



Candida albicans and ImuPro-testing

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Introduction

Candida albicans is ubiquitous and considered as commensal. C. albicans can be found on all human mucosa and skin at low concentrations. C. albicans can be present in different forms, from unicellular yeast to pseudo filamentous, further to real filamentous form. This polymorphic appearance is believed to be responsible for the invasiveness and pathological properties of Candida. Already mild environmental changes such as pH, impaired gut flora, substrate change and many more can lead to morphological changes and increased virulence.

Candida albicans and humoral response (IgG)

- In healthy subjects the gut is the normal host for Candida. It is only present in small number and hardly detectable in stool samples. The normal morphological form is the single ovoid yeast cell. In presence of a normal gut flora, intact gut lining and presence of sIgA, this form is dormant and unable to penetrate the gut barrier. These subjects are considered as healthy carriers. No IgG is detectable in serum.
- If one or more of the components of the gut barrier is impaired, the risk of proliferation and morphological switch of Candida increases. Especially if the physiological gut flora, but also other mucosal flora are damaged, e.g. by antibiotics, Candida starts to spread at high speed. If the gut lining is damaged, Candida can reach lower part of the intestinal barrier and will induce a humoral response by the immune system. The production of antibodies (IgA and IgG) will prevent the invasion of the blood.
- Only in immunocompromised patients, Candida is able to reach the bloodstream and lead to candidaemia.

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Factors leading to the proliferation of Candida

- **sIgA deficiency:** sIgA is the major humoral defence line of the mucosa. sIgA recognizes and fixes antigens, in this case Candida and forms insoluble complexes, which are unable to pass the gut barrier and which are excreted by the stool. In up to 5% of patients this humoral defence is lacking and may lead to uncontrolled colonisation of Candida.
- **Specific physiological flora:** The probiotic flora, such as Bifidobacterium, Lactobacillus and Enterococcus create an acid environment and release mycostatic substances to control colonisation and inhibit proliferation of Candida. Recurrent infections, antibiotic treatment, poor diet, conservation agents, alcohol, drugs, heavy metals, and environmental toxins may lead to a depressed physiological flora and promote proliferation of Candida.
- **High carbohydrate intake:** Candida feeds exclusively on carbohydrates. The modern diet is very high in carbohydrates and favors the colonisation and proliferation of Candida.

If one or more of these conditions apply, proliferation of Candida is inevitable. In presence of impaired gut lining Candida becomes invasive and lead to humoral response in terms of antibody production.

Why do we test for Candida antibodies in ImuPro?

Candida is self-stabilizing once an overgrowth has been established. Candida will prevent the physiological gut flora to recover and normalize. Candida will colonise in so called niches of the gut and contribute actively to the damage of the gut lining, leading to increased gut permeability. Increased gut permeability is the major cause of food intolerance. In order to manage food intolerance, it is essential to address the cause of food intolerance. One is certainly to assess the potential role of Candida. The best way to do so is to detect circulating IgG against Candida albicans.

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Interpretation of positive IgG to Candida in the ImuPro-test

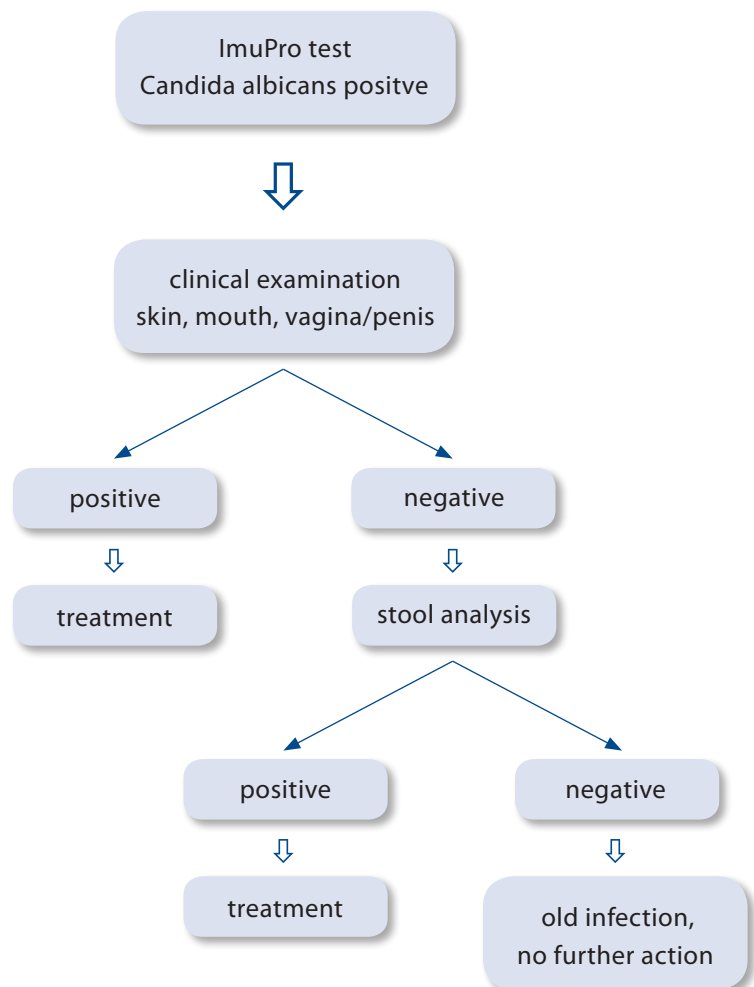
The presence of IgG to *Candida albicans* is an indication of a past or present infiltration of *Candida* to lower parts of the mucosal lining. It is a sign of a normal response of the immune system. It is not an indication of candidaemia!

Presence of IgG to *Candida albicans* is a strong indication that *Candida* infections may have played a crucial role in developing food intolerances.

Action to take in case of positive *Candida* IgG test:

- In case of presence of IgG to *Candida albicans*, a clinical investigation should take place to exclude any external infections of *Candida*, such as the buccal cavity, skin, as well as female and male genitals.
Recurrent vaginal mycosis is a strong indicator for a dysbalance of the probiotic flora and intestinal overgrowth of *Candida albicans*.
- If no infection of the external locations was detected, a comprehensive stool test with sensitive detection of *Candida* should be performed.
- If no *Candida* could be detected, it is highly probable that the IgG detected resulted from an old, successfully treated *Candida* infection. No further action required.
- If *Candida* could be detected in the stool sample, it is likely that *Candida* is still contributing to increased gut permeability. In order to fight and reverse food intolerances, it is extremely important to eradicate the *Candida* infection and prevent recolonisation.
- Eradication can be performed with Nystatine, a potent antimycotic, which is hardly absorbed and thus does not harm the liver and concentrates its action in the gut. Subsequently the use of caprylic acid or other essential oils as well as carbohydrate reduction in the diet will prevent recolonisation.
- Alternatively *candida* infections can also be treated with salvestrols, which are anti-fungus substances isolated from fruits.

Action to take in case of positive candida albicans result



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