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1 **Incidence, risk factors and outcome of multi-drug resistant**
2 ***Acinetobacter baumannii* nosocomial infections during an outbreak in a burn unit.**

3
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33

34 **Abstract**

35 **Background**

36 Multidrug-Resistant *Acinetobacter baumannii* (MR-AB) can cause outbreaks in burn units.
37 We aimed to study the incidence, risk factors and outcome of MR-AB infections in a burn
38 unit (BU).

39 **Methods**

40 A prospective study was conducted from April to November, 2014 during an outbreak in a
41 BU in Paris. Weekly surveillance cultures were performed to determine MR-AB colonization.
42 MR-AB nosocomial infections, discharge or death without MR-AB infection were considered
43 as competing events. To identify risk factors for MR-AB infection, baseline characteristics
44 and time-dependent variables were investigated in univariate analyses using Cox models.

45 **Results**

46 Eighty-six patients admissions were analyzed during the study period. Among them, 15 (17%)
47 acquired MR-AB nosocomial infection. Median time to infection was 22 days (interquartile
48 range: 10-26 days). Cumulative incidence of MR-AB infections was 15% at 28 days (95%
49 CI=8-24). Risk factors for MR-AB infection in univariate analysis were SAPS II (Hazard
50 Ratio (HR):1.08; 95% CI:1.05-1.12; P<0.0001) and ABSI (Abbreviated Burn Severity Index)
51 scores (HR:1.32; 95% CI:1.12-1.56; P=0.001), MR-AB colonization (HR:10.2; 95%CI:2.05-
52 50.3; P=0.004), invasive procedures (ventilation, arterial and/or venous catheter) (P=0.0001)
53 and ≥ 2 skin grafts (HR:10.2; 95% CI:1.76-59.6; P=0.010). MR-AB infection was associated
54 with an increased risk of death (HR: 7.11; 95%CI: 1.52-33.2; P=0.013) and longer hospital
55 stay with a median estimated increase of 10 days (IQR: 6; 14).

56 **Conclusions**

57 Incidence of MR-AB nosocomial infection was high during this outbreak, and was associated
58 with prolonged hospitalization and increased risk of death. High patient severity scores, prior
59 MR-AB colonization, invasive procedures and repeated skin grafts were associated with an
60 increased risk of nosocomial infection.

61

62 **Introduction**

63 In recent years, multidrug-resistant *Acinetobacter baumannii* (MR-AB), defined as strains
64 resistant to 3 or more classes of antibiotics including carbapenem, has emerged as a major
65 cause of health care-associated infection (1–4). Patients with impaired host defenses, such as
66 intensive care units and burned patients are particularly exposed because of the loss of their
67 protective skin and mucosal barrier (5,6). In addition, due to its ability to survive on patients
68 skin and environmental surfaces, MR-AB is known to promote epidemic spread and
69 nosocomial transmission (7–9). Therefore, introduction of AB strains in a facility has an
70 important potential for outbreaks and closure of hospital units can be necessary to stop
71 epidemics (8,10,11).

72 MR-AB infections are difficult to treat and associated with high mortality and morbidity, and
73 longer hospital stays (12,13). Therefore, identifying risk factors for these nosocomial
74 infections is needed to help reduce their occurrence.

75 The aim of this study was to evaluate prospectively the incidence, risk factors and outcome of
76 MR-AB infections in a Burn Unit (BU) during an outbreak leading to the temporary closure
77 of the unit.

78

79 **Material and Methods**

80 *Study population*

81 A prospective single-center study was conducted in a BU located in a 600-bed public teaching
82 hospital in Paris, France. The BU is a 15 beds unit with a multidisciplinary team of physicians
83 and nurses (plastic surgery, intensive care). About 250 patients are admitted every year with a
84 hospital stay of 22 days on average.

85 An outbreak of MR-AB was identified in the BU in January 2014. Hygienic measures were
86 implemented to try to control the epidemic: standard hygiene measures (hand hygiene, use of
87 gloves and coats when appropriate) and environmental cleaning of rooms before admitting a
88 new patient. These measures were unable to control the outbreak and the unit was finally
89 closed temporarily on November 4, 2014.

90 During the course of this epidemic, we implemented a prospective study to assess the
91 incidence and risk factors for MR-AB colonization and infection, and their impact on
92 patients' outcome. The results of the analysis regarding patient's colonization have already
93 been reported (14). Briefly, we included all consecutive patients admitted for more than 24
94 hours to the BU from April 14 to November 4, 2014. Only the first admission for each patient
95 was analyzed.

96 To identify risk factors for MR-AB infection, patient's data were recorded at baseline and
97 daily during follow-up. Baseline patients' characteristics collected at admission were: age,
98 gender, comorbidities (including diabetes mellitus, cancer/hematologic malignancies, chronic
99 pulmonary disease, chronic heart failure, psychiatric disorder, HIV infection, obesity),
100 admission mode (community or hospital), severity of injury evaluated by SAPS II (Simplified
101 Acute Physiology Score II) and **ABSI (Abbreviated Burn Severity Index) scores (15,16)**, prior
102 antibiotic use within 7 days prior to admission. Time dependent characteristics were
103 prospectively collected: invasive procedures (ventilation, central venous and artery catheter,
104 urinary catheter), antimicrobial therapy during hospitalization, number of skin grafts, and
105 MR-AB colonization using surveillance cultures.

106 MR-AB infections were defined using the CDC definition for nosocomial infections and
107 combined specific clinical findings and results of laboratory tests (17). A patient was
108 diagnosed with MR-AB infection if he presented clinical signs of sepsis, clinical or
109 radiological focal signs of infection with isolation of MR-AB, leading the physician to start
110 antimicrobial therapy. These diagnoses were ascertained by two infectious disease specialists.
111 Patients were followed in the BU until their discharge or death. The length of stay in the BU
112 was assessed for each patient.

113

114 *Microbiology*

115 All patients admitted to BU were screened for colonization with carbapenem-resistant Gram-
116 negative bacilli, including MR-AB. Surveillance cultures were performed at admission and
117 weekly thereafter throughout BU stay. Surveillance cultures included inguinal skin and rectal
118 swabs. Additional cultures were performed on burns at each dressing, on lower respiratory
119 samples if the patient was mechanically ventilated and when infection signs or a systemic
120 inflammatory response syndrome occurred.

121 Surveillance culture samples were plated on Drigalski agar with a 10- μ g ertapenem disk
122 (Biomérieux, Marcy l'Etoile, France) for inguinal and rectal swabs or on non-selective agar
123 for burn and respiratory samples and incubated overnight at 37°C. Colonies were selected
124 based on color and morphology and final identification was performed using mass
125 spectrometry (Vitek MS, Biomérieux, Marcy l'Etoile, France). Antibiotic susceptibility
126 pattern was determined by disk diffusion method according to the CA-SFM cut-offs (Comité
127 de l'Antibiogramme de la Société Française de Microbiologie) (18).

128 When infection was suspected, clinical samples were studied using appropriate method. When
129 AB was isolated from blood cultures or clinical specimens, antibiotic susceptibility pattern
130 was determined as described above.

131

132 *Statistical analysis*

133 Quantitative variables are presented with the median (interquartile range (IQR)); qualitative
134 variables with counts (percentage). Risk factors of MR-AB infection were investigated among
135 all patients enrolled in the study. A time-to-event analysis was performed, in a competing
136 risks framework, with MR-AB infection, death or discharge without infection as competing
137 events (19,20). Such a methodology allows accounting for the time-dependency of some
138 potential risk factors for infection (e.g. ventilation, antibiotics prescription). Time to event
139 was defined as the time difference between the date of admission and the date of diagnosis of
140 infection or the date of death/discharge, whichever occurred first. Time independent variables
141 were recorded on admission as described above. Time-dependent explanatory variables were
142 longitudinal exposures prospectively collected as described above. Cumulative incidences of
143 infection, death or discharge over time were estimated. Cause-specific hazard ratios (CSHR)
144 for candidate associated factors were estimated in Cox models in univariate analysis. Given
145 the limited number of infection events, we did not perform a multivariable analysis. The
146 proportional hazards assumption was assessed by examination of the Schoenfeld's residuals;
147 log-linearity assumption for continuous variables was assessed. MR-AB infection effect on
148 survival was also estimated in a Cox model, with discharge alive as a competing event to

149 death in the ICU. The difference in length of stay due to infection was estimated in a
150 multistate model framework (21,22).

151 All tests were two-sided and p-values lower than 0.05 were considered as indicating
152 significant associations. Analyses were performed using R statistical platform, version 3.4.1,
153 using the survival (Survival Analysis), cmprsk (Subdistribution Analysis of Competing Risks)
154 and etm (Empirical Transition Matrix) packages (<https://cran.r-project.org/>).

155

156 **Results**

157 *Incidence and characteristics of nosocomial infections*

158 From 14 April to 4 November 2014, 97 consecutive patients were admitted to BU with a total
159 of 103 admissions (**Figure 1**). Eleven patients with BU length of stay of less than 24 hours
160 were excluded from the study and 86 patient's admissions were included in the final analysis,
161 representing 2492 patients-days of hospitalization. Median length of stay in the BU was 22
162 days (min-max: 2-105).

163 Among these 86 admissions, 15 (17%) led to the development of a MR-AB infection. The
164 cumulative incidence of MR-AB infection was 6% at 14 days (95% CI 2-12%), and 15% at
165 28 days (95% CI 8-24%) (**Figure 2**). Among 32 patients with MR-AB colonization, 13 (41%)
166 developed MR-AB infection. The cumulative incidence of MR-AB infection among MR-AB
167 colonized patients was 44% at 28 days (95% CI 27-60%) (Data not shown).

168 The median time from admission to onset of infection was 22 days (IQR: 10-26).

169 Characteristics of patients with MR-AB nosocomial infections are described in **Table 1**.
170 Patients presented bloodstream infection (n=9), pneumonia (n=7) in ventilated patients (n=5)
171 or non-ventilated patients (n=2), burn infection (n=3), catheter-related infection (n=3),
172 peritonitis (n=2), bone and joint infection (n=1), bronchitis (n=1). Eight patients had more
173 than one infected site.

174 Of the 15 patients with clinical infection, 13 (87%) had prior documented positive
175 surveillance culture, with a median time between positive surveillance culture and infection of
176 7 days (IQR 3-15). Of the 2 patients without MR-AB colonization at the time of infection, the
177 first patient acquired infection 34 days after admission and had undergone negative
178 surveillance cultures on 21 different days. The second patient acquired infection 5 days after
179 admission and had undergone negative surveillance cultures on 2 different days. Median time
180 between the last negative surveillance culture and infection was 48 hours (24 to 72h) in these
181 two patients.

182

183 *Risk factors of MR-AB infections*

184 Univariate analysis of baseline and time-dependent factors associated with MR-AB infection
185 are presented in **Table 2**. Risk factors of MR-AB infection were SAPS II (CSHR:1.08; 95%
186 CI:1.05-1.12; P<0.0001) and ABSI scores (CSHR:1.32; 95% CI:1.12-1.56; P=0.001), MR-AB
187 colonization (CSHR:10.2; 95%CI:2.05-50.3; P=0.004), invasive procedures (P=0.0001),
188 ventilation (CSHR: 9.69; 95%CI=3.06-30.7; P=0.0001), artery and/or venous catheter
189 (P<0.0001), and ≥ 2 skin grafts (CSHR:10.2; 95% CI:1.76-59.6; P=0.010).

190 Risk factors of MR-AB infection among MR-AB colonized patients in univariate analysis
191 were SAPS II (CSHR=1.06; 95% CI=1.03-1.09; $P=0.0003$) and invasive procedures
192 ($P<0.019$), particularly ventilation ≥ 1 day and catheter.

193

194 *Outcome*

195 The median duration of hospitalization, according to MR-AB infection and outcome (death or
196 alive) is presented in the **Table 3**. MR-AB infection was associated with a longer hospital stay
197 whether patients died during hospitalization or were discharged alive. Indeed, probability of
198 being discharged alive the next day was significantly reduced when MR-AB infected (CSHR
199 for discharge=0.17; 95%CI 0.06-0.49, $P=0.001$), with a median estimated increase of 10 days
200 (IQR: 6; 14) following infection.

201 Considering only patients who were discharged alive, median duration of hospitalization was
202 67 days among the 15 patients who acquired MR-AB infection and 19 days among non-
203 infected patients.

204 Eleven patients (13%) died during hospitalization in the BU. Cumulative incidence of death
205 was 6% at 28 days. MR-AB infection was associated with an increased risk of death (CSHR:
206 7.11; 95%CI: 1.52-33.2; $P=0.013$). Seven of the 15 (46.7%) patients who acquired MR-AB
207 infection died in the BU, after a median of 14 days (range: 5 to 76 days) following diagnosis.
208 Death was related to infection in 4/7 patients (57%), uncertainly related to infection in 2
209 (29%) and unrelated to infection in 1 (14%).

210

211 **Discussion**

212 In this prospective study conducted in a BU during an outbreak of MR-AB, the incidence of
213 MR-AB nosocomial infection was high, 15% at 28 days, and increased to 44% at 28 days
214 among patients with prior colonization (13 of 15 patients (86.6% with nosocomial infection
215 had prior colonization) (**Fig. 2**). Such a high incidence of MR-AB infection despite the
216 implementation of infection control strategies in the BU led to its closure to allow thorough
217 cleaning and hydrogen peroxide disinfection (11). A similar incidence of infection (16.5%)
218 was reported by Latibeaudière et al during an epidemic, and MR-AB colonization was also
219 found in a high proportion (56.7%) of MR-AB infected patients (23).

220 In our study, MR-AB nosocomial infections were associated with a prolonged hospitalization
221 with a median increase of 10 days following infection, similar to previous reports (5).

222 Also, among patients who acquired MR-AB infection, 7/15 (46.7%) died as compared to 4/71
223 (5.6%) without infection (**Fig. 1**). In our study, MR-AB infection were associated with a
224 significant increase in the risk of death (CSHR: 7.11; 95%CI: 1.52-33.2; P=0.013). Wong et
225 al did not find in a retrospective study among patients in a burn unit in Singapore that MR-
226 AB infection was associated to an increased mortality (5). Wisplinghoff et al. reported that the
227 mortality rate in MR-AB infected patients was twice higher than in controls in a retrospective
228 case control study in Germany (24). Our results obtained in the setting of a prospective study
229 strengthen the association between MR-AB and increased risk for death, even though we
230 cannot ascertain in all our cases that death was directly related to MR-AB infection. Death
231 was directly related to infection in 4/7 (57%) of MR-AB infected patients who died.

232 Bloodstream infection and pulmonary infections were the most frequent infections and 12/15
233 (80%) of patients with nosocomial infection had positive blood cultures (**Table 1**). This high
234 death rate in our study is probably related in part to the severity of the patients, the
235 dissemination of the infection, and the limited efficacy of antibiotic therapy against these
236 multi-resistant organisms.

237 It is therefore critical to analyze in such a study risk factors for nosocomial infections in order
238 to try to prevent or diagnose and treat as early as possible these infections, until the outbreak
239 is under control.

240 Due to the limited number of cases (25), we could only perform a univariate analysis of risk
241 factors associated with MR-AB infections and this is a clear limitation of our findings. We
242 found that the severity of patients at admission as measured by the SAPS II and ABSI scores,
243 prior colonization by MR-AB, invasive procedures during hospitalization (ventilation, venous
244 or arterial catheter), and 2 or more skin grafts were strongly associated with an increased risk
245 of infection (**Table 2**). In an exploratory analysis to should be interpreted and generalized

246 with caution (25), we found that prior colonization by MR-AB remained significantly
247 associated with MR-AB infection (HR= 5.95, 95%CI 1.11-31.9, p=0.037), when adjusted in
248 ABSI scores to account for illness severity. Similarly, MR-AB infection association with ICU
249 death remained close to the 5%-significance level after adjustment on ABSI score (HR=5.84,
250 95%CI 0.96; 1.56, P=0.056).

251 Our results confirm the results of previous studies in intensive care units that have identified
252 the severity of illness/comorbidity, invasive procedures, mechanical ventilation, long duration
253 of hospital stay (26,27), and the role of prior MR-AB colonization (23,28). Our study
254 however, is the first prospective study assessing risk factors of MR-AB infection in a burn
255 unit.

256 Contrary to previous reports, prior exposure to antimicrobials was not a risk factor for
257 infection in our study but was associated with an increased risk of colonization (11, 26). A
258 previous study conducted in Brazil, where MR-AB colonization is endemic, found that use of
259 antimicrobials was a risk factor for acquisition of MR-AB only when colonization pressure
260 (proportion of patients harboring the microorganism) was low (29). Thus, the absence of
261 association between antimicrobials and MDR-AB infection could be explained either by low
262 sensitivity of analysis (due to small number of infection events) or by high colonization
263 pressure during the outbreak.

264 However, the role of prior colonization leading to infection is reinforced in our prospective
265 study since 13/15 (87%) patients with infections had prior colonization, and the CSHR for
266 infection in colonized patients was significantly greater than 1 (10.2; 95%CI: 2.05-50.3;
267 P=0.004). Latibeaudiere et al in their retrospective studies have previously reported that
268 positive surveillance cultures were the only variable associated with infection in a
269 multivariate analysis (23). The role of these surveillance cultures during an outbreak is
270 therefore critical to identify early colonization and patients at high risk for these life-
271 threatening infections. Nineteen MR-AB colonized patients did not develop an infection.
272 These patients were less severe patients with fewer invasive devices as compared to MR-AB
273 colonized patients who develop a MR-AB infection. Once a patient is colonized, the reduction
274 in invasive procedures may limit the risk of transition from colonization to infection.
275 However, this is difficult to apply in severe burn patients.

276 Another risk factor for infection in our study in a BU was the number of skin grafts. Indeed
277 patients who underwent 2 or more skin grafts had a higher risk of MR-AB infection (CSHR:
278 10.2; 95% CI:1.76-59.6; P=0.010). This risk factor has not been previously reported to be
279 associated with an increased risk of MR-AB infection. The number of skin grafts needed in a
280 burned patient is clearly linked to the severity of burns as measured by the ABSI score. In our

281 univariate analysis, it is therefore difficult to know whether the number of skin grafts is a
282 confounding factor, a proxy of burn severity, and further studies should try to address this
283 issue.

284 In conclusion, this prospective study found a very high incidence of MR-AB nosocomial
285 infection during an outbreak in a BU, associated with prolonged hospitalization and increased
286 risk for death in those infected. Surveillance cultures should be performed to identify
287 colonized patients in whom the risk of MR-AB infection is greatly increased, especially in
288 those with a severe injury as assessed by SAPS II and ABSI scores, those undergoing multiple
289 skin grafts, or various invasive procedures. As it seems difficult to limit the number of skin
290 grafts or invasive procedures needed to manage severely burned patients, prevention of MR-
291 AB colonization remains critical. As reported earlier, since the use of antibiotic therapy is
292 strongly associated with colonization (14), its use should therefore be limited as much as
293 possible during an outbreak.

294

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301

302 **Conflict of Interest**

303 All authors declare they have no conflict of interest.

304

305 **Ethical approval**

306 The ethical committee of the hospital deemed specific approval for this study unnecessary

307

308 **Informed consent**

309 Not applicable (as discussed with the institutional medical ethical committee).

310

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patient	age	sex	infection	MR-AB isolation	delay after admission	treatment of MR-AB infection episode	duration of treatment	outcome	time btw infection and death	death related to infection
1	66	H	VAP	tracheal aspiration	10	colimycin + aminosides + colimycin aerosols	9	discharge alive	—	—
2	34	H	CRI + VAP	blood culture + tracheal aspiration	25	colimycin + colimycin aerosols	8	discharge alive	—	—
3	58	H	BSI +Ventilator-associated bronchitis	blood culture + tracheal aspiration	21	colimycin aerosols + aminosides	5	discharge alive	—	—
4	41	H	BSI + burn infection	blood culture + cutaneous sample	17	colimycin + colimycin aerosols	14	discharge alive	—	—
5	56	F	CRI	blood culture	35	colimycin	8	discharge alive	—	—
6	17	F	CRI	blood culture + catheter	20	colimycin	8	discharge alive	—	—
7	73	H	BSI	blood culture	23	colimycin	31	discharge alive	—	—
8	56	F	pneumonia + BJI + BSI	blood culture + tracheal aspiration + bone sample	33	colimycin + colimycin aerosols	11	death	11	yes
9	39	H	BSI + burn infection	blood culture + cutaneous sample	5	colimycin + aminosides + colimycin aerosols	22	death	76	uncertain
10	28	H	2nd episode peritonitis	peritoneal fluid	58	colimycin + colimycin aerosols	12	death	23	uncertain
11	54	F	BSI + burn infection	blood culture + cutaneous sample	26	colimycin + aminosides + colimycin aerosols	12	death	12	yes
12	51	F	BSI + VAP + peritonitis	blood culture + tracheal aspiration + peritoneal fluid	22	colimycin + aminosides + colimycin aerosols	16	death	16	yes
13	67	H	pneumonia	tracheal aspiration	25	colimycin + colimycin aerosols	6	death	6	yes
14	62	H	VAP	tracheal aspiration	9	colimycin + aminosides + colimycin aerosols	6	death	14	uncertain
15	30	H	BSI	distal pulmonary sample	0	colimycin + colimycin aerosols	11	death	20	no
				blood culture	0	colimycin	8	discharge alive	—	—

Table 1. Characteristics and outcome of MR-AB infections

CRI: catheter -related infection

VAP: Ventilator-associated pneumonia

BSI: Bloodstream infection

BJI: bone and joint infection

Univariate Analysis					
Variables	All patients	No MR-AB infection	MR-AB infection	CSHR (95% CI)	P value
	n=86	n=71 (83)	n=15 (17)		
Baseline characteristics					
Median age, y	46 (30 ; 58)	46 (30 ; 58)	53 (36 ; 60)	1.00 (0.98 ; 1.03)	0.75
Male gender	53 (62)	43 (61)	10 (67)	1.55 (0.53 ; 4.57)	0.43
At least 1 comorbidity	34 (40)	24 (34)	10 (67)	2.25 (0.77 ; 6.62)	0.14
Diabetes	8 (9)	7 (10)	1 (7)		
Cancer	4 (5)	2 (3)	2 (13)		
Chronic pulmonary disease	3 (3)	1 (1)	2 (13)		
Chronic heart failure	3 (3)	2 (3)	1 (7)		
Psychiatric disorder	18 (21)	11 (15)	7 (47)		
HIV infection	1 (1)	1 (1)	0 (0)		
Obesity	4 (5)	3 (4)	1 (7)		
Admission mode					
Community	58 (67)	47 (66)	11 (73)		
Hospital	28 (33)	24 (34)	4 (27)	0.64 (0.20 ; 2.01)	0.44
Median SAPS II	20 (15 ; 32)	17 (12 ; 24)	41 (27 ; 50)	1.08 (1.05 ; 1.12)	<0.0001
Median ABSI ^a	6 (5 ; 8)	6 (5 ; 7)	9 (7 ; 10)	1.32 (1.12 ; 1.56)	0.001
Prior antibiotic use (within 7 days)	21 (24)	16 (23)	5 (33)	1.34 (0.46 ; 3.93)	0.59
MR-AB colonization on admission	9 (10)	5 (7)	4 (27)		
Time-dependent characteristics^b					
MR-AB colonization (previous day)	32 (37)	19 (27)	13 (87)	10.2 (2.05 ; 50.3)	0.004
Invasive procedure (≥ 1 day)	65 (76)	50 (70)	15 (100)	-	0.001*
Ventilation (≥ 1 day)	31 (36)	18 (25)	13 (87)	9.69 (3.06 ; 30.7)	0.0001
Catheter	48 (56)	33 (46)	15 (100)	-	<0.0001*
≥2 skin grafts during the stay ^c	25 (29)	14 (20)	11 (73)	10.2 (1.76 ; 59.6)	0.01
Antibiotic treatment ≥1 day ^d	39 (45)	27 (38)	12 (80)	6.04 (0.76 ; 48.3)	0.09

Table 2. Characteristics of patients and univariate analysis of the association with MR-AB infection, estimated using cause specific hazard ratios (CSHR).

^a Estimations among burn patients only (n=68)

^b Exposure to time dependent characteristics estimated from admission to first outcome (colonization, death or discharge alive)

^c CSHR for ≥ 2 skin grafts vs < 2 skin grafts (reference)

^d ≥ 1 day of antibiotics; duration is reported in days, with median (interquartile range)

* All infections occurred in patients with exposure (invasive procedures and catheter respectively). CSHRs had infinite values; P-values correspond to the score test in a Cox regression model.

Data are presented as No. (%) unless otherwise specified.

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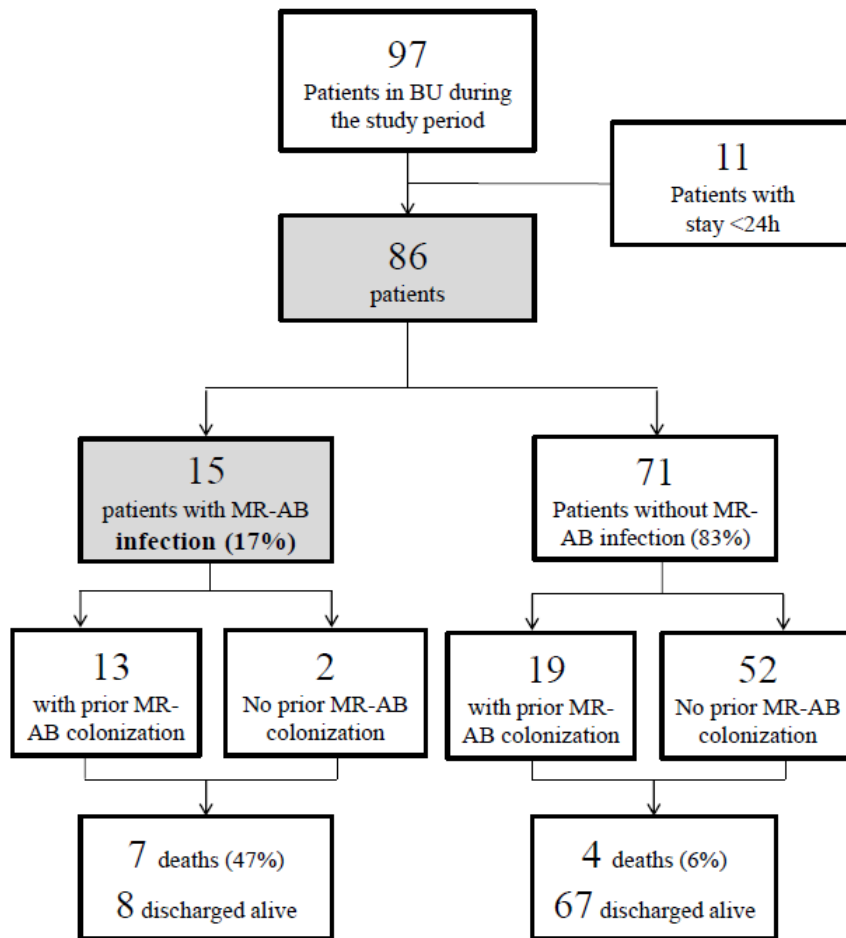
End of stay status	All N=86	No MR-AB infection N=71	MR-AB infection N=15
Death	31 (3 ; 82)	8.5 (3 ; 43)	39 (21 ; 82)
Discharge alive	21 (2 ; 105)	19 (2 ; 76)	67 (9 ; 105)

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4 **Table 3. Median length (min; max) of hospital stays in days according to MR-AB infection and**
5 **outcome (death or discharged alive)**

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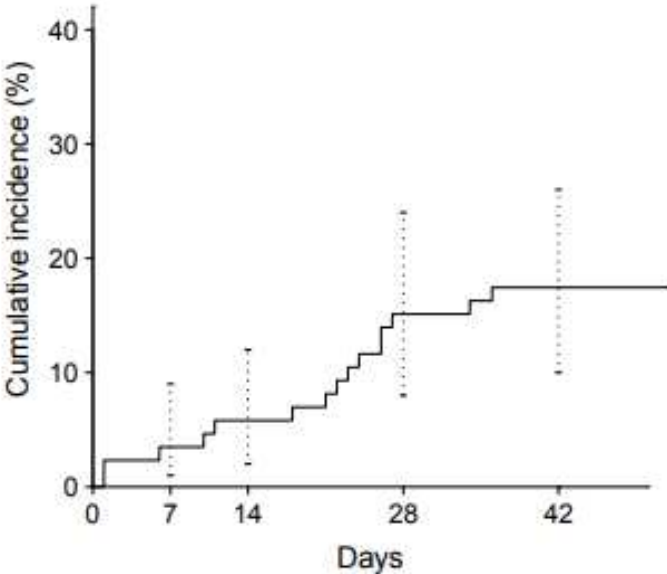
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Figure 1. Study flow chart.

BU: Burn Unit
MR-AB: Multi-Resistant *Acinetobacter baumannii*



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27 **Figure 2. Cumulative incidence of MR-AB infections during hospitalization. (Vertical**
28 **segments represent 95% confidence intervals of the cumulative incidence at 7, 14, 28 and**
29 **42 days)**

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