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## ANTIBACTERIAL ACTIVITY OF TETRACYCLINE AGAINST ESCHERICHIA COLI ANIMAL STRAINS: AN ITALIAN RETROSPECTIVE MULTICENTRE STUDY

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### Introduction:

Tetracyclines exhibit the activity against a broad spectrum of pathogenic microorganisms; they are well absorbed, with a low toxicity and they are relatively inexpensive. In veterinary medicine, the tetracyclines are widely used mainly for the treatment of gastrointestinal, respiratory and skin bacterial infections, osteomyelitis, genito-urinary tract as well as systemic infections and sepsis.

A retrospective multicentre surveillance of the tetracycline activity against *Escherichia coli* strains, isolated from domestic and wild animals, was carried out.

### Materials and Methods:

This study involved hospital microbiology laboratories located in Northern (Turin and Milan), Central (Camerino) and South Italy (Naples and Messina) between January 2014 and December 2015. In all participating laboratories, the collected samples were plated on MacConkey agar plates, which were incubated aerobically at 37°C for 24-48 h. To identify the isolated bacteria, commercial biochemical kits were used. The tetracycline susceptibility pattern was determined by the Kirby-Bauer disk-diffusion method according to EUCAST guidelines.

### Results:

*E. coli* isolates of domestic animal origin showed a range of tetracycline resistance from 61.5% to 82.0%. In particular, Turin showed a percentage of 80.0 and 82.0, Milan 61.5 and 72.7, Camerino 70.0 and 73.5, Naples 66.7 and 72.4, Messina 61.7 and 73.0, in the year 2014 and 2015, respectively. Generally, in the 2015 the percentage rate resulted higher than that one observed in the 2014.

*E. coli* isolates of wild animal origin showed a lower percentage of tetracycline resistance in samples collected in departments that presented data on wild animals (Turin, Camerino, Naples and Messina).

### Conclusions:

Resistance in Gram-negative bacteria has been increasing in the last years. This multi centre study gives a clear indication of the present spread of tetracycline-resistant *Escherichia coli*, the

most common Gram-negative bacterial pathogen, between domestic and wild animals. Regardless of their geographical origin, all isolates displayed an interesting percentage of resistance. Generally, *E. coli* isolates from domestic species showed a higher resistance to tetracycline than those ones from wild animals. The extension of the monitoring systems in Italian territory is required to evaluate the prevalence of tetracycline-resistant microorganisms. The obtained data could suggest a correct use of antibiotics in Veterinary Medicine, because animals may represent one of the major sources of multi drug-resistant bacteria also for humans. Therefore, this investigation opens up new areas of exploration and cooperation about antibiotic resistance in veterinary and in human medicine.