *Candida* was defined by Berkout. The importance of candidiasis as an opportunistic infection was first appreciated in the post antibiotic era of the 1940's when an increase in the number of candidial infections was noted. (1) Controversy over nomenclature persists among countries, as well as among professions. Experts from the United States, Canada, England, and Germany met at a medical meeting in Memphis, Tennessee and they agreed that instead of terms like "chronic candida sensitivity syndrome", "the candidiasis syndrome", or "the yeast syndrome", a better term is "CRC" (*candida-related-complex*). (2)

In a meeting in 1988, health officials spoke on what was once considered "a yeast infection" is now shown to be a neuroimmune disorder that affects the endocrinologic, immunologic, and psychologic make-up of afflicted individuals in profound ways.

Symptoms: Some of the symptoms include infections of the vagina, ears, nose, sinuses, throat, finger and toe nails, and the entire digestive tract. A person may also experience persistent fatigue or lethargy and have trouble concentrating. In addition, constipation, diarrhea, gaseousness, indigestion, heartburn, and mucous in the stool are common complaints. (3) Factors predisposing to candida infections and a typical CRC patient profile are listed as Tables 1 and 2.

TABLE 1
Factors Predisposing to Candida Infections

Mechanical factors

- Trauma (burns, abrasions, etc.)
- Local occlusion, moisture, and/or maceration (dentures, occlusive dressings or garments, obesity)

Nutritional factors

- Avitaminosis
- Iron deficiency (chronic mucocutaneous candidiasis)
- Generalized malnutrition

Physiologic alterations

- Extremes of age
- Pregnancy
- Menses

Systemic illnesses

- Down's syndrome
- Acrodermatitis enteropathica
- Diabetes mellitus and certain other endocrinopathies (Cushing's, hypoadrenalism, hypothyroidism, hypoparathyroidism)
- Uremia
- Malignancy (especially hematologic, thymoma)
- Intrinsic immunodeficiency states (DiGeorge's syndrome, Nezelof's syndrome, severe combined immunodeficiency syndrome, myeloperoxidase deficiency, Chediak-Higashi syndrome, hyperimmunoglobulinemia E syndrome, chronic granulomatous disease, AIDS)

Iatrogenic causes

- Barrier-weak factors (indwelling catheters, intravenous drug abusers)
- X-irradiation
- Medications
 - Corticosteroids and other immunosuppressive agents
 - Antibiotics (especially broad-spectrum, metronidazole)
 - Tranquilizers
 - Oral contraceptives (especially estrogen-dominant)
 - Colchicine
 - Phenylbutazone

TABLE 2
Typical Chronic Candidiasis Patient Profile

Sex: Female

Age: 15-50

General symptoms:

- Chronic fatigue
- Loss of energy
- General malaise
- Decreased libido

Gastrointestinal symptoms:

- Thrush
- Bloating, gas
- Intestinal cramps
- Rectal itching
- Altered bowel function

Genitourinary system complaints:

- Vaginal yeast infection
- Frequent bladder infections

Endocrine system complaints:

- Primarily menstrual complaints

Nervous system complaints:

- Depression
- Irritability
- Inability to concentrate

Immune system complaints:

- Allergies
- Chemical sensitivities
- Low immune function

Past history:

- Chronic vaginal yeast infections
- Chronic antibiotic use for infections or acne
- Oral birth control usage
- Oral steroid hormone usage

Associated conditions:

- Premenstrual syndrome
- Sensitivity to foods, chemicals, and other allergens
- Endocrine disturbances
- Psoriasis
- Irritable bowel syndrome

Other:

- Craving for foods rich in carbohydrates or yeast

What is candida? Candida is a family of yeasts with eighty different species. Of these various species, Candida albicans is the most common cause of superficial and systemic candidiasis. (1) Candida albicans exists in two forms: a Y (yeast-like) form that is a noninvasive, mild mannered, sugar fermenting organism, and an M (mycelial) form that produces rhizoids, long root-like structures that can invade the mucous membranes. (3,9) Candida albicans is found in the normal flora of the body and is gained shortly after birth. The development of disease due to Candida albicans is dependent on the complex

interaction between the innate pathogenicity of the organism and the defense mechanisms of the host. Candida infections are largely opportunistic ones made possible by diminished host defense. (1)

Effects: In the susceptible individual, candida may overgrow and displace some of the beneficial bacteria such as *Lactobacillus acidophilus*, which is needed for its ability to provide the fermentation in the bowel which produces folic acid, niacin, riboflavin, B6, B12, and pantothenic acid. (4) Candida cell wall components, antigens, and other toxins can cause significant tissue destruction directly via free radical damage and indirectly via the generation of toxic metabolites, such as acetaldehyde and the activation of the alternate complement pathway. (1,5) Some strains of *Candida albicans* are able to reduce acetaldehyde to ethanol. In some individuals this can lead to a state of chronic alcohol intoxication. This syndrome was first described in Japan and is called *Meitei-sho* or “drunk disease”. (5)

The heavy growth of candida on the mucosa of the small intestine and colon may impede the normal digestive ability of the bowel, preventing it from absorbing important nutrients such as amino acids - tryptophane, arginine, and tyrosine. This in turn may alter the biochemical chain reaction necessary for creating neurochemicals and transmitters such as serotonin, norepinephrine, and dopamine, resulting in an “out of whack” neurologic network that affects memory, behavior, and emotions. (3)

Diagnosis: How can we diagnose the CRC problem? The diagnosis of CRC is often quite difficult as there is no single specific diagnostic test. The patients medical and health

histories combined are the single most important diagnostic factors for CRC. Stool cultures and elevated antibody levels to candida are useful diagnostic aids but should not be solely relied upon for definitive diagnosis. Candida antibodies can be measured through a variety of techniques, including agglutination, complement fixation, fluorescent antibody, enzyme-linked immunoabsorbent assay and radio immunoassay test. (5) Two such immunoassay tests, one developed by Edward Winger, M. D. (Immunodiagnostic Laboratory, 400 29th Street, Oakland, CA 94609), and another developed by Howard E. Hagglund, M. D. (Hagglund Clinic, 2227 West Lindsey, Suite 1401, Norman, OK 73069), are used today along with a Candida Questionnaire to assess the patient for possible CRC.(12) A copy of a candida questionnaire can be found in The Garden Within or by writing Drs. Winger or Hagglund who are continuing to enlighten the public's mind about candida.(11)

Treatment: Curing CRC takes a total program, involving nutritional supplementation and dietary changes, plus the avoidance of all steroids and broad-spectrum antibiotics unless absolutely necessary. To cure CRC, three goals must be met. First, the internal candida population must be brought back under control. Second, the internal balance of beneficial bacteria must be restored. And third, the immune system must be renewed. Nutritional supplementation and lifestyle changes are essential to all three goals. (6) If left unchecked, the body can be run down and the once healthy strong individual will start experiencing a definite change in physical and mental function. Figure 1 shows the

effects of uncontrolled candidal growth and the importance of why each goal must be met to cure CRC.

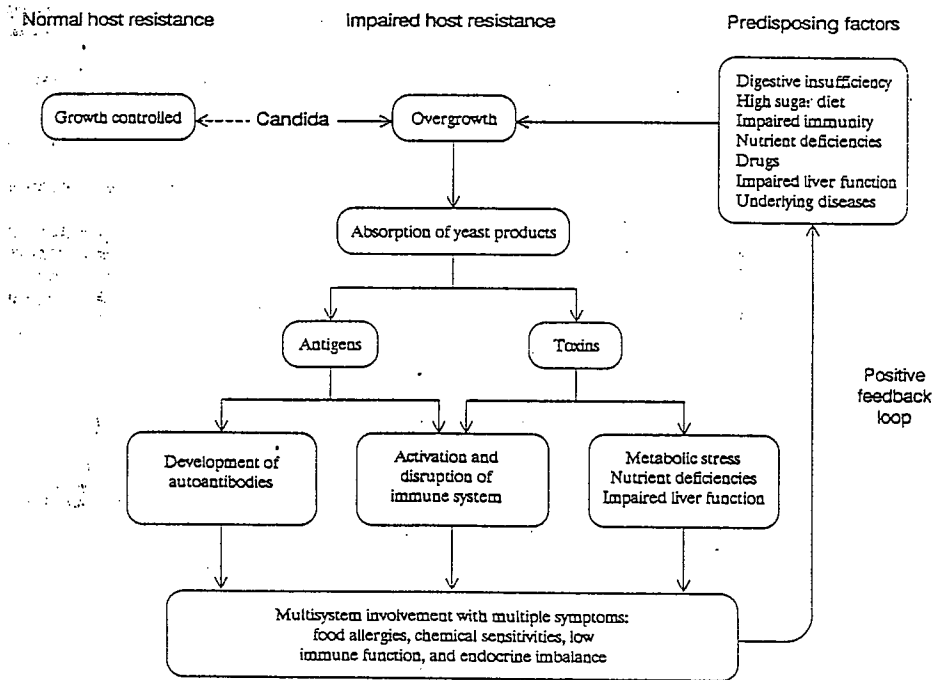


Figure 1. The Vicious Cycle of Chronic Candidiasis

How do we control the internal candida population? For the medical community the first step is a prescription of *Nystatin*. It is a derivative of *Streotomyces noursei*, a mold, and was discovered growing in milk on a dairy farm in New York state. *Nystatin* works by destroying candida's cell wall by binding to its sterols. It is most effective in the GI tract because it is poorly absorbed into the blood. Thus it is said to have little kidney or liver toxicity. (7) There are other stronger prescription drugs available, such as *Gentian Violet*, *Ketoconazole*, and *Amphotericin-B*. While on these medications the patient may exhibit a transient worsening of symptoms. This is the effects of the "die off" or *Herxheimer* reaction. This reaction is produced when large numbers of candida

die, releasing large amounts of toxins and antigens into the blood, usually in excess of the liver's detoxification capacity. (5,8)

Side Effects of Drugs: Potential side effects are varied and numerous. *Gentian Violet's* adverse effects include esophagitis, laryngitis and tracheitis. These effects are nominal in comparison to *Ketoconazole* and *Amphotericin-B*. *Ketoconazole* is also used in the treatment of prostate cancer and *Cushing's syndrome*.(12,13) The side effects can be mild--skin rash, headaches, nausea and vomiting, or serious--suppression of testosterone and adrenal corticosteroid production, liver toxicity or abnormal bruising, and can be further complicated with Alcohol ingestion. *Amphotericin-B* is best used for patients that are immuno-compromised and have serious systemic fungal infections. Many other medications may increase the adverse effects of *Amphotericin-B* if used concurrently. Blood dyscrasia and renal impairment are its most significant adverse effects.(14,15,16)

Holistic Care: For Chiropractors there are many nutrition and botanical medicines that are useful in controlling the internal candida population. Caprylic acid is a short chain fatty acid derived from coconuts that has been reported to be effective in the treatment of candidiasis. Since caprylic acid is readily absorbed in the intestines, it is necessary to take timed-released or enteric-coated caprylic acid formulas to allow for gradual release throughout the entire intestinal tract. (5) *Allium salivum*, which is better known as garlic, has demonstrated antifungal activity against *Candida albicans* and potentially could be better than *nystatin* and *gentian violet*.

To accomplish goal number two, restoring the internal balance of beneficial bacteria, *Lactobacillus acidophilus* can be taken. Supplement the diet with *Lactobacillus acidophilus* to promote a return to normal balance in the digestive tract. *Lactobacilli* will help produce B-complex vitamins and assist in the digestion of proteins. The B vitamins include: niacin, pantothenic acid, pyroxidine, biotin, B6, B12, and folic Acid. It is available in powdered and capsule forms which are both of good value.

To strengthen the immune system, there are additional formulations available. Some are concentrates of the biologically active components of the immune system, including proteins, hormones, and nucleic acids. Others consist of candida antigens that help stimulate the production of antibodies against candida. Chiropractors are uniquely qualified for the fight against CRC. Chiropractic itself is of proven value in rebuilding the immune system. (6) In order to deter growth or regrowth of yeast fungi, patients are advised to avoid antibiotics (unless absolutely necessary), oral contraceptives, corticosteroids and aspirin while on treatment. Life style modifications are also required. Individuals should try to avoid high-stress situations, or counteract the effects of stress through exercise and relaxation techniques.

Summary: All these can help the patient with CRC, but there is no “quick fix”. They all must be combined with a guided diet - one low in sugars and yeasts, an increased exercise program, and a real desire to want to be and feel better. This might entail a complete change in life style, but with the help of a well trained chiropractor, a life of confusion and near despair will evolve into a life of health and happiness.

The overgrowth of candida, the CRC, is real. Many people are just trying to live with the problem because they don't know what is wrong. As Doctors of Chiropractic we should be aware of the signs and symptoms of the CRC and recognize when a patient is a candidate for further tests and possible life giving treatment. The signs and symptoms include lethargy, fatigue, depression, a high sugar and yeast diet, and the broad spectrum use of antibiotics. Remember, helping these patients regain their health takes more than therapeutic knowledge, it requires steady support and all your counseling skills.

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