## Knowledge about HIV in People with Schizophrenia: A General Population Comparison

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#### Abstract

**Background:** Patients with schizophrenia are at higher risk for human immunodeficiency virus infection (HIV) positivity compared to the general population. Only a limited number of studies have evaluated the knowledge about HIV in people with schizophrenia. **Objectives:** To compare the knowledge about HIV between people with schizophrenia and the general population. **Methods:** The knowledge about HIV was assessed with a questionnaire used in the general health survey of the Belgian population in 2004. **Results:** Patients with schizophrenia had a significantly better knowledge about nontransmissible contacts compared to the general population (43.2% vs. 32.6%, df=1, chi-square=11.0; p=0.0009). There was no difference regarding the knowledge about protective methods (50.7% vs. 55.9%, df=1, chi-square=2.45; p=0.12). Patients had a better appreciation about the severity and treatment options for acquired immunodeficiency syndrome (AIDS) (54.6% vs. 37.9%, df=1, chi-square=25.91; p<0.0001). **Conclusions:** Although the overall knowledge about HIV in patients with schizophrenia is better than that of the general population, it is far from optimal. There is a need for systematic educational programs to improve knowledge.

Key Words: AIDS, HIV, Physical Illness, Schizophrenia

#### Introduction

In recent years, there is a growing concern about physical health issues in people with severe mental illnesses (SMI) (1-4). The association between psychiatric disorders and human immunodeficiency virus (HIV) has been well explored

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in recent years. HIV is neurotoxic and results in progressive cognitive deficits. HIV infection can result in delirium, cognitive deterioration, mood changes, psychosis and other neuropsychiatric disorders (2-6).

Since the onset of the HIV epidemic in Belgium until December 31, 2007, HIV infection has been diagnosed in 21,134 individuals. In the past twenty-two years (1986– 2007), the rate of newly diagnosed cases has evolved from 1.8 to 2.9 new cases per day. In 2007, 1,051 new cases were identified. In the period 1997 to 2007, the number of diagnosed cases with HIV has increased by 51% (7). In recent years, the rate of new cases remained stable, with three new cases per day.

Patients with schizophrenia are at increased risk for HIV infection compared to the general population (8-10). A recent study in Belgium indicated an odds ratio of 7.4 (5). Other studies have provided similar results, with prevalences ranging from 3.1 to 23.9% (8-14). The differences

### **Clinical Implications**

Patients with schizophrenia are, as a group, at risk for HIV infection and the co-occurrence of both disorders leads to greater morbidity than in individuals with only HIV/AIDS (5, 10). The knowledge in our patient sample was better than in the general population, but certainly not adequate given their increased risk. More and systematic education about HIV should be provided to people with serious mental illness (SMI) by clinical staff (certainly psychiatrists, case managers and nurses) (37, 39). Based on the limited set of data assessed in this study, additional educational efforts should especially target patients with a lower educational level and a higher illness severity. Assessment of patients' knowledge about HIV can identify specific educational needs. Screening for HIV in people with SMI should be part of routine physical healthcare, certainly in groups with high-risk behaviors (40, 41). A study by Grassi et al. showed that only 36% of patients in their sample were tested for HIV. A recent review indicated that less than half of patients with SMI were tested for HIV in the past year (36). The finding that more than 25% in our sample were tested for HIV, but were not aware of it, supports the need for adequate information given by clinicians. Different groups have recently advocated the promotion of integrated care for somatic co-morbidity in people with severe mental illness, also for HIV prevention and treatment (40, 42, 43). Preliminary data suggest that this can lead to better compliance with HIV treatments in patients with severe mental illness (44, 45).

between studies can be explained by way of sampling and the country of origin (2, 3).

Specific risk factors contribute to the higher prevalence of HIV and AIDS (acquired immunodeficiency syndrome) in people with schizophrenia. Caton et al. and Warner et al. suggest more high-risk contacts due to poor social and economic status (15-17). An important risk factor is substance, mainly IV (intravenous), abuse (8, 9, 18-22). Cournos et al. reported that IV-substance using individuals had a four-fold higher risk than patients without a substance-related disorder (23). Another important risk factor is unsafe sex (24, 25). This also leads to higher rates of other sexually transmitted infections (9, 11, 20, 21, 26). Gotteman and Groome found that patients with schizophrenia were less aware of the risk factors for HIV (25). Some authors have also suggested higher rates of paid sex as an additional factor (9, 11, 20, 21).

Given the higher risk, it is surprising that only very few studies have explored the knowledge about HIV in patients with SMI (21, 27-29). In these studies (with relatively small sample sizes), overall patients with SMI had a poor knowledge about HIV. The situation could be even worse in patients with schizophrenia due to cognitive deficits related to the disorder.

The aim of this study was to analyze the knowledge about HIV in a large sample of patients with schizophrenia compared with a large representative sample of the general population.

### Methods

#### Design

Data for this cross-sectional descriptive study were collected between December 2008 and April 2009. Consecutive patients with a clinical diagnosis of schizophrenia or schizoaffective disorder, either hospitalized or seen as outpatients, were assessed. Inclusion criteria were: clinical diagnosis of schizophrenia or schizoaffective disorder in the electronic patient database of patients under treatment, age 18 years or older, native Dutch speaking, and capable of giving informed consent (our hospital is located in the Flemish, Dutch-speaking region of Belgium). The study was approved by the local and central university ethical committee.

The questionnaires were distributed by the treating clinicians during a routine visit. The psychiatrist explained the reason for the study and collected the informed consent. The questionnaires were filled out by the patients and collected at a next visit with their psychiatrist.

#### Variables and Assessment Instrument

Knowledge about HIV was assessed with a written questionnaire. Treating psychiatrists filled out a structured form on clinical and demographic data.

The questionnaire has been used in a general health survey of the Belgian population in 2004 (for details on questions see Tables 2, 3, and 4). The questions originated from the St. Louis survey, with additional indicators from a project supported by the European Union (30, 31). The same questionnaire was also used in the Belgian general population health survey.

Knowledge was evaluated in five domains: knowledge about noncontagious contacts; knowledge about nonprotective methods; HIV testing (when and why?); knowledge about the severity of HIV/AIDS and treatment options; and, attitudes toward people who are seropositive. In total, there are nine multiple-choice questions.

#### **Control Group**

Data were obtained from the results of the 2004 general population health survey. The aim of the survey was to give a broad overview of health-related issues. The representative population sample, based on the national registry, comprised all people living in the country without limita-

Table 1	Table 1   Demographic Data (N=227)				
Demographic		N (%)			
Sex					
Male		146 (64.3%)			
Female		81 (35.7%)			
Age					
15–24 years		25 (11.0%)			
25–34 years		54 (23.8%)			
35–44 years		73 (32.2%)			
45–54 years		55 (24.2%)			
55–64 years		18 (7.9%)			
65+		2 (0.8%)			
CGI Score					
1		1 (0.4%)			
2		27 (11.9%)			
3		54 (23.8%)			
4		104 (45.8%)			
5		32 (14.1%)			
6		7 (3.1%)			
7		2 (0.9%)			
GAF Score					
Mean		59.0±11.7			
Diploma	(				
Lower educati	on (age 12)	11 (4.9%)			
Lower second	ary (age 15)	57 (25.1%)			
Secondary edu	ication (age 18)	106 (46.7%)			
Higher educat	ion/University	53 (23.4%)			
	5	9 (2 50/)			
295.1		8 (3.5%) 05 (41.0%)			
295.5		29 (12 8%)			
295.7		29 (12.0%) 44 (19.4%)			
295.9		51 (22 5%)			
Living Situatio	n	01 (221070)			
Sheltered hou	sina	30 (13.2%)			
Family	9	75 (33.0%)			
Partner		25 (11.0%)			
Alone		79 (34.8%)			
Other		18 (7.9%)			
Activities					
Paid job		14 (6.2%)			
Sheltered wor	k	7 (3.1%)			
Study or traini	ng	25 (11.0%)			
Unemployed/	disability	181 (79.7%)			
Ambulant/Adm	nitted				
Ambulant/out	patient	114 (58.5%)			
Admission		81 (41.5%)			

CGI=Clinical Global Impression; GAF=Global Assessment of Functioning tion concerning nationality, age or legal status. The sample selected for the 2004 survey consisted of 12,945 individuals (32).

### **Statistical Analysis**

Descriptive and explorative analyses of the data were done with SAS (Statistical Analysis System). Differences between patients and the general population were assessed with chi-square tests for nominal variables (significance p<0.05).

For the comparison with the general population data, we only had access to the results per domain and not on individual item level. The indicator per domain of knowledge was strict. If one item out of the list of four or five was wrong, this lead to a classification of poor knowledge or negative attitude (32).

#### Results

#### **Response Rate**

Two hundred and forty-one patients were recruited for participation in the study period by the treating psychiatrists. The questionnaires were returned by 227 patients. Fourteen (5.4%, 7 men and 7 women, mean age 42.9 years) refused participation in the study.

Data on whether HIV testing was done in the past were available for all respondents.

# Description of the Study and Control Population

Table 1 (demographic data) shows the demographic data of the total patient sample who participated. The sample consisted of 146 men (64.3%) and 81 women (35.7%), with a mean age of 40.0 years ( $\pm$ 11.2 years, youngest patient 18.5 and oldest 75.3 years). The most common diagnosis was paranoid schizophrenia (41.8%). A Clinical Global Impression (CGI) score of 4 was the most frequent (45%) (34), and the mean Global Assessment of Function (GAF) score was 59.0 $\pm$ 11.7 (34). A little more than half of the patients were seen as outpatients (58.5%).

The sample of the general health survey for which HIV questionnaires were available was 9,165 persons with a similar age distribution. The sex distribution was not different from the patient sample (62.5% men) (df=1, chi-square=0.3; p=0.58). The control group consisted of both significantly more people with a higher educational level (36.1%) and significantly more people with only a diploma of lower education (16.7%) (df=3, chi-square=57.6; p<0.0001).

# Knowledge and Attitudes about HIV in Patients with Schizophrenia

Patients with psychosis identified one or more noncon-

Table 2       Answers on Knowledge Questions about HIV/AIDS (N=227)						
H01. Can or the HIV viru	ne be infected with Is by	No	Yes	They say no, but I remain prudent	l do not know	Missing
01. Sitting or	n a toilet seat?	190 (84.1%)	23 (10.2%)	11 (4.9%)	2 (0.9%)	1
02. Drinking	from someone else's glass?	186 (82.3%)	22 (9.7%)	12 (5.3%)	6 (2.7%)	1
03. By kissing	g on the mouth?	157 (69.8%)	38 (16.9%)	20 (8.9%)	10 (4.4%)	2
04. By mosq	uito bites?	160 (70.8%)	38 (16.8%)	10 (4.4%)	18 (8.0%)	1
05. By donat	ing blood in Belgium?	159 (70.4%)	44 (19.5%)	12 (5.3%)	11 (4.9%)	1

H02. Are the following methods safe to protect against the AIDS virus?	Completely safe	Somewhat safe	Somewhat unsafe	Completely unsafe	l do not know	Missing
01. Using a contraceptive pill	14 (6.2%)	13 (5.8%)	6 (2.7%)	181 (80.1%)	12 (5.3%)	1
02. Choosing partner that looks healthy	23 (10.2%)	24 (10.6%)	30 (13.3%)	142 (62.8%)	7 (3.1%)	1
03. Interruption of intercourse before ejaculation	15 (6.6%)	10 (4.4%)	27 (11.9%)	159 (70.0%)	16 (7.1%)	0
04. Washing after sexual intercourse	23 (10.2%)	13 (5.8%)	13 (5.8%)	168 (74.3%)	9 (4.0%)	1

## Table 3Answers on HIV Testing in Patients<br/>with Schizophrenia (N=227)

H03. Did you undergo an HIV test?	N (%)
Yes, on different occasions	47 (20.7%)
Yes, only once	63 (27.8%)
No	54 (23.8%)
Do not know	4 (1.8%)
No/Do not know (but tested in the past)	59 (26.1%)
H04. When was your last HIV test?	
Less than 1 year ago	32 (27.6%)
Longer than 1 year ago	72 (62.1%)
Do not know	12 (10.3%)
H05. Who took the initiative for the HIV testing?	
Own initiative	48 (48.6%)
Doctor	44 (42.7%)
Partner	2 (1.9%)
School	2 (1.9%)
Do not know	1 (1.0%)
H06. Why was the test performed?	
Investigations for pregnancy	2 (1.8%)
General physical examination	53 (46.5%)
Obligatory testing	4 (3.5%)
Worries about AIDS infection after sexual contact	25 (21.9%)
Worries about AIDS infection for other reason	4 (3.5%)
Administrative reason	2 (1.8%)
Start of a new relationship or marriage	17 (14.9%)
Blood donation	3 (2.6%)
Other reason	4 (3.5%)

tagious contacts incorrectly in 56.7% of cases (see Table 2: answers on knowledge questions about HIV/AIDS). Eighty-four percent knew that one could not get infected from sitting on toilet seats; but, 19.5% believed that you could get infected by donating blood. There were no significant differences between the sexes (df=1, chi-square=1.67; p=0.2), educational level (df=3, chi-square=6.34; p=0.09), nor illness severity as measured with CGI (df=6, chi-square=9.1; p=0.17).

Nonprotective contacts were evaluated correctly by 50.7% of patients. A majority, 80.1%, were aware that the contraceptive pill does not protect against HIV. Nevertheless, 10.2% were convinced that choosing partners that seem healthy was safe. There was no difference between men and women (df=1, chi-square=0.3; p=0.59), but a higher education was associated with better knowledge on this domain (df=3, chi-square=12.6; p=0.005). There was a nonsignificant trend of an effect of illness severity (df=6, chi-square=11.3; p=0.07).

Three out of four (74.4%) patients were tested for HIV in the past, with most tests done longer than one year ago (62.1%) (see Table 3: HIV testing in patients with schizophrenia). Of the patients tested, 26.1% did not know that they underwent a test. The main reasons for testing were a general heath screening (46.5%) or fear of infection after a sexual contact (21.9%). The initiative for testing was equally distributed between the patient (48.6%) and a physician (42.7%). Two patients, or 1.2% of the tested sample (n=169), were seropositive.

A little over half of the patients, 54.7%, assessed the severity and treatment options for HIV/AIDS correctly (see

Table 4         Answers on Attitudes toward Seropositive People and Severity/Curability AIDS (N=227)						
Yes	No	Missing				
176 (78.2%)	49 (21.8%)	0				
103 (46.6%)	118 (53.4%)	0				
H08. Would you agree if						
37 (16.6%)	186 (83.4%)	4				
80 (36.0%)	141 (63.8%)	6				
187 (85.0%)	33 (15.0%)	7				
21 (9.3%)	204 (90.7%)	2				
40 (18.4%)	177 (81.6%)	10				
61 (27.6%)	160 (72.4%)	6				
37 (16.9%)	182 (83.1%)	8				
21 (9.4%)	203 (90.6%)	3				
	rity/Curab Yes 176 (78.2%) 103 (46.6%) 37 (16.6%) 80 (36.0%) 187 (85.0%) 187 (85.0%) 21 (9.3%) 40 (18.4%) 61 (27.6%) 37 (16.9%) 21 (9.4%)	Yes       No         176 (78.2%)       49 (21.8%)         103 (46.6%)       118 (53.4%)         103 (46.6%)       118 (53.4%)         37 (16.6%)       186 (83.4%)         37 (16.6%)       141 (63.8%)         80 (36.0%)       141 (63.8%)         187 (85.0%)       33 (15.0%)         21 (9.3%)       204 (90.7%)         40 (18.4%)       177 (81.6%)         61 (27.6%)       160 (72.4%)         37 (16.9%)       203 (90.6%)				

#### Table 5 Knowledge about HIV/AIDS Population Comparison (N=227)

Domain	Patients with Schizophrenia % (N)	General Population % (N)	Chi-square test (df 1) P (Chi-square)
Nontransmissible contacts (5 correct items)	43.3% (94)	32.6% (2,990)	0.0009 (11.0)
Nonprotective measures (4 correct items)	50.7% (115)	55.9% (4,976)	0.1176 (2.45)
Severity/treatment options (5 correct items)	54.7% (124)	37.9% (2,546)	0.0001 (25.9)
Tested for HIV	74.4% (169)	17.4% (1,555)	0.0001 (471.6)

Table 4: answers on attitudes toward seropositive people and severity/curability AIDS). Ninety-one percent agreed that it is a severe condition, but 18.4% believed that HIV/AIDS can be cured. Once again, there was no difference between men and women (df=1, chi-square=0.4; p=0.33), a higher education was associated with better knowledge (df=3, chi-square=13.1; p=0.0045), and patients with a lower illness severity had better knowledge on this domain (CGI: df=6, chi-square=14.6; p=0.0233).

A negative attitude toward seropositive people is present in patients, but it is context dependent. Twenty-two percent would not have a meal with a seropositive individual and 53.4% would not leave their children in their company. More than 80% stated that an employer may not discharge an employee because he/she is infected with HIV, and that people who are seropositive, that have sex without taking precautions and who do not inform their partner, should be taken to court.

Overall, there were no differences between in or outpatients, nor between patients with or without prior HIV testing.

# Knowledge about HIV Compared with the General Population

Compared to the general population, people with a psychotic disorder have a better knowledge about nontransmissible contacts (32.6% vs. 43.2%, df=1, chi-square=11.0; p=0.0009), an equal knowledge about nonprotective measures (55.9% vs. 50.7%, df=1, chi-square=2.45; p=0.12) and a better judgment on the severity and treatment options of HIV/AIDS (37.9% vs. 54.6%, df=1, chi-square=25.9; p<0.0001) (see Table 5: knowledge about HIV/AIDS population comparison).

Rates of testing for HIV were 17.4% in the general population, which is four-fold lower than in the patient sample.

Educational level had a significant impact on the knowledge about HIV. For all domains, individuals with a higher secondary or higher education had a better knowledge of nontransmissible contacts (df=3, chi-square=23.2; p<0.0001), nonprotective measures (df=3, chi-square=10.3; p=0.0013) and severity and treatment options (df=3, chi-square=4.0; p=0.0460). There were no differences between higher secondary and higher education.

#### Discussion

This study evaluated the knowledge about HIV in a large sample of patients with schizophrenia and compared the level of knowledge with a representative population sample.

Patients with schizophrenia had a better knowledge about nontransmissible contacts, but were not fully aware of adequate ways of protection. More than half of the patients had a correct judgment about the severity and the curability of AIDS, which was significantly better compared to the general population. An explanation for the better knowledge could be that patients were more frequently tested for HIV than people in the general population, as well as more frequent contacts with healthcare providers, thus having more opportunities to discuss risk behaviors and its consequences (37, 38). A negative attitude toward seropositive people is present in some patients, but it is context dependent.

Although only a limited number of potential predictors of knowledge were assessed in the study, higher educational level and lower illness severity scores were associated with better knowledge about HIV. This is in agreement with a recent study in Brazil (38).

Most other studies have found a poorer knowledge about HIV in patients with severe mental illness (11, 21, 28, 29, 38). Aruffo et al. found a lower knowledge in people with schizophrenia (35). According to Carey et al., patients are poorly informed about HIV transmission and risk behavior (11). On the contrary, in our study, patients had a better knowledge than the general population about nontransmissible contacts. In the study of McKinnon et al., 51.1% of patients believed that transmission was possible via normal contact, and 43.0% thought that a woman could only be infected by sexual contact with a man. Differences with other studies may be partly explained by the educational level and the relatively high rate of HIV testing in our sample.

Patients with schizophrenia are, as a group, at risk for HIV infection and the co-occurrence of both disorders leads to greater morbidity than in individuals with only HIV/AIDS (5, 10). The knowledge in our patient sample was better than in the general population, but certainly not adequate given their increased risk. More and systematic education about HIV should be provided to people with SMI by clinical staff (certainly psychiatrists, case managers and nurses) (37, 39). Based on the limited set of data assessed in this study, additional educational efforts should especially target patients with a lower educational level and a higher illness severity. Assessment of patients' knowledge about HIV can identify specific educational needs.

Screening for HIV in people with SMI should be part of routine physical healthcare, certainly in groups with highrisk behaviors (40, 41). A study by Grassi et al. showed that only 36% of patients in their sample were tested for HIV. A recent review indicated that less than half of patients with SMI were tested for HIV in the past year (36). The finding that more than 25% in our sample were tested for HIV, but were not aware of it, supports the need for adequate information given by clinicians. Different groups have recently advocated the promotion of integrated care for somatic comorbidity in people with severe mental illness, also for HIV prevention and treatment (40, 42, 43). Preliminary data suggest that this can lead to better compliance with HIV treatments in patients with severe mental illness (44, 45).

Our study has a number of limitations. The construction of the knowledge indicators was strict: one wrong answer in a series of questions on a domain led to a classification of a wrong answer. Analysis on item level was not possible. Only a limited number of variables was available to evaluate potential predictors of poor knowledge in patients. Patient recruitment was limited to one hospital, a university teaching hospital. In order to make more general conclusions about the knowledge about HIV in Belgian patients with schizophrenia, the study should be replicated in different treatment settings. The data for the population controls were based on a population survey of 2004, while patients were assessed four years later. The data from the more recent 2008 health survey are not yet available.

Strengths of our study are the relatively large patient sample compared to other studies, the high recruitment rate (only 5.4% refusal rate), and a large population control group. Only very few studies on HIV/AIDS in SMI have been performed in Europe.

#### Conclusions

People with schizophrenia in Belgium have at least equal or better knowledge about HIV compared to the general population. This knowledge is only partial, and literature data show that they are at higher risk for contracting an HIV infection. There is a need for educational interventions to improve the knowledge about HIV in this vulnerable group of patients. Moreover, having adequate knowledge does not ensure that risk behavior is avoided.

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