Comparative In Vitro Activities of Selected Antimicrobial Agents Against Edwardsiella tarda

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MICs of 14 antimicrobial agents for 29 strains of Edwardsiella tarda were determined by an agar dilution method. Of the agents tested, ciprofloxacin, enoxacin, and norfloxacin were the most active on a weight basis. All strains were also susceptible to clinically achievable concentrations of ampicillin, chloramphenicol, tetracycline, trimethoprim, sulfa- methoxazole, trimethoprim plus sulfa- methoxazole, cefotaxime, and gentamicin. Ninety percent of the strains demonstrated high-level resistance to polymyxin B and colistin.

Edwardsiella tarda is a member of the family Enterobacteriaceae. It has been frequently isolated from cold-blooded animals, particularly aquatic animals and from natural aquatic habitats (4, 13); it is an uncommon pathogen in humans. The majority of strains isolated from humans have been from the feces of patients with diarrhea (6, 7, 10). E. tarda has also been isolated from patients with bacteremia, endocarditis, meningitis, hepatobiliary infection, urinary tract infection, and skin and soft tissue infections (2–4).

Our review of the literature revealed that most of the published antimicrobial susceptibility data for E. tarda involves small numbers of isolates. Because these data are limited, we tested the susceptibility of 29 E. tarda strains to selected antimicrobial agents, most of which might be appropriate for treatment of either enteric or pyogenic infections.

A total of 25 isolates were kindly provided by the Centers for Disease Control (courtesy of A. McWhorter and J. Farmer, III), and four reference strains were from the American Type Culture Collection (ATCC 15947 [type strain], 15469, 23685, and 23692). The identity of all isolates was confirmed by the criteria of Farmer and McWhorter (4). The sources of the isolates were as follows: stool (26 isolates), wound (1 isolate), spinal fluid (1 isolate), and unknown (1 isolate).

MICs were determined for each antimicrobial agent by a standard dilution procedure with Mueller-Hinton agar (11). Each antimicrobial agent was tested at doubling concentrations from 0.063 to 256 μg of drug per ml, except trimethoprim (TMP) (0.063 to 64 μg of drug per ml), sulfa- methoxazole (SMX) (1.2 to 608 μg of drug per ml), and colistin (0.063 to 128 μg of drug per ml). The combination of TMP-SMX was tested at a ratio of 1:19. Escherichia coli ATCC 25922 was used as a control. In addition, we tested all strains for beta-lactamase production by hydrolysis of nitrocefin (8).

Ampicillin, cefotaxime, and chloramphenicol were studied in part because of reports of meningitis caused by E. tarda. Gentamicin was studied because it has good activity against most Enterobacteriaceae and is often used as an empiric agent for treatment of potentially life-threatening systemic gram-negative bacillary infections. Polymyxin B and colistin were studied because of their potential for use as selective agents for isolation of E. tarda from feces.

Results of susceptibility testing are shown in Table 1. All isolates were quite susceptible to the agents tested, except polymyxin B and colistin. In addition, all the isolates produced beta-lactamase; given the low MICs of ampicillin and cefotaxime for E. tarda, the clinical relevance of this finding is not clear. The most active agents on a weight basis were ciprofloxacin, enoxacin, norfloxacin, and cefotaxime. All of our isolates were susceptible to SMX, although occasional resistance to sulfonamides has been reported (4). Ten percent of strains were susceptible to polymyxin B and colistin; the remaining 90% demonstrated high-level resistance, similar to previous reports (9).

New oxynilones such as ciprofloxacin, enoxacin, and norfloxacin have been shown to have excellent in vitro activity against many enteric pathogens (1, 5, 12).

Our data indicate that a variety of different antimicrobial agents might be effective for therapy of both enteric and pyogenic infections involving E. tarda. In addition, these data indicate the potential usefulness of a polymyxin-containing medium for selective isolation of E. tarda from feces of subjects with diarrhea.

LITERATURE CITED