

Research Report

Salivary neutrophils isolation of severe early childhood caries patients with flow cytometry analysis using magnetic beads and CD177 marker

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ABSTRACT

Background: Neutrophils are the first line of defense, not only serving as the killer of microbes through phagocytosis process, in which reactive oxygen species (ROS) and anti-microbial peptides were released, but also regulating activation of immune response. CD177 is a tidylinositol glycosylphosphate glycoprotein with a molecular weight of 58- 64-kDa exclusively found on neutrophils, neutrophilic metamyelocytes, and mielosit. CD177 expression, a protein on the cell surface with an average size ranging from 45% to 65%, is only found on subpopulations of neutrophils. **Purpose:** This study aims to analyze the effects of salivary neutrophil isolation using magnetic beads and CD177 marker on S-ECC patients. **Method:** The study is an observational analytic research with cross sectional approach using flow cytometry analysis on the S-ECC patients and the caries-free children who were asked to use mouthwash, NaCl 1.5%. For the isolation of neutrophils, magnetic beads labeled with FITC funds and CD177⁺ marker were used. **Result:** There were 77.66% of salivary neutrophils expressing CD177⁺ markers, successfully isolated in the S-ECC patients, while in the caries-free children there were 63.67% of salivary neutrophils. **Conclusion:** In the S-ECC patients, there were 77.66% of salivary neutrophils expressing CD177 markers, successfully isolated, while in the caries-free children there were 63.67% of salivary neutrophils.

Keywords: magnetic beads; salivary neutrophils; S-ECC

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INTRODUCTION

Dental caries in preschool children is a very serious health problem, requiring special attention since dental caries is a focal infection that causes a variety of systemic diseases, and it is not possible to recover the formation of tooth structure when a cavity/hole occurs. Dental caries is a disease that is irreversible, consequently, it needs to be cured since its impact is huge in children. For instance, it can cause difficulty in chewing, malnutrition, gastrointestinal disorders, growth disorders, especially weight and height, articulation disorders of speech, and impaired social and cognitive development. Dental caries can be considered as a continuous problem that burden children,¹ such as affecting

the physical and mental health of the children and increasing the risk of dental caries to become the permanent one.²

Streptococcus mutans (*S. mutans*) are the primary etiologic agents of early childhood caries (S-ECC) since they have some mechanisms to colonize the tooth surface, and under certain conditions, they can alter into cariogenic species significantly higher in the oral biofilm environment. As a result, it indicates a causative relation between dental caries and the increasing of *S. mutans*. In other words, the increasing of the number of *S. mutans* in saliva can be an indication of the increasing of dental caries prevalence.³ In the S-ECC cases, the increasing of the number of *S. mutans* can cause the migration of neutrophils out of the bloodstream into oral mouth to perform phagocytosis against microbial pathogens in an effort of homeostasis.