

Use of *bee honey* as alternative medicine in protein energy deficiency

R. Heru Prasetyo¹ , Willy Sandhika² , and Djoni Susanto³

¹ Departement of Parasitology, School of Medicine, Airlangga University

² Departement of Patology, School of Medicine, Airlangga University

³ Departement of Histology, School of Medicine, Airlangga University

Corresponding Author: rma_fispro@yahoo.com

Abstract. The protein energy deficiency cause intestinal villus atrophy and epithel mucous damage. The effect of *bee honey* on histostructure of intestine was studied in the experimental mice as model of protein-energy deficiency. The use *bee honey* in protein-energy deficiency shown to improve intestinal villus atrophy and epithel damage. In conclusion that *bee honey* can use as alternative medicine in protein energy deficiency.

Keywords: *bee honey, alternative medicine, protein energy deficiency, histostructure of intestine*

Introduction

Protein-energy deficiency is still a mayor public health problem in Indonesia. Since 2002 protein-energy deficiency cases shown increasing. It is associated with more than 50% of under-five mortality of malnutrition cases cause by protein-energy deficiency, and it is cause by intestinal infection with diarrhoea. Malnutrition can be cause of several problem for children, one of the problem is threat of stunting. The other threat is baby with low body weight (DepKes RI, 2005). Protein-energy deficiency globally most common cause of immunodeficiency (Chinen and Shearer, 2010), where immunodeficiency condition will trigger oportunistic infection by intestinal parasite protozoa with chronic diarrhoea symptom (Markell, 1999), that it can make heaver malnutrition and increase mortality. The histological examination in the experimental mice as model of protein-energy deficiency shown intestinal villous atrophy and epithelial mucous damage (Prasetyo, 2011). Until now the efforts to decrease protein-energy deficiency cases not shown yet the real result, because to improve malnutrition cases through intake of food only, without concern to intestine epithelial mucous.

Bee honey is widely used all over the world as a complementary and altenative medicine in various disorders including gastrointestinal lesions (Ali and Al Swayeh, 2003). However the study was to evaluate histostructure of epithelial mucous by using bee-honey in protein-energy deficiency are not be done. The aims of this study will to evaluate the effect of bee-honey on improving histostructure of intestine epithelial mucous in protein-energy deficiency mice.

Material and Methods

Five days fasted mice *Mus musculus* Balb/c (adapted from Borelli et al, 1995) were given food and 30% (v/v) bee-honey as drinking water was allowed ad libitum. For collection ileum sample they were killed five days later by cervical dislocation. The separated ileum in 10 % formalin and processed by standard histological techniques (paraffin embedding). Ileum crosssection were stained by Hematoxyllin-Eosin (HE). The change of histostructure illustration was evaluated under light microscope.

Results and Discussion

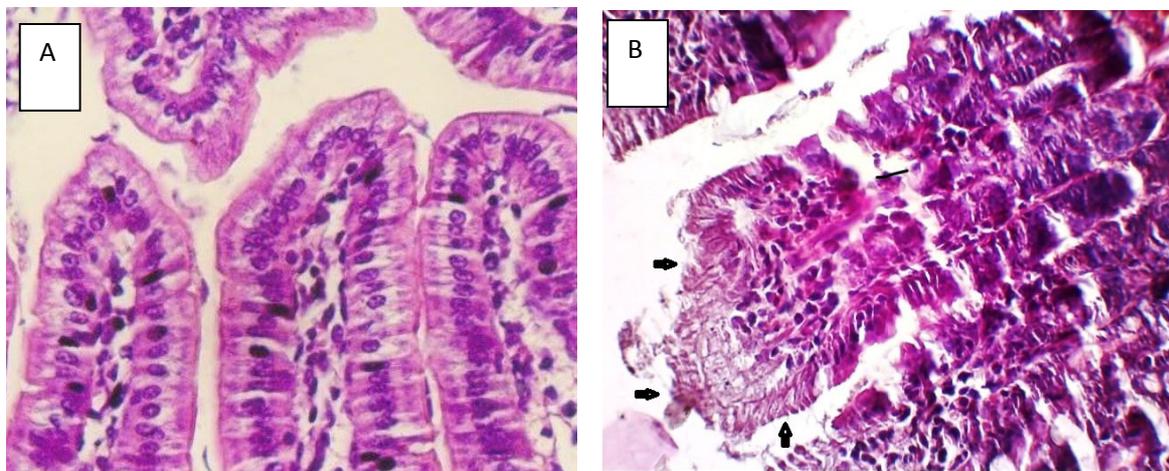


Figure 1 . Histological illustration of ileum were stained by HE, 40 x obj, **A** normal, **B** after five days starvation

Histostructure illustration in normal mice intestine (fig. 1 A) seem cylindrical epitel layer with goblet cell and border striated, cylindrical cell nucleus in orderly line on the basal membrane, cytoplasma pink in colour. Lamina propia seem loose connective tissue with fibroblast cell.

The histostructure illustration in the experimental mice as model of protein-energy deficiency (fig.1 B) became villus atrophy where seem damage of cylindrical epitel layer, cell nucleus lose, irregular cytoplasma, and basal membrane lose. Lamina propia seem loose connective tissue with fibroblast and limfosit. Villus atrophy and ephitelial mucus damage in intestine cause of absorption and secretion disturbance, decrease of intestine motilty, distrubance of intestinal adaptation function, disfunction of sIgA, and disfunction of macrophage. If became intestinal parasite infection, this condition will more easy adhere of intestinal parasite on epitheial mucous, and will more easy the proliferation and colonization of intestinal parasite, that can increase damage of intestinal mucous, so became chronic diarrhoea (Prasetyo, 2011).

Honey has been used as a medicine since ancient times. The Muslim prophet Mohammed recommended the use of honey for the treatment of diarrhoea (Molan, 1999). Giving food and honey in mice after five days of starvation give variety of histostructure

illustration (fig.2 A, B, and C). Research on honey has shown that it has physiological actions that would therapeutic effects. Honey has antibacterial activity, boosting of the immune system, has anti inflammatory action, has antioxidant activity, and stimulation of cell growth (Molan, 1999). In the damage epithelial mucous became decrease of PGE2 expression (Prasetyo, 2011). For intestinal adaptation , PGE2 have function of regulation in epithel proliferation of intestine, mitogenic effect, add intestinal mucous and to prolong of intestine (Ganong, 2000 ; Vanderhoof, 2000).

Histostructure illustration in effect of giving honey to protein-energy deficiency mice were shown by figure 2 A, B, and C.

Figure 2A show a cylindric epitel layer with goblet cell and striated border, nucleus cell seem in ordery line on basal membrane, cytoplasm are pink in colour. Lamina propia of loose conective tissue with fibroblast cell. A part of epitel with damage nucleus and cytoplasm.

Figure 2B show a cylindric epitel layer with goblet cell and stiated border, a part of epitel cell lose nucleus with irregular cytoplasm, striated border lose in damage cell.

Figure 2C show a cylindric epitel layer with goblet cell and striated border from villi, most with intact cell, and the least cell are damage.

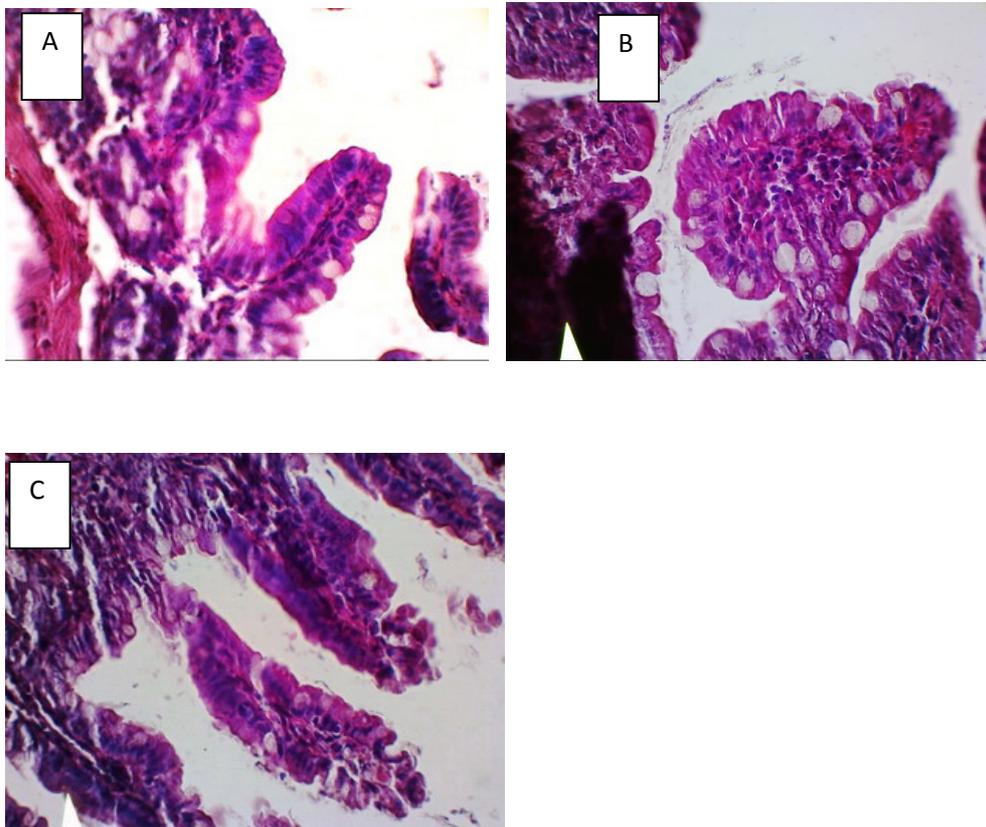


Figure 2. Histostructure ilustration of ileum in giving bee-honey, after five days starvation.

Histostructure ilustration show that bee-honey can improve the damage of epithelial mucous of intestine, and the giving honey need prolong time for complete improvement of epithelial mucous of intestine. Therefore bee-honey can use as alternative medicine in protein-energy deficiency.

Reference

- Ali ATMM and Al Swayeh OA, 2003. Honey potientiale the gastric protection effects of sucralfate against amonia induced gstriclession in rats. *The Saudi Journal of Gastroenterology*, vol.9, issue 3,117-123.
- Borelli P, Mariano M and Borojevic R,1990. Protein malnutrition : effect on myeloid cell production an mobilization intoinflamation reaction in mice. *Nutr.Res* 15, 1477-1485.
- Chinen J and Shearer WT, 2010. Secondary Immunodeficiencies, including HIV infection, *Journal of Allergy and Clinical Immunology*, Vol.125, Issue 2, Suplement 2, Fbruary, S 195-S203.
- Ganong WF, 2000. *Fisiologi Kedokteran*. 22th Edition, Jakarta,EGC, 321-322.
- Markell EK, John DT, Krotoski WA, 1999. *Markell and Voges Medical Parasitology*, 8th Edition, WB Saunders Company, St. Louis.
- Molan PC, 1999. Medicinal 1. Why honey is effective as a medicine. <http://www2.wave.co.nz/-whp/publicat1.htm>.
- Prasetyo RH, 2011. Immunokimiawi PGE2 Usus Ileum yang Kekurangan Enerji Protein, *Indonesian Journal of Clinical Pathology and Medical Laboratory*, Vol. 17, No.3, Juli, 143-145.
- Vanderhoof JA, 2000. Short Bowel Syndrome and Intestinal adaption. In : *Pediatric Gstrointestinal Disease, Pathophysiology, Diagnosis, Management*, 3rd Edition, Edited by Walker WA, Durie PR, Hamilton JR, Smith JAW, Watkins JB, Ontario, BC Deckers Inc, 583-602.