

Session: P075 Dreaming about a perfect hand hygiene

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**Usefulness of the three-dimensional analysis of antimicrobial resistance, antimicrobial agent use and hand-hygiene surveillance data in infection control**

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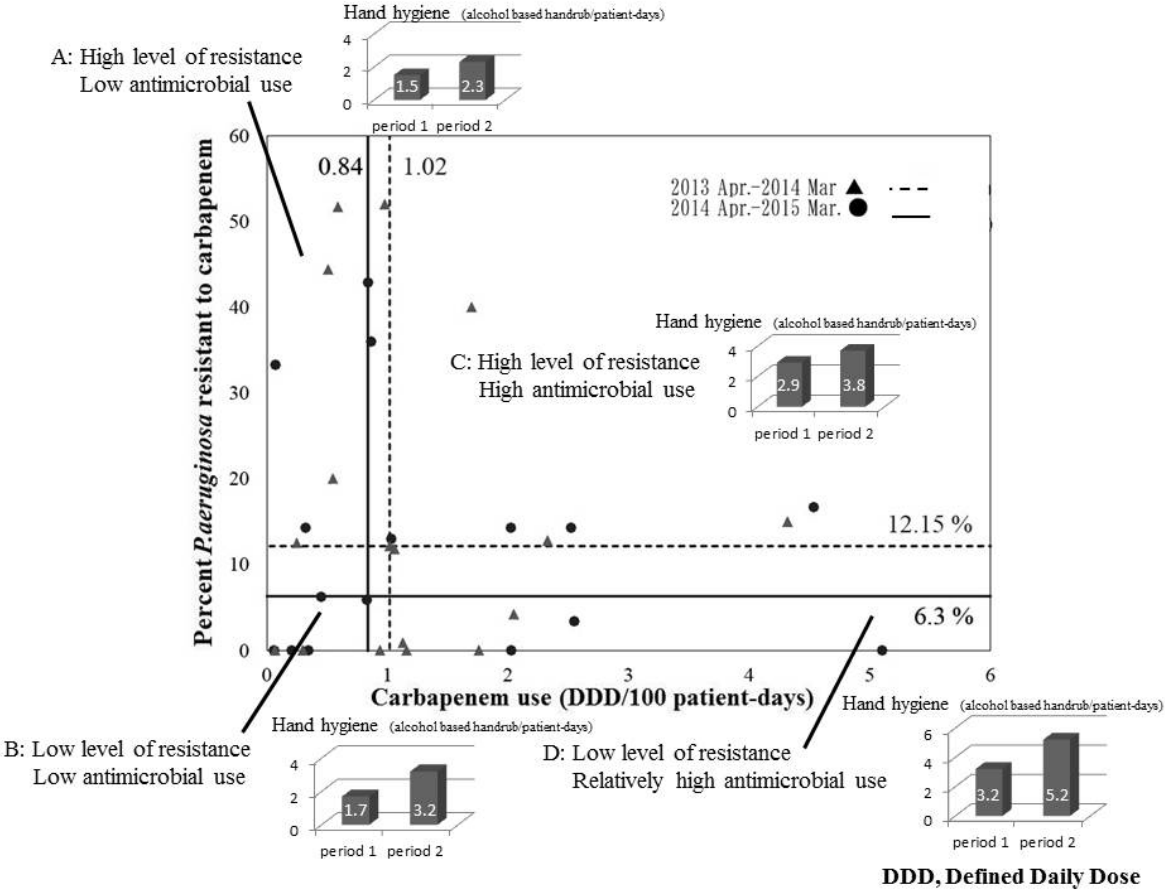
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**Background:** Numerous factors are associated with the development of antimicrobial-resistant microorganisms in hospitals. Monnet conducted a two-dimensional analysis of antimicrobial resistance and the use of corresponding antimicrobial agents (*Int J Antimicrob Agents*. 2000;15:91). Since 2012, cooperation among hospitals in infection control in Japan has been incentivized through additional reimbursement by the universal health insurance system.

**Material/methods:** In 2012, we organized the Hokusetsu Infection Control Network in northern Osaka, which includes 8 large, well-resourced hospitals and 16 small hospitals supported by local public health centers. The following surveillance data were collected: percentage of *Pseudomonas aeruginosa* isolates resistant to carbapenem, hospital use of carbapenem (defined daily dose/100 patient-days), and frequency of use of alcohol based hand rubs by hospital workers (times/patient-days). Data were collected from 8 large, well-resourced hospitals and 9 small hospitals from April 2013 to March 2014 (period 1) and April 2014 to March 2015 (period 2). We divided these hospitals in 4 areas (A: high level of resistance with low antimicrobial use, B: low level of resistance with low antimicrobial use, C: high level of resistance with high antimicrobial use, and D: low level of resistance with relatively high antimicrobial use).

**Results:** We modified the two-dimensional analysis of Monnet to compare the surveillance data for periods 1 and 2 in three dimensions (Figure). Median resistance of *P. aeruginosa* isolates to carbapenem was 12.5% in period 1 and 6.3% in period 2. Median use of carbapenem (DDD/100 patient-days) was 1.02 in period 1 and 0.84 in period 2. Median frequency of use of alcohol based hand rubs by hospital workers (times/patient-days) was 2.2 in period 1 and 3.5 in period 2. We

recommended that 4 hospitals in area C limit the use of carbapenem and 4 hospitals in area A control cross-transmission resulting from poor hand hygiene (2.3 in period 2).



**Conclusions:** Three-dimensional analyses (using modified Monnet's method) of antimicrobial resistance, antimicrobial agent use, and hand hygiene surveillance data are useful for assessing measures to reduce antimicrobial resistance.