

The effect of L-glutamine on salt and water absorption: a jejunal perfusion study in cholera in humans.

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Abstract:

OBJECTIVE: To assess the efficacy of an L-glutamine solution on jejunal salt and water absorption in cholera patients.

DESIGN: A randomized double-blind jejunal perfusion study.

SETTING: International Centre for Diarrhoeal Disease Research, Bangladesh.

PATIENTS: Nineteen adults with acute cholera.

INTERVENTIONS: Perfusion of balanced salt solutions alternated with defined glucose salt solution and glutamine glucose salt or alanine glucose salt solutions.

MAIN OUTCOME MEASURES: Net jejunal water and sodium secretion.

RESULTS: Perfusion of glutamine in the presence of glucose significantly reduced net water secretion ($J_{netH_2O} = -2.6 \pm 1.3$ ml/h/cm) and also reduced net sodium secretion ($J_{netNa} = -213 \pm 153$ μ mol/h/cm). Similar results were observed during the perfusion of solutions that contained alanine in addition to glucose ($J_{netH_2O} = -4.2 \pm 1.1$ ml/h/cm and $J_{netNa} = -444 \pm 142$ μ mol/h/cm, respectively) or glucose alone ($J_{netH_2O} = -4.3 \pm 1.7$ ml/h/cm and $J_{netNa} = -452 \pm 212$ μ mol/h/cm, respectively). In addition, a higher basal secretion was associated with a greater stimulation of water absorption ($F = 17, P < 0.001$).

CONCLUSION: Glutamine in the presence of glucose significantly reduces net water secretion and also reduces sodium secretion; higher basal secretion is associated with greater water absorption. As glutamine is able to stimulate water absorption to the same degree as glucose and alanine, and because it has the theoretical advantage of providing fuel for the mucosa, the inclusion of glutamine as the sole substrate in oral rehydration solution warrants further study.