Escherichia coli and persistent diarrhea
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Chapter 8

No evidence for a role of enteroadherent Escherichia coli in diarrhea in human immunodeficiency virus-infected patients

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No Evidence for a Role of Enteroadherent Escherichia coli in Diarrhea in Human Immunodeficiency Virus–Infected Patients

To the Editor—Diarrhea is an important problem in human immunodeficiency virus (HIV)–infected patients. Although enteric pathogens are implicated in the majority of cases, the diarrhea remains unexplained in about one-third of patients [1]. Recently, Kotler et al. [2] described chronic bacterial enteropathy in AIDS patients that was possibly due to the presence of enteroadherent Escherichia coli. In addition, Mathewson et al. [3] detected such E. coli strains more often in HIV-infected patients with diarrhea than in HIV-negative patients with diarrhea. Enteroadherent E. coli have also been implicated as possible diarrheal pathogens in immunocompetent persons [4]. The bacterial adherence pattern to HEp-2 or Hela cells discriminates diffuse adherent E. coli (DAEC), which display a pattern of well-separated, distinct bacteria with complete cell surface coverage; aggregative adherent E. coli (AAEC), which appear in clumps with a characteristic “stacked brick”–like appearance; and localized adherent E. coli, which form microcolonies. The latter belong to the enteropathogenic E. coli, which cause attaching and effacing lesions (aae) after adhesion to epithelial cells.

We studied the frequency of DAEC, AAEC, and eae E. coli in stool specimens from HIV-infected patients with and without diarrhea in the Netherlands. We studied 32 HIV-infected patients (predominantly homosexual men) who were participating in a prospective study investigating the association of diarrhea with the presence of HIV RNA in stool. Twenty patients had experienced an AIDS-defining illness. Stool specimens were obtained from 16 patients with diarrhea and 16 patients without diarrhea who were matched by CD4 cell count. Patients with diarrhea were included if previous routine examination of stool specimens did not reveal any enteric pathogens. Diarrhea was defined as loose or watery stools at least twice a day during the week before collection of fecal samples. Parasitologic stool examination and routine bacterial cultures were performed on all specimens.

Microsporidia were found in 1 patient with diarrhea and in 1 patient without diarrhea. In 1 patient without diarrhea, cryptosporidia were detected. From each stool sample, the bacterial growth cultured on a cystine lactose electrolyte deficient (CLED) agar plate [2] was subjected to hybridization with DNA probes for detection of genes encoding diffuse adherence [6], aggregative adherence [7], and production of attaching and effacing lesions [8] under stringent conditions. DAEC was found in stool specimens from 6 patients (19%), 3 of whom had diarrhea. One of these patients with diarrhea also had eae E. coli in his stool. An additional patient, who did not have diarrhea but had had loose stools once or twice per day for 2–3 weeks, had eae E. coli. AAEC was not detected in the 32 stool samples tested. Three of the 5 patients with only DAEC and both patients with eae E. coli took cotrimoxazole as prophylaxis for Pneumocystis carinii pneumonia. Thus, no association was found between the presence of enteroadherent E. coli in stool specimens and diarrhea in HIV-infected patients.

Kotler et al. [2] observed adherent bacteria in rectal biopsies from 11 of 51 patients with diarrhea and in none of 15 patients without diarrhea (difference not significant). In 4 of those 11 cases with diarrhea, other pathogens able to cause diarrhea were detected as well. In addition, although enteroadherent E. coli were present in cultures from rectal biopsies, no association of such bacteria with diarrhea was demonstrated. Results from a study among adults in Zambia suggested an association between the presence of HEp-2–adherent E. coli in stool specimens and diarrhea in HIV-infected patients. However, an HIV-positive control group without diarrhea was not included [3]. In a study among HIV-infected and HIV-uninfected infants in Zambia with a high prevalence of AAEC, as detected by DNA hybridization, no association between such E. coli strains and diarrhea was observed [9].

We did not test isolates from rectal biopsies, nor did we perform the HEp-2 cell adherence assay. However, hybridization of the bacterial growth of a CLED agar plate provided us with a sensitive method, as has been shown for detection of enterotoxigenic E. coli [5]. The high rate of DAEC present in our control group justifies the conclusion that the presence of DAEC is similar among HIV-infected patients with and without diarrhea, even when additional detection methods are applied. In conclusion, our pilot study does not support a role for enteroadherent E. coli in diarrhea in HIV-infected patients in the Netherlands.

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References