Nutritional Status is Not Associated with Diarrhea Duration or Weight Recovery in Young Children in a Resource-Poor Setting

Lamb MM¹, Melgar MA², Calvimontes Diva M², Asturias EJ¹,³, Contreras-Roldan I⁴, Dominguez SR³,⁵, Berman S¹,³, Gaensbauer JT¹,³,⁶.

Affiliations:
¹ Center for Global Health and Department of Epidemiology, Colorado School of Public Health, 13199 East Montview Boulevard, Suite 310, Aurora, CO, 80045, USA.
² Hospital Roosevelt, Calzada Roosevelt y 6a avenida zona 11, CP 01011, Guatemala City, Guatemala
³ Department of Pediatrics, University of Colorado School of Medicine, 13123 E. 16th Avenue, Aurora, CO, 80045, USA
⁴ Centro de Estudios en Salud, Universidad de Valle de Guatemala, 11 calle 15-79, zona 15 Vista Hermosa III, Guatemala City
⁵ Department of Pathology and Laboratory Medicine, Children’s Hospital Colorado, 13123 E. 16th Ave. Aurora, CO, 80045, USA
⁶ Department of Pediatrics, Denver Health Hospital Authority, 777 Bannock Street, Denver, CO, 80204, USA

Background: Young children in low and middle income countries suffer from frequent diarrheal illnesses that contribute to acute and chronic malnutrition. It is unclear whether malnourished children recover more slowly from diarrheal illness, due to weakened immunity or a compromised intestinal brush border. Thus, we explored associations between chronic and acute malnutrition, diarrhea duration and weight recovery in young Guatemalan children.

Methods: From 3/2015-1/2016, 301 children age 6-35 months from rural (N = 166) and urban (N = 135) Guatemala who sought clinical care for acute non-severe non-bloody diarrhea were followed prospectively for diarrhea resolution as part of a clinical trial. Severely malnourished children (WHO weight-for-height z-scores (WFLZ) < -3) were excluded. Height, weight, treatments prescribed, and stool tests of 22 diarrheal pathogens were collected at enrollment. Height and weight were also collected 2 and 4 weeks after rehydration. Cox proportional hazards regression was used to model the effect of WHO height-for-age z-scores (HAZ, chronic malnutrition proxy) and WFLZ (acute malnutrition proxy) on diarrhea duration and weight recovery. Analyses were adjusted for age, treatment prescribed, number of pathogens, and presence of parasites; and stratified by urban vs rural due to demographic and treatment differences.

Results: In the rural site, 33% of children had a HAZ below -2, and 22% had a WFLZ between -2 and -3. In separate survival analyses, neither low HAZ (Hazard Ratio (HR): 1.08, 95% Confidence Interval (CI): 0.76–1.54) nor low WFLZ (HR: 1.07, CI: 0.72–1.61) were associated with diarrhea duration. In the urban site, 33% of children had a HAZ below -2, and 10% had a
WFLZ between -2 and -3. Again, neither low HAZ (HR: 1.21, CI: 0.68–2.17) nor low WFLZ (HR: 1.43, CI: 0.74–2.79) were associated with diarrhea duration. Neither low HAZ nor low WFLZ were associated with weight recovery at 2 or 4 weeks in either site.

**Conclusion:** In children with a single episode of infectious diarrhea, moderate malnutrition does not affect diarrhea duration or short term weight recovery. Measures to prevent recurrent infection in such children may be more important to long-term nutritional status than more aggressive acute diarrheal treatment.

*IDSA abstract character limit: 1950 characters, not including title, authors, or spaces.*