OXA- and MβL-type Enzymes among Uncommonly Isolated Acinetobacter spp. in Asia-Pacific Nations: National Reservoir for Resistance Determinants

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AMENDED ABSTRACT

Backgrounds: Acinetobacter spp. other than A. baumannii are occasionally recovered from clinical sources, but carbapenem-hydrolyzing class D ß-lactamases (OXA- and MβL-type) in these organisms are rare. These enzymes are of interest as potential resistance determinants.

Results: 581 isolates from 10 countries in the Asia-Pacific (APAC) region were tested by broth microdilution. Carbapenem non-susceptible isolates were also recovered from 2 Indian centers, while an A. johnsonii strain, and A. calcoaceticus with carbapenem resistance in 3 Indian centers, were identified in the Philippines and China, respectively. OXA- and ß-lactamases encoding genes were detected in 60% (174/291) of isolates from APAC centers. The majority of CHCDß genes were detected in A. radioresistens isolates (100/102, 99.6%). MßL-encoding genes were detected in one A. radioresistens isolate from Thailand. A. baumannii isolates were predominant in the APAC region, followed by A. johnsonii and A. calcoaceticus. These ß-lactamases, especially CHCDß and MßL, were more frequently detected in the Asia-Pacific (APAC) region compared to non-APAC centers. High dissemination of CHCDß genes was detected, with OXA-58 carrying isolates predominating in Hong Kong, Australia, and New Zealand. Molecular typing of clinical isolates was performed by PFGE.

CONCLUSIONS

1. This study showed low sanitation resistance rates among Acinetobacter spp. for most clinically available antimicrobial agents, except for polymyxin B and tigecycline.

2. A. radioresistens harbored a chromosomally located blaOXA-58, suggesting this bacterial species as the source of ß-lactamase resistance in this study.

3. In South Korea and the Philippines, respectively, underlines continue their presence in these regions, albeit at low frequency.

4. This study emphasizes (i) the natural occurrence of ß-lactam resistance genes in several species, (ii) the importance of identifying these genes in new and emerging bacterial species, and (iii) the need for continued surveillance of these resistance determinants in the hospital setting.

MATERIALS AND METHODS

Bacterial isolates: During 2006-2007, 41 medical centers located in 10 countries in the APAC region were recruited to participate in the SENTRY Project. A total of 581 multidrug resistant Acinetobacter spp. were isolated from patients in 10 countries in the Asia-Pacific (APAC) region; these were submitted to the Clinical and Laboratory Standards Institute (CLSI) for testing.

Carbapenem-hydrolyzing class D ß-lactamases (OXA- and MßL-type) were initially detected by PCR using specific primers targeting OXA-58 and MßL. A total of 581 isolates were tested for susceptibility to 10 ß-lactam antibiotics, including imipenem (breakpoint for Acinetobacter spp. isolates, 2 MßL-producing isolates. (i) the natural occurrence of ß-lactam resistance genes in several species, (ii) the importance of identifying these genes in new and emerging bacterial species, and (iii) the need for continued surveillance of these resistance determinants in the hospital setting.

SELECTED REFERENCES


