

Developing countries have 25% of the global disease burden but only 1.3% of the health care professionals. While donor research focuses on important diagnostic and treatment advances, efforts to build local community-focused research capacity have been limited. Training and support for community-based research is needed to address, with evidence context-specific local problems that can lead to improved health outcomes – a must if Africa is to achieve the Millennium Goals of decreasing maternal mortality rates as well as those of children under five years of age. East Africa has bright young university health faculty who know the local health problems and understand the context but lack research skills and resources to address them.

The Canadian Paediatric Society is concerned about child health globally. MicroResearch (MR), sponsored in part by the Canadian Paediatric Society, provides capacity building in community-based research through training, small grants and coaching from Canadian research experts who support eager interdisciplinary MR teams at five sites in East Africa with their local maternal/child health questions. All projects are aimed at improving health outcomes. The present MR brief report summarizes the findings from one MR project that 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](http://www.microresearch.ca).

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## 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 two to 60 months of age with persistent diarrhea in Kampala, Uganda.

### METHODS

The present study was a double-blinded, randomized controlled clinical trial involving children admitted to Mulago Hospital (Kampala, Uganda) with persistent diarrhea. Persistent diarrhea was defined as diarrhea that began acutely and lasted >14 days. Children two to 60 months of age whose parents or caregivers provided consent were included in the study, and children with underlying renal or liver disease or those who were documented to have received antimotility medications during the current illness were excluded. The eligible children were block randomized in a 1 to 1 ratio to receive either standard treatment alone or standard treatment with glutamine supplementation. Glutamine was administered according to weight bands; children weighing 5 kg to 12.5 kg and 12.6 kg to 20 kg received 1.5 g and 2 g every 12 h, respectively.

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 72 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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