

HIV- Related Knowledge, Attitudes and Practice among Health Care Workers in Montenegro

Zorana Gledović¹, Božidarka Rakočević², Boban Mugoša² and Anita Grgurević¹

¹ University of Belgrade, Faculty of Medicine, Institute of Epidemiology, Belgrade, Serbia

² Institute of Public Health, Podgorica, Montenegro

ABSTRACT

The objective of the present study was to assess HIV-related knowledge, attitudes and practice of health care workers (HCWs) in Montenegro. A cross-sectional study was conducted in the University Clinical Centre of Montenegro in Podgorica. A self-administered anonymous questionnaire was used for data collecting. Out of 526 HCWs, 422 were included in the survey and response rate was 80%. An insufficient level of knowledge on HIV transmission and the risk after exposure was observed generally, although the knowledge was better in physicians compared to other HCWs categories. A rather high proportion of HCWs showed inappropriate attitude regarding the need of HIV testing of all hospitalized patients (64.7%) and obligation of HIV+ patient to report his/her HIV status (88.9%) in order to practice universal precaution. Additionally, 6.2% HCWs would refuse to treat an HIV+ patient. More than a half (55.7%) of study participants were educated in HIV/AIDS and 15.9 % of them were HIV tested. Majority of HCWs (67.5%) always applied universal precautions during their daily work with patients. In spite of applying protective devices, number of accidents was great. A continuous education is necessary to increase the level of knowledge of HCWs about the risk of infection at the workplace. This would potentially influence the modification of their attitudes regarding HIV patients and improve prevention at the workplace. Continuous research regarding the professional risk would provide better health and safety among medical staff.

Key words: health care workers, knowledge, attitudes, HIV

Introduction

Since the onset of HIV epidemic, there has been a double challenge for health care workers (HCWs) in terms of their relation to patients and the need to protect themselves through the use of safer procedures in every day practice. Stigma surrounding individuals with HIV/AIDS and fear are key elements that contribute to the negative attitudes of HCWs regarding HIV. Since 1990s a number of Knowledge, Attitudes and Practice (KAP) studies related to HIV have been conducted^{1,2}, but their validity, reliability and generalizability have been questioned^{3,4}. Furthermore, in prospective studies conducted in health care settings, the average risk of HIV transmission after a percutaneous exposure to HIV- infected blood was estimated at approximately 0.3%, while after a mucous membrane exposure was in the range of 0.03% to 0.09%^{5,6}. Cases of HIV transmission after exposure of damaged skin have been confirmed, but the average risk of transmission was estimated to be less than the risk of exposure through the mucous membranes⁷. The risk of HIV trans-

mission via bodily fluids or tissues is probably much smaller than exposure via blood of HIV infected person⁸.

The objective of this study was to assess the knowledge, attitudes and behavior of health care professionals, in the Clinical Center of Montenegro in Podgorica in relation to risk of HIV infection at the workplace.

Material and Methods

Study population

A cross-sectional study was conducted in the University Clinical Center of Montenegro in Podgorica during the months of February and March 2009. The research covered health care workers exposed to infections that are transmitted via blood. The participants were selected from following departments:

1. Surgery (General Surgery, Center for Cardiosurgery, Orthopedics, Gynecology and Obstetrics, Emergency Center, Neurosurgery, Dental surgery, Urology, Ophthalmology, Otorhinolaryngology and Maxillo-facial surgery).
2. Laboratory branches (Laboratory Diagnostics, Pathology and Forensic Medicine);
3. Non-surgical branches (Clinic for Infectious Diseases, Hematology, Blood Transfusion, Nephrology, Department of Anesthesia, Resuscitation and Pain Therapy).

Out of 526 health care workers permanently employed in Clinical center of Montenegro, 422 completely answered the questionnaire and response rate was 80%.

Data collection

In order to collect data on knowledge, attitudes and behavior of HCWs related to HIV, structured questionnaire was prepared. The questionnaire was pilot tested to ensure that all questions were reliable. To provide test-retest reliability, before the starting study, 15 randomly selected HCWs completed the survey. These participants agreed to complete a questionnaire again three week later. Spearman correlation coefficient of test-retest reliability was over 0.74 for all questions. The questionnaire was accompanied by a cover letter explaining the aim of the study in order to increase participation rate. Medical workers in selected departments of the Clinical Centre of Montenegro received anonymous, self administered questionnaires which were collected the following day. In the case that on the day of testing, not all of the workers were in shifts, the questionnaires were given to them upon arrival to work. The HCWs who, at the time of the survey, were on sick leave or vacation received questionnaires after coming back to work, no later than mid April 2009. The consent for participation was implied by returning the completed questionnaire. The study protocol, as well as the questionnaire was approved by the University Research Ethics Committee in Podgorica. The majority of the questions have been widely used and reported in the literature¹.

Questions were divided into the following groups: demographic characteristics, risk of HIV infection in the workplace, behavior and practices of respondents in relation to exposure to blood-transmitted infectious agents, knowledge about HIV, attitudes toward HIV infected persons, HIV testing and education in the field of HIV / AIDS.

Data analysis

In order to describe the study population in relation to demographic characteristics of respondents, position and length of service, knowledge, attitudes and behavior related to HIV infection, basic statistical methods were used: frequency distribution, measures of central tendency (arithmetic mean, mode, median) and measures of variability (standard deviation). In the analysis of the knowl-

edge section of the questionnaire blank fields or non-encircled items were considered as »don't know«. The statistical significance of variables was assessed by Pearson chi – square (χ^2 -test). Differences were considered statistically significant at $p < 0.05$. Data processing was performed using the software package SPSS 17.0 for Windows (Inc.Chicago, IL. USA).

Results

Table 1 presents selected demographic characteristics of 422 HCWs who participated in the study. The age span of HCWs in our sample was in the interval from 20 to 67 years (mean \pm standard deviation – $\bar{X} \pm SD = 38.0 \pm 10.2$). Among the study participants there were more women (78.2%) than men (21.8%). There were 65 physicians (15.4%), 302 nurses (71.6%), 41 laboratory workers (9.7%) and 14 others (3.3%). The length of employment at the current workplace ranged from a few months to 37 years ($\bar{X} \pm SD = 12.3 \pm 9.6$).

TABLE 1
DEMOGRAPHIC CHARACTERISTIC OF STUDY PARTICIPANTS*

	N	%
Sex		
Male	92	21.8
Female	330	78.2
Age		
20–34	165	39.1
35–44	134	31.7
45–54	105	24.9
≥55	18	4.3
Job Category		
Physician	65	15.4
Nurse	302	71.6
Laboratory technician	41	9.7
Other	14	3.3
Professional experience		
<15 years	213	50.5
>15 years	209	49.5

*Health care workers in the University Clinical Center of Montenegro

Knowledge

Health care workers have presented insufficient level of knowledge concerning the ways of transmission of HIV infection (Table 2). According to the opinion of almost all HCWs, a risk of acquiring infection represents the contact with blood, while about two thirds of them consider a contact with vaginal secretions / semen hazardous. There were no statistically significant differences between doctors and other HCWs in answers regarding the level of risk to acquire HIV depending on the type of exposure, except

TABLE 2
KNOWLEDGE RELATED TO HIV IN HCWs* IN MONTENEGRO

	Correct answer		Do not know N	Correct answer Doctors/Others		p
	N	%		N	%	
Mode of HIV transmission						
Blood	405	96.8	14	100.0/99.1	0.449	
Vaginal secretion/sperm	292	69.2	101	94.7/90.2	0.340	
Saliva/tears	104	24.6	192	53.1/43.1	0.461	
Sweat	157	37.2	211	89.4/69.7	0.025	
Urine	115	27.2	202	72.9/46.5	0.004	
Stool	118	27.9	218	74.5/52.9	0.031	
Type of exposure						
Needle stick	398	94.3	14	100.0/97.1	0.392	
Contact with skin	259	61.4	138	94.5/90.4	0.562	
Contact with eye/mucosa	210	49.8	154	90.4/75.5	0.027	
Is risk after needle stick < 1%?	50	11.8	36	29.0/9.9	<0.001	
What is »window period«?	200	47.4	148	90.9/68.5	0.002	
Are HIV and AIDS different expressions of the same disease?	152	36.0	29	60.7/34.6	<0.001	

* Health care workers in the University Clinical Center of Montenegro

for the contact with eye/mucosa. Correct answer regarding the risk to get HIV after the stitches on the needle contaminated with blood of infected patient (the risk is less than 1%) was obtained from 12% of the participants only. Knowledge of the term »window period« (the period when the serological test is negative and the person is infected with HIV), was better in doctors than in other HCWs (90.9%/68.5%, $p=0.002$). Only 36.0% HCWs answered correctly whether HIV and AIDS are different expressions for the same disease. Medical doctors answered the question more accurately compared to other HCWs ($\chi^2=14.71$, $p=0.001$).

Attitudes and practice

According to the opinion of 64.7% of study participants, all hospitalized patients should be tested for HIV (Table 3). Almost 90% of HCWs believe that HIV-positive patient is obliged to disclose his/her status to a HCW, while 6% would refuse to provide health care to a HIV+ patient. Majority of respondents (82.0%) considered that they should know HIV+ status of patients in order to take appropriate protective measures. Universal precautions at work are practiced at all times by 67.5% HCWs. The proportion of accidents in the year prior to testing was large in spite of applying protective devices. The most frequent risk of getting blood borne infection for HCWs in the previous year was contact with blood through damaged skin and needle sticks. Only 15.9% of HCWs were tested for HIV, while half of them had supplementary education regarding HIV/AIDS before the beginning of the study. The

need for additional education in this field was indicated by 63.9% of study participants.

Discussion and Conclusion

The results of this study indicate an overall insufficient level of knowledge, inappropriate attitudes and inadequate behavior of health workers in the Clinical Center in Podgorica related to HIV. Estimating the risk level of acquiring HIV at work is certainly influenced by the lack of knowledge about the causing agent and its characteristics, including modes of transmission. Lack of knowledge most probably reinforces the fear and influences HCWs to estimate the risk of acquiring HIV higher than it is. Numerous studies on this topic have been conducted among HCWs and the results of most studies indicated insufficient level of knowledge, wrong estimation of own risk as well as the presence of fear and prejudice towards infected and sick people, by so far refusal to take care of them^{1,2,9-12}.

A high percentage (82%) of HCWs in this study, who believes that diagnosis of patients should be revealed, points to the fact that HCWs do not keep sufficient concern of their protection and do not apply universal precaution during work with every patient, regardless to diagnosis. Accidents in the workplace, such as contact with blood through the damaged skin, needle sticks, injuries with sharp objects and spraying blood in the eye or other mucous membrane among our HCWs during the previous year indicate an insufficient use of personal protective equipment while performing high-risk interventions. Similar results were found in studies in Serbia^{13,14}, Bosnia and

TABLE 3
ATTITUDES AND PRACTICE OF HCWs^a IN MONTENEGRO RELATED TO HIV

Attitudes	Statement »I agree«		Doctors/Others %	p
	N	%		
Every hospitalized patient should be tested for HIV	273	64.7	44.6/68.9	<0.001
Patient should be obliged to disclose HIV+ status	375	88.9	83.1/90.7	0.107
HCWs would refuse to care HIV+ patient	26	6.2	7.7/5.9	0.590
Additional protection is necessary if HIV+ status of patient is known	346	82.0	70.8/84.5	<0.001
Practice	N	%	Doctors/Others %	p
HIV exposure in the previous year:				
Contact with blood through damaged skin	225	66.6	67.3/66.4	0.519
Needle stick	182	52.4	49.1/53.1	0.345
Injury with sharp object	138	42.5	24.0/45.8	0.003
Spraying blood in the eye	95	29.4	38.5/27.7	0.083
Universal precautions with every patient	285	67.5	76.6/67.0	0.132
HIV testing	67	15.9	29.2/13.5	0.003
Educated in HIV/AIDS	235	55.7	79.7/52.6	<0.001
Need for additional education	264	63.9	66.7/63.4	0.622

* Health care workers in the University Clinical Center of Montenegro

Herzegovina¹⁵ and Iran¹⁶. Better situation was reported in Germany where 31.4% of HCWs had sustained at least one needle stick injury in the previous 12 months¹⁷. On the other hand, in Afghanistan 72.6% of HCWs had sharps object injuries in the previous year¹⁸.

In the present study, universal precaution while performing interventions was practiced by 67.5% of respondents. Such results may be partially explained by the occasional lack of protective devices, but even more by inadequate behavior as a result of insufficient knowledge about blood-transmitted agents and the benefits of using protective equipment. Similar results were found in the literature^{13,16,19–21}.

Analyzing data on accidents at work could help identify risks factors for their occurrence and could help prevent re-injuries of workers when performing the same or other medical procedures. That is, regular reporting and monitoring of the injuries in the workplace provide insight into gaps in work, identifying the medical equipment which cause injuries of HCWs, and procedures during which those injuries occur. Exposure Prevention Information Network exists in the USA, Canada, Italy and Japan²². Unfortunately, there is no registry for hospital injuries in Montenegro.

Although the knowledge related to HIV, as well as attitudes and practice, were significantly better in physicians compared to other HCWs, they were generally low.

Results of this study revealed that there is an urgent need to raise the level of knowledge of HCWs in Montenegro with special attention to health personal other than physicians. It is necessary to work continuously by additional training through seminars, professional meetings, presentations, and educational printed materials. Skills-building workshops are valuable in terms of changes in clinical practice, dissemination of important information to other providers, and assistance to providers in adapting changes to local health care systems²³. It has been shown that those workers who were more knowledgeable about HIV and those with the lower level of discriminatory attitude at work were more likely to diffuse the positive messages to co-workers^{24,25}. Furthermore, there is also a need for more international comparisons of research and comprehensive overview of methodology related to assessment of how attitudes were investigated, because attitudes regarding HIV appear to be closely linked not only to the level of knowledge, but also to culture. Continuous research in relation to the professional risk would enable taking adequate preventive measures.

Although many KAP studies related to HIV have been conducted since 1990s their validity has been questioned^{4,26}. Bearing in mind that this is the first KAP study related to HIV in Montenegro and that data collected are based on the self-perception and self-report of HCWs, we are aware of the limitations of the study. In the answers regarding exposure during the previous year and in the

whole work experience, it is pragmatic to expect that the answer could not be precise, and that there might be a bias in the assessment of exposure by exaggerating the number of accidents. Nonetheless the results of this study revealed that the level of knowledge as well as attitudes and ensuing practice of HCWs in Montenegro is unacceptable and need serious improvement.

REFERENCES

1. IPPOLITO G, SAGLIOCCA L, D'UBALDO C, RUGGIERO A, FABOZZI OC, DE MASI S, PETROSILLO N, *Epidemiol Prev*, 19 (1995) 276. — 2. KERMODE M, HOLMES W, LANGKHAM B, THOMAS MS, GIFFORD S, *Indian J Med Res*, 122 (2005) 258. — 3. HINGSON R, STRUNIN L, *Am J Prev Med*, 9 (1993) 62. — 4. WEBBER GC, *AIDS Care*, 19 (2007) 685. DOI: 10.1080/09540120601084340. — 5. AITKEN C, JEFFRIES DJ, *Clin Microbiol Rev*, 14 (2001) 528. DOI: 10.1128/CMR.14.3.528-546.2001. — 6. BELTRAMI EM, WILLIAMS IT, SHAPIRO CN, CHAMBERLAND ME, *Clin Microbiol Rev*, 13 (2000) 385. DOI: 10.1128/CMR.13.3.385-407.2000. — 7. FAHEY BJ, KOZIOL DE, BANKS SM, HENDERSON DK, *Am J Med*, 90 (1991) 145. DOI: 10.1016/0002-9343(91)90535-6. — 8. HENDERSON DK, FAHEY BJ, WILLY M, SCHMITT JM, CAREY K, KOZIOL DE, LANE HC, FEDIO J, SAAH AJ, *Ann Intern Med*, 113 (1990) 740. — 9. HENTGEN V, JAU-REGUIBERRY S, RAMILIARISOA A, ANDRIANANTOANDRO V, BELEC M, *Bull Soc Pathol Exot*, 95 (2002) 103. — 10. STEIN AD, MAKARAWO TP, AHMAD MF, *J Hosp Infect*, 54 (2003) 68. DOI: 10.1016/S0195-6701(03)00074-4. — 11. UMEH CN, ESSIEN EJ, EZEDINACHI EN, ROSS MW, *J R Soc Promot Health*, 128 (2008) 233. DOI: 10.1177/1466424008092793. — 12. KNI EWALD T, TESOVIC G, BILIC V, *Coll Antropol*, 30 (2006) 121. — 13. JOVIC-VRANES A, JANKOVIC S, VRANES B, *J Occup Health*, 48 (2006) 377. DOI: 10.1539/joh.48.377. — 14. KOCIC B, PETROVIC B, BOGDANOVIC D, JOVANOVIĆ J, NIKIC D, NIKOLIC M, *Cent Eur J Public Health*, 16 (2008) 134. — 15. JANKOVIC S, BOJANIC J, JOVIC-VRANES A, MARINKOVIC J,

Acknowledgments

This study was supported by the Ministry of Science and Technology Development through contract No.175042 and No.175087.

JANKOVIC J, *Cent Eur J Public Health*, 4 (2009) 409. DOI: 10.2478/s11536-009-0087-5. — 16. HADADI A, AFHAMI S, KARBAKSH M, ESMAILPOUR N, *Singapore Med J*, 49 (2008) 492. — 17. WICKER S, JUNG J, ALLWINN R, GOTTSCHALK R, RABENAU HF, *Int Arch Occup Environ Health*, 81 (2008) 347. DOI: 10.1007/s00420-007-0219-7. — 18. SALEHI AS, GARNER P, *BMC Infect Dis*, 10 (2010) 19. DOI: 10.1186/1471-2334-10-19. — 19. DJERIRI K, CHAROF R, LAURICHESSE H, FONTANA L, ELAOUAD R, MERLE JL, CATILINA P, BEYTOUT J, CHAMOIX A, *Med Mal Infect*, 35 (2005) 396. DOI: 10.1016/j.medmal.2005.06.002. — 20. MOGHIMI M, MARASHI SA, KABIR A, TAGHIPOUR HR, FAGHIHI-KASHANI AH, GHODDOOSI I, ALAVIAN SM, *J Surg Res*, 151 (2009) 80. DOI: 10.1016/j.jss.2007.12.803. — 21. ZHANG M, WANG H, MIAO J, DU X, LI T, WU Z, *Am J Ind Med*, 52 (2009) 89. DOI: 10.1002/ajim.20645. — 22. DO AN, CIESIELSKI CA, METLER RP, HAMMETT TA, LI J, FLEMING PL, *Infect Control Hosp Epidemiol*, 24 (2003) 86. DOI: 10.1086/502178. — 23. BASHOOK PG, LINSK NL, JACOB BA, AGUADO P, EDISON M, RIVERO R, SCHECHTMAN B, PRABHUGHATE P, *AIDS Educ Prev*, 22 (2010) 49. DOI: 10.1521/aeap.2010.22.1.49. — 24. LI L, CAO H, WU Z, WU S, XIAO L, *AIDS Educ Prev*, 19 (2007) 511. DOI: 10.1521/aeap.2007.19.6.511. — 25. KAPONDA CP, JERE DL, CHIMANGO JL, CHIMWAZA AF, CRITTENDEN KS, KACHINGWE SI, MCCREARY LL, NORR JL, NORR KF, *J Assoc Nurses AIDS Care*, 20 (2009) 230. DOI: 10.1016/j.jana.2008.12.005. — 26. HORSMAN JM, SHEERAN P, *Soc Sci Med*, 41 (1995) 1535. DOI: 10.1016/0277-9536(95)00030-B.

A. Grgurević

University of Belgrade, Faculty of Medicine, Institute of Epidemiology, Dr. Subotića 8, 11000 Belgrade, Serbia
e-mail: anita.grgurevic@gmail.com

ZNANJE O HIV-U, STAVOVI I PRAKSA MEĐU ZDRAVSTVENIM DJELATNICIMA U CRNOJ GORI

SAŽETAK

Cilj ovog istraživanja bio je utvrditi znanje o HIV-u, stavove i praksu zdravstvenih radnika u Crnoj Gori. Provedeno je transverzalno istraživanje je u Sveučilišnom kliničkom centru Crne Gore u Podgorici. Anonimni upitnik korišten za prikupljanje podataka. Od 526 radnika, 422 su bili uključena u anketu, što iznosi 80%. Uočena je nedovoljna razina znanja o prijenosu HIV-a i rizika nakon izlaganja općenito, iako je znanje bilo bolje u liječnika u odnosu na druge kategorije zdravstvenih radnika. Visok udio radnika pokazali su neprimjereni stav o potrebi testiranja na HIV kod svih hospitaliziranih bolesnika (64,7%) i obveza HIV+ pacijenata prijavljivanja njegovog/njezinog HIV statusa (88,9%) radi prakse univerzalne mjere opreza. Osim toga, 6,2% radnika bi odbilo liječiti HIV pozitivniog bolesnika. Više od polovice (55,7%) od sudionika studije su educirani o HIV/AIDS-u, a 15,9% njih su testirani na HIV. Većina zdravstvenih radnika (67,5%) uvijek primjenjuju univerzalne mjere u svakodnevnom radu s pacijentima. Unatoč primjeni zaštitnih uređaja, broj nesreća bio je velik. Kontinuirana edukacija je potrebna kako bi se povećala razinu znanja zdravstvenih radnika o riziku od infekcije na radnom mjestu. To bi potencijalno utjecalo na promjenu njihovih stavova u vezi HIV-a i poboljšanje prevencije na radnom mjestu. Kontinuirano istraživanje stručnog rizik će osigurati bolje zdravlje i sigurnost među medicinskim osobljem.