NEW APPLICATION OF TRANSGLUCOSIDASE WITH α-GLUCOSIDASE INHIBITOR IN THE DIGESTIVE TRACT

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We have studied transglucosidase derived from Aspergillus niger for self-mediation in the gastrointestinal tract as a dietary supplement. This enzyme is very popular to produce oligosaccharides in industry.

Prof. Sasaki already reported this enzyme showed oligosaccharides production in the digestive tract which improved microflora level in large intestine and decreased the blood glucose level and the excretion of insulin. The clinical study of this enzyme was performed in 21 healthy volunteers and patients with type 2 diabetes mellitus to check the glucose level in blood and secretion of insulin after meal. This enzyme showed good improvement in biological parameters.

But, the result was very similar and did not show good dose dependent to prevent the increase of blood glucose after meal, when the dose of this enzyme was 150mg and 300mg at the preliminary test. The key point is to decrease the absorption of glucose by forming indigestive oligosaccharides in stomach. But this enzyme shows α-glucosidase activity as well as transglucosidase activity and both activities are competitive.

Transglucosidase produced some oligosaccharides at first, however gradually decreased with time and finally produced only glucose. In result, transglucosidase hydrolyzed starch to glucose, through oligosaccharides.

We have investigated the control of this reaction using maltose as a substrate with α-glucosidase inhibitor (α-GI) in vitro. We found that α-GI inhibited directly the hydrolyze activity of transglucosidase and not inhibited the transglucosidase activity, but delayed.

We will try the clinical test of combination of trasglucosidase and α-GI with healthy volunteers.

Combination of transglucosidase and α-GI