

Abstract

The Effects of Glutamine on Sucrase, Maltase, Lactase Activity and Spectrin, Clathrin Expression in Repairing Microvilli Intestine in Rats Malnutrition

Roedi Irawan

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Background: Malnutrition is a global health problem. It is a leading cause of morbidity and mortality in developing countries. Malnutrition affects the immune system, making the body more susceptible to infections and diseases. The aim of this study was to investigate the effects of glutamine on the activity of sucrase, maltase, and lactase, and the expression of spectrin and clathrin in the intestine of malnourished rats.

Objective: The purpose of this study was to determine the effect of glutamine on the activity of sucrase, maltase, and lactase, and the expression of spectrin and clathrin in the intestine of malnourished rats. The study was conducted in a laboratory setting using male rats.

Method: The method employed in this study was experimental research. The study was conducted in a laboratory setting using male rats. The rats were divided into four groups: control, malnutrition, malnutrition+glutamine, and malnutrition+glutamine+glutamine. The rats were fed a karak diet for 15 days. Control and malnutrition groups received a normal diet (rice). The malnutrition+glutamine and malnutrition+glutamine+glutamine groups received a diet supplemented with 500 mg/kg body weight/day of glutamine. On the 15th day, the rats were weighed and sacrificed. The intestine was taken and subjected to histological and immunohistochemical examination.

Results: Sucrase activity between malnutrition with malnutrition+glutamine groups was not significantly different in the duodenum, but significantly different in the jejunum and ileum (p = 0.04). Maltase activity when compared malnutrition+glutamine groups there were no significant differences in the duodenum, jejunum, and ileum (p = 0.00). Lactase activity when compared malnutrition+glutamine groups there were no significant differences in the duodenum (p = 0.03), jejunum (p = 0.04) and ileum (p = 0.03). Spectrin and clathrin were evidence enlarge of enterocyte in the jejunum and ileum when being given glutamine compared to malnutrition group. The expression of spectrin and clathrin expression similar appearance on jejunum and ileum. Spectrin and clathrin molecular weight protein in the duodenum, jejunum and ileum was similar, with a molecular mass of 130-250 KDa. Relationship between sucrase, maltase, lactase, spectrin, and clathrin in the duodenum (p = 0.03), jejunum (p = 0.03), and ileum (p = 0.03).

Conclusion: Malnutrition affects the activity of sucrase, maltase, and lactase, and the expression of spectrin and clathrin in the intestine of rats. The addition of glutamine to the diet of malnourished rats can improve the activity of sucrase, maltase, and lactase, and the expression of spectrin and clathrin in the intestine.

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Key words: sucrase, maltase, lactase, spectrin, clathrin, malnutrition, glutamine

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