

OLB01

2-hour Oral Session

Late breaker session: Colistin resistance

No trend towards increasing *mcr-1* prevalence between 2004 and 2014 in food-producing animals in Europe

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Background: Colistin is a last resort antibiotic for treatment of human infections with multidrug resistant bacteria. This antibiotic is also used in animal production for treatment of colibacillosis in poultry and of diarrhoea caused by *Escherichia coli* and *Salmonella* spp in piglets and veal calves. This use in both human and animal medicine could result in a risk of emerging resistance. Until recently, resistance to colistin consisted in a chromosomally-mediated modification of the lipid A. However, the new plasmid-mediated colistin resistance mechanism MCR-1 was described in November 2015 in *E. coli* strains isolated from pigs in China but also from raw meat and inpatients. Since then, *mcr-1* gene was described in *E. coli* and *Salmonella* spp from animals and humans in Asia, Africa, South America and Europe. We aimed here at evaluating the evolution between 2004 and 2014 of the prevalence of *mcr-1* gene in a collection of *E. coli* and *Salmonella* spp isolated from food-producing animals.

Material/methods: Vétquinol, a veterinary company, surveys the antimicrobial susceptibility of bacteria isolated from food-producing animals, mainly cattle and pigs, across Europe since 1994. Among the 6,274 *E. coli* and 748 *Salmonella* spp isolated from cattle and pigs between 2004 and 2014, 218 *E. coli* and 74 *Salmonella* spp isolates were resistant to colistin according to the veterinary CA-SFM 2013 (inhibition diameter below 15 mm around a 50-µg disk of colistin). All the colistin-resistant isolates were screened by PCR for the presence of *mcr-1* gene. *mcr-1*-positive isolates were phylogrouped by MALDI-TOF MS, tested for susceptibility to antibiotics used in human medicine by disk diffusion testing according to CLSI, and tested for extended-spectrum β-lactamase (ESBL) production by double-disk synergy test.

Results: We found the *mcr-1* gene in 42 (0.67%) *E. coli* and 3 (0.40%) *Salmonella* spp isolates. *mcr-1*-positive isolates were mainly isolated from digestive infections (97.62%) and were more prevalent in pigs (0.96%) than in cattle (0.40%). They were isolated each year from 2004 to 2014 with a prevalence varying from 0 to 2.20% depending on the year and the animal species. They came from animals located in France (n=29), Italy (n=12), Germany (n=2), and Belgium (n=2). Four and 2 isolates produced an ESBL and AmpC, respectively. 90% of the isolates were resistant to cotrimoxazole. Isolates were distributed in phylogroup A (n=26), B1 (n=12), D (n=3) and B2 (n=1). The B2 isolate belonged to ST131, was resistant to fluoroquinolone, and did not produce an ESBL. All isolates were susceptible to carbapenems.

Conclusions: Our results showed that *mcr-1* gene was present since more than a decade in animal field and that it has already spread in Europe. However, our susceptibility monitoring program does not show trend towards increasing *mcr-1* prevalence over years.