healthcare facilities. Challenges of *C. auris* detection emphasize the importance of collaboration between hospitals and the state health department to optimize laboratory capacity for rapid identification of emerging pathogens.

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Nosocomial impact of prevalent β-lactamases from the community enterobacteriaceae: what to do when the resistance doesn't go your way

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To the Editor—Enterobacteriaceae are a common cause of community- and hospital-acquired infections, and they have become increasingly resistant to many classes of antibiotics.[1] Currently, the emergence of these multidrug-resistant (MDR) organisms has raised global concern, and they require immediate control and prevention.[1,2]

The movement of MDR Enterobacteriaceae into the community in distinct ways (eg, patients with prior hospitalization or genetic determinants of resistance emerging from food or environments) has significant nosocomial impact at the patient admission level and for infection control strategies.[2]

Although studies have found that patients asymptomatically colonized with MDR organisms (eg, extended spectrum β-lactamase (ESBL) and carbapenemase producers) constitute a reservoir for transmission of the pathogen to others,[2,3] little is known about the resistance rates among these organisms in the community setting.

Therefore, we conducted a survey to determine the prevalence of MDR Enterobacteriaceae for which MDR was defined as nonsusceptibility to at least 1 agent in 3 or more antimicrobial categories. Urine samples were considered because the recovery of MDR organisms from these samples are most commonly compared with others, especially when enterobacterial species are considered. For these MDR isolates, the pattern of antimicrobial susceptibility to a select panel of antibiotics was determined as well.

Enterobacterial isolates were recovered from outpatients between January 1 and December 26, 2016, in Porto Alegre city and its metropolitan area in southern Brazil. Patients with a first MDR-positive urine culture within 48 hours who were admitted from home were deemed to have community-acquired infection and/or colonization.

Antimicrobial susceptibilities to amikacin, ceftriaxone, ciprofloxacin, ertapenem, gentamicin, and trimethoprim/sulfamethoxazole were determined by disk diffusion, and results were interpreted according to the Clinical and Laboratory Standards Institute (CLSI) protocols.[4] Bacterial identification was performed using the MicroScan WalkAway system (Beckman Coulter, Brea, CA). Resistance mechanisms were detected by phenotypic testing and by gene detection using a previously described polymerase chain reaction (PCR) procedure.[5]

During the study period, a total of 12,193 urinary samples from distinct patients were evaluated. An enterobacterial specie was recovered from 1,885 patients (15.4%). Of these 1,885 isolates, 114 (6.05%) were MDR. Among them, 80 isolates (80 of 1,885, 4.2%) were ESBL producers, including 65 *Escherichia coli*, 8 *Enterobacter* spp, and 7 *Klebsiella* spp. In addition, 12 isolates (0.63%) were non–carbapenemase-producing carbapenem-resistant Enterobacteriaceae (nCP-CRE): 7 *Enterobacter* spp, 4 *Klebsiella* spp, and 1 *Proteus mirabilis*. Also, 22 isolates (1.2%), all *Klebsiella pneumoniae* isolates, were *Klebsiella pneumoniae* carbapenemase (KPC) producers.

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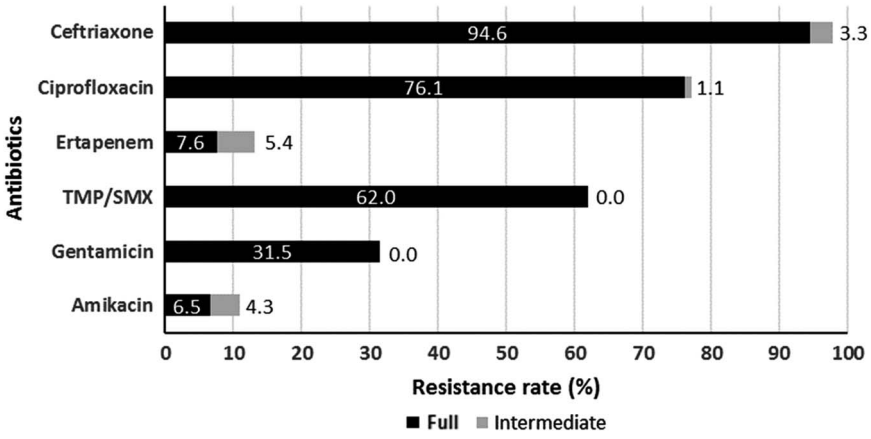

Fig. 1. Full and intermediate resistance rates for the panel of antibiotics against 92 multidrug-resistant organisms, except carbapenemase producers, recovered during the study period.

Amikacin and ertapenem demonstrated the most reliable in vitro activity, with susceptibility rates of 89.2% and 87% in tested isolates, respectively, while gentamicin showed only a reasonable activity (68.5% of susceptibility). Trimethoprim/sulfamethoxazole and ciprofloxacin presented a high resistance rate (>60%), and ceftriaxone (as well as another β-lactams [data not shown]) was the most affected agent (Figure 1). Among the KPC producers, in vitro susceptibility was observed only to amikacin (100%) and gentamicin (54.5%).

ESBL-producing organisms were the most prevalent in this survey, and they are frequently resistant to multiple antimicrobial agents, which greatly limits therapeutic options.[3,6] Currently, carbapenems are recommended for the treatment of serious infections caused by ESBL-producing organisms. On the other hand, additional data on ESBL incidence and risk factors for infection and/or colonization are needed to better establish the use of carbapenems. Notably, carbapenem-resistance has also emerged in the community by KPC producers and non-carbapenemase producers.[2,3,5,7] In this study, ertapenem-resistance was observed only among *Enterobacter* spp isolates. As reported elsewhere,[8,9] *Enterobacter* spp have emerged as an important nosocomial MDR threat. Its presence in the community underscores the need for more comprehensive surveillance to curb spreading.[7,9]

This study has some limitations. First, the isolates identified were categorized as community acquired. Data on prior health care exposures that may have preceded the current admission from community were not fully available. The distinction between colonization and infection is quite difficult, especially in older patients. A second limitation is inherent in the use of urinary samples for surveillance purposes, which may underestimate the findings of a real colonization. Also, this was a surveillance study, and the genetic backgrounds of the isolates were not evaluated.

Notably, some patients may have had prior healthcare or long-term care exposure but were admitted from community during the study period. Although the distinction between community and nosocomial patients is increasingly complex, this survey has important implications for hospitals that screen patients for MDR organisms upon admission.

In conclusion, these results confirm that, in concordance with previously published data,[2,3] ESBL-producing *E. coli* strains are a notable cause of community infection and/or colonization in predisposed patients. However, the presence of *Enterobacter* spp. (mainly *Enterobacter cloacae* complex) with ertapenem-resistance phenotype and KPC-producing *Klebsiella pneumoniae* illustrate the complexity of resistance mechanisms emerging in settings other than the hospital. There is an urgent need to design stewardship programs and infection control efforts involving not only nosocomial but also community strategies against multidrug resistance. Our findings need to be validated in other independent studies to further our understanding of the community epidemiology of MDR isolates.

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