EFEK PEMBERIAN GLUTAMIN TERHADAP AKTIVITAS *SUCRASE, MALTASE, LACTASE* DAN EKSPRESI *SPECTRIN, CLATHRIN* DALAM PERBAIKAN MIKROVILI USUS PADA TIKUS MALNUTRISI

Irawan, Roedi
Promotor : Prof. Dr. H. Subijanto M.S, dr., SpA(K)
GLUTAMINE; MALNUTRITION
KKA KK Dis K 27 / 12 Ira e

Abstract

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

Roedi Irawan

Back groud: Glutamine is the most abundant amino acid in the blood and plays a key role of intestinal response to local and systemic injuries such as diarrhea and malnutrition. Malnutrition occurs interference in intestinal enzyme activity.
Obyective: The purpose of this study is to explain the effect of oral glutamine on *sucrase*, *maltase*, *lactase* enzyme activity and *spectrin*, *clathrin* expression also the correlation with *ERK-1* and *STAT-3* signaling pathways in repairing microvilli intestine in rat malnutrition.
Method: The method employed in this study was experimental research, with control samples, measurable and reliable, with the design of the study was post test only group design. showed that twenty growing male rats (aged 12 week) were divided into 4 groups: control, malnutrition, control+glutamine and malnutrition+glutamine. For the first 15 days experiment, animals in the test groups received a karak diet (low calorie diet of dried rice) for the next 15 days. Control and malnutrition groups received either glutamine supplement with the doses 500 mg/kg body weight/day. On the 30^{th} days, the animals were weighed and sacrificed of the intestine was taken and prepared for enzymatic and expression examination.
Results: *Sucrase* activity between malnutrition with malnutrition+glutamine groups there indicated no significant differences in duodenum, but significance in jejunum ($p = 0.04$) and ileum ($p = 0.04$). *Maltase* activity when compared malnutrition with malnutrition+glutamine groups there were no significant differences in duodenum and jejunum, but significantly in the ileum ($p = 0.00$). *Lactase* activity when compared between malnutrition with malnutrition+glutamine groups there were significant differences in duodenum ($p = 0.03$), jejunum ($p = 0.04$) and ileum ($p = 0.04$). The expression of *spectrin* and *clathrin* were evidence enlarge of enterocyte in the normal group after being given glutamine compared to malnutrition group after being fed glutamine, *spectrin* and *clathrin* expression similar appearance on jejunum and ileum. *Spectrin* and *clathrin* molecular weight protein in the duodenum, jejunum and ileum were the same, with a molecular mass of 130-250 KDa. Relationship between glutamine and meaningful pathway signaling proteins *ERK-1* in the duodenum ($p = 0.00$), jejunum ($p =$

0.00) and ileum (p = 0.03) and also significant association between glutamine and *STAT-3* in the duodenum (p = 0.00), jejunum (p = 0.00) and ileum (p = 0.00).
Conclusion : The research proved that there was an increase activity of *sucrase*, *maltase*, *lactase*, also *spectrin* and *clathrin* which have expression differences of each group. There are links between *ERK-1* and *STAT-3* signaling pathway in the repairing microvilli of rat intestinal epithelial mucosa damaged by malnutrition and improved after administration of oral glutamine

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