

Profile of patients with newly diagnosed HIV in the Łódź region in Poland from 1996 to 2005

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Abstract

Introduction: To determine whether the profile of patients diagnosed with HIV changed during the years 1996-2005.

Material and methods: Data from 407 patients diagnosed with HIV between 1996 and 2005 were collected and retrospectively analyzed. The patients were grouped according to the year in which they were diagnosed with HIV. The age, gender, route of transmission, CD4 lymphocyte count, clinical evaluation according to CDC, and presence of anti-HCV and HBsAg antigen were assessed at the time of diagnosis. Each group of parameters was compared according to the year in which the HIV infection was detected.

Results: The group consisted of 407 patients: 291 men and 116 women. Men represent a larger proportion in each of the studied periods. The patients' average age was 28.31 and was comparable in the individual years. The average level of CD4 lymphocytes in the entire group was 427.73 cells/mm³, and a change in the trend of their count was not observed over the years, although statistically significant differences were seen between the years (1996-1998, 1996-2004, 1998-2004, 2001-2004). In 2004, as many as 20.5% of the patients were simultaneously diagnosed with HIV and AIDS. In all of the studied periods, the use of intravenous drugs was the main route of transmission. It should be emphasized that, in 2005, the decrease in the percentage of such exposures was statistically significant. In the same year, there was also a statistically significant reduction in the number of patients in whom anti-HCV was detected (a statistically significant change compared to the results obtained during the other years). A significant difference in the frequency of anti-HBsAg was not observed over the years.

Conclusions: We did not observe a stable trend of change in the profiles of newly diagnosed patients, in our region, despite some periodic differences. In 2005, a statistically significant decrease in the number of infections caused by intravenous drug use was observed. This drop had a substantial effect on the frequency of HCV co-infection.

Key words: AIDS, HIV, route of transmission, CD4 count, HBsAg, anti-HCV.

Introduction

The HIV/AIDS epidemic has spread worldwide since the first report on AIDS was published in 1981. It has been estimated that about 33.2 million people are infected with HIV. There are 2.5 million new cases of HIV infection each year [1]. In some countries of sub-Saharan Africa, over 20-30% of the population is infected with this virus. The epidemiological situation is very disturbing in Russia and the Ukraine, where a fast increase in the number of newly diagnosed HIV infections has been detected. In

Poland the HIV/AIDS epidemiological situation is stable. According to data collected by PZH (National Institute of Hygiene), in a study that began in 1985 and continued up till the end of September 2008, 11,901 Polish citizens have been diagnosed with HIV; 5,465 of these cases were connected with intravenous drug use [2].

For over 20 years, intensive social education and many prophylactic programmes have been operating in Poland. The population is more aware of the ways through which HIV infection is spread and the methods that can be used in order to prevent infection. This was the reason why we decided to analyze and compare, clinically and epidemiologically, a group of patients diagnosed with HIV in our centre from 1996 to 2005.

Aim of the work is to determine whether the profile of patients diagnosed with HIV in our clinic during the past 10 years has changed.

Material and methods

We analyzed the medical documentation taken from a group of patients in whom HIV infection was detected in our clinic between 1996 and 2005. The group consisted of 407 patients. These patients were grouped according to the year in which they were diagnosed with HIV. The age, gender, route of transmission, CD4 lymphocyte count, clinical evaluation according to CDC, and presence of anti-HCV and HBsAg were assessed at the time of diagnosis. Each group of parameters was compared according to the year in which the HIV infection was detected. Tests for HCV and HBsAg were performed using immuno-enzymatic methods (such as HCV EIA II

COBAS CORE tests) at the Centralny Wojewódzki Specjalistyczny Szpital im. dr Wł. Biegańskiego in Łódź.

Statistical methods

The average values and standard deviation of quantitative traits were calculated, and the minimal and maximal values were given. The average values of quantitative features in the individual years were compared according to the Mann-Whitney test. To compare how frequently certain categories of quantitative traits occurred in individual groups, we used: χ^2 distribution, Yates' correction for continuity or Fisher's exact test (according to the size of the studied group).

Results

Gender

The study group consisted of 116 women (28.5%) and 291 men (71.5%). In all of the time periods, there were more men (59.0-83.3%) than women. The highest proportion of women infected with HIV was noted in 2001 (41%). The lowest proportions (under 20%) were noted in 1996 (16.7%) and in 2002 (19.6%).

Age of patients

The patients' average age at the moment of diagnosis was 28.3 ± 8.9 (17-71). The highest average age among the newly diagnosed patients was noted in 2005 (31.1), while the lowest average age was identified in 1997 (25.94). The change in the average age of patients, in consecutive years of the study, is shown in Table I.

Probable route of transmission

In the study group, intravenous drug use was the main route of transmission (301 patients: 74%), heterosexual contact was the cause of infection in 65 patients (16%), and homo/bisexual contact in 31 patients (7.6%). Other causes were seen in 1 person (0.2%) (self-mutilation), and the route of transmission was unknown in 9 patients (2.2%) (Table II). Intravenous drug use was the main source of infection in all of the studied time periods, yet we noticed a statistically significant drop in 2005 (in comparison to 1996, 1997, 1999, 2000, 2001, 2002, and 2003) (Table II).

CD4 lymphocyte count and classification according to CDC (A, B, C)

At the moment of diagnosis, the average CD4 lymphocyte count was 427.7 ± 276.4 cells/ μ l (7-1515). Over the years of the epidemic, a tendency of change in the CD4 lymphocyte count was not seen. However, statistically significant differences were seen in the CD4 lymphocyte count between individual years (1996-1998, 1996-2004, 1998-2001, 2001-2004) (Table I).

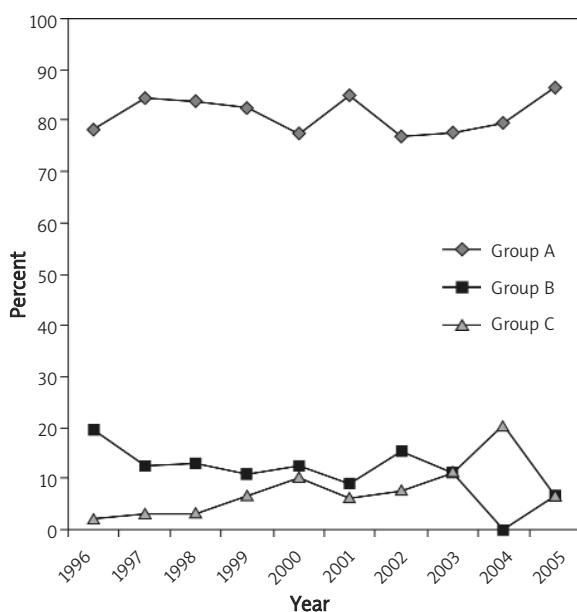


Figure 1. Proportion of patients in group "A", "B" and "C" according to CDC classification and the year of diagnosis

Table I. Characteristics of the study group according to sex, age and lymphocyte CD4 count

Year	Number	Female n[%]	Male n[%]	Mean age [years]	Mean CD4 [count/ μ l]	CD4 \leq 350 (count/ μ l) [%]	CD4 > 350 (count/ μ l) [%]
1996	48	8/16.7	40/83.3	27.9	504.9	33.3	66.7
1997	34	9/25.7	25/74.3	25.9	494.2	38.2	61.8
1998	33	10/30.3	23/69.7	27.1	341.2	51.5	48.5
1999	48	13/27.1	35/72.9	26.4	450.4	37.5	62.5
2000	45	14/31.1	31/68.9	27.9	416.0	42.2	57.8
2001	39	16/41.0	23/59.0	28.5	501.6	33.3	66.7
2002	46	9/19.6	37/80.4	31.0	413.8	43.5	56.5
2003	43	11/25.6	32/74.4	28.0	419.4	37.2	62.8
2004	41	16/39.0	25/61.0	29.1	348.1	53.7	46.3
2005	30	10/33.3	20/66.7	31.1	386.0	56.7	43.3
Total	407	116/28.5	291/71.5	28.3	427.7	42.0	58.0

Statistically significant differences

For sex		For mean CD4_		For age	
1996-2001	$p < 0.05$	1996-1998	$p < 0.05$	1996-2002	$p < 0.05$
1996-2004	$p < 0.01$	1996-2004	$p < 0.05$	1997-2002	$p < 0.01$
2001-2002	$p < 0.05$	1998-2001	$p < 0.05$	1999-2002	$p < 0.005$
2002-2004	$p < 0.05$	2001-2004	$p < 0.05$	2000-2005	$p < 0.05$
				2002-2003	$p < 0.05$

Table II. Characteristics of the study group according to HIV transmission route

Year	Route of transmission											
	N		Hetero		Homo/Bi		Unknown		Other		Total	
	n	[%]	n	[%]	n	[%]	n	[%]	n	[%]	n	[%]
1996	35	72.9	5	10.4	7	14.6	0	0.0	1	2.1	48	100.0
1997	27	79.4	4	11.8	3	8.8	0	0.0	0	0.0	34	100.0
1998	23	69.7	8	24.2	2	6.1	0	0.0	0	0.0	33	100.0
1999	40	83.3	4	8.3	4	8.3	0	0.0	0	0.0	48	100.0
2000	35	77.8	7	15.6	2	4.4	1	2.2	0	0.0	45	100.0
2001	32	82.1	4	10.3	2	5.1	1	2.6	0	0.0	39	100.0
2002	33	71.7	7	15.2	3	6.5	3	6.5	0	0.0	46	100.0
2003	33	76.7	7	16.3	1	2.3	2	4.7	0	0.0	43	100.0
2004	28	68.3	10	24.4	3	7.3	0	0.0	0	0.0	41	100.0
2005	15	50.0	9	30.0	4	13.3	2	6.7	0	0	30	100.0
Total	301	74.0	65	16.0	31	7.6	9	2.2	1	0.2	407	100.0

For N		For Hetero		For Homo/Bi	
1996-2005	$p < 0.05$	1996-2005	$p < 0.05$	1996-2003	$p < 0.05$
1997-2005	$p < 0.01$	1997-2005	$p < 0.05$	2003-2005	$p < 0.05$
1999-2005	$p < 0.001$	1998-1999	$p < 0.05$		
2000-2005	$p < 0.01$	1999-2004	$p < 0.05$		
2001-2005	$p < 0.005$	1999-2005	$p < 0.01$		
2002-2005	$p < 0.05$	2001-2005	$p < 0.05$		
2003-2005	$p < 0.01$				

N – intravenous drug users

Table III. Characteristics of the study group according to CDC classification and the year of diagnosis

Year	CDC							
	A		B		C		Total	
	n	[%]	n	[%]	n	[%]	n	[%]
1996	36	78.3	9	19.6	1	2.2	46	100.0
1997	27	84.4	4	12.5	1	3.1	32	100.0
1998	26	83.9	4	12.9	1	3.2	31	100.0
1999	38	82.6	5	10.9	3	6.5	46	100.0
2000	31	77.5	5	12.5	4	10.0	40	100.0
2001	28	84.9	3	9.1	2	6.1	33	100.0
2002	30	76.9	6	15.4	3	7.7	39	100.0
2003	28	77.8	4	11.1	4	11.1	36	100.0
2004	31	79.5	0	0.0	8	20.5	39	100.0
2005	26	86.6	2	6.7	2	6.7	30	100.0
Total	301	80.9	42	11.3	29	7.8	372	100.0

Table IV. Frequency of HBsAg according to the year of diagnosis

Year	HBsAg+		HBsAg-		Total	
	n	[%]	n	[%]	n	[%]
1996	5	10.9	41	89.1	46	100.0
1997	3	9.7	28	90.3	31	100.0
1998	3	10.7	25	89.3	28	100.0
1999	6	13.3	39	86.7	45	100.0
2000	3	7.5	37	92.5	40	100.0
2001	4	12.1	29	87.9	33	100.0
2002	3	7.3	38	92.7	41	100.0
2003	6	17.1	29	82.9	35	100.0
2004	6	16.2	31	83.8	37	100.0
2005	2	6.9	27	93.1	29	100.0
Total	41	11.3	323	88.7	364	100.0

At the time of diagnosis most of the patients (76.9-86.8%), in each of the studied groups, were classified, according to CDC, in group A (Figure 1). In 2004, AIDS was diagnosed simultaneously with HIV in as many as 20.5% of the patients, presenting a statistically significant difference compared to the results obtained from 1996 to 2002 (Table III).

HBsAg and anti-HCV

The HBsAg was found in 11.3% of all patients. The highest proportion of patients with a positive result for the HBsAg was seen in 2003 (17.1%) while the lowest proportion was observed in 2005 (6.9%) (Table IV). Anti-HCV antigens were found in 75.4% of the patients. The highest proportion of patients in whom the anti-HCV antigen was found was observed in 1999 (86.7%), and the lowest proportion was seen in 2005 (48.3%). These observations were statistically significant (Table V).

Discussion

The HIV/AIDS epidemic is progressing differently in different regions of the European continent. In Western Europe, the highest rates of morbidity were seen around 1983 in homosexuals while later, in 1987-1988, they were found in intravenous drug users [3]. On the other hand, in Eastern Europe, a rapid increase of new cases of HIV infection, seen later, in 1999-2000, was connected with intravenous drug use. In 2004 the number of new cases of HIV was 174.2 per million inhabitants in Eastern Europe, 77.9 per million inhabitants in Western Europe, and 8.5 per million inhabitants in Central Europe.

The first cases of HIV infection in Poland were described in 1985. Among them were 6 haemophilic patients, 4 homo/bisexual men, and 1 prostitute. In our country, at the turn of the 1980s and 1990s, HIV infection started spreading among intravenous drug users [4], and till this day, this group is at a high risk of exposure to HIV. A drop, to about 400 cases per year, of newly diagnosed patients occurred in the first half of the 1990s, and then slowly rose to about 650 cases per year, which we currently observe [5]. This rising tendency of newly diagnosed patients was not seen in our clinic between 1996 and 2005. We suspect that the observed growth trend is so feeble, in Poland, that it might not be visible in small study groups.

In Central European countries very diverse routes of HIV transmission have been observed. In Hungary, homosexual contact is the dominant route of HIV transmission [6], in Romania, heterosexual contact [7], whereas in Poland the main route is connected with intravenous drug use [2]. Like in our country, needle sharing among drug users is the dominant route of HIV transmission in all Eastern European countries. Currently, in Poland, in the group of patients in whom the route of

transmission is known, intravenous drug users comprise 70% of newly diagnosed patients [5]; in 1999-2004 this proportion was 78.6% [8]. The situation in the Łódź region is similar to that in the rest of the country. In the research we conducted between 1995 and 2004, the proportion of patients infected through intravenous drug use was between 68.3 and 83.3%. These results were not statistically significant. For the first time, in 2005, we noted a statistically significant drop in the proportion of diagnosed patients infected through this route, in comparison to previous years. In the coming years, it will be clear whether this is the beginning of a new trend or it was just a short-term change. Perhaps the changes in the pattern of intravenous drugs administration, education, and harm reduction programmes are starting to have an effect on the epidemiological situation of HIV infections in the Łódź region.

In the last years, our country has observed a higher proportion of infections through heterosexual contact. This was also seen in the Łódź region, and in 2005 this proportion was of statistical significance. A rise in the number of infections contracted through sexual contact was more pronounced in our neighbours, Russia and the Ukraine [1, 9]. In 2001, in Russia, only 6% of patients registered as infected with HIV were infected through sexual contact, but in 2004 this percentage rose to 25%. In Western European countries, heterosexual contact has remained the main cause of HIV infection [1].

In 2004, homosexual contact was the cause of 26% of newly diagnosed HIV infections in Western Europe, 13% in Central Europe, but only 0.3% in Eastern Europe [10]. In Poland, the percentage of infections caused by homosexual contact was about 10% [5], and it would be much lower if only HIV infections with an established route of transmission were taken into account. In the group that we investigated, 7 men were infected through homo/bisexual contact in 1996. In the following years we diagnosed 1-4 patients per year as infected through homo/bisexual contact. In our clinic, from 1996 to 2005, the average proportion of newly diagnosed patients infected through this route was 7.6%.

Between 2003 and 2004, a visible increase in the number of late diagnoses of HIV infections was observed in Poland. A similar increase was seen in our region. In 2004 as many as 20.5% of the patients were diagnosed with AIDS at the same time as HIV [5].

In 2004, the proportion of women diagnosed with HIV was 36% in Western Europe, 30% in Central Europe, and 40% in Eastern Europe [10]. In the last years, a growth trend was seen in the percentage of women with newly diagnosed HIV

Table V. HCV serology according to the year of diagnosis

Year	Anti-HCV+		Anti-HCV-		Total	
	n	[%]	n	[%]	n	[%]
1996	34	73.9	12	26.1	46	100.0
1997	22	75.9	7	24.1	29	100.0
1998	21	77.8	6	22.2	27	100.0
1999	39	86.7	6	13.3	45	100.0
2000	30	79.0	8	21.0	38	100.0
2001	30	83.3	6	16.7	36	100.0
2002	29	72.5	11	27.5	40	100.0
2003	26	78.8	7	21.2	33	100.0
2004	24	70.6	10	29.4	34	100.0
2005	14	48.3	15	51.7	29	100.0
Total	269	75.4	88	24.6	357	100.0

Statistically significant differences

1996-2005	$p < 0.05$
1997-2005	$p < 0.05$
1998-2005	$p < 0.05$
1999-2005	$p < 0.0005$
2000-2005	$p < 0.005$
2001-2005	$p < 0.01$
2002-2005	$p < 0.05$

infections, in all European regions. A similar increase in the number of women diagnosed with HIV was seen in Poland. The proportion of women with newly diagnosed HIV infection had been rising steadily, from 20% in the 1990s, to 27% in 2000-2005 [5]. The mean age (28.5%) of women in the study group is higher than the one given by PZH (National Institute of Hygiene). An exceptionally high percentage of infection among women was seen in 2001 and 2004, and was 41 and 39% respectively.

The average age of patients in the analyzed study at the time of diagnosis was 28.3. The highest figure (31.02 years) was observed in 2002. In Poland, the average age at which systemic infection was detected rose from 26 in the early 1990s to 32 at present [5]. A steady trend of increase in age was not observed with each consecutive year that we analyzed, but the average age of patients during the last four years has been higher than that assessed in the previous time periods.

The frequency of HIV/HBV and HIV/HCV co-infection among patients with newly diagnosed HIV infection, in the Łódź region, was 11.3 and 75.4%. In Europe as a whole, the incidence of HIV/HCV or HIV/HBV co-infection varies between regions. In a large international European study, the presence of HBsAg was found in 9% of patients infected with HIV,

while anti-HCV was detected in 34% of the studied patients [11]. The differences between the results obtained in our study and the Euro SIDA study were based on the differences in the characteristics of the studied groups. The presumed dominant cause of infection, in the Euro SIDA study, was either hetero- or homosexual contact, while in our study, in 74% of our patients, the presumed route of transmission was intravenous drug use. Results similar to ours were described in another Polish centre. Comparably to our study, anti-HCV was found in 72.3% of patients infected with HIV in Bydgoszcz, where the dominant route of transmission was also intravenous drug use [12]. In 2005 we noticed a statistically significant drop in the frequency of HIV/HCV co-infections in newly diagnosed patients, which was the result of a decrease in the number of patients with HIV infections caused by intravenous drugs.

Summarizing the results that we obtained, it should be emphasized that we have observed a lower proportion of infections of unknown source, compared to the data collected by PZH. The data gathered by PZH between 1999 and 2004 showed that as many as 47.9% of patients diagnosed with HIV did not provide information as to the source of infection, whereas in our study such patients made up only 2.2% of the studied population. We believe that this difference is the result of the trust that our patients have in our research team, and it is caused by the fact that we have had the possibility to observe the patients longer. These differences make it hard to compare the epidemiological data collected by PZH with the data that we collected.

In conclusion, we did not observe a stable trend of change in the profiles of newly diagnosed patients in our region, despite some periodic differences. In 2005, a statistically significant decrease in the number of infections caused by intravenous drug use was observed. This drop had a substantial effect on the frequency of HCV co-infection.

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