

Vitamin B3 May Help Treat Fungal Infections

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The bacteria *C. albicans* (*Candida albicans*) is responsible for most fungal infections in humans, with severity ranging from minor skin and mucosal infections to life-threatening infections in the body (1). Ironically, it does not pose a threat and is one of a number of bacteria in the mouth and digestive system of healthy individuals. In those with weakened immune systems (patients undergoing cancer chemotherapy, organ or bone marrow transplantation and AIDS sufferers), *C. albicans* can become very dangerous (2).

C. albicans infections are difficult to treat and "create very serious challenges" in medicine. Death rates among patients with candidiasis have been increasing and can be as high as 40% to 60%, especially when *C. albicans* infections enter the bloodstream (3). It's estimated that *C. albicans* is estimated to cause \$2.6 billion in the U.S. alone (4).

Now a new study in mice (5) has now found that vitamin B3, shown to be effective at treating skin lesions (6), may have the potential to help treat fungal infections caused by *C. albicans*. In the study, researchers injected 12 mice with vitamin B3 (500 mg per kg of bodyweight, which is about 35 grams or 1 ¼ oz. for a 70 kg human) 30 minutes before and 8 hours after infecting them with *C. albicans*. Kidney tissue samples obtained from the mice found that vitamin B3 prevented the growth of *C. albicans* by acting on a gene in the bacteria called Hst3p which is crucial for reproduction (7). Acting on Hst3P increased levels of another protein called H3K56ac which is toxic to *C. albicans*.

For the researchers, "Our results demonstrate that [altering]...H3K56ac is a unique strategy for treatment of *C. albicans* and, possibly, other fungal infections." The importance of these results lies in the fact that it presents vitamin B3 may now be a viable treatment option for *C. albicans* infections as the bacteria frequently develops resistance to azoles and echinocandins, the prescription medications most commonly used to treat fungal infections (8, 9).

Greg Arnold is a Chiropractic Physician practicing in Danville, CA. You can contact Dr. Arnold directly by emailing him at PitchingDoc@msn.com or visiting his web site www.PitchingDoc.com

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