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Carbapenemase-producing *Acinetobacter baumannii*, Algeria

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Running title: OXA-58 from *A. baumannii* in Algeria

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4 Sir,
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7 *Acinetobacter baumannii* is increasingly reported as a nosocomial pathogen [1].
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9

10 Carbapenem resistance is now observed worldwide in *A. baumannii* isolates, leading to
11
12 limited therapeutic options. Several mechanisms are responsible for resistance to
13
14 carbapenems in *A. baumannii* [1].
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21 The carbapenem-hydrolyzing β -lactamases in *A. baumannii* are either metallo- β -lactamases
22
23 (MBLs) or oxacillinases (carbapenem-hydrolyzing class D β -lactamases [CHDLs]) [2]. Four
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25 major subgroups of acquired CHDLs have been identified in *A. baumannii*, being OXA-23,
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1 screening performed in that ICU ward were included. MICs of ticarcillin, ticarcillin plus
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3 clavulanic acid (4 mg/L), piperacillin, piperacillin plus tazobactam (4 mg/L), ceftazidime,
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5
6 cefepime, aztreonam, imipenem, gentamicin, tobramycin, amikacin and ciprofloxacin were
7
8
9 determined by the agar dilution technique in Mueller Hinton medium. Results were
10
11
12 interpreted according to the guidelines of the Clinical and Laboratory Standards Institute [4].
13
14
15 All isolates were multidrug resistant, including resistance to the broad-spectrum
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18 cephalosporins, aztreonam, imipenem (MIC of 16 mg/L), fluoroquinolones, and
19
20
21 aminoglycosides. All the 16 isolates studied here showed identical pulsed-field gel
22
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24 electrophoresis patterns, suggesting that they were closely related. The presence of *bla*_{OXA}
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26
27 carbapenemase genes was searched by PCR using previously described primer pairs for the
28
29
30 *bla*_{OXA-23}, *bla*_{OXA-40}, and *bla*_{OXA-58} genes, representative of the four OXA clusters [5]. All of
31
32
33 these carbapenem-resistant strains were positive for the *bla*_{OXA-58} gene, suggesting that β-
34
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36 lactamase OXA-58 significantly contributed to the imipenem resistance in these
37
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39 *Acinetobacter* strains. The *bla*_{OXA-58} amplicons were fully sequenced, demonstrating 100%
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41
42 identity to the *bla*_{OXA-58} sequence, although the OXA-58 point-mutant derivative OXA-97 had
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44
45 been recently identified in Tunisia [6]. Plasmid extraction followed by electro-transformation
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1 into an *A. baumannii* recipient strain as described revealed that the *bla*_{OXA-58} gene was located
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3 on a plasmid that transferred a decreased susceptibility to carbapenems but not to ceftazidime.
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7 Genetic investigations showed that the *bla*_{OXA-58} gene was bracketed by insertion sequences
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9
10 (IS*Aba3*-*bla*_{OXA-58}-IS*Aba3*), which were likely at the origin of its acquisition and expression
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12
13 [5]. The plasmid mediated *bla*_{OXA-58} gene described in this study could contribute to a rapid
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15
16 spread of carbapenem resistance in *Acinetobacter* in our hospital. This work constitutes the
17
18
19 first evidence of an outbreak situation involving CHDL-producing *A. baumannii* strains in
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26 Algeria.

27 28 29 30 31 32 33 34 35 **Funding**

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51 France.

52 53 54 55 **Transparency declaration**

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None to declare

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