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THE ROLE OF MACROFAGS IN PREGNANT RATS WITH CHRONIC PERIODONTITIS AS A RISK OF PREECLAMSIA

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ABSTRACT : Periodontitis is an inflammatory disease of tooth supporting tissue caused by specific microorganisms, one of which is the bacteria *Porphyromonas gingivalis* (*P. gingivalis*). Based on the Basic Health Research (RISKESDAS) in 2018, dental and mouth problems reached 57.6% in Indonesia and only 10.2% had received services from medical personnel. In pregnancy there are hormonal changes that can affect periodontal tissue. Increasing the number of macrophages in pregnancies with chronic periodontitis can lead to a risk of preeclampsia. The aim of this study is toprove that pregnant mice with chronic periodontitis can increase the number of macrophages as a risk of pre-eclampsia. Thirty females *Rattus novergicus*, weighing 250-300 g with age 5-6 months, divided into 3 groups, consisting of 1 control group and 2 treatment groups. The control group is only pregnant mice. In treatment group 1 is the group of pregnant rats with chronic periodontitis and in treatment group 2 is the group of rats with chronic periodontitis. *P. gingivalis* ATCC 33277 was injected locally 0.03ml with a concentration of $1x10^9$ CFU / ml under the incisor gingival sulcus in the right and left mesials. Data on the number of macrophages were analyzed using Kolmogorov-Smirnov and One-Way Anova. There were significant differences in the mean number of macrophages between groups. There is an increase in macrophages in pregnant mice with chronic periodontitis

Key words : Macrophages, preeclampsia, maternal health, chronic periodontitis.

INTRODUCTION

Periodontitis is one of the most common diseases in humans, which is an inflammatory disease of dental support tissue caused by specific microorganisms *Porphyromonas gingivalis* (*P. gingivalis*) is a gram-negative anaerobic bacteria in the oral cavity, which is a major cause of peridontal disease (Rafiei *et al*, 2017; Nugraha *et al*, 2020). Based on the Basic Health Research (RISKESDAS) in 2018, dental and mouth problems reached 57.6% in Indonesia and only 10.2% had received services from medical personnel (Riskesdas, 2018). Periodontitis does not only cause oral dysfunction but is also associated with systemic pathology and has been considered a risk factor for cardiovascular disease, peripheral arterial disease, respiratory disease and low birth weight (Arigbede *et al*, 2013; Han *et al*, 2018; Newman *et al*, 2014).

Periodontitis is described as a potential risk that can increase complications in pregnancy. Periodontal disease occurs in 20% to 50% of pregnant women (Sgolastra *et al*, 2013). In pregnant women hormonal changes occur which will trigger the body's response to infection. The most common manifestation in the oral cavity in pregnant women is pregnancy gingivitis and it has been reported that almost 100% occur in pregnant women. This occurs because of an increase in estrogen and progesterone which causes an increase in vascularity and vascular flow along with changes in the immune system (Martina *et al*, 2007). During the process of pregnancy there will be physiological and psychological changes. Changes that occur during pregnancy can affect several parts of the body including the oral cavity especially in the periodontal tissue which is caused by an increase in the levels of the hormones progesterone and estrogen, which can affect small blood vessels of the gingiva, periodontal ligament and alveolar bone (Özen *et al*, 2012; Nareswari *et al*, 2019; Hisham *et al*, 2019). Preeclampsia is followed by an increase in proinflammatory mediators namely Interleukin-6 (IL-6), Tumor necrosis factor-α (TNF-α) and C-reactive protein (CRP) and a decrease in Interleukin-10 (IL-10) (Xie *et al*, 2011). Then the bacteria enter the placenta and will increase the inflammatory

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