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Concurrent Infection in a Dog and Colonization in a Child with a Human Enteropathogenic *Escherichia coli* Clone

Pets can be natural reservoirs of several organisms potentially able to cause disease to humans, who, in turn, may also be carriers of countless infectious agents specific for animals. Children are central players in this cross-transfer game in view of their frequent nonobservance of proper hygiene habits. Human adults and animals are immune to enteritis caused by enteropathogenic *Escherichia coli* (EPEC), a common agent of infantile diarrhea in some developing countries (10). EPEC hallmarks are the abilities to express localized adhesion (LA) to epithelial cells and to induce cytoskeletal rearrangements resulting in histopathological alterations known as attaching and effacing in these cells (9). The LA is dependent on the expression of multiple adhesins, among which the plasmid-encoded bundle-forming pilus (BFP) is the best characterized. EPEC identification can be performed by the detection of the gene for the structural subunit of BFP (*bfpA*) and the *E. coli* attaching and effacing (*eae*) gene. Typical EPEC strains belong to a restricted number of O:H serotypes representing natural *E. coli* clones (3). Although the above features have been identified in clinical isolates of *E. coli* from dogs, the association of typical EPEC with canine enteritis and the recognition of pet dogs as reservoirs of the organism are still controversial (10, 12). Here we report an observed similarity between *E. coli* isolates from a 3-year-old healthy child and her 3-month-old diarrheic pet dog which tested negative for parvovirus, rotavirus, and *Cryptosporidium*, *Salmonella*, and *Shigella* organisms. Three isolates out of five bacterial colonies picked on MacConkey agar from both the dog and the child's stool culture were identified as *E. coli*. The six isolates were nonmotile, did not produce gas from glucose, and were unable to decarboxylate lysine. When submitted to serotyping (4) with antisera specific for classical EPEC O serogroups (14), assays for adhesion to HEp-2 cells (2), PCR for *eae* (6) and *bfpA* (8), and assessment of their genetic relationship by enterobacterial repetitive intergenic consensus-PCR (ERIC-PCR) (13), they showed complete identity. They were all serotyped with the O111 antiserum, displayed LA to HEp-2 cells, were PCR positive for *eae* and *bfpA*, and displayed similar ERIC-PCR fingerprints.

EPEC is a human-specific enteropathogen affecting infants in their first year of life, whose significance was questioned in the past (5) because of the failure of many investigators to identify known virulence markers among clinical isolates of the organism (11). However, studies conducted particularly in the 1980s and 1990s on several aspects of its pathogenesis generated sufficient data to dissipate the doubts about EPEC's relevance as a human enteropathogen. The recent detection of EPEC markers among *E. coli* isolates from diarrheic dogs (1, 7) raised the question of its supposed association with enteritis in animals as well. In this report we show both that the dog's and the child's *E. coli* isolates are closely related and that they represent a typical human EPEC clone. Since they were phenotypic and genetically similar, belonged to the same O:H serotype (O111:H$^-$), and showed identical EPEC markers, they certainly represent a single *E. coli* clone. In addition, because the diarrheic dog was negative for common viral, parasitic, and bacterial agents, the EPEC strains that it shed may well have been the cause of its symptoms of diarrhea. Concerning the child, the absence of these symptoms associated with a positive result for EPEC is not a surprise, since she belongs to an age group in which humans are immune to EPEC infections. Although this is a single case report, the results presented seem to suggest that pet dogs may be not only carriers but also susceptible hosts of typical EPEC strains. Yet, in order to validate this hypothesis, the study should be expanded, with the survey of a larger number of animals, which must also be evaluated for symptoms of diarrhea and whose stools should be tested periodically for the presence of EPEC.

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Josias Rodrigues*
Cristiane M. Thomazini
Carlos A. M. Lopes
Liliane O. Dantas
Departamento de Microbiologia e Imunologia
Instituto de Biociências da UNESP em Botucatu
Campus de Rubião Júnior
CEP 18.618-000
Botucatu, São Paulo, Brazil

*Phone: 055 (14) 3811-6058
Fax: 055 (14) 3815-3744
E-mail: josias@ibb.unesp.br