ABSTRAK

Pendahuluan: Pemberian zinc saja dalam nutrisi tambahan belum mampu menurunkan angka malnutrisi. Pemberian kombinasi probiotik dan zinc perlu dilakukan penelitian lebih lanjut untuk melihat efek keduanya di saluran pencernaan dengan melihat kadar hormon pengatur nafsu makan, seperti *Glucagon Like Peptide-1* (GLP-1) dan ghrelin, serta perbaikan histologi usus halus pada tikus malnutrisi. **Tujuan:** Mengetahui efek kombinasi probiotik dan zinc terhadap gambaran histologi usus halus, kadar GLP-1 dan ghrelin pada tikus malnutrisi. **Metode:** Penelitian eksperimental *post test only randomized control group design* menggunakan 30 ekor tikus, usia 8 minggu, berat badan 150-200 g, dibagi menjadi 5 kelompok. Kelompok K(+), P.I, P.II, dan P.III diberi pakan rendah kalori selama 14 hari untuk membuat kondisi malnutrisi, kecuali K(-). Hari ke-15 sampai 28, K(+) tetap diberi pakan rendah kalori, sedangkan P.I diberi kombinasi probiotik dan zinc, P.II diberi probiotik, dan P.III diberi zinc dengan pakan standar. Preparat histologi usus halus diwarnai dengan *Hematoxylin-Eosin*, kadar GLP-1 dan ghrelin diukur dengan metode *ELISA*. **Hasil:** Uji *post hoc* menunjukkan peningkatan tinggi vili kelompok P.I berbeda signifikan dibandingkan K(+) (p=0.029). Peningkatan tebal mukosa kelompok P.I tidak berbeda signifikan dibandingkan K(+) (p=0.903). Peningkatan kadar GLP-1 pada seluruh kelompok berbeda signifikan dibandingkan K(+) (p=0.000). Penurunan kadar ghrelin pada seluruh kelompok berbeda signifikan dibandingkan K(+) (p=0.000). **Kesimpulan:** kombinasi probiotik dan zinc berpengaruh terhadap peningkatan tinggi vili, peningkatan kadar GLP-1, dan penurunan kadar ghrelin pada tikus malnutrisi.

Kata kunci: *probiotik, zinc, malnutrisi, usus halus, GLP-1, ghrelin*

ABSTRACT

Introduction: Malnutrition causes small intestinal atrophy leading to impaired of nutrient absorption, zinc deficiency, and intestinal microbiota imbalance affecting appetite. Zinc supplementation programs has been shown to be ineffective to reduce national prevalence of malnutrition. **Objective:** This study was design to assess the effect of the combined probiotics and zinc supplementation on histological features of ileum, GLP-1 and ghrelin levels in the malnourished rats. **Methods:** This experimental study, using 30 rats, aged 8 weeks, weighing 150-200g, were divided into 5 groups. Group K(-) served as normal receiving standard diet, group K(+) served as malnourished receiving low calorie diet. Group P.I, P.II, and P.III were pretreated with calorie restriction for 14 days to induce malnutrition. The treatment was given for 14 days. Group P.I treated with probiotics and zinc combination, group P.II treated with probiotics, group P.III treated with zinc. All treatment group received standard diet at the same time. Ileum sample was taken and subjected to histological preparations using *hematoxylin-eosin* staining to evaluate villi height and mucosal thickness, blood sample was taken for GLP-1 and ghrelin levels evaluation using ELISA methods. **Results:** Probiotics and zinc co-supplementation significantly increased in villi height (p=0.029) and GLP-1 levels (p=0.000), and reduced in ghrelin levels (p=0.000) compared to malnourished rats. **Conclusion:** Probiotics and zinc co-supplementation improve malnourishment in rats.

Keywords: *probiotic, zinc, malnutrition, ileum, GLP-1, ghrelin*