

## **Microbiologic Testing to Identify Shiga Toxin-producing *E. coli* in HUS Patients: FoodNet 1997-2001**

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**Background:** Hemolytic uremic syndrome (HUS) is a life threatening illness characterized by hemolytic anemia, thrombocytopenia, and acute renal failure. In developed countries, nearly all cases of HUS in children are caused by infection with Shiga toxin-producing *E. coli* (STEC), of which the most well known serotype is O157:H7. *E. coli* O157:H7 may be identified by the characteristic color of its colonies on Sorbitol-McConkey agar (SMAC). Other serotypes may be responsible for a portion of HUS cases, but their isolation from stool specimens is difficult since they do not share this distinguishing characteristic. With the advent EIA and PCR tests for Shiga toxin, and the potential for human serology to identify antibodies to STEC in HUS cases, the etiology of STEC in HUS may be better understood.

**Methods:** Since 1997, HUS surveillance has been part of CDC's Foodborne Diseases Active Surveillance Network (FoodNet) at all sites (California, Colorado, Connecticut, Georgia, Maryland, Minnesota, New York, Tennessee, Oregon). Pediatric nephrologists in catchment areas for sites were contacted at least monthly for surveillance. Adult cases are reported in a passive system, as are cases outside of catchment areas. Case information is collected using standard medical and microbiologic record abstraction forms.

**Results:** From 1997 through October, 2001, 322 cases of HUS were reported. The average incidence among sites was 0.2 per 100,000 population, with a range from 0.04 to 0.5. There were a total of 25 deaths (8%). Of 288 cases for which information was available, microbiologic testing identified STEC for 169 cases (59%). The proportion of cases with an STEC isolate identified increased from 38% in 1997 to 64% in 2000. All but 2 STEC identified were serotype O157:H7. Among all cases, 97% had stool cultured on SMAC and 38% had stool tested for Shiga-toxin. Among cases without STEC identified, only 24% had Shiga toxin testing done. This proportion increased from 5% in 1997 to 47% in 2000. A total of 21 cases had STEC serology done to identify anti- O157, O111 or O126 antibody; 10 cases (48%) had detectable antibody to O157. No antibody against non-O157 STEC serotypes was detected among these cases.

**Conclusion:** *E. coli* O157 causes the majority of pediatric HUS cases: the proportion caused by other STEC is uncertain. To determine the etiology of HUS in the United States, a complete microbiologic assessment should be conducted. Although SMAC culture is done for high proportion of cases, serotype indiscriminate tests for Shiga-toxin was conducted for only a minority of cases. Increased efforts by clinicians and clinical laboratories to conduct complete STEC testing will aid the specific diagnosis. Serologic testing for antibodies against the major STEC serotypes may be helpful if microbiologic tests are not done or negative.

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