

## LETTER TO THE EDITOR

### Multidrug-resistant *Acinetobacter baumannii*- the pathogen with no borders?

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Organisms of the genus *Acinetobacter* are ubiquitous and widely distributed in soil and water (1). Most clinically significant isolates belong to the 'Acinetobacter baumannii complex' (*A. baumannii* and close relatives genomic species 3 and 13TU) and biology researchers located species *A. baumannii* highly adapted to hospital environment (1). Consequently, the origin of infections caused by *A. baumannii* is always in hospital settings. These bacteria has the remarkable ability to survive and spread in the hospital environment (encapsulated strains survive for more than 4 months on PVC, ceramics, rubber and steel) and rapidly acquire resistance determinants to a wide range of antibacterial agents as well as possibility to biofilm formation by pili chaperone-usher secretion system (1, 2). Until the 1970s, most isolates were susceptible to a wide range of antibiotics. The emergence in resistance trends arises in ability to 'switch' its genomic structure, combined with variable gene expression and presence of mobile elements, which probably explains the unmatched speed at which *A. baumannii* can respond to selection pressure from antimicrobial agents (1).

In Croatia the collection of regional antibiotic resistance data has been organized through the Croatian Committee for Antibiotic Resistance Surveillance at the Public Health Collegium of the Croatian Academy of Medical Sciences since 1996. During the 15 years of continuous work the members of the Committee provided a rich source of information on resistance patterns in different regions of the country (3). An increase

of resistance in carbapenems (imipenem, meropenem) as antibiotics of widest activity is worrying. At Split University Hospital, the first carbapenem (meropenem) resistant strain of *A. baumannii* was isolated in 2002 from urine sample at the Intensive Care Unit (4). Over the period of seven years carbapenem resistance in clinical isolates of *A. baumannii* at Split University Hospital did not exceed 30 % for meropenem and 10 % for imipenem. Molecular characterization of reduced susceptibility to carbapenems in more than a hundred non repetitive patient isolates of *A. baumannii* collected between 2002 and 2007 at Split University Hospital confirmed the presence of insertion sequence IS<sub>Aba1</sub> upstream of *bla*<sub>OXA 51/69 like</sub> gene in majority strains (4,5). Isolates from Split University Hospital contained the newer OXA-107 enzyme, closely related to OXA-69, with an amino-acid change at position 167 that replaces leucine with valine, and described in *A. baumannii* isolates only from Poland and Slovenia (6).

In the beginning of 2009, a 51 year-old female was transferred to the ICU of Split University Hospital, Croatia, following brain surgery at the General Hospital of Mostar, Bosnia and Herzegovina (7). During the hospitalization in the General Hospital of Mostar, *Acinetobacter* spp. resistant to all tested antibiotics was isolated from a bronchial aspirate. Following the transfer of the patient to Neurosurgery ICU of Split University Hospital, multidrug-resistant *Acinetobacter baumannii* was isolated from bronchial lavage, blood culture and cerebrospinal fluid. The antimicrobial testing by E-tests (AB Biodisk, Solna, Sweden) confirmed susceptibility to ampicillin/sulbaktam (MIC 1 µg/ml) and colistin (MIC 0,5 µg/ml) and by disc-diffusion and broth microdilution resistance to imipenem (MIC 64 µg/ml), meropenem (128 µg/ml), amikacin (64 µg/ml), gentamicin (64 µg/ml), ceftazidime (256 µg/ml), cefepime (128 µg/ml), ciprofloxacin (32 µg/ml), piperacillin/tazobactam (128 µg/ml) and ceftriaxone (256 µg/ml) according to the Clinical and Laboratory Standards Institute recommendations (7). During the next 12 months more than 50 similar isolates of *A. baumannii* were obtained from different departments and ICUs at Split University Hospital. All collected isolates were identified by ATB 32GN and Vittek 2 systems (bioMerieux, Marcy l'Étoile, France). Pulsed-field gel electrophoresis (PFGE)

confirmed identity with origin isolate and emphasized dissemination of a new clone during 2009 inside Split University Hospital (7). Molecular investigation for presence of genes encoding carbapenem resistance was detected by multiplex PCR and confirmed the presence of OXA-90 gene (a variant of OXA-51/66), gene encoding OXA-72 (a variant of OXA-40 like family), and VIM-type gene cassette for metallo-enzyme (7, 8). Recently published data cited the first report of OXA-72 in Southeast Europe (7). The new clone of *A. baumannii*, so called „Mostar clone“, has become dominant at Split University Hospital and gives rise to an increase in carbapenem resistance (meropenem 52%, imipenem 50 %) as compared with the previous years according data of the Croatian Academy of Medical Sciences for 2009 (3).

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