ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
DIPARTIMENTO DI SCIENZE MEDICHE VETERINARIE

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CURRICULUM: Sanità animale
Anno di attività: 2°
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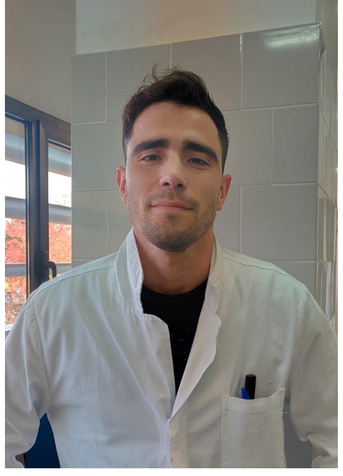


Active and passive surveillance of bacterial hospital-acquired infections (HAIs) into Veterinary University Hospitals (VUHs)

Objective

The project aims at developing a surveillance plan for hospital-acquired infections (HAIs) in Small Animal University Veterinary Hospitals. This includes both creating standard definitions in data collection and standard processes, with the creation of a database to estimate the endemic rate of HAIs, occurrence/prevalence of multi-drug (MDR) resistant bacteria, acquisition rates, most involved infectious agents and risk factors (such as placement of a urinary catheter, previous antimicrobials use…).

Materials and Methods

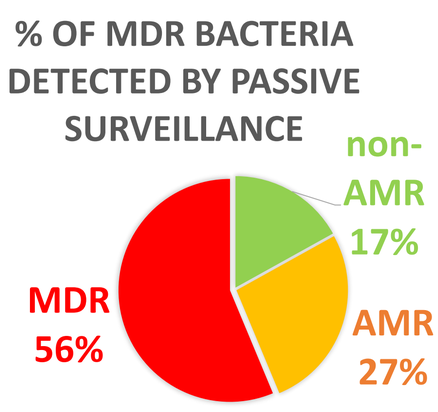
Active surveillance: quarterly executed since May 2021, performed at Bologna VUH by sampling plans with a subsequent bacteriological culture on selective chromogenic media for MDR bacteria and identification of positives through MALDI-TOF: extended-spectrum beta-lactamases (ESBL) and carbapenemases (CPE) producing Enterobacteriaceae and methicillin-resistant Staphylococci (MRS).

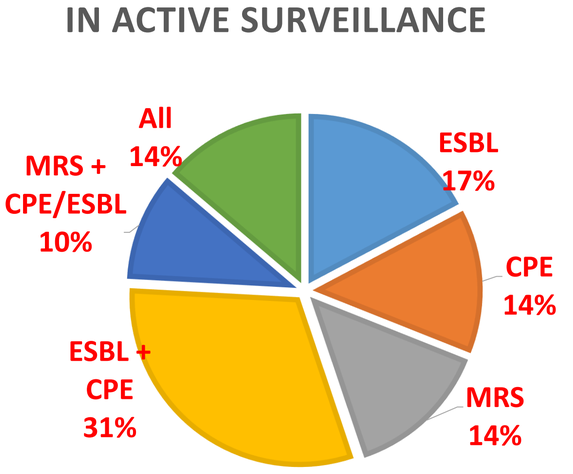
- Environmental samplings is performed with sterile sponges and swabs in clinical and surgical environments, including cages and personnel's hands and cloths;
- Samplings on patients hospitalized for more than 48 hours, both oral (for MRS) and rectal (for ESBL and CPE – Enterobacteriaceae), in admission and before discharge.
- Targeted samplings are executed *ad hoc* in case of potential outbreaks detected.

Passive surveillance: data collection (both perspective and retrospective) from clinical samples collected at Bologna VUH for other purposes, such as diagnostics. Strains were considered MDR when resistant to 3+ antimicrobial classes.
Tree-weekly reports: sharing moments with clinical and surgical staff about results communication, research feedback, discussion of clinical cases and planning of preventive measures.
Statystical analysis. Risk factors were evaluated with chi-square test or Fisher exact test (significant at $p < 0.05$).

Results

- Passive surveillance: from 23/5/2020 to 1/3/2022 803 strains from clinical samples were analyzed, with a % of MDR of 56%. 97 strains (12.1%) were potentially associated with HAIs.
- Active surveillance on environment: in the first 3 sessions, personnel's hands and cloths (prevalence 33%) were the most critical points for the isolation of MDR bacteria.
- Active surveillance on patients: 75 animals sampled (3 sessions), 29/75 (38%, 95% CI, 27.3-49.3) registered at least one MDR in-hospital acquisition. Risk factors associated with acquisition are antimicrobials use (p=0.01357) and >6 days of hospitalization (p=0.017844) .
- Active targeted surveillance: executed only once (february-march 2021) for an outbreak caused by *Enterobacter cloacace* (6 cases)





COMPARISON OF 2 OUTBREAKS MANAGEMENT	*S. marcescens* (2019) No surveillance	*E. cloacae* (2021) Surveillance
Timing since 1° case	**6 months**	**35 days**
Clinical outcomes	**More severe (3 sepsis, 1 eutanizhed patient)**	**Less severe (no sepsis, no deaths)**
Number of patients involved	**12**	**6**
Patient admission restriction	**7 days**	**3 days**

Conclusions:

A surveillance plan provides important data about endemic rates and risk factors, it increases communication and feedback mechanisms, improving the awareness about MDR and HAIs between veterinarians and owners.

Future Proposal:

1) To continue and to refine the plan; 2) Genetic characterization of isolated strain; 3) Validation of operative protocols