NOTES

Susceptibility Pattern of *Campylobacter jejuni* from Human and Animal Origins to Different Antimicrobial Agents

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Received 24 November 1981/ Accepted 22 March 1982

The in vitro antimicrobial activities of different antimicrobial agents on *Campylobacter jejuni* from human and animal origins were compared by using a Dynatech MIC 2000 system. In general, the minimal inhibitory concentration distributions for the human strains were very comparable with those of the animal strains. The animal strains had a bimodal distribution for ampicillin, clindamycin, and tetracycline.

*Campylobacter jejuni* has been established as a very common cause of bacterial diarrhea (3, 6, 10), especially since the introduction of improved methods for the isolation of this microorganism (3, 10). From different epidemiological studies, it is clear that animals, especially domestic animals such as dogs and chickens, may act as a natural reservoir for *C. jejuni* (1, 4). Recently, transmissible plasmids from *C. jejuni* have been described (12). Because animals can function as a reservoir of antibiotic resistance plasmids which could be transferred to humans (8, 9), it is important to know the susceptibility patterns of *C. jejuni* from animals to different antibiotics to recognize possible natural sources of antibiotic-resistant strains.

The 426 isolates from humans were all fecal in origin. With the exception of 23 isolates from Rwanda, Africa, all were from city dwellers (ranging in age from <1 to >65 years), mainly North Africans living in Brussels and with a high incidence in children below the age of five years. Of the 276 animal isolates 107 were from chickens, 95 were from apes, 65 were from calves, and 9 were from sheep. The calf and sheep isolates were kindly supplied by P. Dekeyser (National Institute of Veterinary Research, Brussels). The chicken isolates came from two different flocks. The ape isolates came from various laboratory vivaria. Little or nothing was known of the history of the apes and the antibiotics previously used. The strains were preserved in fluid thioglycolate agar medium (Difco Laboratories, no. 0256-01) and stored in liquid nitrogen or kept in a freezer at −70°C until further investigation. The in vitro activity of the different antimicrobial drugs on the *C. jejuni* isolates was determined by using a technique previously described by Vanhoof et al. (14). The following antimicrobial agents were tested: ampicillin (Bristol Laboratories), chloramphenicol (Le Petit), clindamycin (The Upjohn Co.), colistin (Bellon Laboratories), erythromycin (Abbott Laboratories), furazolidone (Norwich Benelux), gentamicin (Schering Corp.), and tetracycline (Certa). The minimal inhibitory concentrations at 50 and 90% (MIC50 and MIC90) were deduced from the straight line fitted by the method of weighted least squares (2).

The results of the study are summarized in Table 1. In general, the MIC distributions for human and animal isolates are very comparable. Ape and calf isolates have a broad distribution and a relatively high MIC90 value for ampicillin. There were no chloramphenicol-resistant isolates. One sheep isolate and three chicken isolates were resistant to clindamycin (MIC, >100 μg/ml). Furazolidone was the most active compound against human and animal isolates, none of which were resistant to this drug. Gentamicin was also highly active. Of the human isolates, 4% was resistant to tetracycline (MIC, ≥25 μg/ml). Only one calf isolate and 24 chicken isolates showed resistance to tetracycline. Resistance to erythromycin (MIC, ≥25 μg/ml) was found in 4.2% of the human isolates and 8.4% of the chicken isolates. Two erythromycin-resistant isolates were found in the sheep, and one erythromycin-resistant isolate was found in the calves.

Although much work has been done on the mode of transmission and the source of infection of campylobacteriosis, the real mechanism is not known in detail. The infection can be transmitted from person to person and from animals to humans. Campylobacters with identical sero-
types have been isolated from both humans and animals (7). Different studies (8, 9) suggest that animals can act as a reservoir of bacteria harboring antibiotic resistance plasmids. In this study, we have determined the sensitivities of campylobacters from human and animal origins to different antimicrobial agents. Information on the antibiotic sensitivity of C. jejuni from animals is rather scarce. The MIC distribution for the human strains is in general agreement with those of previous studies (14, 15). Although the incidence of erythromycin-resistant strains is lower than previously reported by our laboratory (15), it is still higher than that reported in Great Britain (13) and Canada (5). Recently, a study has been published on the antimicrobial susceptibility of C. jejuni isolated from healthy chickens (11). In this study, the MIC distribution for human and chicken isolates was very comparable. A high proportion of tetracycline-resistant chicken isolates was found. The prevalence of erythromycin resistance in the chicken isolates was comparable with our finding, i.e., 8%.

In view of epidemiological findings (1, 4), it must be kept in mind that the increased level of antibiotic resistance in campylobacters from animals may represent a human health concern.

We are very indebted to L. Kaufman (Department of Statistics) for statistical advice.

LITERATURE CITED


