HIV & AIDS Review 11 (2012) 84–86

Contents lists available at SciVerse ScienceDirect

HIV & AIDS Review

journal homepage: www.elsevier.com/locate/hivar

Original Research Article

Modern trends of the epidemic process of HIV infection in North-Eastern region of Ukraine

A.I. Piddubna*, M.D. Chemych[1]

Sumy State University, Department of Infectious Diseases and Epidemiology, Sumy, Ukraine

ARTICLE INFO

Article history:
Received 26 January 2012
Received in revised form 5 September 2012
Accepted 7 September 2012

Keywords:
HIV infection
Epidemic process
Ukraine
Sumy region

ABSTRACT

The distribution of HIV infection among different groups in Sumy region is expounded in this article. The most infected people in this region were men with the age range of 18–29 years. Sumy region is relatively stable in relation to distribution of the epidemic. There is a trend involving women in the epidemic process, demonstrating an increase in sexual transmission and high rates of infected prisoners. However, the intravenous drugs users (IDUs) remain the highest risk of infection.

HIV infection is one of the major social and health problem in a low and middle income countries of the world [1,2]. Taking Ukraine as a case study, the epidemic process of HIV infection increases drastically yearly [3]. This has become one of the most important challenges in the healthcare sector in the country [4]. In the North-Eastern part of Ukraine the incidence of HIV/AIDS is becoming common when compared with the data of the previous years. As of 01/01/2012 1729 HIV-infected persons were registered in Sumy region, in which 409 people were diagnosed with AIDS, making the prevalence of HIV infection to be 148.5 per 100,000 population and the prevalence of AIDS to be 35.12 per 100,000 population. Compared to 2005, the number of officially registered with the first-ever diagnosis of HIV infection in 2011 increased by 2.2 times and amounted to 203 people (17.4 per 100,000 population) [3]. The incidence of AIDS has also increased from 4.3 per 100,000 population in 2008 to 5.5 in 2009 (growth rate 27.7%) [5,6]. In 2011, 17 people whom are resident of the North-Eastern part of Ukraine died of AIDS related diseases giving the rate of 1.4 per 100,000 population [3].

1. Aim of study

The aim of this study was to outline the prevalence of HIV infection among different populations of North-Eastern region of Ukraine and to identify trend of epidemic process in this region.

2. Materials and methods

Work is performed using epidemiological, serological and statistical research methods based on the Sumy Regional Centre for Disease Prevention and Control of HIV/AIDS. A retrospective analysis of statistical data is conducted on the spread of HIV among injecting drug users (IDUs), people with sexually transmitted diseases (STDs), people with multiple sexual partners, including men, who have sex with other men (MSPs), blood donors, pregnant women, people who has been deprived of their liberty, patients screened for clinical indications (PSCI). To assess the epidemiological situation in the groups listed above the rate of newly diagnosed HIV infected people based on 100,000 population in the region, the correlations between newly diagnosed HIV infected patients and the number of screening tests, the significant difference between the regional indices and national average data was considered.

3. Results and discussion

During the observation period of 2001–2010 the rate of HIV infection among injecting drug users in Sumy region was below the national average data (Table 1), which may indicate a more favorable situation for the epidemic spread of HIV among this risk group. In 2010 the number of newly diagnosed HIV patients among

* Corresponding author at: Department of Infectious Diseases and Epidemiology, Sumy State University, 15 Rokiv Peremogy Str., 20, 40021 Sumy, Ukraine. Tel.: +380 99 239 31 61; fax: +380 542 655 294.
E-mail addresses: tranki1@mail.ru (A.I. Piddubna), chemych@gmail.com (M.D. Chemych).
[1] Address: Department of Infectious Diseases and Epidemiology, Sumy State University, R.-Korsakov Str. 2, 40007 Sumy, Ukraine. Tel.: +380 542 655 294; fax. +380 542 655 294.

1730-1270/$ – see front matter
http://dx.doi.org/10.1016/j.hivar.2012.09.001

Table 1
Rates of HIV prevalence among different groups in Sumy region per 100,000 population.

Year	IDUs	STDs	MSPs	Prisoners	Blood donors	Pregnant women	PSCI
2001	6.28[a]	0.15[a]	0.23	1.38	0.31[a]	0.46[a]	1.23[a]
2002	4.58[a]	0.47[a]	1.01[a]	1.32[a]	0.23[a]	0.86[a]	1.32[a]
2003	3.78[a]	0.71[a]	0.95[a]	1.66[a]	0.08[a]	1.42[a]	0.39[a]
2004	2.79[a]	0.4[a]	0.56	2.64[a]	0.08[a]	1.2[a]	0.64[a]
2005	5.51[a]	0.24[a]	0.24	1.78[a]	0.41[a]	1.22[a]	1.46[a]
2006	4.6[a]	0.25[a]	1.32	1.97[a]	0.25[a]	1.32[a]	2.38[a]
2007	3.82[a]	0.33[a]	0.42	2.5[a]	0.42[a]	2.25[a]	3.58[a]
2008	2.52[a]	0.34[a]	0.59[a]	2.78[a]	0.34[a]	2.27[a]	3.62[a]
2009	2.28[a]	0.33[a]	0.33[a]	2.46[a]	0.5[a]	2.11[a]	3.38[a]
2010	2.32[a]	0.31[a]	0.36[a]	2.61[a]	0.39[a]	2.24[a]	3.45[a]

[a] Indexes in Sumy region was significantly lower than the average in Ukraine.

IDUs to 100,000 population in the region was 4.3 times lower than those in Ukraine.

Recorded a downward trend of IDUs from the first-ever diagnosis of HIV infection indicates a decrease in the value of an epidemic of parenteral transmission in consequence of injecting drug use. As can be seen from Table 2, after 2001, when in Sumy region it was recorded the maximum number of IDUs with antibodies to HIV1/2, there is a decrease in the proportion of HIV transmission – from 62.6% in 2001 to 18.0% in 2010. This may be due to a decrease in the total volume of testing in the region – from 83.71 per 100,000 population in 2001 to 71.32 in 2010, as the number of studies to a large extent determines the number of identified infected individuals.

Despite the fact that among persons with STDs in the region during 2003–2008, the number of studies significantly exceeded the average in Ukraine 1.1–1.6 times, list shows those with the first time in life diagnosed with HIV infection for all years were below national average (Table 1), which may indicate a low prevalence of HIV among this contingent in the region.

In 2010, the number of newly diagnosed HIV-infected patients with sexually transmitted diseases per 100,000 people in Sumy was 5.2 times lower than the average in Ukraine. In recent years, the situation with the spread of infection among this group may be characterized as relatively stable: for example, from 2005 to 2008, the proportion of individuals with antibodies to HIV1/2 in STDs among the total number of identified HIV-positive individuals is at the same level and ranged 2.04–2.7% (Table 2).

In the recorded high volume of screening tests among individuals with MSPs and years of observation the number of surveys among groups significantly exceeded the average in Ukraine in 2.2–7.2 times. Despite this, the rate of newly diagnosed HIV-infected patients with MSPs in 2001, 2004–2007 was in national level, and only in 2002–2003 exceeded the national average by 2.4–3.1 times (Table 1). In 2010, the number of newly diagnosed HIV-infected patients with MSPs per 100,000 people in Sumy region was 5.2 times lower than the national average. Percentage of people with the first-ever diagnosis of HIV infection in this risk group among the total number of identified HIV-positive people over the years of the study ranged from 2.24 to 10.53% (Table 2).

The level of regional screening studies for antibodies to HIV1/2 among prisoners increased from 10.62 per 100,000 population in 2005 to 23.73 in 2008, and although it remains below the nationwide results for the entire period of observation. The index of first identified HIV-infected persons in prison increased from 1.32 per 100,000 population in 2002 to 2.78 in 2008, but was in 2–3.3 times lower than that of all over Ukraine percentage (Table 1). This can be explained by the 1.3–4.4 times less than the number of prisoners surveyed at 100,000 population for the relevant national average value. Between the index of newly diagnosed HIV-infected individuals from prison in Sumy region and the number of surveyed shows a direct strong correlation ($r = 0.74$, $p < 0.05$). Analysis of the proportion of the different ways of infection in the group of prisoners does not exist.

As can be seen from Table 2, the proportion of persons from prisons among the total number of HIV-infected individuals increased by 2.3 times in 2004 compared with the minimum recorded in 2001, but in subsequent years it has declined.

First time identified HIV-infected blood donors were significantly 5–32 times lower than the national numbers, which indicates a low prevalence of HIV among this contingent (Table 1). In 2010, the number of newly diagnosed HIV-infected donors per 100,000 population in the region was 5.9 times less than the average in Ukraine. However, against the background of reducing the total number of blood donation rate of HIV-infected donors have a tendency to increase.

Among the newly diagnosed HIV-infected pregnant women the figure was 3.5–6 times lower than the average in the country, but every year there is a clear increase by 5 times – from the minimum value in 2001 to a maximum in 2008 (Table 1). In 2010, the number of newly diagnosed women with antibodies to HIV1/2 to 100,000 people in the region was 3.9 times lower than all over Ukraine. Between the index of newly diagnosed HIV-infected pregnant women and the number of surveys (per 100,000 population) was a direct strong correlation ($r = 0.81$, $p < 0.05$). Proportion of HIV-infected pregnant women in the total number of identified HIV-positive people in 2006 increased by 1.7 times (Table 2). This indicates a worsening in the spread of HIV among sexually active people in the region.

It shows an increase in the number of HIV-positive patients who were examined for the presence of clinical signs of HIV infection (Table 2). The percentage of people with antibodies to HIV1/2 of this group among the total number of identified HIV-positive people has grown over time and was highest during the observation period in 2010 – 34.5%. The index for first time identified HIV-infected people among the groups surveyed for clinical indications were less than all over Ukraine values (Table 1), but its growth is observed from the minimum value (0.39) in 2003 to a maximum (3.62) – in 2008. Meanwhile, the first indicator of HIV-infected and the number of surveys found a direct strong correlation ($r = 0.93$, $p < 0.01$).

On studying the age structure, it revealed that newly diagnosed HIV-infected group was dominated by people aged 18–29 years, which amounted to 59.12% (Fig. 1). Substantial share in the epidemic process took people of 30–39 years (31.58%). Emphasis is placed on performance in the epidemic process involving persons under 18 years among IDUs, pregnant women, prisoners and persons with MSPs. Number of individuals with antibodies to HIV 1/2 from 18 to 40 years was 90.7%, which exceeds the average age statistical figure in Ukraine.

There is a dominant male among HIV-infected persons in most groups studied above (IDUs, prisoners, PSCI and blood donors). Of contingents for alleged sexual HIV infection (STDs and MSPs)

Table 2
The share of persons with antibodies to HIV1/2 study groups in the total structure of HIV-infected persons.

Group	Year									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
IDUs	62.6	46.83*	42.11	33.65	50.75*	38.1*	28.75*	20.27*	19.34	18.0
STDs	1.53	4.76	7.89	4.81	2.24	2.04	2.5	2.7	2.5	2.66
MSPs	2.29	10.32*	10.53	6.73	2.24*	10.88*	3.12*	4.73	4.82	4.14
Prisoners	13.74	13.49	18.42	31.73*	16.42*	16.33	18.75	22.3	20.8	19.1
Blood donors	3.05	2.38	0.88	0.96	3.73	2.04	3.12	2.7	2.6	2.36
Pregnant women	4.58	8.73	15.79*	14.43	11.19	10.88	16.88*	18.24	18.5	19.24
PSCI	12.21	13.49	4.38*	7.69	13.43*	19.73*	26.88*	29.06	31.44*	34.5*

* Significant difference of indexes compared to previous year.

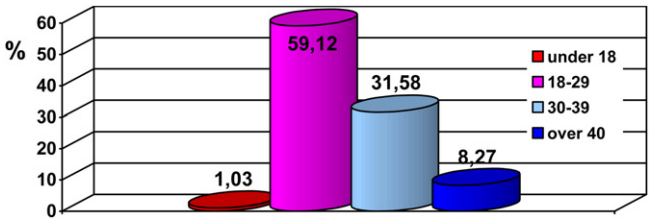

Fig. 1. Age structure of HIV-infected in Sumy region.

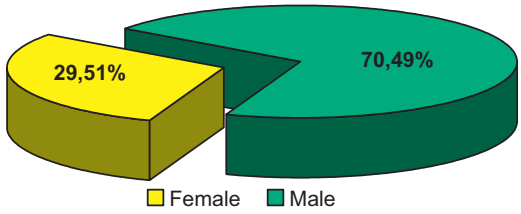

Fig. 2. Sexual structure of HIV-infected in Sumy region.

observed a slight predominance of females. In the region the percentage of HIV-infected males among the total number of HIV-positive was 70.49% and was significantly higher than the national average. The number of females was 2.4 times lower (Fig. 2).

4. Conclusions

1. Among the regions of Ukraine, North-Eastern region is relatively prosperous and better area in terms of newly diagnosed HIV-infected persons, but there are prerequisites for the development of the epidemic process of HIV infection among the general population. This situation can be attributed to several factors. First of all, Sumy region – a region with a low industrial potential, which promotes migration of young working population in other developed regions of the country. Also, it should be noted, lower income of citizens, which results in the preservation of the traditional way of life and a lower level of drug addiction.
2. Despite a decline in the proportion of parenteral transmission, the largest proportion of HIV-infected persons during the years is recorded among this group.
3. There is an increase rate of HIV infected patient among prisoners, despite to limited screening to HIV infection in this group.
4. Along with an increase in screening studies conducted in the presence of antibodies to HIV1/2 in PSCI, there is an increasing rate of newly diagnosed HIV-positive persons.
5. There is a tendency of increase in the number of women with antibodies to HIV1/2 and the active involvement of the female population of Sumy region in the epidemic process.
6. Men aged 18–29 years dominated among newly diagnosed HIV-infected people.
7. Due to the increase in HIV-infected individuals in the population field, there is a need to focus more on educational effort to build a model of safe behavior among high risk groups, such as IDUs, prisoners, persons with MSPs and STDs.
8. The above results indicate the need for an ongoing program of HIV preventive measures among the people.

Conflict of interest

None declared.

References

[1] D.D. Celentano, C. Beyrer, D. Wolfe, R. Elovich, A. Boltaev, et al., Public Health Aspects of HIV/AIDS in Low and Middle Income Countries, Springer, New York, 2008, pp. 557–581 (HIV in Central Asia: Tajikistan Uzbekistan and Kyrgyzstan).
[2] UNAIDS, 2010 Report on the Global AIDS Epidemic, UNAIDS, Geneva, 2010.
[3] National AIDS Prevention Centre/Ministry of Health Information Bulletin No. 35, HIV Infection in Ukraine in 2010, National AIDS Prevention Centre/Ministry of Health, Kyiv, 2011.
[4] S.S. Alistar, D.K. Owens, M.L. Brandeau, Effectiveness and cost effectiveness of expanding harm reduction and antiretroviral therapy in a mixed HIV epidemic: a modeling analysis for Ukraine, PLoS Med. 8 (March (3)) (2011) e1000423.
[5] National AIDS Prevention Centre/Ministry of Health Information Bulletin No. 31, HIV Infection in Ukraine in 2008, National AIDS Prevention Centre/Ministry of Health, Kyiv, 2009.
[6] National AIDS Prevention Centre/Ministry of Health Information Bulletin No. 33, HIV Infection in Ukraine in 2009, National AIDS Prevention Centre/Ministry of Health, Kyiv, 2010.