CANDIDA OVERGROWTH: HOW TO TACKLE IT!

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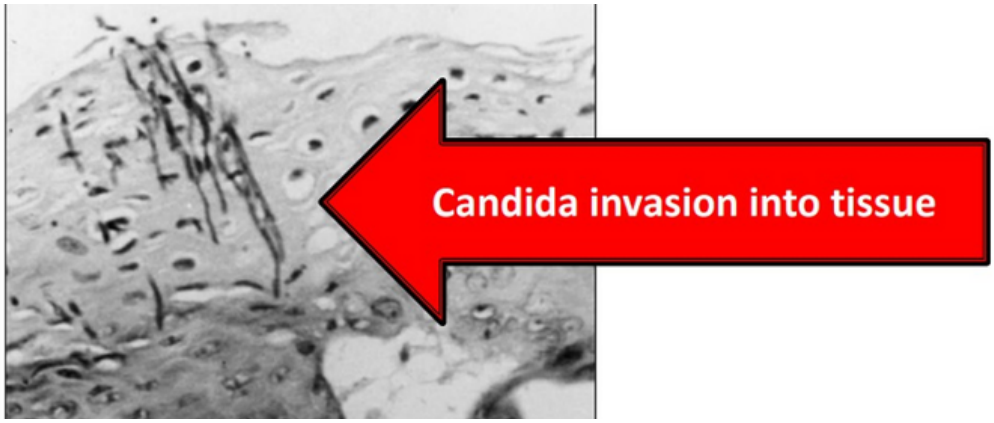

Candida can be a real pain in the... ehm gut. Here is a short summary on what Candida is, why it is so hard to get rid of and a little protocol advised by Dr. Kurt Woeller from Great Plains Laboratories on how to eradicate Candida Albicans Overgrowth.

But first...

What is Candida Albicans?
Candida is a fungus that lives in our gut. It can live in different forms. It can live as a unicellular yeast, but it can also change its form and grow into its hypha form (its root or tentacle structure - see image above) and become invasive. It can start digging itself into the mucosal lining and cause enhanced intestinal permeability or as many people call it: leaky gut.

Candida is quite 'smart' and can steal metals like heme iron, zinc, copper and manganese for its own survival.

Why can't our immune system deal with Candida?
Candida prefers glucose as its main fuel. White blood cells like neutrophils and macrophages 'eat' the candida and try to starve the yeast cell. But once glucose becomes unavailable, it starts to generate its own glucose (via a process called gluconeogenesis) from amino acids & fats from the immune cells. Candida can survive an attack from white blood cells by using its hypha to penetrate the cell wall. In fact, they can use the white blood cells as a taxi and use them as a transport to move to other tissues!

How does Candida protect itself from antibiotics?
Candida can create its own biofilm by producing proteins like adhesions. A biofilm is like a little comfortable home where other species like bacteria & mold are welcomed as well. The biofilm of Candida also has efflux pumps that, work as a sewer system and can get rid of the metabolic waste products of the yeast. When antibiotics enter the biofilm, the efflux pumps can spit out the antibiotics before they can do their job.

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Candida Albicans is a survivor. Click here if you like to learn more about Candida's survival strategies.

How to get rid of invasive Candida
In the Symptom Dictionary, we have a summary of how to approach a Candida infection (click here).

But here are some additional tips:

- Dietary control through eliminating reactive and toxic foods
- Improving digestive system health and microbiome diversity
- Eradicating opportunistic infections such as parasites, bacteria, including clostridia
- Identifying and eliminating mold colonization in the gut
- Eliminating or reducing environmental toxin exposures such as chemicals and heavy metals
- Consistent and ongoing antifungal intervention. Great Plains Laboratories recommends the following combination:
    - Use interphase plus 45 minutes prior to anti-microbial remedy to weaken the biofilm
    - Give the prebiotic fibre PureLean (or other fibre/prebiotic product) one hour away (minimally) from the antifungal remedy.
    - Use Activated Charcoal (AC) - 1 to 2 capsules, as needed, to help reduce or eliminate die-off reactions induced by the disintegration of bacterial and yeast biofilm. The AC can be given at the same time as the prebiotics. Another option is GI Detox. This product can be less constipating than straight Activated Charcoal.
    - The Symptom Dictionary gives a wide variety on what herbs to use. A nice combination formula is Biocidin. A great alternative with even more research backing up the products are Candibactin AR + Candibactin BR
- Confirm eradication of candida/yeast by running an Organic Acids Test or Microbial Organic Acids Test markers after 90 days for example.

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How do antifungals against Candida work?
Antifungal medications, supplements or foods can intervene in several mechanisms. For example:

- **Mechanism 1:**
  Some antifungals make it hard to transform Candida Albicans from the 'innocent' one-cell yeast form to the invasive hyphae form.
- **Mechanism 2:**
  Some antifungals can damage the cell walls of this yeast.
- **Mechanism 3:**
  Candida, in the hyphae form, can also form networks with other Candida hyphae cells making it even harder to eradicate Candida. Some antifungals inhibit network formation between the yeast cells.
- **Mechanism 4:**
  Some antifungals inhibit/destroy biofilm formation.

The art of choosing the best combinations of foods and supplements is understanding what food/supplement intervenes in what mechanism.

Here are some foods and supplements which we believe have antifungal properties, inclusive of what mechanisms we think they target.

Virgin Coconut oil
Coconut oil... who doesn't love it? There is a lot of evidence pointing in the direction that coconut oil has some antimicrobial properties. Specifically, components of coconut oil intervene in mechanisms 1 & 3.

Coconut oil contains short-chain fatty acids (SFCA) lauric acid and caprylic acid. This study compared lauric acid & caprylic acid with the antifungal medications clotrimazole & fluconazole. Ok, this study was done in a petri dish, which is not the same as testing on humans, but the results were promising. Clotrimazole was the most effective of the four, but caprylic acid killed the Candida Albicans slightly better than fluconazole. Lauric acid worked slightly less effectively than fluconazole, but was still effective nonetheless!

Coconut oil can inhibit biofilm formation
The caprylic and lauric acid in coconut oil also made it hard for the yeast form to transform into the invasive hyphal form. This study also found evidence that biofilm formation was inhibited by caprylic & lauric acid.

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How much caprylic & lauric acid is in coconut oil?
Lauric acid accounts for 45%–53% of all fatty acid composition in coconut oil. Caprylic acid accounts for 25%–30% of all fatty acid composition in coconut oil. It has the greatest antibacterial activity of all medium-chain aliphatic fatty acids.

Oregano Oil
Oregano oil has three naturally occurring antimicrobial agents: carvacrol, eugenol and thymol. In this study, the antifungal properties of oregano oil were compared with the medications nystatin and amphotericin B. They found that oregano oil was able to completely inhibit the growth of C. Albicans (again in a petri dish).

Oregano oil also inhibited the transformation from the more innocent one-cell yeast form to its invasive hyphal form (mechanism 1). In the same study, they also found that oregano oil inhibited this network formation (mechanism 3).

In this and other studies (for example this one), they showed that carvacrol was one of the most potent compounds found in oregano against Candida. Carvacrol is also found in essential oils of thyme, black cumin, pepperwort and wild bergamot (click here).

Oregano oil & mice
In the same study, they infected 2 groups of 6 mice with Candida. I know this is a small group, but think of all those poor mice! They treated one group with oregano oil, while the other group didn't have the treatment. The group without treatment died in 30 days. 5 mice of the other group survived.

Other studies also showed promising results in rats, dogs, monkeys and other animals. However, human studies are hard to find likely because infecting humans with Candida is considered unethical. Another reason is that testing the microbiome is hard since it is hard to reach.

Undecylenic Acid
Undecylenic Acid is an unsaturated fatty acid derived from castor oil which was discovered in 1877. It helps disrupt the biofilm (Mechanism 4). It's also believed to inhibit the formation of the hyphae form (mechanism 1). See this study for more information.

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Grapefruit Seed Extract

Grapefruit seed extract is useful as an all-round anti-microbial (according to this article). But with Candida, it looks very promising: a 5-minute treatment of Candida Albicans with Grapefruit Seed Extract inhibited the biofilm formation even after 24 hours (mechanism 4).

Berberine

Berberine is known for its blood sugar-lowering effects, but it has also potent antimicrobial activities against a range of pathogens that include bacteria, viruses, fungi and yeast. Berberine, with Candida, weakens the biofilm (mechanism 4 - see this study). Berberine can also damage the cell wall of the hyphae form of Candida Albicans under an electron microscope (mechanism 2 - Look at this study here).

Final Thoughts

Candida is smart. It starts to outsmart antifungal medications and this is becoming a problem. Getting to know how foods & supplements work can help you make tactical supplement choices to outsmart Candida.

Hopefully, this article was helpful and as always, stay healthy!