

Antibiotic consumption to detect epidemics of *Pseudomonas aeruginosa* in a burn centre: A paradigm shift in the epidemiological surveillance of *Pseudomonas aeruginosa* nosocomial infections

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Abstract

Purpose: The control of antibiotic resistance and nosocomial infections are major challenges for specialized burn centres. Early detection of those epidemic outbreaks is crucial to limit the human and financial burden. We hypothesize that data collected by antibiotic consumption medico-economic surveys could be used as warning signal to detect early nosocomial outbreaks.

Methods: A retrospective analysis was conducted that included all burn patients staying >48h on the Lausanne BICU (Burn Intensive Care Unit) between January 2001 and October 2012 who received systemic therapeutic antibiotics. Infection episodes were characterized according to predefined criteria. Antibiotic consumption data, obtained from the quarterly surveillance of drug consumption surveys, were translated into defined daily doses (DDDs).

Results: In total, 297 out of 414 burn patients stayed >48h, giving a total of 7458 'burn-days'. We identified 610 infection episodes (burn wound [32.0%], respiratory [31.1%], and catheter [21.8%]), from 774 microorganisms. *Pseudomonas aeruginosa* (26.2%), *Staphylococcus aureus* (11.5%), and *Candida albicans* (7.0%) were the main pathogens. We observed three distinct outbreaks of *P. aeruginosa* infections in 2002-2003, 2006, and 2009-2011. These outbreaks correlated with an increase in the DDDs of anti-*Pseudomonas* antibiotics.

Conclusions: Our data support a paradigm shift in the epidemiological surveillance of nosocomial *P. aeruginosa* epidemics in burn centres, using the rise in antibiotic consumption as an early trigger to initiate the molecular typing of *P. aeruginosa* strains and the reinforcement of standard infection control procedures.