TEN-YEARS RESISTANCE TRENDS OF NOSOCOMIAL *Acinetobacter* spp. IN RUSSIA

P 1717

[1] Institute of Antimicrobial Chemotherapy, (IAC), Smolensk State Medical Academy

A. Martinovich[1] N. Ivanchik[1] O. Kretchikova[1] G. Reshedko[1] E. Riabkova[1] M. Edelstein[1] R. Kozlov[1]

alex.martinovich@antibiotic.ru

INRODUCTION AND PURPOSE

Acinetobacters, particularly *A. baumannii*, are now one of the most frequently encountered nosocomial pathogens, and are renowned for being difficult to treat because of resistance to most antibiotics. In Russia, the prevalence of *Acinetobacter* spp. among all Gram-negative nosocomial pathogens increased from 7.3% in 1997-99 to 15.0% in 2006-07. The aim of this study was to assess the trends in antimicrobial resistance of nosocomial *Acinetobacter* spp. in Russia over the period of 1997-2007.

METHODS

- A total of 997 consecutive non-duplicate (one per patient) nosocomial isolates of *Acinetobacter* spp. were collected as part of the national surveillance studies in Russia during the following periods: 1997-1999 (n=203), 2002-2004 (n=464), and 2006-2007 (n=330). The geographic location of the hospitals where the strains were isolated is shown in Figure 1.

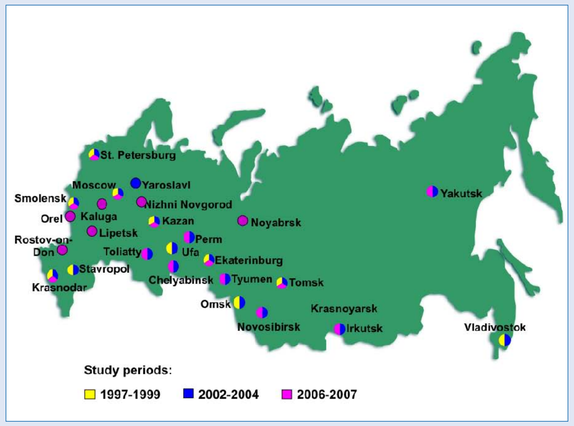

Figure 1. **Geographic location of the of the hospitals where *Acinetobacter* strains were isolated**

- Isolates were identified using the VITEK 2 Compact (bioMérieux) and Phoenix (BD) systems.
- The susceptibilities of isolates to various antimicrobial agents were determined by agar dilution method and interpreted according to EUCAST clinical breakpoints (v 1.4; 2008-06-19). Strains of *E. coli* ATCC® 25922 and *P. aeruginosa* ATCC® 27853 were used for quality control of susceptibility testing.

RESULTS

- The antimicrobial susceptibility of *Acinetobacter* isolates is summarised in Table 1 and Figures 2-3.

Table 1. **In vitro susceptibilities of *Acinetobacter* strains**

Drug	Years	% of isolates with indicated MIC (0.03 0.06 0.13 0.25 0.5 1 2 4 8 16 32 64 128 256 512)	% of isolates S	I	R	MIC, mg/l 50%	90%
Amikacin	1997-1999	0.5 1.5 3.4 15.8 52.2 13.8 1.5 2.0 2.0 1.0 2.5 3.9	88.6	2.0	9.4	2	16
	2002-2004	0.6 0.9 9.9 17.5 4.7 1.3 4.5 8.0 20.9 22.0 9.7	33.6	1.3	65.1	128	256
	2006-2007	0.3 1.2 7.3 7.6 4.2 0.3 0.9 1.2 13.3 24.2 39.4	20.6	0.3	79.1	256	≥512
Gentamicin	1997-1999	4.9 7.9 10.3 3.9 3.9 7.4 5.9 14.8 12.8 6.4 21.7	31.0	--	69.0	32	≥256
	2002-2004	0.2 0.2 5.6 2.4 2.8 5.0 2.8 5.0 12.1 14.9 49.1	11.2	--	88.8	128	≥256
	2006-2007	0.6 0.9 5.8 2.4 6.1 7.6 3.9 4.8 9.1 12.4 46.4	15.8	--	84.2	128	≥256
Ciprofloxacin	1997-1999	0.5 1.0 15.8 13.3 16.3 22.2 3.0 1.0 6.4 3.9 15.8 0.0 0.0 1.0	69.0	--	31.0	1	32
	2002-2004	1.1 3.4 3.9 10.1 7.9 0.9 4.1 9.1 2.6 3.0 15.9 38.1	26.3	--	73.7	64	≥128
	2006-2007	0.9 3.3 2.4 1.8 1.2 0.9 5.2 5.8 3.9 16.1 58.5	8.4	--	91.6	≥128	≥128
Imipenem	1997-1999	7.4 26.1 34.0 23.2 6.4 0.5 0.0 0.5 2.0	97.0	0.5	2.5	0.5	1
	2002-2004	0.9 8.8 13.6 48.5 22.2 3.7 0.2 0.6 1.3 0.0 0.2	94.0	3.9	2.1	1	2
	2006-2007	0.3 0.9 2.4 9.7 49.4 32.7 1.8 0.6 1.8 0.3	95.5	2.4	2.1	1	2
Netilmicin	2006-2007	0.9 0.9 15.2 18.5 16.7 26.1 13.9 3.9 1.2 0.0 2.7	52.2	--	47.8	4	16

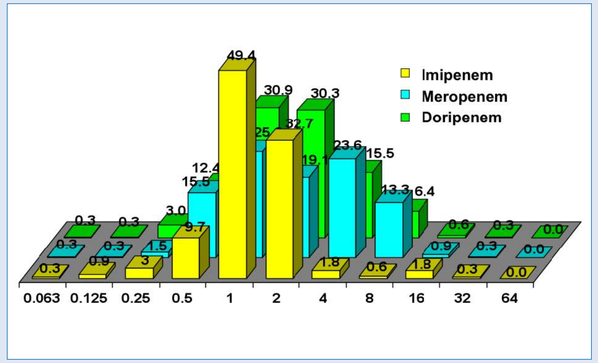

Figure 2. **MIC distributions of carbapenems for *Acinetobacter* strains isolated in 2006-07**

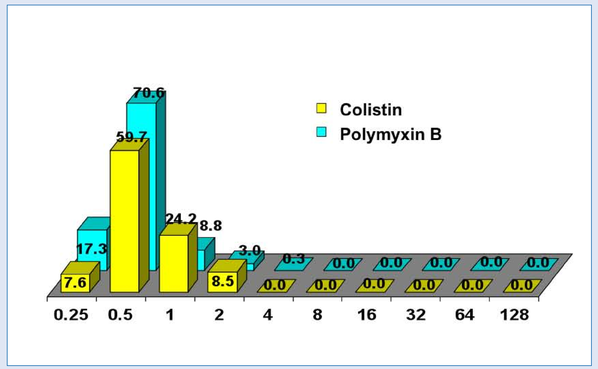

Figure 3. **MIC distributions of polymyxins for *Acinetobacter* strains isolated in 2006-07**

- A constant increase in resistance rates to ciprofloxacin (from 31.0% to 91.6%), gentamicin (from 69.0% to 84.2%), and amikacin (from 9.4% to 79.1%) was observed from 1997/99 to 2006/07. The in vitro activity of netilmicin was studied only in the years 2006-07. In this period, netilmicin was the most active among aminoglycosides (52.2% susceptible isolates).

- Most notably, carbapenems (imipenem, meropenem and doripenem) demonstrated high activities against the majority of *Acinetobacter* strains. The percentage of isolates non-susceptible to imipenem remained relatively low over the 10-years: 3.0% in 1997-99, 6.0% in 2002-04, and 4.5% in 2006-07. The MICs of individual isolates were generally 1 or 2 two-fold dilutions lower for imipenem than for meropenem and doripenem reflecting higher intrinsic susceptibility of acinetobacters to imipenem. According to EUCAST clinical breakpoints, the susceptibly rates to imipenem, meropenem and doripenem in 2006-07 were, respectively, 95.5%, 61.9%, and 46.9% (Figure 2).

- Polymyxins (colistin and polymyxin B) were the most active in vitro among all antibiotics tested. The MIC distributions of colistin and polymyxin B were similar (Figure 3). No colistin-resistant isolates were detected in 2006-07.

CONCLUSIONS

- The rapid increase in antimicrobial resistance, particularly to ciprofloxacin and amikacin, in nosocomial strains of *Acinetobacter* spp. in Russia is noteworthy.

- Based on results of in vitro surveillance studies carbapenems (especially imipenem), and polymyxins may be still considered as effective treatment for nosocomial *Acinetobacter* infections.