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EPIDEMIOLOGY OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN HIV-INFECTED POPULATION

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Abstract. The increase in the incidence of chronic obstructive pulmonary disease (COPD) in HIV infection is due to an increase in the life expectancy of patients on the background of antiretroviral therapy. The article is devoted to COPD - the most common non-infectious lung disease, the prevalence of which among HIV-infected patients is higher than in the population. The article presents the features of the clinical course of COPD in HIV infection, as well as the incidence of extrapulmonary and pulmonary manifestations of COPD among the HIV-infected population.

The socio-economic significance of both nosologies justifies a broader informing of pulmonologists, therapists and infectious disease specialists about the peculiarities of the course and therapy of COPD in HIV infection.

Key words: chronic obstructive pulmonary disease, COPD, HIV infection, AIDS, epidemiology, features of the clinical course.

Introduction

Among other problems, the situation with chronic obstructive pulmonary disease (COPD) on the background of HIV infection, as already emphasized in the previous chapters of the dissertation, deserves special attention. This is due to the lack of knowledge of aspects of the epidemiology of COPD in the population of HIV-infected people. If we take into account the high cost of AIDS treatment - up to 10 thousand US dollars per year and the high risk of HIV spread, it becomes clear how relevant this problem is for practical healthcare and the country as a whole. “In the era of AIDS, the lack of knowledge becomes a deadly threat” [8; 9].

Today, chronic obstructive pulmonary disease (COPD) is considered a serious medical and social problem that remains unresolved. COPD morbidity and mortality continue to increase globally. The reason for this, first of all, is the widespread smoking. It has been shown that 4-6% of men and 1-3% of women over 40 suffer from this disease [2; 4; 6].

An increase in the frequency of registration of non-opportunistic respiratory diseases in HIV infection is due to an increase in the life expectancy of patients on the background of antiretroviral therapy [1].

COPD tends to grow, rejuvenate, spread to various groups of the population, including the population of HIV-infected individuals, previously less susceptible to the development of this pathology, and the features of the clinical course against the background of HIV infection are poorly understood [7; 8].

As a result, difficulties arise in the diagnosis, treatment and prevention of chronic heart failure, the probability of error increases, and the quality of medical care for patients with COPD with HIV infection decreases [3; 5].

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The aim of work was to study the clinical features of the course of COPD in the HIV-infected population - the first step in the development and implementation of population-based clinical programs for the prevention of COPD, aimed at reducing the incidence and, subsequently, mortality from COPD among this population.

Purpose of the study

The aim of work was to study the epidemiology of COPD in the HIV-infected population.

Materials and methods

In the conditions of the city of Andijan, 507 patients with HIV / AIDS who were registered and monitored at the regional center for the prevention and control of AIDS were examined using a comprehensive selection method. Of these, 244 are women (48.1%), 263 (51.9%) are men. Among them there were 101 patients with newly diagnosed COPD, 97 with a long history of COPD. The average age of the examined was 34.6 years. 197 (38.9%) patients were 20-29 years old, 235 (46.4%) - from 30 to 39 years old, 65 (12.8%) - 40-49 years old, 8 (1.6%) - at 50-59 years old and 2 (0.4%) - at 60-69 years old. Almost all surveyed persons (503 people, 99.2%) were representatives of the indigenous nationality. Epidemiological monitoring of COPD and their RF was carried out using generally accepted and standardized methods recommended by WHO (2016): questionnaires, instrumental and biochemical ones.

Research results

In this regard, we carried out comprehensive epidemiological studies to study the population characteristics of the prevalence of COPD in the population of HIV-infected people.

Table 1 presents data on the prevalence of COPD and its individual forms among the general population of 20-69 years old HIV-infected.

Table 1

The prevalence of COPD and its individual forms among the general population of HIV-infected

Group of surveyed	Num-ber of examin ed	COPD groups:								P		
		PIBO (1)		CIBO (2)		PE (3)		COPD (4)				
		abs	%	abs	%	abs	%	abs	%	<0,05	<0,01	<0,001
General HIVi-population 20-69 years old	507	129	25,4	54	10,7	15	3,0	198	39,1	1-2	-	1-3 2-3

As can be seen from the data presented in Table 1, COPD among the population of 20-69 years old HIV-infected was detected with a high frequency of - 39.1%.

The highest prevalence (25.4%) in the structure of COPD is COPD with partially irreversible bronchial obstruction (PIBO). The prevalence of COPD with

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completely irreversible bronchial obstruction (CIBO) was revealed in a relatively lower frequency (10.7). In the composition of COPD, the lowest prevalence was characterized by pulmonary emphysema - PE (3.0%).

Noteworthy is the relatively rarer (1.6 times) detection of COPD in HIV-infected women (Table 2).

Table 2

The prevalence of COPD and its individual forms in the HIV-infected population of men and women aged 20-69

Floor	Number of examined	COPD groups:								P		
		PIBO (1)		CIBO (2)		PE (3)		COPD (4)				
		abs	%	abs	%	abs	%	abs	%	<0,05	<0,01	<0,001
Men	244	72	62,1	33	28,4	11	9,5	116	47,5	1-2	2-3	1-3
Women	263	57	69,5	21	25,6	4	4,9	82	31,3	-	1-2 2-3	1-3

Thus, as follows from the data in Table 2, among men and women HIV-infected, the prevalence of COPD and its individual forms are marked by a noticeable difference: COPD with PIBO - 62.1% and 69.5% each (P> 0.05), COPD with CIBO - 28.4% and 25.6% each (P>0.05), pulmonary emphysema - 9.5% and 4.9% each (P<0.05) and in general, COPD - 47.5% and 31% each, 3% (P<0.05).

The results of our analysis also showed (Table 3) that with age, the prevalence of COPD in the HIVi and COPD population (HIVa-COPD) increases from 25.8% to 87.5%, that is, 3.3 times (P<0.001). Relatively high rates of COPD prevalence were in the age groups 40-49 (75.4%) and 30-39 years (37.8%). Lower rates of COPD were observed in the groups aged 20-29 (26.9%) and 30-39 years old (37.8%), P<0,05.

At the age of 60-69 years, the number of those examined is less and, apparently, therefore, in the older age groups, COPD was recorded with the highest frequency (100.0%).

At the same time, the percentage of patients with PIBO increases - from 66.0% (at 20-29 years old) to 67.4% (at 30-39 years old). In other age groups, PIBO was registered with a frequency of 61.2% (at 40-49 years old), 57.1% (at 50-59 years old) and 50.0% (at 60-69 years old).

Among those surveyed, COPD with CIBO, depending on age, was detected as follows: in the group of patients 20-29 years old - 35.8%, in 30-39 years old - 26.9%, in 40-49 years old - 24.5%, in 50 -59 years old - 28.5% and 60-69 years old - 50.0%. With age, COPD with CIBO is defined with a difference in prevalence rate of -25.5% or 2 times (P<0.05). In the age groups 50-59 and 60-69 years, this form of COPD was recorded at levels of 28.5 and 50.0%, respectively (P<0.05).

Table 3

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The prevalence of COPD and its individual forms among the population of HIV-infected people depending on age

Age groups of the examined (years)	Num-ber of exami ned	COPD groups:								P		
		PIBO (1)		CIBO (2)		PE (3)		COPD (4)				
		abs	%	abs	%	abs	%	abs	%	P<0,05	P<0,01	P<0,001
20-29	197	35	66,0	14	27,5	2	3,7	51	25,8	-	1-2	1-3 2-3
30-39	235	60	67,4	24	26,9	5	5,6	89	37,8	-	1-2	1-3 2-3
40-49	65	30	61,2	12	24,5	7	14,3	49	75,4	2-3	-	1-3
50-59	8	4	57,1	2	28,5	1	14,3	7	87,5	-	1-2	1-3
60-69	2	1	50,0	1	50,0	0	0,0	2	100,0	-	-	1-3 2-3

In the structure of COPD, the lowest frequency, at all ages, is emphysema. Thus, the prevalence of PE was at the age of 20-29 years - 3.7%, 30-39 years - 5.6%, 40-49 years - 14.3%, 50-59 years - 14.3% and 60-69 years - 0.0%. In general, depending on the age of the examined the detection rate of EL increases to 14.3% or more than 4 times (P<0.001).

Of interest is the data on the prevalence of HIVa and COPD, depending on the degree of its severity. Such epidemiological data are still absent in foreign and domestic literature.

In the course of our study, we conducted such an analysis and their results are shown in Table 4.

Table 4

The prevalence of COPD among the population of HIV-infected people depending on the severity of the disease

Group of surveyed	Num-ber of examin ed	COPD stage								P		
		(1)		(2)		(3)		(4)				
		abs	%	abs	%	abs	%	abs	%	<0,05	<0,01	<0,001
General HIVi-population 20-69 years old	507	16	3,3	42	8,2	83	16,4	57	11,2	-	2-1	4-1 3-1

Of interest is the data on the prevalence of HIV and COPD, depending on the degree of its severity (Table 4.). The prevalence of HIV and COPD, defined by severity, was as follows: COPD stage I - 3.3%, COPD stage II - 8.2%, COPD stage III - 16.4% and COPD stage IV -11.2%.

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It should also be taken into account that among the surveyed, there are mainly severe (16.4%) and extremely severe forms (11.2%) of COPD. Mild COPD was detected only in 3.3% of cases, and moderate COPD was noted in 8.2% of cases (P_1<0,001; P_2<0,01).

It is obvious that COPD stage IV compared with COPD stage I, occurs 3.4 times more in the presence of HIV infection (P<0.001), and COPD stage III is detected with an increase of 5 times (P< 0.001). Among the population of HIV-infected COPD stage II compared with COPD stage I is observed with an increase of 2.4 times (P<0.01).

This means that HIV-infected individuals are at increased risk for having severe forms of COPD.

The study of the prevalence rates of various stages of COPD depending on the gender characteristics of the population of HIV-infected (Table 5) showed that they were the highest (1.4 times) in men than in women (P<0.05).

Thus, from the above statistical analysis in Table 5, it follows those different stages of COPD in men and women - HIV-infected were detected by the following prevalence: COPD stage I - 3.1 and 1.1% each (P<0.001), COPD stage II - 12.0% and 6.8% each (P<0.05), stage III COPD – 19.7% and 13.3% each (P>0.05).

Table 5

Features of the prevalence of COPD among the population of HIV-infected people depending on the severity of the disease

Group of surveyed	Num-ber of exam-ined	COPD stage								P		
		(1)		(2)		(3)		(4)				
		abs	%	abs	%	abs	%	abs	%	<0,05	<0,01	<0,001
Men	244	7	3,1	29	12,0	48	19,7	32	13,1	-	-	4-1 3-1 2-1
Women	263	3	1,1	18	6,8	35	13,3	26	9,9	-	3-2	4-1 3-1 2-1

Severe and extremely severe COPD are observed 6.4 (COPD stage III) and 4.2 times (COPD stage IV) more often than its mild forms in men (P<0.001).

A similar trend is observed among the examined women: COPD stage IV and stage III, compared with a mild degree of the disease, they were detected with an increase of 24.9% or 9 times (P<0.001) and 12.2% or 12.1 times (P<0.001) – respectively.

Table 6 presents data on the prevalence of various stages of COPD among the general population of HIV-infected people depending on age.

Table 6

The prevalence of various stages of COPD among the population of HIV-infected people depending on age

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Group of surveyed	Num-ber of exam-ined	COPD stage:								P		
		(1)		(2)		(3)		(4)				
		abs	%	abs	%	abs	%	abs	%	<0,05	<0,01	<0,001
20-29	197	3	1,5	11	5,6	20	10,2	15	7,6	3-2	-	4-1 3-1 2-1
30-39	235	6	2,6	19	8,1	31	13,2	26	11,1	-	-	4-1 3-2 2-1
40-49	65	4	6,2	6	9,2	18	27,7	15	23,1	-	4-2	4-1 3-1
50-59	8	0	0,0	0	0,0	1	12,5	2	25,0	-	4-2	-
60-69	2	0	0,0	0	0,0	0	0,0	2	25,0	-	-	4-1

From Table 6, attention is drawn to the fact that milder forms of COPD are detected much more rarely in all age groups of the examined, which indicates a low possibility of the reverse development of this condition against the background of HIV infection. At all ages, there is a fairly high prevalence of COPD with extremely severe, severe and moderate course. Thus, COPD stage I increases from 1.5% (in the group of people aged 20-29 years) to 6.2% (in the group of 40-49 years), that is, 4.1 times (P<0.001). There were no cases of COPD stage I in older age groups (50-59 and 60-69 years) (0.0%).

The frequency of COPD stage II in different age groups was revealed as follows: at 20-29 years old - 5.6%, at 30-39 years old - 8.1%, at 40-49 years old - 9.2%, at 50-59 years old - 0.0% and at 60-69 years old - 0.0%. There was an increase in the prevalence of stage II COPD with age by 3.6% or 1.6 times (P<0.05).

Among those surveyed in the age group of 20-29 years, the prevalence of stage III COPD was generally noted in 10.2%, in 30-39 years - in 13.2%, in 40-49 years - in 27.7%, in 50-59 years - in 12.5% and in 60-69 years - 0.0%. With age, the incidence of severe forms of COPD increases by 17.5%, that is, by 2.7 times (P<0.01).

The prevalence of extremely severe forms of COPD associated with HIV infection in different age groups was detected with the following frequency: at 20-29 years old - 7.6%, at 30-39 years old - 11.1% (with an increase of 3.5%, P >0.05), at 40-49 years old - 23.1% (with an increase in detection by 3 times, P<0.01), at 50-59 years old - 25.0% (with an increase of 3.3 times, P<0.01) and at 60-69 years old - also 25.0% (P<0.01).

Discussion of research results

Thus, it turned out that the highest rates of morbidity and severe forms of COPD in the examined patients are observed in all age groups. However, relatively high rates of prevalence of severe forms of COPD, nevertheless, fall on the age groups of 30-39, 40-49 and 50-59 years.

In our opinion, this is consistent with the data of those researchers who consider COPD as a gradually developing / progressive pathology with age - from less pronounced to more pronounced "epidemiological" manifestations, especially against the background of HIV infection / AIDS [8,9,23].

In general, HIV-infected individuals are characterized by an increased tendency to develop severe forms of COPD. The presence of HIV infection increases the risk of developing COPD and its complications (Fig. 1,2,3 and 4).

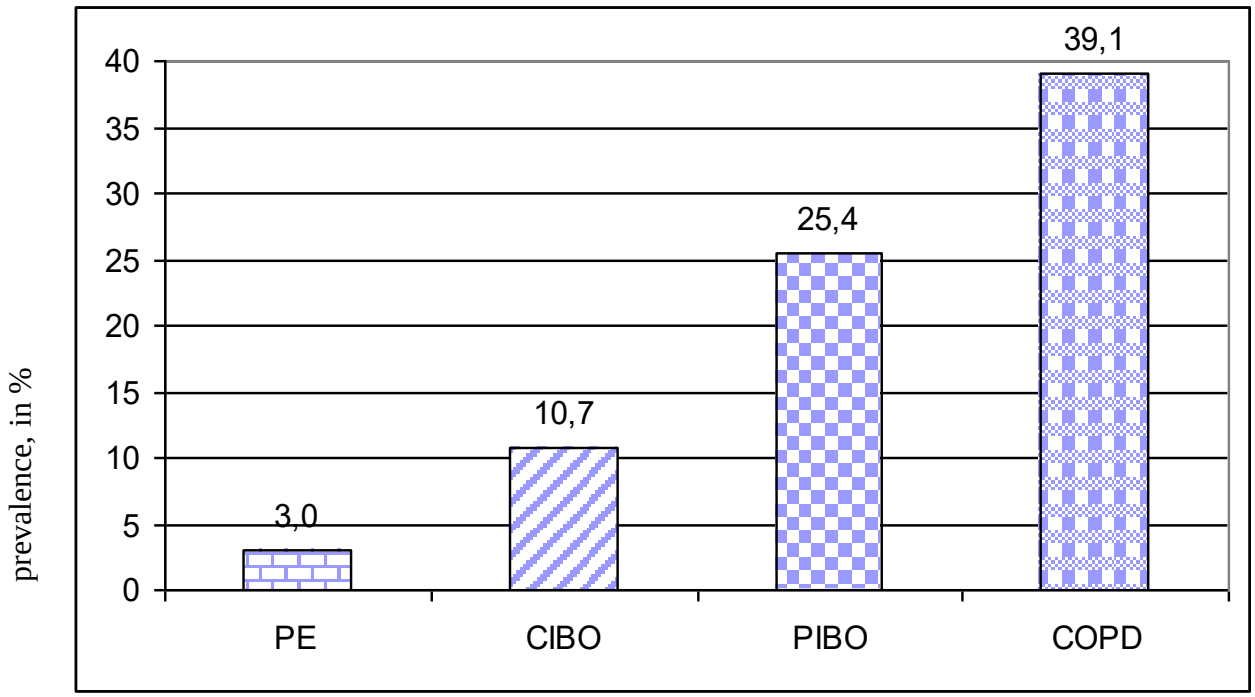

Fig.1. The prevalence of COPD among the population of HIV-infected

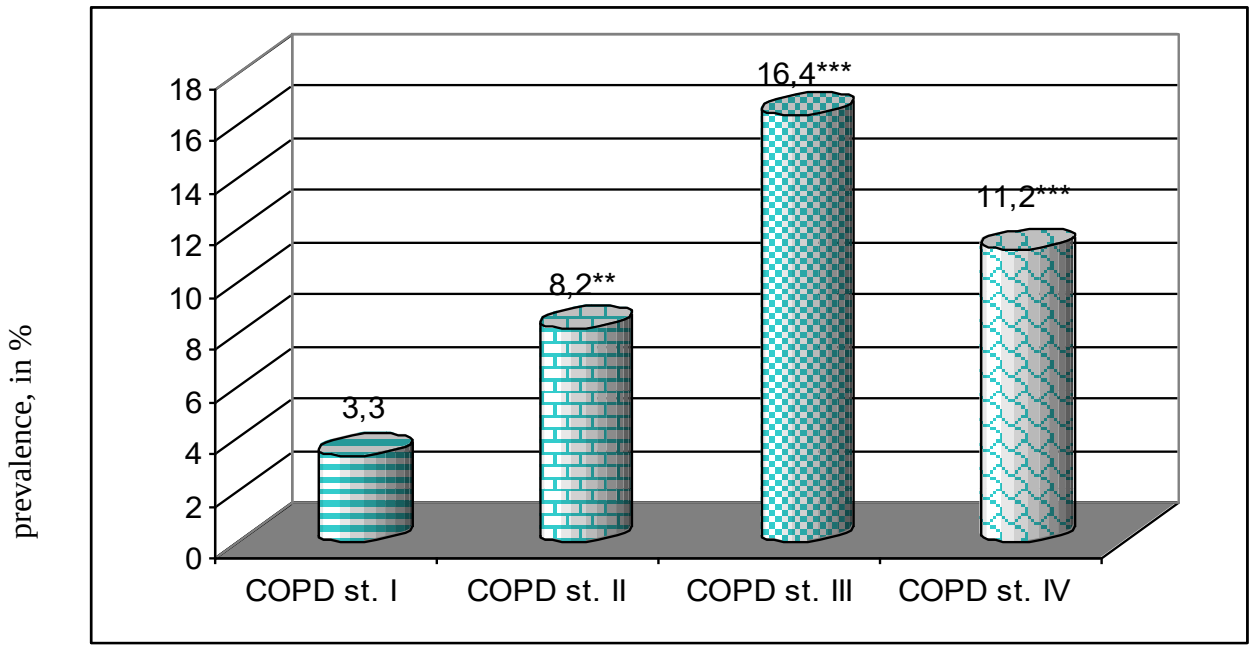

Fig.2. The prevalence of verified COPD among the HIV-infected population by severity

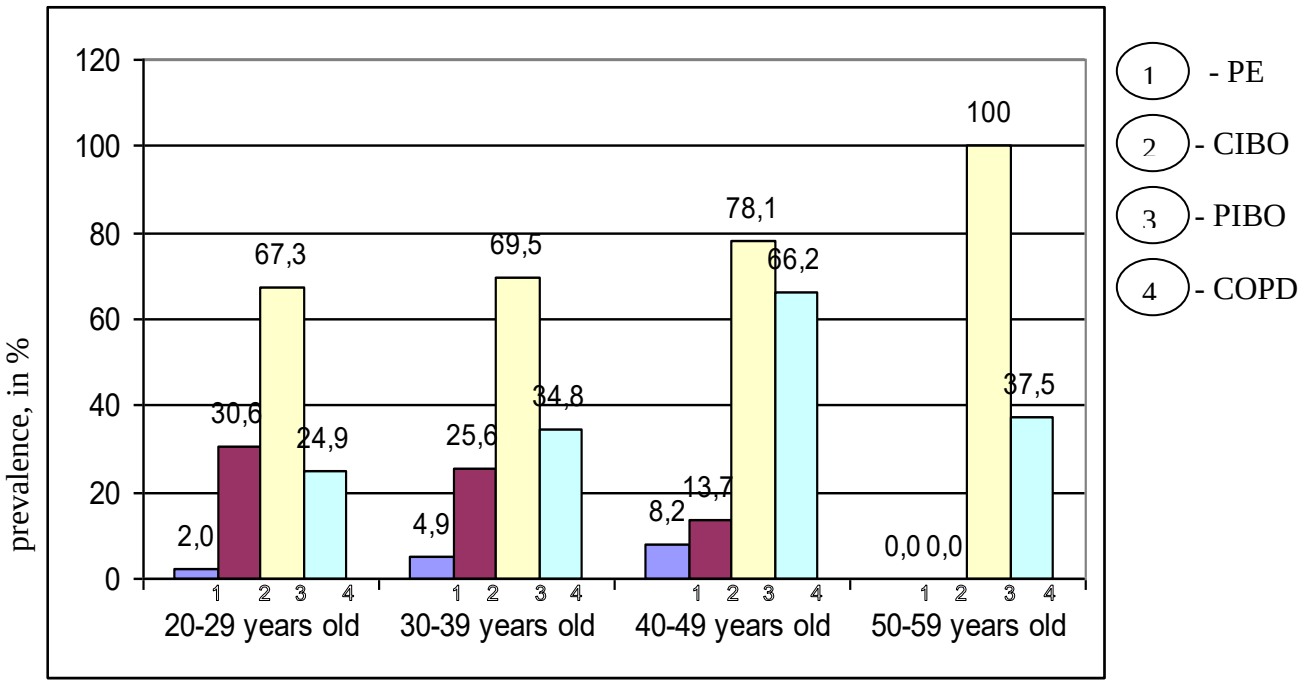

Fig.3. Age features of HIV detection COPD

The incidence of COPD in the study sample in HIV-infected patients was 39.1%, including: in men - 47.5% and in women - 31.3%; COPD stage I - 3.3%, COPD stage II - 8.2%, COPD stage III - 16.4% and COPD stage IV - 11.2%.

Against the background of HIV infection, the prevalence of COPD significantly increases: in young people under 30 years of age it was 24.9%, at the age of 30-39 years - 34.8%, in people over 40 years old - up to 66.2%.

It follows from our data that epidemiological monitoring / research can not only be used to study the epidemiological situation in relation to COPD, but also serves as a fairly simple and cost-effective / cheap tool for identifying groups at increased risk against the background of HIV infection in relation to the presence of COPD, with conducting preventive surveys of the population.

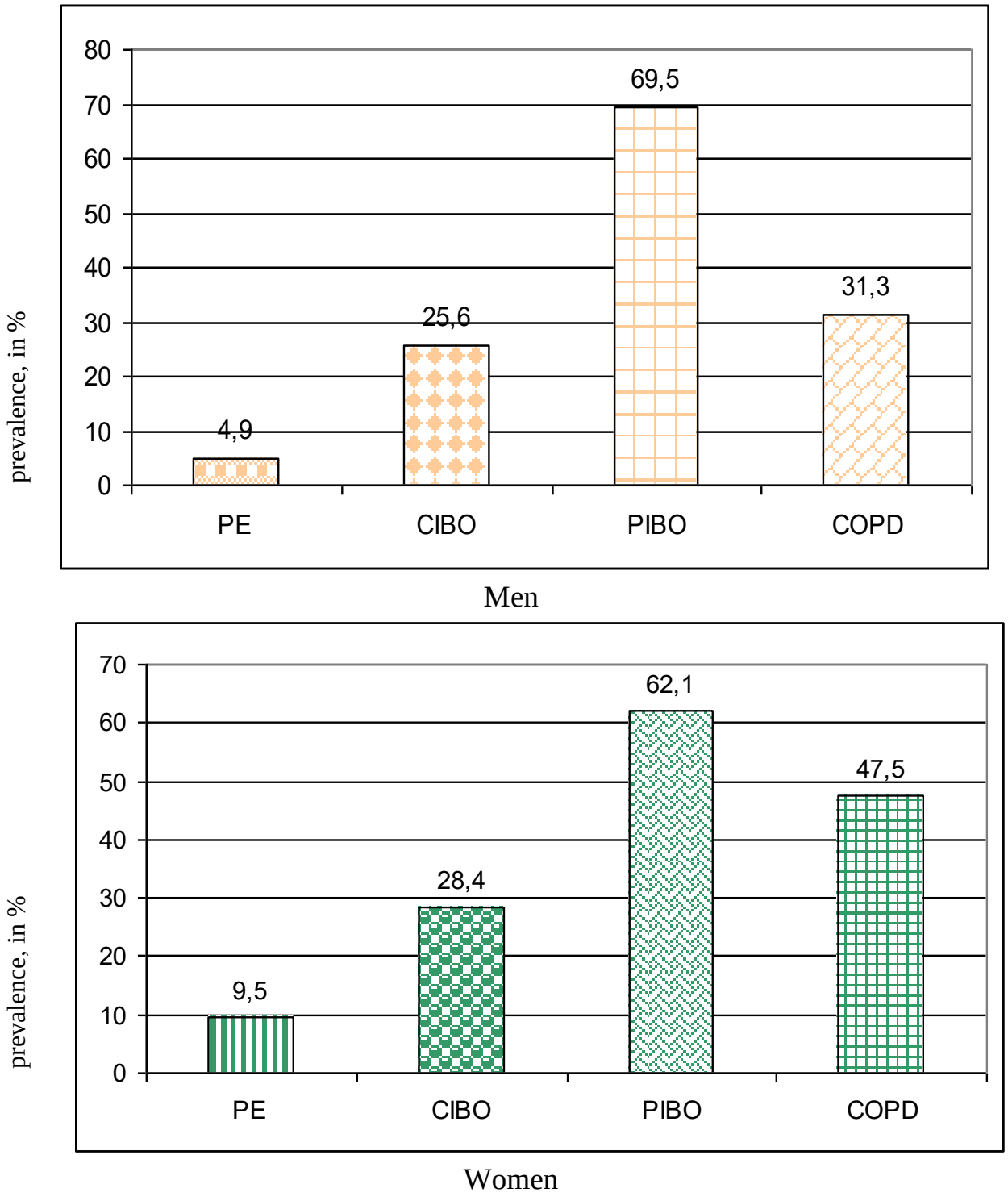

Fig.4. The prevalence of verified COPD among HIV-infected men and women

Conclusions

Given the large contribution of COPD to the causes of "endpoints", the use of an epidemiological approach, along with other methods, will help to identify them earlier in the HIV-infected population.

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