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Oral glutathione increases tissue glutathione in vivo.

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Abstract

Mice were given an oral dose of glutathione (GSH) (100 mg/kg) and concentrations of GSH were measured at 30, 45 and 60 min in blood plasma and after 1 h in liver, kidney, heart, lung, brain, small intestine and skin. In control mice, GSH concentrations in plasma increased from 30 microM to 75 microM within 30 min of oral GSH administration, consistent with a rapid flux of GSH from the intestinal lumen to plasma. Under these GSH-sufficient conditions, no increases over control values were obtained in GSH concentrations in most tissues except lung over the same time course. Mice pretreated for 5 days with the GSH synthesis inhibitor, L-buthionine-S,R-sulfoximine (BSO, 80 mumol/day) had substantially decreased tissue concentrations of GSH. Oral administration of GSH to these GSH-deficient animals gave statistically significant increases in GSH concentrations in kidney, heart, lung, brain, small intestine and skin but not in the liver. Administration of the equivalent amount of the constituent amino acids, glutamate, cysteine, and glycine, resulted in little change in GSH concentrations in all tissues in GSH-deficient animals. Thus, the results show that oral GSH can increase GSH concentrations in several tissues following GSH depletion, such as can occur in toxicological and pathological conditions in which GSH homeostasis is compromised.

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