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ePoster Viewing

Microbial pathogenesis & virulence

The enhanced sensitivity of *Acinetobacter baumannii* strains resistant to bactericidal activity of normal human serum after exposure to the subminimal inhibitory concentrations of antibiotics

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Background: The aim of this study is to evaluate the *in vitro* effect of subminimal inhibitory concentrations (subMICs) of antibiotics on the sensitivity of *Acinetobacter baumannii* clinical isolates to the bactericidal activity of the normal human serum (NHS). Similar antibiotic's subMICs effects was described previously but the role of the sub lethal antibiotics concentrations on the *A. baumannii* pathogenicity in the era of multiresistant strains is uncertain, especially with the last resort antibiotics or some other unconventional antibiotics which don't render inhibitory concentrations and aren't used for the treatment of *A. baumannii* infections.

Material/methods: Sixty five non duplicate clinical isolates of *A. baumannii*, resistant to the bactericidal activity of the NHS were included in the study. They were exposed to the 1/2, 1/4, 1/8 and 1/16 of previously determined minimal inhibitory concentrations (MICs) of imipenem, ampicillin/sulbactam, azithromycin, rifampicin and colistin. After the overnight exposure of the tested bacterial strains to the subMICs of antibiotics, suspensions were pelleted, twice washed in the phosphate buffered saline (PBS) and afterwards exposed to the bactericidal effect of the NHS at 37°C. After two hour exposure to the serum, 100 µl of the prepared suspension were transferred to Mueller-Hinton agar plate and overnight incubated at 37°C in aerobic conditions. The colony forming units (cfu) was determined and the percentage of the bacterial reduction was calculated in comparison to the bacterial suspensions exposed to the heat inactivated serum (HIS) within the same conditions (2 h/37°C/air). The reduction of the cfu ≥ 90% was considered as significant.

Results: The observed frequencies of the enhanced bactericidal activity of NHS to tested *A. baumannii* strains after their exposure to the 1/2, 1/4, 1/8 and 1/16 concentrations of MIC are presented in Table 1.

Table 1. The effect of subMICs of antibiotics on the serum sensitivity of the serum-resistant *A. baumannii* strains isolated from various clinical samples (total of 65 strains)

subMICs

ANTIBIOTIC	1/2		1/4		1/8		1/16	
	N	χ^2	N	χ^2	N	χ^2	N	χ^2
IMIPENEM	4	2.25	1	0	0	-	2	0,5
AMPICILLIN/SULBACTAM	14	12.07*	12	10.08*	10	8.1*	10	8.1*
AZITHROMYCIN	14	12.07*	11	9.09*	11	9.09*	10	8.1*
RIFAMPICIN	5	3.2	3	1.33	5	3.2	5	3.2
COLISTIN	5	3.2	3	1.33	0	-	1	0

*Chi square test with Yates' correction if frequency is less than 20, $p < 0.05$; N = number of serum-sensitive strains after exposure of subMIC of selected antibiotic.

Conclusions:

The results of this study indicate that the subminimal inhibitory concentration of ampicillin/sulbactam and azithromycin enhances the bactericidal activity of the normal human serum, whereas imipenem, rifampicin and colistin have not exhibited the same ability.