Treating intestinal E. coli infection with antibiotic may reduce duration of bacterial carriage

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In the *E coli* outbreak in Germany in May 2011, treatment with azithromycin was associated with a lower frequency of long-term carriage of the bacteria and shorter duration of shedding of the bacteria in stool specimens, according to a study in the March 14 issue of *JAMA*.

"Since May 2011, a large outbreak of Shiga toxin-producing Escherichia coli (STEC) has caused 3,816 documented infections in Germany, including 845 confirmed cases of hemolytic uremic syndrome [HUS; a condition characterized by the breakup of red blood cells and kidney failure]," the authors write. "According to existing recommendations, antibiotic treatment of STEC infection is discouraged because this therapy might increase the risk of HUS development." The researchers add that long-term carriage can cause persistent diarrheal symptoms. "Moreover, long-term carriers of enteropathogenic [capable of causing disease in the intestinal tract] bacteria represent a chronic risk of human-to-human transmission and, therefore, their individual social and working life is legally restricted by the German health authorities, posing a high psychological and socioeconomic burden."

For this outbreak, data on long-term STEC carriage have not as yet been published. Martin Nitschke, M.D., of the University Hospital Schleswig-Holstein, Lubeck, Germany, and colleagues analyzed the duration of bacterial shedding in patients with this infection, comparing those who received azithromycin with those without antibiotic treatment. A

substantial number of patients in this outbreak received prophylactic azithromycin treatment as part of a therapeutic regimen with the C5 antibody eculizumab. The study included 65 patients with STEC infection, including patients with HUS as well as STEC-infected outpatients without manifestation of HUS, between May 15 and July 26, 2011, and who were monitored for an average of 39.3 days after onset of clinical symptoms.

The initial azithromycin-treated group included 22 patients, and the control group included 43 patients without antibiotic treatment. On average, patients treated with azithromycin started therapy 11.8 days after the onset of clinical symptoms. There were no significant differences in the age or sex distributions between the groups.

The researchers found that the number of STEC carriers was significantly lower among patients treated with azithromycin. "At day 21, rates of STEC carriage were 31.8 percent in the initially treated group and 83.7 percent in those not treated. Long-term carriage (at day 28) was 4.5 percent in the treated group and 81.4 percent in the untreated group. At day 35, no patient in the treated group was a STEC carrier and all patients remained STEC-negative after the completion of 14 days of treatment. In contrast, 25 of 43 patients (57.7 percent) in the control group were STEC carriers at day 42 after onset of clinical symptoms."

Additionally, the observation of rapid clearance of STEC in stool specimens among azithromycin-treated patients and the high rate of long-term STEC carriage in the control group led to the decision to provide azithromycin treatment for 15 patients with remaining symptoms. After completion of treatment, all patients had at least 3 STEC-negative stool specimens. There were no signs of HUS induction due to azithromycin therapy.

"These findings warrant confirmation for other STEC strains, as well as prospective evaluation and possible clinical trials."

More information: *JAMA*. 2012;307[10]:1046-1052.

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