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DIABETIC ORAL CANDIDIASIS : PREVALENCE DETERMINATION BASED ON A1C VALUE AT HAJI HOSPITAL, SURABAYA

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ABSTRACT : Hyperglycemia due to insulin resistance, lack of insulin secretion or both, in long-term condition can lead to metabolic disease known as diabetes mellitus. A1c which refers to glycated hemoglobin can be used in diabetes diagnosis that can indicate long-term blood sugar level and blood sugar control. Along with other habitual predisposing factor, uncontrolled diabetes is the main predisposing factors of oral candidiasis. A descriptive observational study with a cross-sectional method was conducted. Inclusive criteria were patients with A1c value > 6.5%, aged ≤ 65 years old and outpatients in Haji Hospital Surabaya. Exclusive criteria were smokers, denture wearers, patients who consumed medications other than ones for diabetes, and unable to open mouth. Oral swab was done in participants with and without oral candidiasis lesion for fungal examination using direct KOH and *Candida* culture to identify the species. Out of 38 diabetic patients, 18 suffered from oral candidiasis in which 6 of them were categorized as controlled diabetes (A1c > 6.5-8%) while the rest 12 patients included in uncontrolled diabetes category (A1c > 8%). Statistical analysis showed no significant relation between oral candidiasis and A1c value (p=0.4373; p>0.05). This may conclude that the occurrence of oral candidiasis was not fully affected by A1c value, it might be affected by other oral candidiasis predisposing factors.

Key words : Diabetes mellitus, A1c, oral candidiasis.

INTRODUCTION

Hyperglycemia due to insulin resistance, lack of insulin secretion or both, in long-term condition can lead to metabolic disease known as diabetes mellitus (Suciadi *et al*, 2019). Compared to several types of diabetes, type-1 and type-2 diabetes are the most frequent with higher prevalence in type-2 (Al-Maskari *et al*, 2011; Narmada *et al*, 2019).

Diabetes is one of the predisposing factors of oral candidiasis. Along with other predisposing factor such as smoking, denture wearing, medications (steroid and broad-spectrum antibiotics), and poor glycemic control, diabetes trigger opportunistic infection of *Candida* spp (Poradzka *et al*, 2013; Al-Maskari *et al*, 2011). Main species of *Candida* spp. namely *C. albicans* often found in oral, genital and skin infection besides other pathogenic non-albicans species such as *C. dubliniensis*, *C. glabrata*, *C. guilliermondii*, *C. krusei*, *C. lusitaniae*, *C. parapsilosis, C. pseudotropicalis* and *C. tropicalis* (Anaissie *et al*, 2009; Nugraha *et al*, 2018a).

Patients with poor glycemic control have uncontrolled glucose levels, and salivary glucose may increase which affects the loss of homeostasis and increases the susceptibility of infections in the oral cavity and wound healing (Humairo and Apriasari, 2014; Rezkita *et al*, 2020). High concentrations of glucose in blood and saliva may stimulate the growth and amplify adherence of yeast to epithelial cell surfaces. This condition also weakened the functions of polymorphonuclear (PMN) leukocytes leading to reduced phagocytosis, intracellular killing and chemotaxis which may grant to the increased colonization of *Candida* and susceptibility to oral candidiasis (Nugraha *et al,* 2018b).

A1c refers to glycated hemoglobin which can be used in diabetes diagnosis. In every â-chain of hemoglobin A (HbA), glucose attached to N-terminal valine of amino acid, therefore A1c can indicate long-term blood sugar level in diabetic conditions (Welsh *et al*, 2016; Florkowski, 2013). According to American Diabetes Association, blood sugar control considered good for non-pregnant adults if A1c level < 7%, and poor if A1c level found to exceed 8% (Cosson *et al*, 2018; Omar *et al*, 2018). A study