

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH

Judul Artikel Ilmiah : Chemopreventive Effect of Carica Pubescens Leaf Extract on Neutrophil-lymphocyte Ratio, Erythrocyte Count, and Colon Histopathological Appearance of Dimethylhydrazine-induced Colon Cancer Rats

Penulis Artikel Ilmiah : Ainun Rahmasari Gumay, Saekhol Bakri, Devi Oktavia, Kurnia Vanie Saritsya, Dwi Retnoningrum, Darmawati Ayu Indraswari, Indah Saraswati, Hermawan Istiadi, Yosef Purwoko, Muflihatul Muniroh, Hardian

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Semarang,
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ORIGINAL ARTICLE

Correlation Between Ferritin and Thyroid Hormones in Obesity

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ABSTRACT

Introduction: Obesity is one of the risk factors for various metabolic diseases that will cause various kinds of complications. Continuous sub-acute chronic inflammation is characterized by increased inflammatory markers, one of which is ferritin. Low iron that can be detected with ferritin, may alter thyroid metabolism. Chronic inflammatory conditions can cause disruption of thyroid hormone production. The purpose of this study was to examine the correlation between ferritin levels and thyroid hormone levels in obese populations. **Methods:** This was a cross-sectional study enrolling 41 subjects with obesity with BMI >27 in Diponegoro National Hospital Semarang. Thyroid hormone levels (TSH, T3, FT3, T4 and FT4) and ferritin were examined with an immunology analyzer. Spearman correlation test was performed. $p < 0.05$ was considered as statistically significant. **Results:** There were significant weak positive correlations between ferritin levels with T3 ($r=0.38$; $p=0.02$) and with FT3 levels ($r=0.33$; $p=0.05$). There were no correlations between ferritin levels with TSH, T4, and FT4. **Conclusion:** Ferritin levels might have association with T3 and FT3 levels in obese population. If confirmed by further studies, ferritin and thyroid hormones levels could be used in therapeutic monitoring in obese population.

Keywords: Ferritin, Thyroid hormones, Obesity

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INTRODUCTION

Obesity has become a major problem in Southeast Asian countries and in Indonesia. The prevalence of overweight and obesity in Southeast Asian countries has increased into 8–30% in men and 8–52% in women (1). According to Indonesian Basic Health Research (Riset Kesehatan Dasar) in 2018, the prevalence of obesity in Indonesian patients with age of >18 years old was 21.2%. The incidence of obesity in men was 14.5%, whereas in women was 29.3% (2). The nutritional status of an adult over 18 years old was measured with body mass index (BMI) by calculating anthropometric parameters of body weight (BW) and height (H). According to Indonesian Basic Health Research (Riset Kesehatan Dasar) 2018,

obesity in adults was defined as BMI 27 kg/m² or higher, (2) while according to world health organization (WHO), obesity in adults was defined as BMI 30 kg/m² or higher (3, 4). Diet, physical activity, genetics, environmental factors are the predisposing factors of obesity (5).

Obesity can occur continuously with chronic inflammatory state. Several studies have shown an increase in inflammatory markers in patients with obesity, including ferritin (6-8). Obesity was also thought to be associated with anaemia. This condition might be due to fat accumulation and chronic inflammation in adipose tissue that could reduce iron absorption (9, 10). There were an increase in serum ferritin levels in obese patients, and it was also thought that ferritin in obesity was more due to chronic inflammatory conditions that occurred in comparison to conditions associated with iron deficiency (11-13). Meanwhile, other previous studies showed that several minerals and trace elements, including iron, were needed for thyroid hormone

ORIGINAL ARTICLE

The Association Between Plasma Natural Antibodies and Inflammatory Biomarkers Two Weeks After Calving in Cows with No Dry Period

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ABSTRACT

Introduction: Improved energy balance, metabolic status, and natural antibodies (NAb) has been shown in cows with no dry period, however these cows showed increased inflammation status in early lactation. The aim of this study was to determine the association between plasma natural antibodies and inflammatory biomarkers in cows with no dry period during the first two weeks postpartum. **Methods:** Holstein-Friesian dairy cows (n=55) were selected. Before enroll to the experiment, cows were clinically healthy. Plasma samples were collected at week 1 and 2 after calving and were analyzed for NAb binding megantura-keyhole limpet hemocyanin and inflammatory biomarkers. **Results:** Cows with no dry period in this study had an improved energy balance and maintain NAb titers but increased ceruloplasmin (inflammatory biomarkers) in early lactation. In this study we found a significant correlation between NAb IgG binding KLH and haptoglobin in plasma ($P < 0.01$). However, there were no correlations between albumin, cholesterol and NAb (IgG and IgM) binding KLH. **Conclusion:** This study demonstrate that cows with no dry period have an improved energy balance and maintained the level of natural antibodies in plasma. Moreover, IgG titers in plasma might be correlated with haptoglobin due to inflammation during calving until 2 wk postpartum.

Keywords: Continuous milking, Inflammation, Antibodies

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INTRODUCTION

During transition period, immune status in dairy cows were suppressed and need to be increased. It is known that dairy cows are characterized with immune suppression during transition period, which is related with severe negative energy balance (EB), and high rate of infection diseases and metabolic disorders (8). Innate immunity is the first line defense against infection (1), and natural antibodies (NAb) are a part of humoral innate immunity before get any antigenic stimulation (2). CD5+ B-1 cells produce natural antibodies in healthy individuals and NAb mainly consist of immunoglobulin M (IgM), IgG and IgA (3,4). In previous research, NAb binding keyhole limpet hemocyanin (KLH) were higher in cows with an

improved EB in early lactation (7). Transition period is the crucial time for dairy cows especially in the first two weeks after calving. In early lactation, cows experienced negative EB, which is related to immunosuppression (9). Negative EB was not only related to NAb but also was associated with enhanced level of inflammatory biomarkers (10) and metabolic disorders (11) in dairy cows during early lactation.

In early lactation, increased disease rates are commonly reported among high-yielding dairy cows and characterized by the occurrence of an inflammatory response indicated by acute phase protein (APR) (12). Inflammation evokes white blood cells (WBC) to release of tumor necrosis factor-alpha (TNF- α) and (interleukin-1 and -6) (IL 1 or 6). As a consequence, TNF- α and IL-1 or 6 triggered the release of acute phase response (13). During the response of acute phase protein, positive acute phase reactants (+AP) including haptoglobin and ceruloplasmin were increased in plasma and negative