Normal mouth fungus changes after admission to the intensive care unit

The mouth is an important entry point into the body. Under normal conditions the mouth has many kinds of fungus, called the oral mycobiome, that help the body maintain health and resist infections. Several factors contribute to the kinds of fungus that live in the mouth such as diet, medical conditions, medications and oral hygiene. When patients are admitted to the hospital and especially the intensive care unit, their routine diet and daily activities (like teeth brushing) change. Also, many hospitalized patients receive antibiotics that alter the normal bacteria and fungus in their bodies.

Thrush, a kind of fungal infection in the mouth. Image from Public Health Image Library, www.cdc.gov.

Previous studies have shown that the fungus in the mouth is different in patients with HIV infection. The goal of this study was to determine if changes occur to the oral mycobiome when a person is admitted to the intensive care unit.

Ten patients who were admitted to the intensive care unit were enrolled in the study. Oral rinses using saline were collected and then testing was performed on the samples.The patients ranged from 19 to 84 years of age and the most common reason for admission was trauma. Most of them had other chronic medical conditions such as diabetes and heart disease. Upon entering the intensive care unit, 23 species of fungus were identified from the 10 patients. By day 7 the number had decreased to 13. There was also an increase in a fungus called *Candida albicans* which frequently causes thrush and bladder infections. *C. albicans* can also get in the bloodstream leading to serious complications like endocarditis (infection of the heart valves) and endophthalmitis (an eye infection). Only 3 of the patients received antibiotics during their intensive care unit stay and their oral mycobiome did not change compared to those who did not receive

antibiotics.

The results of our study showed that intensive care admission changes the normal fungi that live in the mouth. *C. albicans*, which is known to be a pathogen, increased while other, more beneficial species of fungi decreased. Fungal infections pose a significant risk for hospitalized patients. It is important that doctors and scientists find ways to lower this risk. One way might be to give patients in the intensive care unit and on the regular medical floors mouthwashes that kill *C. albicans*. More research is needed to test this idea and see if it would lead to better outcomes for hospitalized patients. Our study was small and therefore the results need to be interpreted cautiously. However, the findings seem logical and add to the body of knowledge regarding how patients might acquire fungal infections in the hospital.

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