International Journal of Advances in Medicine
Tan E et al. Int J Adv Med. 2021 Sep;8(9):1415-1418
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: https://dx.doi.org/10.18203/2349-3933.ijam20213247

Case Report

Oral candidiasis and the risk factors: a serial case reports

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Received: 08 June 2021
Revised: 09 July 2021
Accepted: 31 July 2021

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ABSTRACT

Oral candidiasis (OC) is also referred as 'thrush' is caused by the infections of the tongue and other oral mucosal sites and characterized by fungal overgrowth and invasion of superficial tissues. The main causative agent of 95% OC cases is Candida albicans. The prevalence of fungal oral infection was increased due to the increasing use of antibiotic and immunodeficiency condition. However, many factors have been suggested as risk factors for oral colonization. These predisposing factors are divided into local and systemic factors. We present two cases of patient with oral candidiasis that have admitted at Wangaya Regional Hospital, Denpasar, Bali, Indonesia with different precipitating factors in order to remind health provider that oral candidiasis does not only occur in people living with HIV/AIDS (PLWHA).

Keywords: Oral candidiasis, Candida albicans, Immunocompromised, Associated risk factors

INTRODUCTION

Oral candidiasis (OC) is also referred as 'thrush' is caused by the infections of the tongue and other oral mucosal sites and characterized by fungal overgrowth and invasion of superficial tissues. The main causative agent of 95% OC cases is Candida albicans. C. albicans is commercial organism that commonly colonizes the oral mucosa of healthy individuals.[1] There are seven other Candida species that have been contributed to the oral cavity disease: C. glabrata, C. guillermondii, C. kruesi, C. lusitaniae, C. parapsilosis, C. pseudotropicalis, C. stellatoidea, and C. tropicalis.[2]

Recently, the prevalence of fungal oral infection was increased. It is due to the increasing use of antibiotic and immunodeficiency condition which is associated with Human immunodeficiency virus (HIV) infection. The prevalence of Candida spp in the oral cavity of healthy individuals is 40-60%, while in the immunocompromised patients (HIV-infected patients) is 62-93%.[3] Even though, oral candidiasis is one of the most common fungal opportunistic infection in immunocompromised individuals. Many factors have been suggested as risk factors for oral colonization.[4]

These predisposing factors are divided into local and systemic factors. Local factors include the use of dental prostheses, topical medications such as corticosteroid inhalers and overzealous use of antimicrobial mouthwashes, xerostomia, smoking, poor oral hygiene, and unbalance dietary intake of refined sugars, carbohydrates and dairy products. While systemic factors include immunosuppressed states such as HIV, leukaemia, and pregnancy, malnutrition, decreased immunity secondary to age, endocrine dysfunction such as diabetes mellitus, systemic chemotherapy, radiation therapy, and the use of systemic corticosteroids, immunomodulatory drugs, xerogenic drugs, and broad-spectrum antimicrobials.[4-6] In people living with HIV/AIDS (PLWHA), the risk factors are age, sex, xerostomia, alcohol consumption, antibiotics usage, Cluster differentiation 4 (CD4) counts, viral load, WHO clinical stage, usage of Highly active antiretroviral therapy (HAART) and the type of Antiretroviral (ARV) medication.[3,4]

We presented two cases of patient with oral candidiasis that have admitted at Wangaya Regional Hospital, Denpasar, Bali, Indonesia due to other condition. The aim of the study was to remind health provider that oral candidiasis does not only occur in PLWHA. There are other risk factors may affect the occurrence of oral candidiasis.

CASE REPORT

The first case was a 52 years old man admitted to department of internal medicine, Wangaya Regional General Hospital through a referral from Surya Husada Hospital on 13th May 2021. His chief complaint was shortness of breath since, 1 week ago. Shortness of breath happened progressively together with general weakness, cough with phlegm, sore throat, oral thrush, and weight loss. Phlegm can't be described because the patient can't cough it out. Weight loss happened since, 5 years ago from 62 kg to 45 kg when he is diagnosed as diabetes mellitus type 2. The patient denied any symptoms regarding fever, headache, xerostomia, abdominal pain, chronic diarrhoea, night sweat, and long-term drug consumption. He only admitted to have uncontrolled diabetes mellitus type 2. The history of diabetes mellitus, hypertension, dyslipidaemia, and heart disease in the family were denied. Patient also denied any bad habit like smoking and alcohol consumption.

Patient was conscious and underweight (Body mass index 15.57 kg/m^2) with blood pressure 110/70 mmHg, heart rate 78 beats per minute (bpm), respiratory rate 20 times per minute, temperature 36.5°C, and oxygen saturation 97% without supplemental oxygen. From physical examination: conjunctival pallor (+/+), single tooth denture and pseudomembranous plaques in the oral. From blood examination: anaemia (haemoglobin 7.5 g/dl), hyperglycaemic (random blood glucose 206 mg/dl), rapid molecular test for tuberculosis negative and HIV test positive. From chest X-ray: pneumonia. Thus, we diagnosed as HIV stage IV, diabetes mellitus type II, anaemia, oral candidiasis, and pneumocystis pneumonia. Patient was given intravenous fluid, packed red cell, proton pump inhibitor (PPI) (omeprazole injection 40 mg/24 hours), antiemetic (ondansetron injection 4 mg/8 hours), mucolytic agent (N-acetylcysteine 3×200 mg), insulin (glulisine 3×6 unit, glargine 1×22 unit), corticosteroid (methylprednisolone 31.25 mg/12 hours), inhalation ipratropium/salbutamol together with budesonide every 8 hours, antibiotics (cotrimoxazole 1440 mg/8 hours, levofloxacin 750 mg/24 hours) and antifungal (nystatin drop 100.000 IU/ml 4×1 ml, fluconazole 2×150 mg). Patient was hospitalized for 1 week and discharged from hospital.

The second case was a 50 years old man admitted to department of neurology, Wangaya Regional General Hospital on 5th May 2021 due to tetraparesis et causa myelitis transversa. He was consulted to department of internal medicine because of oral candidiasis et causa suspect immunocompromised (HIV/AIDS). His chief complaint was general weakness since past 2 days. The patient also complaint about xerostomia, hiccups, sore throat and low appetite. He denied any fever, headache, cough, weight loss, chronic diarrhoea, and long-term drug consumption. The history of diabetes mellitus, hypertension, dyslipidaemia, and heart disease in the patient and his family were denied. He admitted history of benign prostate hyperplasia (BPH) and had went through operation. Patient also denied any bad habit like smoking and alcohol consumption, but he admitted bad oral hygiene.

Patient was conscious and underweight (Body mass index 16.57 kg/m^2) with blood pressure 84/59 mmHg, heart rate 104 beats per minute (bpm), respiratory rate 20 times per minute, temperature 36.5°C, and oxygen saturation 98% without supplemental oxygen. From physical examination: dental caries and pseudomembranous plaques in the oral. From blood examination: anaemia (haemoglobin 10.9 g/dl) and HIV test negative. From chest X-ray: normal. Therefore, we diagnosed the patient as tetraparese et causa myelitis transversa, low intake and oral candidiasis et causa bad oral hygiene. Patient was given intravenous fluid, corticosteroid (methylprednisolone 62.5 mg/24 hours), antipyretic (paracetamol 3×500 mg), proton pump inhibitor (PPI) (omeprazole injection 40 mg/24 hours), vitamin (mecobalamin 500 µg/12 hours), antipsychotic (chlorpromazine 3×25 mg), antibiotic (ceftriaxone 2 g/12 hours), and antifungal (fluconazole 2×150 mg). Patient was hospitalized for 2 weeks and discharged from hospital.

DISCUSSION

OC is a clinical predictor of HIV infection progression. The prevalence of Candida sp in the oral cavity of the immunocompromised patients (HIV-infected patients) is 62-93%. OC is more frequently happened in patient with CD4 count <200 cells/µl. The risk factor of OC in PLWHA are increasing age of PLWHA (≥34 years old), sex (male has a significant association with OC), xerostomia, smoking (7-fold risk for OC), alcohol consumption (6 times risk for OC), using antibiotic more than 7 days (4 times risk for OC), CD4 counts <108 cells/µl (3 folds risk for OC), and AIDS.[3]

Beside from HIV disease, systemic disease that results in systemic immunocompromise such as developmental, iatrogenic, immune-mediated, autoimmune, endocrine, or malignancy state may give rise to OC.[1] The main reason for Candida sp colonization seem to be altered functions of immune system in diabetic patients with poor glycaemic control, providing specific condition for intensive fungal colonization. Uncontrolled hyperglycaemia may cause intensification salivary glucose levels and cause Candida sp to multiply, even in the presence of normal bacterial flora. During hyperglycaemic episodes, the chemical reversible glycosylation products with protein in tissues and the accumulation of glycosylation products on buccal epithelial cells may increase the number of available

receptors for Candida sp. Glucose also capable in killing capacity of neutrophils and cause colonization (immunosuppression).[7]

From the first case was 52 years old male patient with risk factor HIV stage IV and diabetes mellitus type II. Poor immunity (HIV stage IV) added with risk factor OC in PLWHA such as age (≥34 years old) and sex (male has a significant association with OC), have increased the risk of developing OC. The limitation from first case report was we didn't assess patient's CD4 count. Aside from that, risk factor of diabetes mellitus type II was also increasing the risk of developing OC by altering immune system and providing suitable environment for fungal colonization. Local factor such as the use of dental prostheses in the patient may predispose to OC.

The micro-environment of denture-bearing palatal mucosa is low oxygen, largely devoid of saliva and low acidic pH that favours yeast overgrowth. Candida has affinity for acrylic surface of denture and non-denture surfaces such as dental fillings. Other risk factor of Candida albicans biofilm formation are poor oral hygiene, failure to remove the denture while sleeping, poor denture cleansing, and denture age.[1,8] During our history taking with patient, patient has a good oral hygiene, habit of denture cleansing, and remove denture while sleeping. However, we can't prove his denture age. Denture age was shown to be an important factor as a result of poor fit, roughness, inadequate hygiene, and accumulation of plaque due to aging denture.[8]

OC have received clear surge of interest due to escalation of acquired immune deficiency syndrome (AIDS) epidemic and individuals with weakened immune systems.[1] However, the prevalence of oral candidiasis in healthy individuals were healthy individuals were 40-60%.[3] Condition that altered local resistance to infection is also played an important role. Poor oral hygiene promotes organism adherence and colonization.[9] The presence of plaque, tartar and high index oral hygiene (IOH) in patients with Candida is statistically significant.[10] The decrease in saliva flow could disrupt several oral functions. When salivary flow was significant reduced, the oral microbiome is altered. Defects in oral clearance, low salivary pH and changes in salivary compositions lead to microbial dysbiosis and increase the risk of oral disease, including gingivitis, dental caries and fungal infection.[11] Malnutrition, malabsorption, and eating disorder states are reported to predispose to OC. Deficiencies of iron, zinc, magnesium, selenium, folic acid, and vitamins (A, B6, B12, and C) were attributed to increase the risk.[1]

The second case was a 50 years old man with risk factor poor oral hygiene, xerostomia, and nutritional deficiencies. From history taking, the patient didn't have any habit of regular tooth brushing and often feel xerostomia. From oral examination, we found dental caries that may prove to be results of poor oral hygiene and decrease in saliva flow. Additionally, the patient has a low appetite and underweight with BMI 16.57 kg/m^2 that may increase the risk of developing OC.

CONCLUSION

Even though, oral candidiasis is one of the most common fungal opportunistic infection in immunocompromised individuals. Many factors have been suggested as risk factors for oral colonization. Local factors include the use of dental prostheses, topical medications, xerostomia, smoking, poor oral hygiene, and unbalance dietary intake. While systemic factors include immunosuppressed states, malnutrition, decreased immunity secondary to age, endocrine dysfunction, systemic chemotherapy, radiation therapy, and the use of systemic corticosteroids, immunomodulatory drugs, xerogenic drugs, and broad-spectrum antimicrobials.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Tan E, Suryana K. Oral candidiasis and the risk factors: a serial case reports. Int J Adv Med 2021;8:1415-8.