M ULTICENTER ANALYTICAL STUDY ON INVESTIGATING MEDICAL PROFESSIONALS' PERCEPTION ABOUT INFECTION CONTROL (IC) IN VARIOUS WARDS OF MULTIDISCIPLINARY HOSPITALS IN RUSSIA Paper # 2309

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

2 E. D. AGAPOVA¹, N. A. BAZIKINA², E. N. BOCHANOVA³, S. F. IVANOVA⁴, N.V. KLIMOVA⁵, T. V. KOMISSAROVA⁶, L. N. KOPITKO³, N. K. KRONSHTOFIK⁷, O. B. LEVIN⁶, D. V. LOPUSHOV⁸, E. S. MANEEVA⁹, P. V. MARUTIN¹⁰, Z. Z. MUNASIPOV¹¹, G. I. NEKHAEVA², T. A. NIKOLAEVA¹², E. A. ORTENBERG¹³, SH. H. PALUTIN¹⁴, E. S. PASECHNIK¹⁵, A. A. PETROVA¹⁶, M. V. PRIGORODOV¹⁷ L. A. ROGOZINA¹⁸, S. V. SKALSKIY¹⁹, T. N. SUBOROVA²⁰, Y. S. SHAPOVALOVA²¹, A. N. TOLKACHEV²², I. A. TOROPOVA²³, G. S. VALISHINA²⁴, N. V. VLASOVA²⁵, N. A. ZUBAREVA²⁶

INTRODUCTION AND PURPOSE

Prediction made by Central Research Institute of Epidemiology of Federal Agency for Protection of Consumer Rights estimated that annual number of nosocomial infections (NI) in Russia is not less than 2–2.5 million cases with total annual costs more than 212 millions of USD [1].

Valuing a global world trend to the increase in NI morbidity, mortality and costs, reducing NI is now considered to be an inherent part of patient safety and quality of care. High-quality carrying out of IC programs prevents 20% and 40% of NI in developed and developing countries correspondingly [2-6].

Unfortunately in most developing countries the delivery of IC services and as a result an adequate compliance to IC measures in hospitals is not always satisfactory. It can be explained by series of causes: administrative system indifference, resources shortage, circumambiency restrictive factors, personal, group and public characteristics etc. [7, 8].

Taking into account the lack of data on physicians' perceptions on NI problem and adherence to IC measures in Russia we aimed our study to assess knowledge on NI and common practices of IC among physicians in Russian hospitals.

METHODS

The study was conducted in 38 hospitals from April to August 2007. Project coordinators worked in each of 23 cities and distributed questionnaires among medical doctors. Data were than collected and analyzed at the institute of Antimicrobial Chemotherapy (IAC) of Smolensk State Medical Academy.

RESULTS

Out of 1,398 physicians' questionnaires 83.0% (n=1,162) were from university based hospitals (UBH) and 16.6% (n=232) from non-university based (NUBH) ones. No information was provided in 0.4% (n=6).

1,346 physicians (96.3%) to the question «What is a correct definition to «antimicrobial resistance (AR)«?» answered «Microorganism resistance to antibiotic», 38 physicians (2.7%) – «Antibiotic resistance to

microorganism» and 14 physicians (1.0%) – «Microorganism non-resistance to antibiotic».

Distribution of clinicians' perceptions on the problem of AR is shown in Table 1.

Table 1. *Distribution of clinicians' answers to «Indicate is AR a ...?» (n/%)*

Answer	National problem	My hospital problem	My unit problem
Yes	1,164 (83.2)	1,164 (83.2)	700 (50.0)
No	126 (9.0)	126 (9.0)	335 (24.0)
Not sure	107 (7.7)	107 (7.7)	349 (25.0)
Not indicated	1 (0.1)	1 (0.1)	14 (1.0)

Presence of local (clinic/unit) guidelines on antimicrobial chemotherapy for patients with NI is represented in Figure 1. It was more in UBH than in NUBH (42.3% vs. 23.7% (p<0.0001) and adherence to local guidelines indicated by physicians who answered «Yes» was 76.3% on average.



Figure 1. Distribution of clinicians' answers to «Are there any guidelines on antimicrobial chemotherapy for patients with NI in your hospital/unit?» (%)

Answers to «What is the drug of choice in MRSA infections management?» were: vancomycin - 44.1% (n=1062), linezolid - 19.0% (n=457), imipenem - 16.7% (n=403), ciprofloxacin - 11.1% (n=267), oxacillin - 5.8% (n=139) and co-trimoxazole - 3.4% (n=82); to «What is the drug of choice in ESBL infections management?» - cefoperazone/sulbactam -

28.7% (n=775), amoxicillin/clavulanic acid - 27.3% (n=735), imipenem - 25.4% (n=686), cefepime - 9.7% (n=261), ceftazidime - 6.0% (n=163) and aztreonam - 2.9% (n=77).

Thirty two and seven percent (n=457) of respondents indicated «Medical personnel contaminated hands» as the most frequent way of nosocomial antibiotic-resistant pathogens transmission from patient to patient, 35.9% (n=502) - «Contaminated equipment contact» and 31.4% (n=439) - «Airborne».

Distribution of respondents answers to the questions «Which of the following pathogens are able to survive in the environment of the patient for a long time (for weeks)?» and «Which of the following microorganisms can be potentially transmitted from patients to clinical staff if appropriate glove use and hand hygiene are not performed?» is represented in Table 2 and 3 respectively

Table 2. Distribution of clinicians' answers to «Which of the following pathogens e able to survive in the environment of the patient for a long time (for weeks)?»		
Microorganism (-s)	n/%	
Escherichia coli	310 (8.9)	
Klebsiella spp.	412 (11.9)	
Clostridium difficile	407 (11.7)	
MRSA	825 (23.7)	
Enterococcus spp.	241 (6.9)	
Pseudomonas aeruginosa	895 (25.7)	
Acinetobacter spp.	386 (11.1)	

• Table 3. Distribution of clinicians' answers to «Which of the following microorganisms can be potentially transmitted from patients to clinical staff if appropriate glove use and hand hygiene are not performed?»

Microorganism (-s)	n/%
Hepatitis B virus	285 (7.6)
Salmonella spp.	626 (16.6)
Escherichia coli	836 (22.2)
Klebsiella spp.	399 (10.6)
MRSA	706 (18.8)
Enterococcus spp.	481 (12.8)
Pseudomonas aeruginosa	427 (11.4)



¹State Children Clinical Hospital, Irkutsk, ²City Clinical Emergency Hospital No. 10, Voronezh, ³Regional Clinical Hospital, Omsk, ⁵Amur State Medical Academy, Blagoveshchensk, ⁷State Regional Clinical Hospital, Novosibirsk, ⁶Clinical Emergency Hospital, Smolensk, ⁸Regional Healthcare Department, Kazan, ⁹Regional Hospital No. 1, Vladivostok, ¹⁰Regional Hospital, Toksovo, Vsevolojskiy area, Leningradskaya region, ¹¹Central Medico Sanitary Department No. 15, Snejinsk, ¹²City Clinical Hospital No. 5, Tolliati, Tumen, ¹⁴Yaroslavl State Medical Academy, Yaroslavl, ¹⁵Regional Clinical Hospital, Kaluga, ¹⁶Regional Clinical Hospital, Barnaul, ¹⁷Saratov Army Medical Institute, Saratov, ¹⁸City Clinical Hospital No. 1, Norilsk, ¹⁹Omsk State Medical Institute, Saint-Petersburg, ²¹Road Clinical Hospital, Chelyabinsk, ²²City Clinical Hospital No. 1, Smolensk, ²³Republican Hospital No. 2, Yakutsk, ²⁴Healthcare department, Kazan, ²⁵Emergency Hospital, Krasnodar, ²⁶E.A. Vagner Perm State Medical Academy, Perm

respondents' answers is shown in Figure 2.

Figure 2. Average disinfectants usage frequency in UBH and NUBH (%)

The most frequent answer to «Which of the following statements about alcohol-based products is accurate?» was given by 37.8% (n=528) of respondents («Dry the skin more than repeated hand washing with soap and water»), 18.5% (n=259) of respondents answered «Cause stinging of the hands due to pre-existing skin irritation», 17.5% (n=245) -«Kill bacteria less rapidly than chlorhexidine gluconate», 16.6% (n=232) – «Effective even when the hands are visibly soiled» and 9.6% (n=134) - «Cause more skin allergy than chlorhexidine gluconate».

According to participants' answers WHO recommended duration of entire procedure of hand hygiene with alcohol hand rub solution in 45.3% of answers was 2-4 minutes, in 35.1% - 40 seconds-1 minute, in 11.9% - 20-30 seconds and in 7.7% - 5-9 minutes; with soap and water in 55.2% of cases was 2-4 minutes, in 21.9% - 5-9 minutes, in 18.1% - 40 seconds-1 minute and in 4.8% - 10-15 minutes.

CONCLUSIONS

1. More than 80.0% of respondents consider antimicrobial resistance to be the national problem whereas only 59.6% and 50.0% consider it to be the hospital and unit problem correspondingly. This difference can be partly explained by the insufficiency of physicians' disquietude and comprehension on antimicrobial resistance problem. The latter also can be responsible for comparatively low professionals' knowledge level on and compliance with hospital infection control measures revealed in that study.

214019, Russian Federation, Smolensk, 28 Krupskaya Street, P.O. Box 5; Phone: +7-4812-450602; Fax: +7-4812-450602 (extension number 123)

2. This was the one of the first studies to evaluate professionals' knowledge level on nosocomial infections topic and current situation with infection control in Russian hospitals that showed that education of physicians and feed-back seminars carrying out on nosocomial infections problems and infection control measures with intake of administrative resources for implementation of such programs are of prime necessity.

Support for this publication was provided in part by the FLEX Alumni Grants Program, which is funded by the Bureau of Educational and Cultural Affairs of the United States Department of State (ECA) and administered by the American Councils for International Education: ACTR/ACCELS. The opinions expressed herein are the author's own and do not necessarily express the views of either ECA or the American Councils for International Education

REFERENCES

1. R. S. Kozlov, G. K. Reshedko. Nosocomial infections. In: L. S. Stratchounski, Y. B. Belousov, S. N. Kozlov, editors. Practical guidelines on anti-infective chemotherapy. Smolensk: IACMAC; 2007. p. 324-326

2. Levy S. B., Marshall B. Antibacterial resistance worldwide: causes, challenges and responses Nat Med 2004; 10(12 Suppl): **S122-9**

3. Wise R., Hart T., Cars O., e.a. Antimicrobial resistance is a major threat to public health Br Med J 1998; 317: 609-10.

4. A Guide to Infection Control in the Hospital. An official publication of the International Society for Infectious Diseases. 2nd edition. Editors: R. Wenzel, T. Brewer, J-P. Butzler. BC Decker Inc Hamilton, London, 2002

5. Stone P., Braccia D., Larson E. Systematic review of economic analyses of health care-associated infections. Am J Infect Control 2005; 33(9): 501-509

6. Plowman R. P., Graves N., Griffin M. A. S., e.a. The rate and cost of hospital-acquired infections occurring in patients admitted to selected specialties of a district general hospital in England and the national burden imposed. J Hosp Infect 2001; 47(3):198-209

7. Damani N. Simple measures save lives: An approach to infection control in countries with limited resources. J Hosp Infect 2007; 65(S2): 151-154

8. Pittet D., Mourouga P., Perneger T. V. Compliance with handwashing in a teaching hospital. Ann Intern Med 1999; 130:126-13**0**