

Carbapenem resistant *Klebsiella pneumoniae* in University Clinical Hospital Mostar, Bosnia and Herzegovina

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Introduction

The appearance of carbapenemases in enterobacteria is a major problem in clinical practice, due to the great diversity of enzymes and the fact that carbapenemases resistance can be spread by horizontal gene transfer.

Material and methods

The study was conducted at the University Clinical Hospital (UCH) Mostar on 100 isolates of carbapenem-resistant (CR) *K. pneumoniae* collected during 2018, 2022-2025. Isolates were collected from different clinical samples of hospital patients regardless of age, gender and underlying disease.

For all tested antibiotics (carbapenems, quinolones, trimethoprim/sulfamethoxazole and other beta-lactam antibiotics) except colistin and tigecycline, MIC was determined using Vitek 2 according to EUCAST (European Committee on Antimicrobial Susceptibility Testing) standards. MIC for colistin was determined by the method of microdilution in broth. MIC for tigecycline was determined by E test. The presence and type of carbapenemase was determined in vitro by rapid diagnostic test for the detection of OXA-163, OXA-48, KPC, NDM and VIM carbapenemases (RESIST – 5 O.O.K.N.V., Coris BioConcept).

Results

For all tested isolates, MIC for meropenem and imipenem was ≥ 8 mg. Some of the tested isolates were sensitive to amikacin and colistin. All tested isolates were sensitive to tigecycline.

Most of the tested isolates possess carbapenemase OXA-48 as the dominant mechanism of resistance to carbapenems. 1 isolate from 2022, 2 isolates from 2024 and 1 isolate from 2025 possessed carbapenemase NDM.

Chart 1. Antibiotic sensitivity of CR isolates of *K. pneumoniae* through years

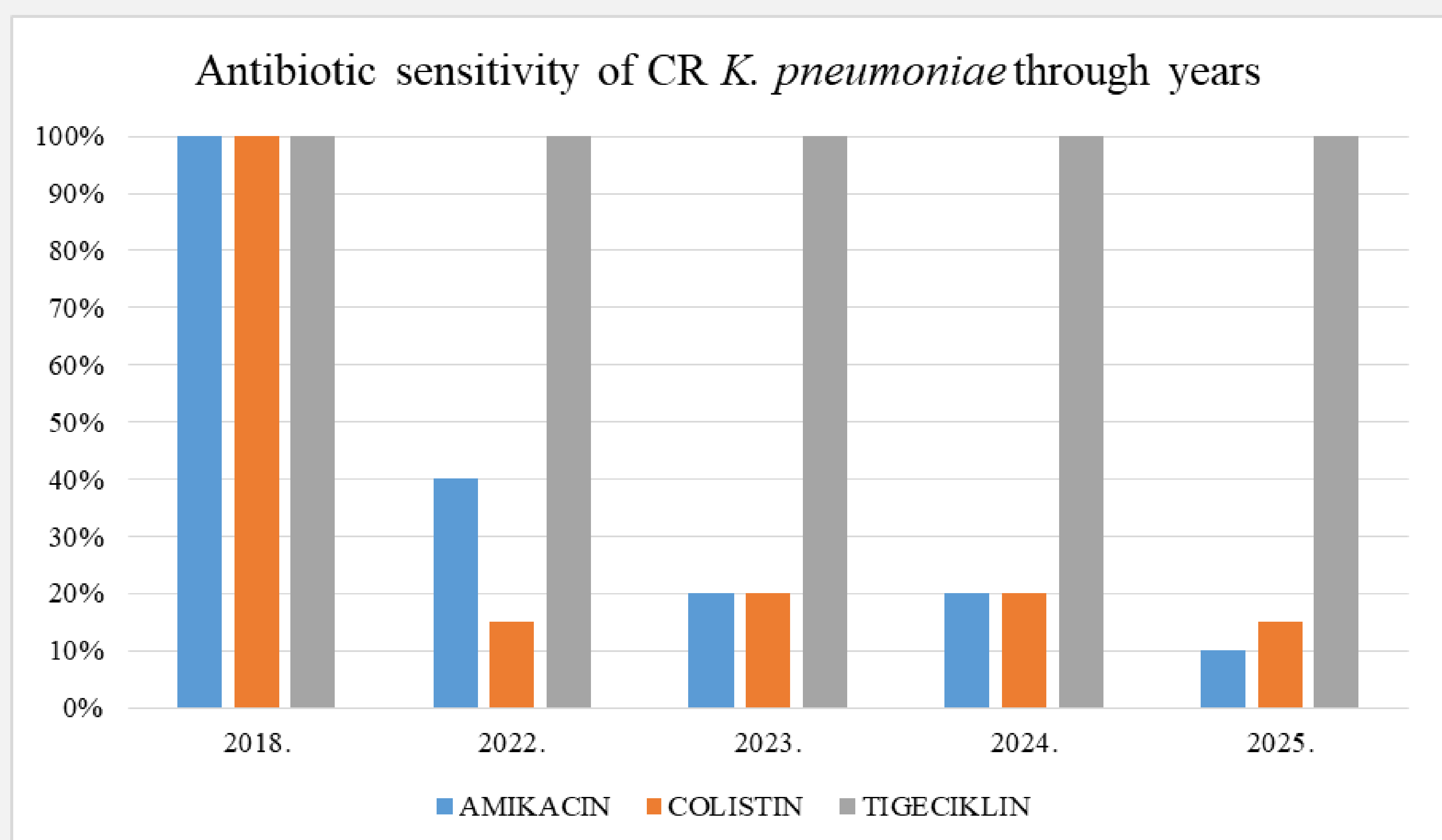
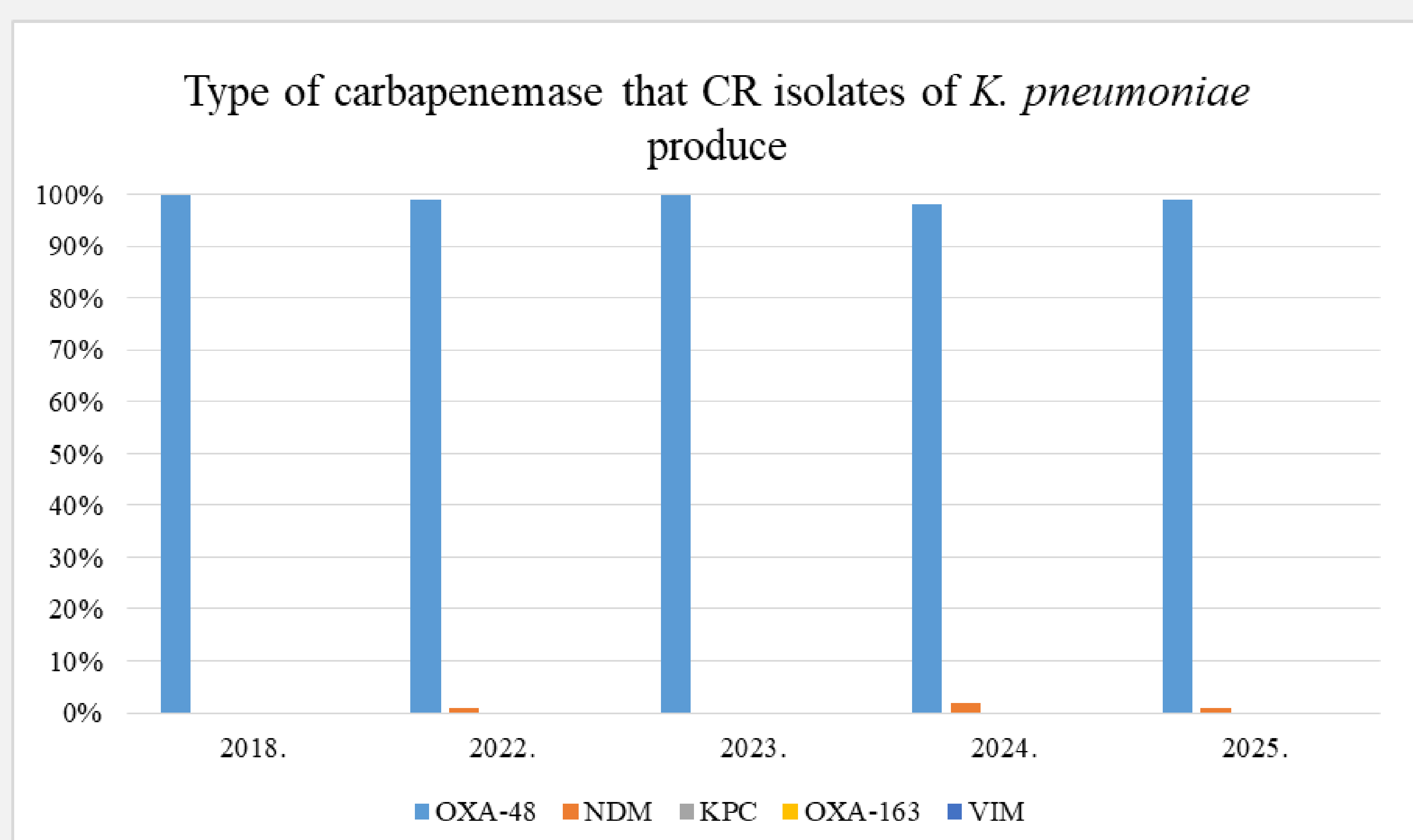


Chart 2. Type of carbapenemase that CR isolates of *K. pneumoniae* produce



Conclusion

Given that the conducted study proved resistance of isolates on several groups of antimicrobial drugs, they can be characterized as multi-resistant. These are the first multi-year data on the presence of CR *K. pneumoniae* with OXA-48 and NDM resistance mechanism within UCH Mostar.