Increasing prevalence of KPC-producers as an emerging resistance mechanism among carbapenem non-susceptible isolates: Report from the SENTRY Antimicrobial Surveillance Program

MCASTANEIRA, LN WOOLEY, RM MENDES, LM DESHPANDE, RN JONES
JMI Laboratories, North Liberty, IA

Background: The dissemination of metallo-
ß-lactamase (MßL) and serine-carbapenemases (S-Carb) producing Enterobacteriaceae jeopardize the clinical utility of the last remaining antibiotics. The prevalence of MßL and S-Carb is still low, but rapidly increasing. We evaluated the occurrence of MßL (IMP, VIM) and S-Carb (KPC, NDM, GES, VIH) among 5,068 carbapenem non-susceptible Enterobacteriaceae isolates collected during 2007 from Europe, North and Latin America. Occurrence of carbapenem MIC values and their modulation by ß-lactamase were evaluated. Results: A total of 102 isolates (2% of overall, 77 EU, 25 USA, 95% K. pneumoniae) showed increased carbapenem MIC values were evaluated. Fifty (96%) isolates were found to harbor blaKPC (92 KPC, 16 IMP). These isolates were from the USA (40, mainly east coast), Israel (9) along with one KPC-2 from Argentina. KPC-3 was more prevalent than KPC-2: 21/161 was detected in 6 (9%) KPC, 5 from Italy and from Turkey. IMP-1 was found in 1 (2%) isolates from Turkey. OXA-48 was discovered in 2 (0.04%) isolates in the SENTRY Antimicrobial Surveillance Program in 2007.

RESULTS

- Among 5,068 isolates collected during the SENTRY Program in 2007, 95 K. pneumoniae and T. J. coli (102 total) 2% of isolates overall non-susceptible carbapenem MIC values (MIC, ≤2 μg/mL).
- Only 10% of the isolates exhibited a resistant phenotype.

CONCLUSIONS

- Increased prevalence of KPC producers as an emerging resistance mechanism among carbapenem non-susceptible isolates.

SELECTED REFERENCES


- KPC-producing isolates showed higher resistance levels against the carbapenems compared to isolates carrying other resistance mechanisms. These isolates were dominantly distributed in four USA states (40 strains), N.Y, NJ, WA and HI and Israel, respectively.

- Overall, KPC-producing isolates showed higher resistance levels against the carbapenems compared to isolates carrying other resistance mechanisms. These isolates were dominantly distributed in four USA states (40 strains), N.Y, NJ, WA and HI and Israel, respectively.

- The genes encoding most of these carbapenemases reside on plasmids or transposons carrying additional resistance genes to other antimicrobial classes. These translated enzymes can be readily transferred among negative pathogens, facilitating the dissemination of these potent resistance mechanisms and also, in many cases, confering a multiplex resistance profile.

- In this study, we evaluated the prevalence of MßL and serine-carbapenemase encoding genes among 102 carbapenem-non-susceptible Escherichia coli and Klebsiella pneumoniae collected during the SENTRY Antimicrobial Surveillance Program in 2007.

- The genes encoding most of these carbapenemases reside on plasmids or transposons carrying additional resistance genes to other antimicrobial classes. These translated enzymes can be readily transferred among negative pathogens, facilitating the dissemination of these potent resistance mechanisms and also, in many cases, confering a multiplex resistance profile.

- In this study, we evaluated the prevalence of MßL and serine-carbapenemase encoding genes among 102 carbapenem non-susceptible Escherichia coli and Klebsiella pneumoniae collected during the SENTRY Antimicrobial Surveillance Program in 2007.

- The genes encoding most of these carbapenemases reside on plasmids or transposons carrying additional resistance genes to other antimicrobial classes. These translated enzymes can be readily transferred among negative pathogens, facilitating the dissemination of these potent resistance mechanisms and also, in many cases, confering a multiplex resistance profile.

- In this study, we evaluated the prevalence of MßL and serine-carbapenemase encoding genes among 102 carbapenem non-susceptible Escherichia coli and Klebsiella pneumoniae collected during the SENTRY Antimicrobial Surveillance Program in 2007.

- The genes encoding most of these carbapenemases reside on plasmids or transposons carrying additional resistance genes to other antimicrobial classes. These translated enzymes can be readily transferred among negative pathogens, facilitating the dissemination of these potent resistance mechanisms and also, in many cases, confering a multiplex resistance profile.

- In this study, we evaluated the prevalence of MßL and serine-carbapenemase encoding genes among 102 carbapenem non-susceptible Escherichia coli and Klebsiella pneumoniae collected during the SENTRY Antimicrobial Surveillance Program in 2007.