

Active and passive surveillance of bacterial hospital-acquired infections (HAIs) in Veterinary University Hospitals (VUHs)



Objective: To develop a surveillance plan for bacterial hospital-acquired infections (HAIs) and antimicrobial-resistance (AMR) in Veterinary University Hospitals (VUHs).

Materials and Methods:

Passive surveillance: data collection from clinical samples collected for diagnostics purposes. Susceptibility to 12 antimicrobics was evaluated. Strains were considered multi-drug resistant (MDR) when resistant to drugs from >2 classes.

Active surveillance: sampling plans executed quarterly, with subsequent culture on selective media for AMR (e.g. carbapenems-resistant) bacteria and identification through MALDI-TOF. Both on environment/staff and on patients hospitalized for >48h (at the admission and before discharge) to evaluate the commensal flora and the in-hospital AMR acquisition; targeted samplings executed *ad hoc* in case of potential outbreaks detected.

Results:

Passive surveillance: from 23/5/2020 to 31/3/2023, 1294 strains from clinical samples were analyzed, with a % of AMR/MDR of 76,7 and 41,4%, respectively. 162 strains (12,5%) were isolated from suspected HAIs.

Active surveillance on environment: staff's hands/cloths (prevalence 33%) were detected as the most critical points.

Active surveillance on patients: 125 animals sampled, 50/125 (40%) registered at least one AMR in-hospital acquisition.

High-percentages were recorded for the acquisition of rectal carbapenem-resistant (CR) Enterobacterales (24,8%).

Active targeted surveillance: executed twice (2021 and 2022) for outbreaks caused by *Enterobacter cloacae*.

Conclusions:

A surveillance plan provides important data about AMR and HAIs, it increases communication mechanisms, improves the awareness and form a basis to develop antimicrobial stewardship and infection control policies.

Future Proposal:

- 1) To refine the plan;
- 2) To complete the genetic characterization
- 3) To validate protocols;
- 4) To redact guidelines applicable to other VUHs.

Period Abroad/at Company: from Sept 2022 to Feb 2023, the candidate spent a period at the Universidad Complutense of Madrid (UCM). He developed a similar surveillance system at the VUH, allowing a comparison of the results, and performed genotypical characterization of some selected strains of CR Enterobacterales.

Passive surveillance - drug	% of non-susceptible strains
Amikacin	10.66%
Gentamicin	21.99%
Ampicillin	49.82%
Amoxicillin-clavulanate	20.67%
Piperacillin-tazobactam	14.62%
Cefazolin/cephalotin	27.81%
Ceftiofur	23.63%
Tetracycline	43.46%
Erythromycin	53.55%
Clindamycin	58.03%
Enrofloxacin	44.82%
Trimethoprim-sulfamethoxazole	25.24%

% of in-hospital acquisition during time

