
BRIEF COMMUNICATIONS

Travelers' Diarrhea in Children Visiting Tropical Countries

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We studied a group of 174 Portuguese children (aged 2 mo–16 y) who mostly traveled to tropical Portuguese-speaking countries and found an attack rate of 21.8% for travelers' diarrhea, much lower than previously described. We also showed that African rate analysis by region may hide significant differences between countries.

Travelers' diarrhea (TD) is the most common illness affecting travelers originating from industrialized countries and visiting less affluent nations. The attack rates vary according to the visited regions of the world, ranging from 13.6% to 54.6%.¹ To date, few published studies focused on the epidemiology of this disease specifically in children: a single study by Pitzinger and colleagues² forms the body of this literature. These authors studied a group of 363 young travelers from Switzerland, finding an attack rate of 39.1%. Because TD was not so frequent in our recent experience, we conducted a study to determine the real incidence and risk factors for TD in the Portuguese-born children who attended a pretravel consultation at our center. Standardized questionnaires were completed by phone interview with the parents or directly with the adolescents from 1 week up to 3 months upon their return throughout three convenience periods between August 2002 and May 2007. Diarrhea was defined as a change in the usual stool consistency with one or more unformed bowel movements. Statistical analysis was made with SPSS version 11.5 software, including chi-square tests for rate comparisons (95% confidence intervals).

A total of 174 specific questionnaires were completed from children aged 2 months to 16 years with a median age of 4 years. Fifty-four percent were males. The most frequent destinations were Portuguese-speaking countries (Table 1) except for India (10.1%), the fourth most visited country. The median travel duration was 25 days (P_{25} – P_{75} : 15–37 d). The attack rate for TD was 21.8%, a much lower rate than previously described by Pitzinger

and colleagues² (39.1%). This was also true when considering rates by world region: 6 of 19 (31.5%) in India, 18 of 67 (26.9%) in southern Africa, 6 of 27 (22.2%) in West Africa, and 1 of 15 (6.7%) in Latin America compared to 61.3, 38.6, 32.6, and 38.8%, respectively, in the previous work. The rate differences between the two series cannot be explained by age, for our sample median age was lower. They also cannot be explained by the differences in TD definitions. In fact, in the absence of a universally accepted definition for children, our definition even included the cases with less than 3 stools/24 h, milder than those considered in Pitzinger and colleagues' study.^{2,3} Like previous authors, we found higher attack rates in younger people (Table 1).^{2,4} We did not determine how many of those children were breastfed, but it would be interesting to correlate this with the occurrence of TD in future studies. The rate of dysentery was 3 of 38 patients (7.9%) and 7 patients (18.4%) had fever. The mean duration of the diarrhea was 4.6 ± 3.5 days (median 3 d, P_{25} – P_{75} : 2–7 d) without significant variations between different countries or age groups, whereas the study by Pitzinger and colleagues found a mean TD duration of 11.5 days.

Southern European countries, including Portugal, have in the past been classified as moderate risk areas for TD. Therefore, one possible explanation could be that Portuguese children might have an early protecting contact with some of the developing countries, enteropathogens. However, epidemiologic data from nontraveler diarrhea in Portuguese children show a developed country pattern, where viruses are the major pathogens.^{5,6} The incidence may actually also be declining due to an improvement in local hygienic conditions in the past years. Other possible factors include the travel type (one hotel, round-trip, and adventure), season, the extent of potentially contaminated food avoidance, and even genetic susceptibility.⁷

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Table 1 Prevalence of travelers' diarrhea

Country	Number of travelers (%)	Number of subjects with travelers' diarrhea				Total	Attack rate [‡] (%)
		0–2 y* (N=75)	3–6 y (N=50)	7–14 y (N=47)	15–20 y (N=8)		
Angola	34 (19.4)	10	5	—	1	16	47.1
Guinea-Bissau	9 (5.1)	1	1	1	—	3	33.3
India	19 (10.9)	5	0	1	0	6	31.6
São Tomé	21 (12.1)	1	—	2	—	3	14.3
Mozambique	22 (12.6)	—	2	—	—	2	9.1
Cabo Verde	12 (6.9)	1	—	—	—	1	8.3
Brazil	12 (6.9)	1	—	—	—	1	8.3
Other countries [‡]	57	5	1	—	—	6	10.5
Total	174	24	9	4	1	38	
Attack rate [§] (%)		32.0	18.0	8.5	12.5		21.1

*The youngest was 2 months old.

[‡]Significant attack rate differences between discriminated countries ($p = .008$).

[‡]Costa Rica, Dominican Republic, Mexico, Bali, Bangladesh, Thailand, Egypt, Guinea Conakry, Namibia, Nigeria, South Africa, and more than one African destiny in the same travel ($N = 10$, including Kenya, Mozambique, South Africa, Tanzania, and Zimbabwe).

[§]Significant attack rate differences between age groups ($p = .026$).

Although African rates aggregation into geographic regions makes series comparisons easier, it may hide important differences between individual countries. We found that in two southern African countries, Angola and Mozambique, showing rates of 47.1 and 9.1%, respectively, there were no significant dissimilarities concerning age groups and average length of stay. This was also true for Guinea-Bissau and Cabo Verde (West Africa: 33.3% vs 8.3%). Unfortunately, we did not check for the travel type as well as for the accomplishment of the recommended preventions rules, which also could influence these results.

We recognize a possible bias related to the variability of the period between the travel return and the phone interview. Nevertheless, we present relevant new epidemiologic data concerning TD in pediatric age.

Declaration of Interests

The authors state that they have no conflicts of interest.

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