

CRITICAL SURFACES CONTAMINATION BY MULTIDRUG RESISTANT BACTERIA IN THE COMPANION ANIMAL VETERINARY HEALTHCARE SETTING

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The increasing complexity of medical and surgical procedures in the small animal veterinary practices in Portugal requires the understanding of the prevalence and transmission of multidrug resistant (MDR) bacteria. The aim of this study is to determine prevalence and transmission of multidrug resistant bacteria in the veterinary healthcare setting.

Three hospitals and five clinics were studied. Environmental samples from critical surfaces were collected. Nasal swabs were voluntarily obtained from workers. All swabs were plated on specific selective media for resistant bacteria: ESBL- and carbapenemase-producing Enterobacterales; Methicillin-Resistant *Staphylococcus* (MRS) and MDR *Acinetobacter* spp. Major families of beta-lactamases, *mecA* gene and carbapenemase genes were screened by PCR. Whole-genome sequencing (WGS) was performed for carbapenemase-producing strains.

At least one MDR strain was found in 18.9% (n=34/182) of the surfaces analysed: i) 41.2% (n=14/34) had MDR *Acinetobacter* spp.; ii) 38.2% (n=13/34) were positive for MR Coagulase Negative Staphylococci; iii) 11.8% (n=4/34) were positive for MR *S. pseudintermedius*. In one practice, 18.2% of surfaces analysed (n=4/22) tested positive for OXA-23-producing *Acinetobacter*: *Acinetobacter schindleri* (n=1) was identified on a waiting room weight scale and *Acinetobacter lwofii* (n=3) was identified on treatment room weight scale, table, and laptop keyboard. All strains were resistant to carbapenems, which are critically important antimicrobials according to WHO and are of prohibited use in Veterinary Medicine. The *bla*_{OXA-23}-carrying plasmids shared a high degree of homology to a plasmid found on a human nosocomial strain from Portuguese hospital. Forty-nine percent (n=40/81) of the workers had at least one Methicillin-Resistant Staphylococci isolate, being 22.5% (n=9/40) MR *S. aureus* (MRSA) carriers.

The finding of carbapenem resistant isolates on critical surfaces in the veterinary healthcare setting highlights the need for implementing infection, prevention and control (IPC) guidelines in Veterinary Medicine. Evaluation of nasal carriage of workers is also an important factor to consider when delineating IPC measures. Such measures might prevent the dissemination of these multidrug resistant bacteria, which are a Public and Animal Health hazard.

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