



Oral Candidiasis Management in a Child with Pacifier Sucking Habit: A Case Report

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Abstract: Oral candidiasis is a widely known mucosal fungal infection caused by an overgrowth of *Candida* species. Children and infants are highly more susceptible to *Candida* infection than adults. We report an oral candidiasis case in a 5-year-old girl with white spots on her lips and tongue. When the white spots were scrapped off, they would be detached leaving red patches on the mucosal surfaces. The patient had pacifier sucking habit and tended to place the pacifier everywhere carelessly. Previously, the patient was treated at a primary healthcare center and received nystatin therapy. However, there was no improvement at all after the therapy. Based on her current and historical conditions, the patient was diagnosed as oral candidiasis, and in this case nystatin administration was ineffective. Therefore, the patient required better oral hygiene management, and the medication given was a gargle containing 0.1% hyaluronic acid. A week after using the gargle without using pacifier anymore, white spots had disappeared, and oral hygiene had improved. Re-control was conducted one month after the first visit and no *Candida* infection was detected. In conclusion, gargle containing 0.1% hyaluronic acid associated with better dental and oral hygiene is effective to treat oral candidiasis in children.

Keywords: oral candidiasis; children; pacifier sucking habit; gargle containing 0.1% hyaluronic acid

INTRODUCTION

Candida is a non-photosynthetic eukaryotic fungus with a cell wall outside the plasma membrane. *Candida* can metabolize glucose under anaerobic and aerobic conditions. The growth temperature of this fungus is around 37⁰ C which is available on potential hosts. This temperature is usually found in tropical countries, such as, Indonesia. Candidiasis is one of the most common fungal infections in Indonesia due to the high air temperature and humidity.¹

Adhesion of *Candida* to the cell wall is essential at the beginning of infection. It has carried by components of the fungal cell wall. Factors that influence the occurrence of candidiasis depend on the body which supports several other influencing factors. Humans with impaired salivary gland function, drug consumption, and denture wearing are local factors supporting the occurrence of candidiasis. In addition, systemic factors come from unhealthy lifestyles that cause decreased immunity as smoking and diabetes.²

Almost 60% of healthy adults and 26–65% of healthy children are reported to harbor candidal microorganisms in absence of signs or symptoms of candidiasis. Like most pathogens, *Candida albicans* (*C. albicans*) has developed virulence factors and specific strategies to facilitate colonization in host tissues and cause disease. Generally, antiseptic oral rinses used to medicate these infections are considered an adjunct or alternative anti-fungal treatment. Studies have suggested that the intra-oral concentrations of antiseptics decrease substantially to the sub-therapeutic levels on the dynamics of the oral cavity. The previous research showed that sub-therapeutic level of each antiseptic may modulate candidal exoenzyme production, consequently suppressing the pathogenicity of *C. albicans*.³

Candida albicans and several related *Candida* species are opportunistic pathogens that live as benign commensal organisms in the oral cavities of healthy individuals. Albeit, these microorganisms may change from commensal to pathogenic microorganisms in the mouth due to oral and systemic conditions. In the study of Kadir et al⁴ on the oral cavity of 300 healthy Turkish children, six species of *Candida* were found, as follows: *C. albicans* (84.8%), *C. parapsilosis* (15.2%), *C. krusei*, *C. kefyr*, *C. famata*, and *C. tropicalis*.

Candidiasis in the mouth, throat, or esophagus is usually treated with antifungal medicine. The treatment for mild to moderate infections in the mouth or throat is usually an antifungal medicine applied inside of the mouth for 7 to 14 days. These medications include clotrimazole, miconazole, or nystatin. For severe infections, the most common treatment is fluconazole (an antifungal medication) per oral or intravenously. If patient does not get better after taking fluconazole, healthcare providers may prescribe a different antifungal. The treatment for candidiasis in the esophagus is usually fluconazole.⁵

Nystatin is a common drug to treat oral candidiasis. This drug is fungicidal and fungistatic. The dosage of the drug given for oral candidiasis in children less than 12 months of age is 100,000 units, while for children over 12 months, it is 500,000 units every 6 hours. This treatment can also be used as prophylactic therapy in the presence of fungal infection with a dose of half the administration given for treatment. As prophylaxis, nystatin is given 50,000 units for children less than 12 months of age, meanwhile, for children over 12 months is 250,000 units every 8 hours.⁶

In some cases, there is a strong relationship between body hygiene and the environment for candidiasis infection. Therefore, efforts are needed to improve good habits in maintaining oral hygiene to reduce the recurrence of fungal infections. This study aimed to determine the effectiveness of a combination of oral medication and an improved oral hygiene index in treating oral candidiasis in children with pacifier sucking habit. Through this study, the authors want to provide an overview of the treatment for oral candidiasis in children.

CASE REPORT

A 5-year-old female patient came with white spots on her lower upper lip and tongue. The white spots could be scrapped off leaving red patches on the mucosa. Based on information from her mother, the patient had a habit of using a pacifier and placing the pacifier anywhere.



Figure 1. Clinical condition of patient's oral cavity, white spots in the lip and tongue



Figure 2. Clinical condition of patient's oral cavity, white spots in the upper lip



Figure 3. Clinical condition of patient's oral cavity, white spots in the lower lip

Previously, the patient was treated at a primary healthcare center. Samples were taken by scrapping the lesions in the mouth suspected of having a fungal infection. The preparations viewed through a microscope using KOH staining showed the presence of *pseudohyphae*. The patient had been treated with nystatin but there was no improvement after a week of therapy.

Based on the analysis of the patient's current and historical conditions, nystatin only was ineffective and required better dental and oral hygiene management. Therefore, it was necessary to improve the oral hygiene index based on previous research.³ Candidiasis patients are given gargle containing 0.1% hyaluronic acid that has to be applied to the white patches on the lips and tongue three times a day.

In addition, the patient is motivated not to use a pacifier and to improve her oral hygiene in order to prevent recurrent infection. Based on previous research, *C. albicans* infection can recur due to poor hygiene.

DISCUSSION

Pacifier sucking habit can be one of the causes of candidiasis. It can occur if the pacifier used is not hygienic or contaminated with *C. albicans* which play a significant role in regulating or forming the oral microbiomes. Therefore, it is necessary to pay attention to the mechanisms of adhesion and co-existence of *C. albicans* with other pathogenic bacteria as well as host factors that influence the occurrence of candidiasis, such as impaired salivary gland function, denture using, consuming drugs, and smoking habits.⁷

In this case, the patient had pacifier sucking habit and placed the pacifier carelessly, so that it cleanliness was lacking. Unclean pacifiers can contain *C. albicans* spores resulting in growth of the fungi on the lips and tongue, which further causing oral candidiasis. To avoid a pacifier from *C. albicans* is by placing it in a clean container and cleaning it with a food-grade antiseptic before using.

Hyaluronic acid (HA) can have an effect as an inhibitor of *C. albicans* growth activity directly proportional to the dose of HA given. Hyaluronic acid inhibits lysozyme and the peroxidase system in *C. albicans*.⁸ To determine whether the epithelial-cell anti-Candida activity results in killing the fungus or in retarding its growth, the evaluation of Candida using distinct fluorescent dyes that differentially stain live (FDA) and dead (PI) microorganisms. The results of these experiments showed a predominance of live Candida following nine hours of co-culture with either KB cells or HA, suggesting that oral epithelial cells and HA retard or arrest growth rather than kill the Candida.⁹

Efforts to reduce the recurrent infection of *C. albicans* could be performed inter alia by educating the children and their parents about the long-term effects of pacifier sucking habit. Parents have very important role to keep away the pacifiers from their children. It is expected that the parents can provide understanding and education to their children properly.¹⁰

A week after the administration of the gargle, white spots disappeared, and her oral hygiene was improved. The patient did not use a pacifier anymore, and understood the risk of using it. Re-control has carried out one month after the patient's first visit and showed better condition of the oral mucosa as well as better oral hygiene. White patches indicating *C. albicans* infection were not detected.

CONCLUSION

We reported a case of a 5-year-old girl with white spots on her oral cavity and pacifier sucking habit. Samples of the lesions indicated fungal infection, however, nystatin therapy for one week showed no improvement. Therefore, it is necessary to improve the oral hygiene index added with gargle containing 0.1% hyaluronic acid. A week after using the gargle, white spots disappeared, and oral hygiene was improved. Re-control was carried out one month after the first visit and showed no *Candida albicans* infection detected. Antifungal medication was not needed since there was no recurrent infections.

Conflict of Interest

The authors affirm no conflict of interest in this study.

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