High Performance Liquid Chromatography Analysis of Tetrahydrozoline Hydrochloride in Ophthalmic Solution by Silica Column Eluted with Aqueous Solvent Mixtures

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Abstract

L-Dopa-D-phenylglycine was synthesized in this laboratory as L-dopa derivative for improving its intestinal absorption. As designed for transport through the intestine via oligopeptide transporter (PepT1), the competition of this dipeptide with known substrates for PepT1 in brush-border membrane vesicle (BBMV) was investigated. At the presence of L-Glycinyl-L-proline (L-Gly-L-Pro), L-Glycinyl-L-phenylalanine (L-Gly-L-Phe) or cephradine, the uptake of L-dopa-D-phenylglycine in BBMV was reduced to 54.1±4.5%, 57.6 ± 5.2% or 62.9±10.2%, respectively. The inhibition by these dipeptides and the tripeptide mimetic amino-b-lactam was significantly higher than by amino acids L-Phenylalanine (L-Phe) or L-dopa. The results suggested that the intestinal H+-coupled PepT1 was involved in the uptake of L-dopa-D-phenylglycine. The steady state plasma concentrations of L-dopa-D-phenylglycine and L-dopa in rats after a single pass in-situ jejunal perfusion with 0.1 mM perfusate were 104.0±12.90 mg/mL and 1.24 mg/mL respectively. L-Dopa-D-phenylglycine demonstrated a 50.1 fold higher plasma concentration, in terms of molar ratio, than that of L-dopa. D-Phenylglycine was proved to be a satisfactory moiety for the improvement of L-dopa absorption in the intestine.

Key words: L-Dopa-D-phenylglycine, dipeptide mimetics, PepT1, intestinal absorption