Efficacy of glutamine supplementation on the outcome of children admitted with persistent diarrhea in Uganda: A randomized controlled study

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Diarrheal diseases are a leading cause of morbidity and mortality in children in the developing world, responsible for one billion episodes of illness and 1.6 million to 2.5 million deaths annually. Persistent diarrhea contributes to approximately one-half of the total diarrhea-related deaths, although only approximately 3% to 20% of acute diarrheal episodes become persistent. Several factors including prolonged intestinal injury, increased intestinal permeability, delayed intestinal regeneration and translocation of bacteria into the blood stream, may account for this high mortality. Glutamine, a nonessential amino acid, improves intestinal mucosal regeneration, decreases intestinal permeability and improves intestinal absorption. Glutamine supplementation has been shown to improve diarrhea secondary to nelfinavir and chemotherapy in adults. In the present study, we evaluated the efficacy of oral glutamine supplementation in children with persistent diarrhea in Kampala, Uganda. The full project report can be found at www.microresearch.ca.

Children were assessed every 6 h for the first 24 h then twice per day thereafter by a research assistant for the number of diarrhea stools, vomiting, hydration status and fever. The study participants were followed up to a maximum of 12 days. The primary outcome measure was cessation of diarrhea. Cessation of diarrhea was defined as <3 watery or loose stools per 24 h over a 12 h period of follow-up.

The present study and consent form were approved by the School of Medicine Research and Ethics Committee at Makerere University College of health sciences (Kampala, Uganda).

RESULTS
From October 2011 to March 2012, 138 children were enrolled with 69 in each group. The baseline characteristics were comparable in both groups with an equal median follow-up time of five days (interquartile range = 3 days). Two patients in each group were lost to follow up. The median duration of diarrhea in the two groups was the same (four days in the glutamine group versus three days in the standard group; P=0.84). The proportion of children with cessation of diarrhea was 79.7% in the glutamine group and 87% in the standard treatment group (RR 0.5 [95% CI 0.2 to 1.4]; P=0.25). Three deaths occurred in the glutamine group and one death occurred in the standard treatment group. All the deaths were determined to be unrelated to the study product by the Data Safety Monitoring Board.

CONCLUSION
Glutamine supplementation showed no benefit on the outcome of persistent diarrhea in admitted children two to 60 months of age.

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