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## DOES THE POOR HIV/AIDS KNOWLEDGE AMONG MEDICAL STUDENTS MAY CONTRIBUTE TO LATE DIAGNOSIS?

### CZY SŁABA WIEDZA STUDENTÓW MEDYCYNY DOTYCZĄCA HIV/AIDS MOŻE SIĘ PRZYCZYNIĄĆ DO PÓŹNYCH ROZPOZNAŃ?

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#### STRESZCZENIE

W Polsce, jak w wielu innych krajach, zakażenie HIV często rozpoznawane jest późno. Podjęto badania mające na celu określenie wiedzy i umiejętności diagnostycznych studentów medycyny niezbędnych do rozpoznawania zakażeń HIV. W latach 2004-2006 studenci szóstego roku wydziału lekarskiego Uniwersytetu Medycznego w Białymstoku proszeni byli o wypełnienie anonimowej ankiety, w której zawarto pytania dotyczące dróg przenoszenia i przebiegu klinicznego zakażenia HIV. Choć ponad 50% studentów określiło swoją wiedzę dotyczącą HIV/AIDS jako dobrą lub bardzo dobrą, to jednak nie potwierdziły tego odpowiedzi na dalsze pytania. Ponad 40% studentów twierdziło, iż nie ma takich objawów, które mogą lekarzowi pierwszego kontaktu nasunąć podejrzenie zakażenia HIV. Znacząca większość nie potrafiła wymienić nazw chorób wskaźnikowych AIDS. Poprawa zdrowia publicznego i jakości opieki nad osobami żyjącymi z HIV wymaga lepszej edukacji przyszłych lekarzy w zakresie problemów związanych z HIV/AIDS, a także seksualnością człowieka i profilaktyką zakażeń przenoszonych drogą płciową.

**Słowa kluczowe:** HIV, rozpoznawanie HIV, wiedza, przyszli lekarze

#### ABSTRACT

In Poland, as in many other countries, HIV infection is often detected at a late stage. We conducted this study to determine if Polish medical students possess adequate HIV/AIDS knowledge and diagnostic skills needed to improve HIV detection and care in Poland. Between 2004 and 2006, sixth-year (senior) medical students at the Medical University of Białystok were asked to complete an anonymous questionnaire with questions about HIV transmission route and clinical characteristics. Although more than 50% of student respondents estimated their knowledge of HIV/AIDS as good or very good, HIV/AIDS knowledge assessment results did not support this self-reported level of proficiency. More than 40% of students answered that there are no symptoms associated with HIV infection that would make primary care physicians suspect the diagnosis. A significant majority of students could not name AIDS indicator diseases. To improve public health and quality of care for persons infected with HIV, it is necessary to better educate physicians-in-training about the clinical characteristics and transmission routes for HIV/AIDS, as well as approaches to discuss human sexuality and sexually transmitted infection prevention with patients.

**Key words:** HIV, HIV diagnosis, knowledge, future doctors

#### INTRODUCTION

The clinical course of HIV infection is characterized by an asymptomatic phase of 10 to 12 years. Because **the symptoms** and signs of **primary HIV** infection (acute retroviral syndrome) are nonspecific and disappear irrespective of the management, infection is seldom diagnosed at this stage (1). Since the beginning of the AIDS epidemic, persons engaging in high-risk behaviors have been encouraged to undergo voluntary screening. Early diagnosis allows for behavioral risk reduction and

decreased transmission to others. Despite the benefits of early diagnosis, many HIV-infected persons in Poland are unaware of their HIV status. The widespread availability of antiretroviral therapy in Poland now allows for decreased opportunistic infections (OIs) and AIDS-associated malignancies, allowing patients to live much longer (2). HIV-infected patients whose CD4 counts are below 200/ $\mu$ L experience increased morbidity and mortality, diminished responses to antiretroviral therapy, and higher health-care expenditures (3). However, 10% to 30% of patients in Western countries still present late

for care, when CD4 T-cell counts are below 200/ $\mu$ l and symptomatic HIV disease has occurred (4). In a report from Italy, 50% (five out of ten) of AIDS diagnoses during the first 4 months of 2002 occurred in patients who were unaware of their HIV-status. Each of those five patients experienced three to seven AIDS-defining illnesses during his first hospitalization (5). The frequency of late diagnoses is increasing in Sweden: the proportion of people diagnosed with AIDS within three months of HIV diagnosis increased from 22% in 1996 to 58% in 2002 (6). Similarly, in Italy the proportion of people diagnosed with AIDS within six months of HIV diagnosis increased from 19.9% in 1996 to 50.5% in 2002 (7). Epidemiologic data from Poland indicate that AIDS diagnoses within three months of HIV diagnosis increased from 32.7% in 1986 to 46.7% of patients in 2006, and delayed diagnosis most often occurs in those younger than 25, older than 45, and in those infected sexually (8).

Delayed HIV diagnosis in Poland may result in part from a poor general knowledge of HIV transmission routes, and the long asymptomatic phase. Primary (family) care physicians may also contribute to delayed diagnosis by not testing patients until severe symptoms occur. Physicians should consider HIV in all patients who present with symptoms suggestive of immune dysfunction.

To improve patient care and HIV/AIDS testing, physicians must be vigilant to subtle symptoms and risk factors for HIV infection. We conducted this study to determine if Polish medical students in their final year possess adequate HIV/AIDS knowledge and diagnostic skills needed to improve HIV detection and care in Poland.

## MATERIAL AND METHODS

Between 2004 and 2006, 235 of the sixth year (senior) medical students at the Medical University of Białystok completed an anonymous questionnaire during their family medicine course. The questionnaire was prepared by The National Centre for AIDS in Poland and included 50 questions concerning knowledge of and attitudes to HIV/AIDS. A five-point Likert-type scale (definitely yes, rather yes, rather no, definitely no, undecided) was used. Completion of the questionnaire was followed by a four-hour seminar in groups of 12 to 15 summarizing the essential information about HIV and AIDS. Statistical analysis was performed using the statistical package Statistica 7.0 PL.

The Ethical Committee at the Medical University of Białystok approved the study protocol.

## RESULTS

In total, 235 students aged 24 to 39 years (mean 25 years) completed the questionnaire; respondents included 156 women (72.2%) and 79 men (27.8%). Students rated their HIV/AIDS knowledge as very good (2.1%), good (52.8%), poor (43.4%), very poor (0.4%), or no knowledge (1.3%).

When asked if symptoms exist to help primary care physicians identify persons with probable HIV infection, 79 students (33.6%) answered probably not, and 18 students (7.7%) answered definitely not. Twenty-three students (9.8%) could name symptoms of HIV infection, and 112 (47.6%) knew that such symptoms exist, but could not name them. Only 95 students (40.4%) named symptoms of generalized lymphadenopathy or AIDS-defining illnesses such as *Pneumocystis carinii* pneumonia or Kaposi's sarcoma. In subsequent discussions, it was noted that most students were unfamiliar with AIDS-defining diseases.

Students reported that knowing a patient's sexual orientation, multiple sexual partners and types of sexual activity practiced would aid physicians in suspecting HIV infection in high-risk groups. However, all students reported that they were unlikely to ask questions about sexual orientation or number of sexual partners. Students also did not know rates of transmission associated with oral, vaginal and anal sex. Most students (> 90%) did not know that infection is more easily transmitted from males to females.

Table I displays results from questions regarding transmission routes. More than 45% of students did not know that maternal to child transmission can occur during pregnancy or delivery. Approximately 48% believed that transmission may occur through shared use of household items such as cutlery, towels, and dishes. Almost 35% believed it possible to become infected by using public toilets or baths. Nearly 15% believed that respiratory transmission of HIV occurs.

More than 87% of students responded that an HIV-infected woman should not terminate a pregnancy (48.5% definitely not, 38.7% probably not). Further discussion revealed that a majority of students (> 80%) did not know whether pregnancy affects negatively the course of HIV infection. They were also not aware that vertical transmission is nearly 100% preventable. Approximately 40% believed that HIV-infected women should deliver in separate hospitals from uninfected women.

More than 32% of students stated it was possible to determine HIV status by physical appearance, whereas 55% reported that this was not possible, and 11.9% were unsure. Nearly 35% of students admitted a fear of AIDS for personal or professional reasons. More than

Table I. Knowledge of students about routes of HIV infection.

Tabela I. Wiedza studentów dotycząca dróg przenoszenia HIV

	definitely yes n (%)	rather yes n (%)	rather not n (%)	definitely not n (%)	undecided n (%)
An HIV infected mother may infect her child during pregnancy or delivery	97 (41.3)	28 (11.9)	34 (14.5)	73 (31.0)	3 (1.3)
	125 (53.2)		107 (45.5)		
It is possible to become infected by shared use of cutlery, towels, cups etc. with person with HIV/AIDS	81 (34.5)	31 (13.2)	40 (17.0)	80 (34.0)	3 (1.3)
	112 (47.7)		120 (51.0)		
If a woman with HIV infection or AIDS gets pregnant termination of the pregnancy should be encouraged	14 (6.0)	8 (3.4)	91 (38.7)	114 (48.5)	8 (3.4)
	22 (9.4)		205 (87.2)		
It is possible to become infected with HIV after exposure to cough or sneezing of HIV infected person	6 (2.6)	29 (12.3)	70 (29.8)	127 (54.0)	3 (1.3)
	35 (14.9)		297 (63.8)		
Frequent change of sexual partners increases the risk of HIV infection	154 (65.5)	51 (21.7)	15 (6.4)	12 (5.1)	3 (1.3)
	205 (87.2)		27 (11.5)		
Women with HIV infection or AIDS should not give birth in the same hospitals as non-infected women	43 (18.3)	48 (20.4)	86 (36.6)	47 (20.0)	11 (4.7)
	91 (38.7)		224 (56.6)		
The most effective protection against HIV is avoidance of any contacts with infected individuals	9 (3.8)	24 (10.2)	96 (40.9)	85 (36.2)	21 (8.9)
	35 (14.0)		195 (77.1)		
It is possible to become infected with HIV through use of public bath or toilet.	21 (8.9)	63 (26.8)	77 (32.8)	72 (30.6)	2 (0.9)
	84 (35.7)		149 (63.4)		
HIV/AIDS can attack anyone	130 (55.3)	55 (23.4)	31 (13.2)	12 (5.1)	7 (3.0)
	185 (78.7)		43 (18.3)		
I am afraid of AIDS	38 (16.2)	44 (18.7)	103 (43.8)	47 (20.0)	3 (1.3)
	82 (34.9)		150 (63.8)		
HIV/AIDS infection does not threaten anybody from my surrounding, my relatives	30 (12.8)	61 (25.9)	74 (31.5)	51 (21.7)	19 (8.1)
	91 (38.7)		125 (53.2)		
It is possible to assess by one's appearance whether he is infected with HIV	22 (9.4)	54 (23.0)	64 (27.2)	67 (28.5)	28 (11.9)
	76 (32.4)		131 (55.7)		
Every patient should be treated as an HIV infected person	53 (22.6)	66 (28.1)	88 (37.4)	21 (8.9)	7 (3.0)
	119 (50.7)		109 (46.3)		

38% believed that HIV/AIDS infection is not a threat to their relatives.

According to 14% of respondents, the most effective protection against HIV is avoidance of any contacts with infected individuals.

Students were also asked whether they knew personally anybody living with HIV/AIDS, and 23 individuals (9.8%) responded positively.

## DISCUSSION

Prior to the availability of antiretroviral therapy, HIV-infected patients frequently consulted physicians only after immunologic deficit occurred (9). There are many reasons why persons at high risk for HIV have not sought testing. In Poland, many people believe that HIV only affects injection drug users or men who have sex with men. They do not realize the risks associated with other behaviors such as unprotected heterosexual contact. The historical delay in consultation was worsened by fear of confidentiality breach (10). Today many still delay seeking treatment, although there is widespread availability of combined antiretroviral therapy. This

may be due in part to negative experiences in previous encounters with physicians and lack of awareness about effective treatment options.

The poor knowledge of HIV/AIDS transmission and clinical characteristics among medical students in Poland has been demonstrated earlier. There is a poor understanding of vertical transmission (11) and a lack of knowledge regarding risks associated with sexual activity (12). Physicians experience difficulties in talking to their patients, in particular to adolescents, about sexuality. Poland is not alone in its physicians' reluctance to discuss sexual health issues such as sexually transmitted infections and unplanned pregnancy. In United States, for example, sexual health issues were discussed at only 42.8% of female adolescent visits and only 26.4% of male adolescent health maintenance visits (13). This is despite the fact that the American Academy of Pediatrics recommends that physicians educate all children and adolescents about sexuality (14).

In the United Kingdom, the large number of delayed HIV diagnoses has caused many to appeal to clinicians to consider the possibility of HIV infection in symptomatic patients who do not respond well to treatment or when the etiology of the illness is unknown (15). A US

study showed that patients visited a health care provider an average of five times before HIV infection was correctly identified as the cause of the patients' symptoms (16). Schwarcz et al. (17) showed that patients who are young (<30 years), heterosexual, privately insured, or uninsured are less likely to be offered HIV testing. Physician consultations are frequently missed opportunities which contribute to delayed HIV diagnosis. The students in the present study did not possess basic knowledge of clinical characteristics of HIV infection such as anemia, leukopenia, and lymphocytopenia, which may occur many years before the onset of AIDS or AIDS-defining diseases.

Medical students in their final year of medical studies must receive proper training to eliminate fears and prejudices against HIV-infected persons, and to improve recognition so that treatment can be initiated at an earlier stage of disease. However, this is not always possible, as shown by reports from the Pomeranian Medical University in Szczecin, Poland, where three weeks of clinical training reduced but did not eliminate fear of contracting HIV. Before clinical training, fear of contracting HIV from exposure to HIV-infected patients was expressed by 25.7% students; after training the rate was 15.4%. Before training, 78.3% of students believed that treatment of HIV-infection is necessary; after training 89.0% expressed this opinion (18). The lack of interest in HIV/AIDS may result from the relatively small number of HIV/AIDS cases diagnosed thus far in Poland. According to the National Institute of Hygiene in Warsaw, only 12,441 cases were diagnosed in Poland between 1985 and June 2009. Of those, 5503 were in injection drug users, and 2268 had developed AIDS. Only 1,011 persons have died from HIV/AIDS in Poland (19). Obviously, registered cases provide only crude estimates of the HIV/AIDS epidemic in Poland. Increased international travel to and from endemic regions will likely increase the number of persons with HIV/AIDS in Poland. Lack of awareness of HIV status and modes of transmission among Polish persons will increase vulnerability to HIV unless patients are tested, treated with antiretroviral therapy, and counselled regarding behavioral risk reduction.

Unsatisfactory knowledge future doctors about clinical aspects of HIV infection is worrisome. The questioned students were unable to name HIV stage B symptoms or AIDS indicator diseases (clinical category C according to CDC 1993 revised classification system for HIV infection – 20), when they met in small groups.

Our study participants may not be representative of Polish medical students, so the results may not be generalizable to future physicians in Poland. However, earlier studies showed that practicing Polish physicians may also have inadequate knowledge and skills to treat

HIV-infected patients (21, 22). Patients may be unaware of HIV transmission routes and clinical symptoms associated with HIV; however, physicians must understand these concepts to diagnose patients at the earliest opportunity. This is important both for individual patients and for limiting the HIV epidemic from a public health perspective. To address the problem of late HIV diagnosis in Poland and improve opportunities for patient longevity, more attention must be given to educating future physicians about HIV/AIDS, human sexuality, and prevention of sexually transmitted diseases.

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#### REFERENCES

1. Flanigan T, Tashima KT. Diagnosis of acute HIV infection: it's time to get moving? *Ann Intern Med* 2001;134:75-77.
2. Podlasiński RB, Wiercińska-Drapała A, Olczak A, et al. Opportunistic infections and other AIDS-defining illnesses in Poland in 2000-2002. *Infection* 2006;34:196-200.
3. Chen RY, Westfall AO, Accort NA, et al. Distribution of health care expenditures for HIV-infected patients. *Clin Infect Dis* 2006;42:1003-1010.
4. Battegay M, Fehr J, Flückiger U, Elzi L. Antiretroviral therapy of late presenters with advanced HIV disease. *J Antimicrob Chemother* 2008;62:41-44.
5. Manfredi R, Calza L, Chiodo F. Three to seven concurrent AIDS-defining disorders at first hospitalization of AIDS presenters as an unexpected emerging feature during the era of highly active antiretroviral therapy. *AIDS* 2002;16:2356-2358.
6. Brännström J, Akerlund A, Anrebom M, et al. Patients unaware of their HIV infection until AIDS diagnosis in Sweden 1996-2002 – a remaining problem in the highly active antiretroviral therapy era. *Intern J STD AIDS*;200516:702-706.
7. Longo B, Pezzotti P, Boros S, et al. Increasing proportion of late testers among AIDS cases in Italy, 1996-2002. *AIDS Care* 2005;17:834-841.
8. Nitka A, Rosińska M, Janiec J. AIDS and HIV infection in Poland in 2006. *Przegl Epidemiol.* 2008;62:357-68.
9. Samet JH, Freedberg KA, Savetsky JB, et al. Understanding delay to medical care for HIV infection: the long-term non-presenter. *AIDS* 2001;15:77-85.
10. Solomon L, Landrigan J, Flynn C, & Benjamin GC. (1999). Barriers to HIV testing and confidentiality: the concerns of HIV-positive and high-risk individuals. *AIDS Public Pol J* 1999;14:147-156.
11. Rogowska-Szadkowska D, Chlabicz S, Ołtarzewska AM. Knowledge of medical students about risk of HIV transmission from mother to child. *HIV & AIDS Review* 2005;4:20-23.

12. Izdebski Z. Ryzykowna dekada. Seksualność Polaków w dobie HIV/AIDS. Studium porównawcze 1997 – 2001 – 2005. Uniwersytet Zielonogórski, Zielona Góra, 2007.
13. Burstein GR, Lowry R, Klein, JD, Santelli JS. Missed opportunities for sexually transmitted diseases, human immunodeficiency virus, and pregnancy prevention services during adolescent health supervision visits. *Pediatrics* 2003;111:996-1001.
14. American Academy of Paediatrics. Committee on Psychological Aspects of Child and Family Health and Committee on adolescence. Sexuality Education for Children and adolescents. *Pediatrics* 2001;108:498-502.
15. Gilbar VL, Doughan S, Sinka K, Evans BG. Late diagnosis of HIV infection among individuals with low, unrecognized or unacknowledged risk in England, Wales and Northern Ireland. *AIDS Care* 2006;18:133-139.
16. Liddicoat RV, Horton NJ, Urban R, et al. Assessing missed opportunities for HIV testing in medical settings. *J Gen Intern Med* 2004;19:349-356.
17. Schwarcz S, Hsu L, Dilley JW, et al. Late diagnosis of HIV infection. Trends, prevalence, and characteristics of persons whose HIV diagnosis occurred within 12 months of developing AIDS. *J Acquir Immune Deficy Syndr* 2005;43,491-494.
18. Leszczyszyn-Pynka M, Hołowiński K. Attitudes among medical students regarding HIV/AIDS. *Med Wieku Rozwoj* 2003;7:511-519
19. National Institute of Hygiene. Epidemiologic reports. HIV infections and AIDS cases. [http://www.pzh.gov.pl/oldpage/epideld/hiv\\_aids/index.htm](http://www.pzh.gov.pl/oldpage/epideld/hiv_aids/index.htm)].
20. Centers for Disease Control and Prevention. (1992). 1993 revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. *MMWR* 1992;41,RR-17:1-19. <http://www.cdc.gov/mmwr/>
21. Jabłonowska E, Małolepszy E. Acceptance of HIV+ patients by health care workers as experienced by seropositive patients in Lodz Region, Poland. *Wiad Lek* 2007;60:497-501.
22. Rogowska-Szadkowska D, Oltarzewska AM, Sawicka-Powierza J, Chlabicz S. (2008). Medical care of HIV-infected individuals in Poland: impact of stigmatization by health care workers. *AIDS Patient Care STDs* 2008;22:81-84.

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