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Evaluation of antimicrobial susceptibility among *Campylobacter jejuni*

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ABSTRACT

The European Food Safety Authority (4) reported that *Campylobacter* infections still topped the list of zoonotic diseases in the European Union whereas the number of *Salmonella* infections in humans fell for the fourth year and the number of listeriosis remained in the same level.

The antimicrobial resistance of *Campylobacter* spp. has been increasing worldwide. In general, the campylobacteriosis is resolved without antimicrobial intervention; however, treatment is crucial to manage severe or invasive illness. In the present study, several strains of *Campylobacter jejuni* (n=159) collected from poultry food products (61%) and from clinical cases of campylobacteriosis occurred in Portugal (39%) were evaluated concerning their antibiotic susceptibility.

MATERIALS AND METHODS

The minimal inhibitory concentration (MIC) of each antibiotic was determined according to the method of agar dilution described by CLSI (1).

Enterococcus faecalis ATCC 29212 and *Staphylococcus aureus* ATCC 29213 were used as controls. The tested antibiotics were: ciprofloxacin, gentamicin, tetracycline, erythromycin, nalidixic acid and chloramphenicol.

RESULTS

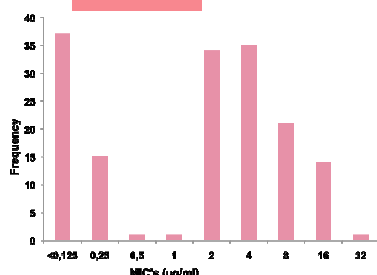


Figure 1 – Minimal inhibitory concentration distributions of chloramphenicol for *Campylobacter jejuni*.

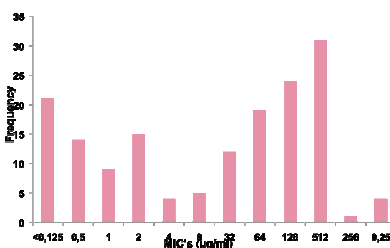


Figure 2 – Minimal inhibitory concentrations distributions of tetracycline for *Campylobacter jejuni*

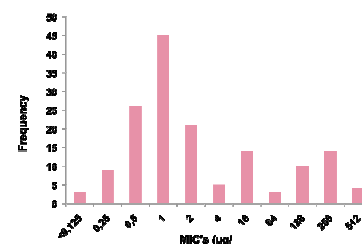


Figure 3 – Minimal inhibitory concentrations distributions of erythromycin for *Campylobacter jejuni*

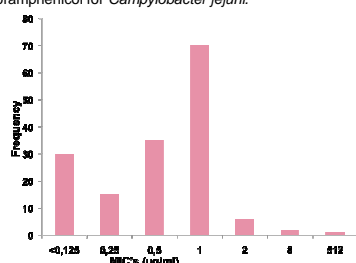


Figure 4 – Minimal inhibitory concentrations distributions of nalidixic acid for *Campylobacter jejuni*

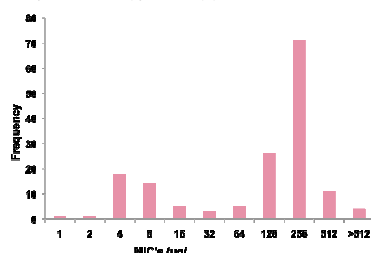


Figure 5 – Minimal inhibitory concentrations distributions of gentamicin for *Campylobacter jejuni*

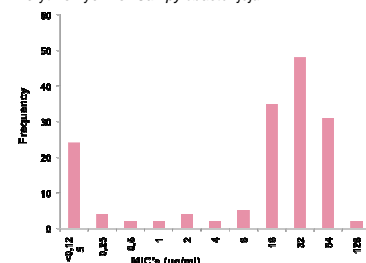


Figure 6 – Minimal inhibitory concentrations distributions of ciprofloxacin for *Campylobacter jejuni*

DISCUSSION/CONCLUSIONS

0.6%, 5.6%, 30%, 74%, 60% and 80% of *C. jejuni* isolates were resistant to chloramphenicol, gentamicin, erythromycin, tetracycline, nalidixic acid and ciprofloxacin, respectively (2, 3).

The resistance to antibiotics was showed to be dependent on the origin of the isolates (food or clinical). In fact, and for all the tested antibiotics, the MIC₅₀ for the food isolates was higher than the MIC₅₀ for the clinical isolates. The differences among the susceptibility through antibiotics might be related to the overuse of antibiotics in the veterinary medicine. On the other hand, the resistance of the bacteria can be transmitted to human and thus affect the human health.

REFERENCES

- (1) CLSI (2009) Performance Standards for Antimicrobial Susceptibility Testing.
- (2) Danish Integrated Antimicrobial Resistance Monitoring and Research Program. DANMAP-2005—consumption of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from food animals, food and humans in Denmark. (http://www.danmap.org/pdf/files/danmap_2005.pdf)
- (3) EFSA (2008) Harmonised monitoring of antimicrobial resistance in *Salmonella* and *Campylobacter* isolates from food animals in the European Union. *Clinical Microbiology and Infection*, 14: 522-533.
- (4) EFSA (2008) Report of task force on Zoonoses data collection on proposed technical specifications for a coordinated monitoring programme for *Salmonella* and *Campylobacter* in broiler meats at retail in de EU.