Through the use of gentamicin and netilmicin, which have low MICs for \textit{H. pylori}, aminoglycoside-intercalated smectite hybrids are expected to supersede the standard therapy for \textit{H. pylori} eradication. In the previous study, we synthesized S-GEN complexes as a novel therapeutic agent. In a murine model, S-GEN released gentamicin to the gastric wall stably and the therapeutic effect was not inferior to the conventional standard therapy. The aim of this study was to confirm whether the minimum inhibitory concentration (MIC) of aminoglycosides applied as smectite hybrids remained low against recently isolated \textit{H. pylori} strains.

The \textit{H. pylori} strains were collected via endoscopic biopsy from 1,422 patients at Gangnam Severance Hospital in Seoul, Korea, between March 2015 and February 2018. Antimicrobial susceptibility tests were performed, and the MICs of eight antibiotics (amoxicillin, chloramphenicol, metronidazole, tetracycline, levofloxacin, gentamicin, netilmicin, and tobramycin) were determined by using the Epsilometer test and following the European Committee on Antimicrobial Susceptibility Testing (EUCAST) guidelines. Individual drugs were tested at ¼, ½, 1, 2, 4× MIC. A total of 282,000 people (17% veterans) in the United States have SCI/D. CRE infection is a significant source of morbidity and the leading cause of death in this population. Due to frequent healthcare contact and antibiotic use, SCI/D is associated with high risk of multidrug-resistant infections, including CRE. CRE are resistant to most antimicrobials and are associated with high mortality. The objective of this study was to describe antibiotics used for CRE infection and clinical outcomes in veterans with SCI/D.

This retrospective cohort used national VA data of veterans with SCI/D and active CRE infection (per documentation in the health record) from 2011 to 2013. CRE was defined as resistant to a carbapenem and third generation cephalosporin. Antibiotics were described by empiric/definitive and monotherapy/combination therapy. Clinical outcomes included clinical failure/improvement, microbiological resolution, and mortality and readmission in 30 days/1 year. SAS was used for analysis with significance at α ≤ 0.0125 due to multiple comparisons.

Results. Ninety-two CRE infections (62% \(K. pneumoniae\)) were identified in 87 patients, most often in urine cultures (58.7%). Carbapenems (20.7%) were used most frequently for CRE treatment. Combination therapy with an aminoglycoside and a different class of antibiotics was used more often than monotherapy (empiric 56.3%, definitive 69.0%). Definitive combinations consisted of carbapenems/polyoxins (16.7%) or carbapenems/aminoglycosides (13.3%). Clinical outcomes for definitive monotherapy vs. combination, respectively, were: clinical failure (26.6% vs. 46.7%), improvement 1–10 days (48.2% vs. 33.3%), and 11–30 days (70.4% vs. 53.3%); microbiological resolution (48.2% vs. 38.3%); mortality at 30 days (22.2% vs. 30%), 90 days (22.2% vs. 41.7%), 1 year (25.9% vs. 51.7%) and readmission at 30 days (11.1% vs. 10%) and 1 year (37% vs. 30%). No significant differences in outcomes were identified for monotherapy vs. combination therapy or susceptible vs. nonsusceptible treatment.

Conclusion. For CRE treatment in the SCI/D population, carbapenems were the most widely used drug class; combination therapy was used most frequently. No improvements in clinical outcomes were found for combination treatment as either empiric or definitive treatment as compared with susceptible treatment.

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