RESISTANCE OF CAMPYLOBACTER SPP. TO QUINOLONES IN FOOD PRODUCING ANIMALS IN STYRIA (AUSTRIA)

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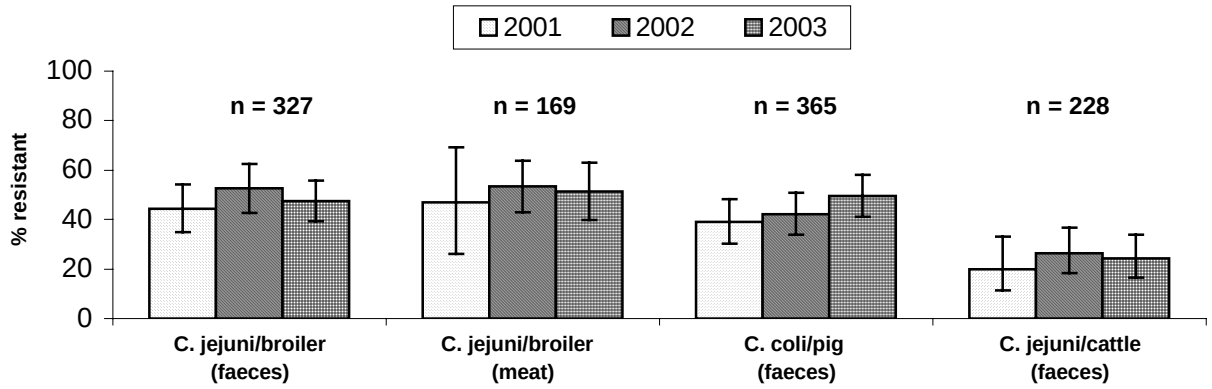
Introduction

Campylobacter, especially *C. jejuni*, is one of the most common bacterial causes of diarrhoeal illness in humans (1). Feierl et al. (2) reported 3,771 cases of illness caused by *C. jejuni* in Austria in 2003, corresponding to an incidence of 46.5 per 100,000 inhabitants. The resistance of *Campylobacter* to quinolones is increasingly limiting their therapeutic use. The rise in human infections caused by *C. jejuni* and *coli* shows the significance of growing quinolone resistance in *Campylobacter* (3). The goal of our study was to investigate the extent of resistance of Campylobacter to quinolones.

Material and Methods

Campylobacter jejuni was isolated from faeces of broilers (n=327), faeces of cattle (n=228) and from the surface of broiler meat (n=169); *Campylobacter coli* was isolated from pig bowels (n=365). Isolation of *Campylobacter* spp. is done by streaking the faeces on mCCDA agar. After biochemical verification of suspect colonies, they were tested for resistance to ciprofloxacin and nalidixic acid using the SENSITITRE® system, a commercially available MIC technique. The breakpoints used are recommended by NCCLS.

Figure 1: Resistances to ciprofloxacin of *Campylobacter jejuni and coli* isolated from faeces and meat (2001 – 2003)



Results and Discussion

Our study shows a stable quinolone resistance of Campylobacter for the years 2001 to 2003. Approximately 50 per cent of the *C. jejuni* strains isolated from poultry show resistance to ciprofloxacin and about 44% to nalidixic acid (fig. 1). Although these results lie within the range reported in other European countries, quinolone resistance in Campylobacter remains high (4). The cause for these high resistance rates can be found in the intensive use of quinolones in the treatment of Salmonella infections. European legislation requires that only Salmonella free poultry herds may be slaughtered. Quinolone resistance in Campylobacter is as familiar in pig production as it is in poultry production. Because of their effectiveness against E. coli and other infective gram-negative bacteria, quinolones are also widely used in the therapy of pig diseases. On the other hand, quinolones are used less in the therapy of cattle diseases, which is reflected in the significantly lower extent of quinolone resistance in *C. jejuni* isolated from cattle faeces. The development of bacterial resistance to quinolones is caused by multiple step mutations of two essential bacterial enzymes, DNA gyrase and DNA topoisomerase IV. The level of resistance depends on the frequency and intensity of bacterial contact with quinolones (5). Because of the importance of quinolones in the treatment of human bacterial infections Austrian regulations are aimed at minimising the therapeutic use of quinolones in animal production. Quinolones are thus acknowledged as "last resort antibiotics" and must not be administered to animals without prior examination and evidence of their absolute necessity. This means that it must be proved that therapeutic success cannot be achieved by any other approved antibiotic.

References

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