

# Etiology and Management of Hospitalized and Outpatient Diarrhea Among Children Less Than 5 Years of Age in Lambaréné, Gabon



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## Background

Diarrhea remains the second leading cause of death among children aged 1-59 months, with nearly half of deaths occurring in Sub-Saharan Africa.<sup>1</sup>

World Health Organization (WHO) guidelines recommend oral rehydration salts (ORS), continued feeding or breastfeeding, and zinc supplementation for all children with diarrhea to prevent dehydration and malnutrition; antibiotics only for bloody diarrhea (i.e. probable shigellosis), suspected cholera, or severe non-intestinal infections (e.g. pneumonia or sepsis); and avoidance of antidiarrheal drugs and antiemetics owing to lack of benefit and potential for harm in young children.<sup>2</sup>

Gabon is an upper-middle income country in Sub-Saharan Africa for which there is a lack of recent, high quality data on the etiology and management of childhood diarrhea.<sup>3</sup>

This prospective study aimed to describe the etiology, clinical symptoms, associated demographic factors, and management of hospitalized and outpatient cases of diarrhea in Gabonese children under 5 years of age.

## Methods

**Study design:** Prospective observational study

**Setting:** Albert Schweitzer Hospital/CERMEL and George Rawiri Regional Hospital, Lambaréné, Gabon

**Period:** February-July 2017

**Participants:** Children  $\leq$  59 months presenting with  $\geq$  3 liquid stools per day within the past 3 days

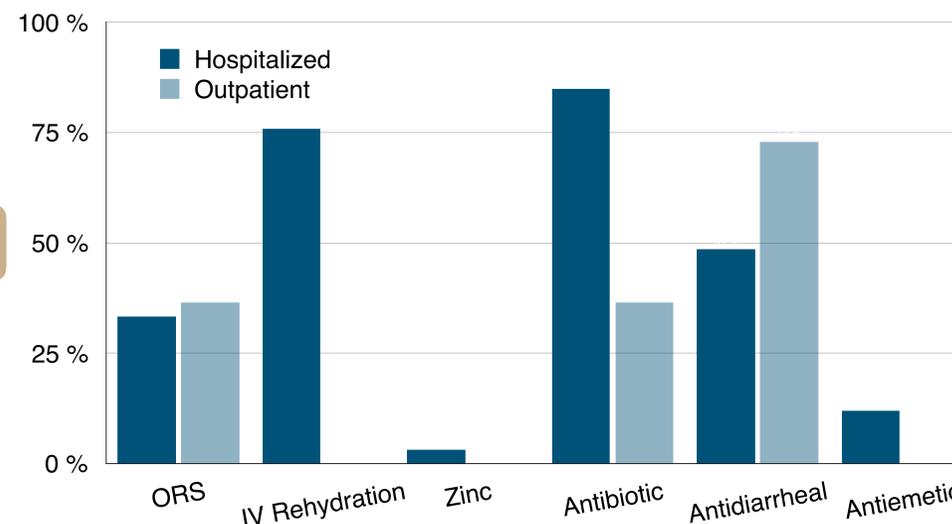
**Data collection:** Patient screening and collection of clinical, anthropometric, and demographic parameters were performed by a trained nurse or medical student using standardized questionnaires with caregivers. Prescribed treatments were obtained from medical records. Dehydration and nutritional status were defined according to WHO standards.<sup>2</sup>

**Laboratory testing:** Diarrheaogenic *Escherichia coli*, *Salmonella enterica*, and *Shigella spp.* were detected using conventional culture techniques. Rotavirus, adenovirus, and *Cryptosporidium spp.* antigens were detected with commercial rapid immunoassays. Multiplex PCR was used for *Cryptosporidium spp.*, *Giardia intestinalis*, and *Cyclospora cayetanensis* detection.

**Table 1. Demographic Characteristics of Cases**

<b>Gender</b>	Female	n=26 (58%)	
	Male	n=19 (42%)	
<b>Age</b>	0-11 mos	n=20 (44%)	
	12-23 mos	n=17 (38%)	
	24-59 mos	n=8 (18%)	
<b>Nutritional status †</b>	Severe acute malnutrition	n=31 (79%)	
	Moderate acute malnutrition	n=4 (10%)	
	No or mild malnutrition	n=4 (10%)	
<b>Diet ‡</b>	Children <6 mos	Current breastfeeding	n=7 (88%)
		Never breastfed	n=1 (12%)
	Children $\geq$ 6 mos	Breastfed $\geq$ 6 mos	n=20 (61%)
		Breastfed <6 mos	n=10 (30%)
		Never breastfed	n=3 (9%)

†6 missing values; ‡4 missing values



**Figure 1. Treatments received by hospitalized and outpatient children**

**Table 2. Clinical Characteristics of Cases**

Mean time since onset of diarrhea before presentation to hospital	4.7 days [range 1-21]
Mean number of stools in last 24 hr	4.1 [range 1-9]
Macroscopic blood in stool	n=8 (18%)
Severe dehydration	n=10 (22%)
Moderate dehydration	n=30 (67%)
Fever (body temperature $\geq$ 38°C)	n=34 (76%)
Vomiting	n=17 (38%)
Extra-intestinal signs	n=27 (60%) [25 pulmonary signs, 1 anaemia, 1 dermatologic sign]

## Results

45 children were included in the study, 34 of whom were hospitalized. Mean age at inclusion was 12.2 months. 49% were infected with at least one of the sought-for pathogens, most commonly with *Giardia intestinalis* (n=13, 28.9%) or *Cryptosporidium spp.* (n=11, 24.4%). Mixed infections were observed in 7 cases (16%).

33% and 36% of hospitalized and outpatient children, respectively, received ORS. Zinc was given to one (3%) hospitalized patient and zero outpatients. Antidiarrheal drugs were frequently given to both hospitalized (48%) and outpatient (73%) children.

Antibiotics were prescribed in 85% and 36% of hospitalized and outpatient cases, respectively, while only 8 children (18%) presented with macroscopic blood in the stool.

79% of children presented with severe acute malnutrition and an additional 10% with moderate acute malnutrition. 21% of children had never been breastfed.

## Conclusions

Ongoing education of healthcare workers and communities regarding WHO-recommended management of childhood diarrhea is needed. The overuse of antibiotics observed in this study is consistent with previous reports and is concerning given high levels of antimicrobial resistance in Sub-Saharan Africa.<sup>4</sup> Strategies to increase provider awareness of indicated uses of antimicrobials in the setting of childhood diarrhea may help limit the spread of resistance.

## References

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