

HIV, syphilis, and hepatitis B and C prevalence among patients with mental illness: a review of the literature

Prevalência de infecção por HIV, sífilis e hepatite B e C entre portadores de doenças mentais crônicas

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Abstract

A limited number of studies worldwide have investigated the prevalence of HIV, syphilis, and hepatitis B and C infection among psychiatric patients. However, prevalence of these infections in the population with chronic mental illness has not been clearly established. Most of the published papers are from developed countries and have derived from relatively small and non-representative samples. We performed a systematic review of the published literature to identify studies on these infectious diseases within psychiatric populations in Brazil and other developing countries. Overall, prevalence rates varied from 0% to 29% for HIV; 1.6% to 66% for HBV; 0.4% to 38% for HCV; and 1.1% to 7.6% for syphilis. Several risk factors were identified and discussed, although sampling limitations restrict the generalization of study findings. This review highlights the lack of information on the prevalence of sexually transmitted diseases and their associated factors among persons with chronic mental illness and identifies gaps in the knowledge base in both developing and developed countries.

Mentally Ill Persons; Sexually Transmitted Diseases; HIV

Introduction

It is estimated that worldwide at least 33 million people are chronically infected with HIV ¹, 170 million with HCV ², and 350 million with HBV ³, while about 12 million become infected with syphilis each year ⁴. Most affected people live in developing countries. These infections have similar transmission routes, mainly by unprotected sex and/or sharing needles or drugs with exchange of blood or body fluids, and they have become a focus of increased public health concern.

By the end of 2001, the World Health Organization (WHO) reported that approximately 450 million people suffered from mental or behavioral disorders, which include four of the 10 leading causes of disability worldwide ⁵. The World Bank has estimated an increase from 10.5% in 1990 to 14.7% in 2020 in the proportional share of the global burden of disease due to neuropsychiatric disorders. It is also estimated that major depression will rank second, after ischemic heart disease, by 2020 ⁶. These increases are expected to be even higher in developing countries ⁶.

Most studies examining these infectious diseases among psychiatric populations have focused on adults with severe mental illness (SMI), the term used to describe a constellation of diagnoses that includes the major psychiatric disorders such as schizophrenia, bipolar disorder, and major depression with psychotic features ⁷.

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These disorders are characterized by persistent and chronic symptoms and pervasive impairment of function, and typically require periods of hospitalization⁸. There is evidence that persons suffering from SMI are at increased risk of HIV and other sexually transmitted infections (STI)^{9,10,11,12,13,14,15} as compared to other population groups. However, precise and representative prevalence of these infections among persons with SMI has not been clearly established, and there is an even greater lack of data from the developing world.

Therefore, we performed a systematic review of the published literature to describe studies on prevalence of HIV, syphilis, and hepatitis B and C among patients with chronic mental illness in Brazil and other developing countries and to present findings from studies in developed countries to contextualize what has been learned and what remains to be investigated.

Review of the literature

Overview

Reported data on the prevalence of the above infections in this population are highly variable, with heterogeneous criteria for defining key factors such as recruitment site, sample size, use of additional eligibility criteria beyond SMI (i.e. dementia, homelessness, and use of illicit or injection drugs), and definition of serological tests used. Additionally, a limited number of studies have investigated the actual prevalence of these infections within psychiatric populations, by which we mean estimates with reliable external validity based on well-designed epidemiological studies with representative samples of adult patients with chronic rather than severe mental illness, covering inpatients and outpatients as well as developed and developing countries. Most published studies are from developed countries and have been derived from relatively small and non-representative samples of one or more cities. They showed SMI populations with higher prevalence rates for these infections as compared to estimates for the general population in the same regions.

We used MEDLINE and SciELO databases as sources of peer-reviewed publications, plus a manual search of references cited in selected studies. Key words included HIV, syphilis, HCV, HBV, risk factors, and prevalence. We found 13 HIV, syphilis, and hepatitis B and C prevalence studies focusing on psychiatric patients in developing countries and 22 in developed countries. Tables 1 and 2 present the infection rates by

country. Taken together, these studies show persons with SMI to be disproportionately affected by HIV/AIDS infection in several countries.

HIV

Developed countries have demonstrated a wider range of infection rates among psychiatric patients than those found in developing countries. For example, a large North American multi-city study reported 3.1% HIV seroprevalence in psychiatric patients, with rates varying from 1.7% to 5% in rural and metropolitan areas, respectively¹¹. These results were several times the estimated 0.3-0.4% rate in the general population¹. Himelhoch et al.¹⁶ reviewed HIV prevalence among American veterans with and without SMI and found 1% and 0.5%, respectively. Klinkenberg et al.¹⁷ studied 172 homeless persons with concurrent SMI and substance use disorders in Saint Louis (USA) and found a 6.2% HIV rate. In Spain, Fernández-Egea et al.¹⁸ studied 332 acute psychiatric inpatients and found that 1.4% were HIV-1-positive, while Ayuso-Mateos et al.¹⁹ found that 5.1% of 390 acute-care psychiatric inpatients were HIV-1-infected.

By contrast, there are few studies on HIV infection among samples of psychiatric patients in developing countries showing relatively narrow ranges of infection. In a study of 948 patients seeking treatment for mental disorders in India¹⁵, the HIV prevalence was 1.7%, higher than the 0.7% WHO estimate for the general population of India¹. In Brazil, Almeida & Pedroso²⁰ found a 1.6% HIV prevalence rate among 295 male patients in a psychiatric hospital in Belo Horizonte, Minas Gerais State, while Portella²¹ found a 1.46% HIV rate among 298 patients in a psychiatric unit in Salvador, Bahia State. Guimarães et al.²² reported a 0.8% HIV rate in a representative national multi-center sample of adults with chronic mental illness (n = 2,238), randomly selected from 26 mental health institutions throughout Brazil. These rates are higher than the national estimate for the adult Brazilian population (0.6%)¹.

Although most of these studies lack representativeness, they suggest an increased HIV infection rate among persons with SMI as compared to the general population. Further research is necessary to estimate the actual prevalence of HIV infection and determine this population's susceptibility to HIV.

Syphilis

In late 2001, WHO⁴ estimated 12 million new cases of venereal syphilis per year during the pre-

Table 1

Prevalence of HIV, syphilis, and hepatitis B and C infection among patients with chronic mental illness in developing countries (ordered by HIV prevalence).

| Study | Country/ Date | Study site | Additional eligibility criteria * | Data collection | N | HIV (%) | HBV (%) | HCV (%) | Syphilis (%) |
|---------------------------------------|-----------------------------|----------------------------|---|--------------------|-------|------------|------------------------|------------|-----------------|
| Chen ¹⁰⁰ | Taiwan/1994 | Inpatients | - | Blood sample | 834 | 0.0 | - | - | - |
| Guimarães et al. ²² | Brazil | Inpatients/ Outpatients | National sample | Blood sample | 2,238 | 0.8 | 14.7 ** and 1.6 *** | 2.6 | 1.12 |
| Tharyan et al. ¹⁰¹ | India/2003 | Inpatients | - | Blood sample | 1,160 | 1.0 | - | - | - |
| Portella ²¹ | Brazil/2000 | Inpatients | - | Blood sample | 298 | 1.5 | - | - | - |
| Almeida & Pedroso ²⁰ | Brazil/2004 | Male inpatients | - | Blood sample | 295 | 1.6 | 19.7 | 5.7 | 7.6 |
| Carey et al. ¹⁵ | India/2007 | Inpatients | - | Blood sample | 948 | 1.7 | 3.0 # | - | 3.3 ## |
| Dasananjali ¹⁰² | Thailand/1994 | Inpatients | Mentally ill offenders | Blood sample | 325 | 1.8 | - | - | - |
| Hutchinson & Simeon ¹⁰³ | Trinidad and Tobago/1999 | Inpatients | - | Chart review | 1,227 | 6.9 | - | - | - |
| Acuda & Sebit ¹⁰⁴ | Zimbabwe/ 1996 | Inpatients | - | Blood sample | 143 | 23.8 | - | - | - |
| Chang et al. ²⁹ | Taiwan/1993 | Inpatients | - | Blood sample | 780 | - | 18.1 | 6.8 | - |
| De Souza et al. ²⁸ | Brazil/2004 | Inpatients | - | Blood sample | 408 | - | 22.4 | - | - |
| Kulik ²⁷ | Brazil/1999 | Inpatients | - | Blood sample | 702 | - | 49.1 | - | - |
| Takada et al. ²⁴ | Brazil/2003 | Outpatients | Dementia | Blood sample | 454 | - | - | - | 3.3 ## |

* Additional eligibility criteria besides the presence of mental illness;

** Prevalence rate = 14.7% for anti-HBc;

*** Prevalence rate = 1.6% for HBsAg;

HBsAg tested only;

Treponemic tested only.

ceding decade, more than 90% of which in developing countries. Syphilis is an important medical problem among patients with SMI worldwide, especially because of the neurotropic potential of syphilis. Neurosyphilis can be a reversible cause of dementia and has frequently been under-diagnosed in psychiatric patients. The introduction of penicillin therapy has led to a progressive decline in syphilis-related mortality in psychiatric patients ²³, but neurosyphilis and syphilis infection rates among psychiatric patients remain high. All published studies on syphilis rates in the psychiatric population have come from samples in developing countries. Carey et al. ¹⁵ found a 3.3% syphilis rate among 948 inpatients with psychiatric disorders in India, and Takada et al. ²⁴ studied 275 inpatients with dementia in Salvador, Bahia State, Brazil, and found a similar

proportion (3.3%) of neurosyphilis. Almeida & Pedroso ²⁰ described a higher proportion (7.6%) of reactive VDRL among male SMI patients (n = 295) in a psychiatric hospital in Belo Horizonte. Guimarães et al. ²² also found a high prevalence of active syphilis (1.12%) in the national sample of psychiatric patients in Brazil.

Hepatitis B and C

Less public attention has focused on the problem of viral hepatitis among psychiatric patients, even though more than a third of the world population has been infected with HBV and at least 350 million people have been carriers of HBV worldwide ³. Although many HBV-infected individuals are lifelong carriers (HBsAg positive, anti-HBc positive), not all can transmit the infec-

Table 2

Prevalence of HIV, syphilis, and hepatitis B and C infection among patients with chronic mental illness in developed countries (ordered by HIV prevalence).

| Study | Country/ Date | Study site | Additional eligibility criteria * | Data collection | N | HIV (%) | HBV (%) | HCV (%) | Syphilis (%) |
|---|------------------|----------------------------|---|--------------------|---------|------------|------------|------------|-----------------|
| Di Nardo et al. ¹⁰⁵ | Italy/1995 | Inpatients | - | Blood sample | 206 | 0 | 47.5 | 0.4 | - |
| Fernández- Egea et al. ¹⁸ | Spain/2002 | Inpatients | Acute psychiatric patients | Blood sample | 332 | 1.0 | 3.2 | 5.1 | - |
| Himelhoch et al. ¹⁶ | USA/2007 | Inpatients/ Outpatients | Military veterans | Chart review | 191,625 | 1.0 | - | - | - |
| Beyer et al. ¹⁰⁶ | USA/2007 | Outpatients | - | Chart review | 11,284 | 1.2 | - | - | - |
| Rosenberg et al. ¹¹ | USA/2001 | Inpatients/ Outpatients | - | Blood sample | 931 | 3.1 | 23.4 | 19.6 | - |
| Naber et al. ¹⁰⁷ | Germany/1994 | Inpatients | - | Blood sample | 623 | 4.8 | - | - | - |
| Ayuso-Mateos et al. ¹⁹ | Spain/1997 | Inpatients | - | Blood sample | 390 | 5.1 | - | - | - |
| Cournos et al. ⁵⁷ | USA/1994 | Inpatients | - | Blood sample | 971 | 5.1 | - | - | - |
| Cournos et al. ⁹ | USA/1991 | Inpatients | - | Blood sample | 451 | 5.5 | - | - | - |
| Schartz-Watts et al. ¹⁰⁸ | USA/1995 | Inpatients | - | Chart review | 220 | 5.5 | - | - | - |
| Stewart et al. ¹⁰⁹ | USA/1994 | Inpatients | - | Blood sample | 533 | 5.8 | - | - | - |
| Klinkenberg et al. ¹⁷ | USA/2003 | Outpatients | Homeless; subst. use disorders | Blood sample | 172 | 6.2 | 32.5 ** | 29.8 ** | - |
| Zamperetti et al. ¹¹⁰ | Italy/1990 | Inpatients | - | Blood sample | 475 | 6.5 | - | - | - |
| Krakow et al. ¹¹¹ | USA/1998 | Inpatients | Subst. Use disorders | Blood sample | 147 | 19 | - | - | - |
| Pirl et al. ¹³ | USA/2005 | Inpatients | - | Chart review | 548 | 29.0 *** | 23.9 | 21.5 | - |
| Tabibian et al. ²⁶ | USA/2007 | Inpatients | - | Blood sample | 129 | - | 16.0 | 38.0 | - |
| Butterfield et al. ³¹ | USA/2003 | Inpatients | Military veterans | Blood sample | 376 | - | 21.3 | 18.9 | - |
| Lohiya et al. ²⁵ | USA/1986 | Inpatients/ Outpatients | - | Blood sample | 1,149 | - | 66.0 | - | - |
| Freudenreich et al. ³⁰ | USA/2007 | Outpatients | Schizophrenia | Blood sample | 98 | - | - | 8.2 | - |
| Dinwiddie et al. ¹¹² | USA/2003 | Outpatients | - | Blood sample | 1,556 | - | - | 8.5 | - |
| Buttfield et al. ¹¹³ | USA/2004 | Inpatients/ Outpatients | - | Blood sample | 777 | - | - | 15.7 | - |
| Meyer ¹¹⁴ | USA/2003 | Inpatients | - | Chart review | 507 | - | - | 20.3 | - |

* Additional eligibility criteria besides the presence of mental illness;

** Among 114 participants tested for anti-HBc and anti-HCV;

*** Among 62 participants tested for anti-HIV.

tion and a large proportion may clear the virus after varying intervals (HBsAg negative, anti-HBc positive).

Individuals with SMI have been shown to be at increased risk for acquiring HBV and HCV infections in both developing and developed countries. Tables 1 and 2 show the high prevalence of HBV markers among individuals with SMI, which varies considerably. While Lohiya et al.²⁵ and Klinkenberg et al.¹⁷ found a prevalence of HBV markers of 66% and 32.5%, respectively, Tabibian et al.²⁶ found 16%.

In Brazil, Kulik²⁷ found a 49.1% HBV prevalence rate, De Souza et al.²⁸ 22.4%, and Almeida & Pedrosa²⁰ 19.7%, while Guimarães et al.²² found a prevalence of 1.64% and 14.7% for previous exposure and active HBV infection, respectively. In Taiwan, Chang et al.²⁹ reported an HBV prevalence rate of 18.1%, and in India, Carey et al.¹⁵ found a 3% active HBV infection rate.

One reason for the wide range of HBV prevalence rates is the choice of serological markers used by researchers. Several authors have studied prior exposure to HBV (anti-HBc positive) while others used current HBV infection (HBsAg positive). HBV prevalence also differs by geographic region. Higher HBV prevalence rates are present in Asia, Africa and South America, for example, than in the United States. Finally, most of these studies sampled only a specific psychiatric center and thus do not represent their respective national psychiatric populations.

HCV infection presents a different epidemiological picture from HBV. However, there is also wide variability of HCV prevalence rates in the psychiatric population. Some researchers in the United States have found HCV exposure rates as high as 38%²⁶, and others as low as 8.2%³⁰. The lowest HCV rates were found in developing countries, with 2.63%²² and 5.7% in Brazil²⁰ and 6.8% in Taiwan²⁹. The wide range in HCV prevalence may be related to different patterns of injection drug use and needle-sharing among individuals with SMI as well as geographic differences in prevalence in the general population.

Sociodemographic risk factors for HIV and STI

Some studies have investigated the role of sociodemographic factors in the increased risk of HIV and other STI among individuals with SMI. However, most studies come from developed countries, and not all sociodemographic characteristics were studied consistently or were reported with sufficient methodological detail. Lack of representativeness has also been common.

Several investigators in developed countries have suggested that women may be at higher risk of HIV infection among patients with SMI^{9,31,32,33}, although others have described a higher likelihood of HIV infection in men^{16,34}. However, not all these studies analyzed gender differences in psychiatric diagnoses and other associated factors. While some authors have identified an increased risk of HIV and other STI among younger patients with chronic mental illness^{33,35,36}, others have reported increased risk among adult and older patients¹⁶. Other sociodemographic factors that have been associated with increased risk of HIV infection are never having been married, being divorced or widowed^{16,36}; ethnicity (Hispanic or African-American)^{9,16,35}; receiving care in urban settings¹⁶; or homelessness¹⁶.

In terms of hepatitis, older age was consistently reported as a risk factor for HBV across countries with different degrees of development^{11,17,37,38}. Other risk factors for hepatitis B infection among people with intellectual disability were described such as male gender, older age, and geographic region³⁸. Other risk factors for hepatitis C infection in psychiatric patients were increasing age^{11,13,17} and male gender^{17,34}. Butterfield et al.³¹ conducted a large study with 777 patients with SMI to investigate gender differences in hepatitis C infection. The authors concluded that male gender did not contribute independently to the risk of hepatitis C infection, whereas age and needle sharing were significantly related to hepatitis C serological status. The higher rates of hepatitis C in men can be explained primarily by more lifetime exposure to injection drug use, specifically needle sharing.

Sexual behavior and risk of HIV and STI

Sexual transmission is the most common route of HIV infection worldwide¹, and adults with SMI are at particular risk. Studies consistently show that this population is sexually active, and the majority engages in high rates of sexual risk behaviors³⁹. Sexual practices that can increase the risk of acquiring HIV include: unprotected vaginal or anal sexual intercourse, sex with multiple partners, sex with partners at high risk for HIV (e.g. injection drug users and sex workers), or sex exchange practices. In order to intervene successfully and decrease risk among this population, it is important to understand patterns of risk behaviors and which specific behaviors are associated with greater likelihood of HIV infection.

In addition, high rates of comorbid alcohol and drug use disorders are found among per-

sons with SMI⁴⁰, but we did not review that literature here. Nevertheless, substance use may be a common part of the sexual experience of persons with SMI^{41,42}, so it is also important to examine the HIV sexual risk behaviors associated with the effects of substance use, such as sex while drunk or high. Sexual intercourse under the influence of alcohol or other drugs is often unplanned, and is associated with having sex with risky partners, lower condom use, and decreased ability to negotiate safe sex practices⁴². Substance use in other populations is also highly correlated with exchanging sex for drugs, money, shelter, etc., greatly increasing the risk of HIV transmission⁴³.

Sexual activity

In developed countries, between 51% and 74% of adults with SMI report being sexually active within the previous 12 months^{39,44}; this rate ranged from 32% to 65% in the previous 3 months^{14,39,45,46}. Meade & Sikkema⁴⁰ in their recent review of sexual risk behaviors among persons with SMI found that, on average, a larger proportion of persons with SMI in the United States were sexually active as compared to studies in Australia, New Zealand, and Italy.

In developing countries, rates of sexual activity were lower than the ranges found in developed countries. In Brazil, Guimarães et al.²² found that 61.6% of inpatients and outpatients reported sexual intercourse at least once in the previous six months. Using a measure with demonstrated reliability among outpatients in Rio de Janeiro, Wainberg et al.⁴⁷ found that 42% of 98 patients had engaged in vaginal or anal sex within the previous three months. The lowest rate of sexual activity among psychiatric inpatients was found in India, where 41% had been sexually active in the previous 2 years⁴⁸.

Between 2% and 10% of individuals with SMI reported having anal sex in the previous year^{49,50,51,52,53}. Studies assessing the prevalence of anal sex during the previous 10 years or longer (i.e. lifetime) among adults with SMI found that 13% to 84% had ever engaged in this behavior^{8, 42,44,54,55,56,57,58,59,60,61,62}. These high lifetime rates of anal sex are particularly alarming. Susser et al.⁶³ found that a lifetime history of male-male sex among homeless males with SMI in the United States was associated with more than a threefold increase of being HIV positive, a finding replicated in other studies⁶⁴. Although reliability of sexual behavior reports beyond six months in the past has not been established, a review of studies examining HIV seroprevalence among individuals with SMI found that across 11 studies,

approximately one in four of those with a history of male-male sex were HIV-positive⁶⁵.

All the above studies, which span the past 14 years and several countries, clearly demonstrate that individuals with SMI are not in fact asexual but are a sexually active population, at potential risk of HIV/AIDS through risky sexual practices.

Condom use

Alarming, sexually active adults with SMI use condoms inconsistently. Between 12% and 68% reported inconsistent condom use in the previous 12 months^{14,39,44,49,51,54,55,66}, and 43%-78% reported any unprotected sex in the previous 3 months^{39,46}. Inversely, between 8% and 63% reported consistent condom use in the previous 12 months^{39,44}, with the highest rate found in a sample of HIV-positive persons with SMI⁴⁴. Rates of unprotected sex are much higher for adults with SMI who engage in anal sex or have partners who are HIV-positive. Over 70% and 85% of these sexual events, respectively, were reported to be unprotected in U.S. samples^{52,67}.

Males with SMI report more condom use than females. An Australian study found that approximately 15% of males compared to only 2% of females with SMI always use condoms with a casual or non-primary partner⁵¹. However, over three-fourths of both males and females reported never using condoms with main partners⁵¹. Similarly, a U.S. study found that women with SMI had significantly more unprotected vaginal intercourse than their male counterparts⁶⁷.

In Brazil, Guimarães et al.²² and Wainberg et al.⁴⁷ found that only 16% and 22% of sexually active participants used condoms consistently in the previous six and three months, respectively. In one study conducted in Minas Gerais, 68.2% of the sexually active sample of male inpatients reported not using condoms²⁰. These are the only data on condom use in the psychiatric population from a developing country.

Multiple partners

Having multiple sex partners also increases the risk of HIV/AIDS infection, but there are few studies on this direct association in psychiatric populations. Rosenberg et al.⁸ noted that having multiple partners in the previous 6 months more than doubled the likelihood of being HIV-positive (non-significant trend) or HBV-positive (significant).

However, because of the high prevalence of multiple partners among individuals with SMI, the potential for HIV transmission is great. Between 7% and 69% of psychiatric samples report-

ed having two or more partners in the previous 12 months^{14,39,44}, and 13% to 46% in the previous 3 months^{39,46}. Again, in developing countries data are scarce on multiple partners. In Brazil, 26.8% of psychiatric outpatients reported having multiple partners in the previous 3 months⁴⁷. Further research is need to better ascertain the role of multiple partners as a risk factor for HIV among individuals with SMI.

High-risk partners

High-risk partners are those who are known or thought to be HIV-positive, to use intravenous drugs, to share needles with other partners, to be sexually active with other partners, to have unprotected sex with other partners, or to engage in sex trade with other partners^{50,54,66,67,68}. In their review of 11 studies, Cournos & McKinnon⁶⁵ found that over one-third of adults with SMI who reported sex with a high-risk partner (e.g. IDU) were HIV-positive.

Among adults with SMI in developed countries, between 2% to 58% identified having sex with a high-risk partner in the previous 3 to 12 months^{44,47,50,51,54,60,68}, 3% to 14% had sexual intercourse with an IV drug user^{50,51,54,60,67}, 9% to 58% had sex with a non-monogamous partner^{51,54,67}, and 23% had ever had a partner who was a sex worker⁶¹. Between 1% and 7% reported ever having sex with someone who was HIV-positive^{51,60,61}. Thompson et al.⁶¹ examined differences between males and females in prevalence of types of risky partners (e.g. sex worker, IDU, HIV-positive) over the previous 10 years and found no differences by gender.

In Brazil, the only developing country from which data were found, 53.7% of individuals with SMI reported having high-risk partners or partners whose HIV status was unknown, and 7.3% reported having a known HIV-positive partner⁴⁷, while Almeida & Pedroso²⁰ found that 20.1% of male psychiatric inpatients reported having a risky partner.

Sex exchange

Individuals with SMI frequently have lower socioeconomic status and are sometimes homeless or addicted to drugs or alcohol; sexual services can be a means of obtaining food, shelter, money, and/or drugs⁴¹. Trading sex is a particularly worrisome behavior since it is highly correlated with other HIV/AIDS risk behaviors: drug use, sex with high-risk partners, decreased condom use, and higher rates of IDU and needle sharing³⁹. Rosenberg et al.¹¹ found that individuals with mental illness who ever traded sex for money

and/or drugs were more than 5 times more likely to be infected with HIV and approximately twice as likely to have HBV and HCV. In their review of 11 studies, Cournos & McKinnon⁶⁵ found that almost 40% of those who engaged in sex exchange were HIV-positive.

In developed countries, between 2% and 42% of adults with SMI reported exchanging sex within the previous 12 months^{14,39,44}; between 5% and 38% reported this behavior within the previous 3 months^{46,68}. In a sample of Australian inpatients and outpatients, while almost 50% of males (and 0% of females) reported ever paying for sex, similar rates of men (13%) and women (15%) reported exchanging sex for money and drugs⁶¹.

Few studies from developing countries examined commercial sex rates. In Brazil, commercial sex was reported by 19.5% of psychiatric outpatients in Rio de Janeiro⁴⁷ and by 2.6% of male psychiatric inpatients in Minas Gerais²⁰. In a sample of inpatients in India, 66% of males compared to 0% of females had ever traded money for sex. In contrast, 27% of women and 9% of men reported traded sex for money⁶⁹. This suggests that females with SMI may be more likely than males to engage in "survival sex" as a means to obtain money, food, or shelter.

Sex while drunk or high

Between 5% and 45% of adults with SMI in developed countries used drugs or alcohol either prior to or during a sexual experience in the previous 12 months^{41,50,52,53,54,60,70}. Use of substances prior to sexual activity is significantly related to the presence of other HIV/AIDS risk behaviors. Adults with SMI who had at least one risk behavior were two times more likely to use alcohol during sex⁵². Risky behaviors were also associated with use of specific substances among males and females with SMI. Among males with SMI, inconsistent condom use and sex with a high-risk partner was significantly associated with the use of crack or alcohol before sex; having sex with a high-risk partner was significantly associated with cocaine use. Among females with SMI, alcohol use before sex was associated with receptive anal sex⁷¹. Moreover, adults with SMI who expect alcohol to increase the likelihood of engaging in risky sex were more likely to do so⁷². These studies suggest that individuals with SMI frequently use substances before or during sex, placing themselves at risk of HIV/AIDS.

In Brazil, the single developing country to examine this phenomenon among psychiatric patients, 39% of outpatients with SMI reported some type of alcohol or drug use during sex⁴⁷.

Substance use disorder and risk of HIV and STI

It is important to differentiate between use and abuse and dependence, which are disorders. The use of psychoactive substances, alcohol, and other drugs is common in the general population and is especially prevalent among persons with SMI. Use of alcohol and other drugs may or may not be a consequence of a mental disorder. Patients with mental disorders such as schizophrenia, bipolar disorder, depression, anxiety, anti-social personality disorder, among others, have high proportions of other psychiatric comorbidities related to the abuse or dependence of psychoactive substances, and their occurrence can vary from 25 to 65%^{73,74}. Alcohol and other drugs can produce significant effects on cognitive function, mood, sensory perception, and behavior. It can also contribute to decreased therapeutic effects or increased odds of adverse effects related to psychiatric drugs, with implications for the therapeutic approach, the organization of services, and increased treatment costs^{75,76}.

Few studies have specifically investigated the association between the use of alcohol and other drugs and risk behavior for sexually transmitted infections, especially HIV, among individuals with SMI. An important limitation is the inability to establish a cause-and-effect relationship. Samples of individuals with SMI are small and in large part restricted to specialized health centers^{8,11,32,45,52,59,71,77,78}.

IDU among people with severe mental disorder is very common in the United States, possibly exceeding 25%^{11,41,60,67,79}. Patients with SMI who report alcohol and other drug abuse or dependence become particularly vulnerable to HIV, HBV, and HCV infection due to risky sexual behavior and a history of IDU^{9,11,80,81,82}. IDU appears to be a more common risk factor for HIV, HBV, and HCV among patients with SMI, as compared to the general population. In the United States, the IDU prevalence is 1.4% in the general population⁸³, lower than estimates among people with SMI, who reported 4% to 7% in the previous year and 5% to 35% lifetime⁴¹. Furthermore, IDU appears to be associated with high-risk sexual behavior. IDU psychiatric patients have a higher number of sexual partners⁸⁴ and increased odds of trading sex for money or drugs⁶⁰, of having sex with unknown partners, and of not using condoms during sexual intercourse^{41,42,85}.

SMI inpatients with a history alcohol and other drug use have higher risk of HIV infection, even if they have no history of IDU⁸⁵. However, there is no sufficient evidence in the current scientific literature of a direct association between

use of alcohol and other drugs and high-risk sexual behavior or STI, including HIV among individuals with SMI^{8,11,45,52}. More studies are needed to investigate associations between the risk of HIV infection and other STI and psychoactive substance use among individuals with SMI.

The only studies to examine these relationships in a developing country were conducted in Brazil. Almeida & Pedroso²⁰ reported that psychiatric patients who report alcohol and other drug abuse were particularly vulnerable to HCV infection. Wainberg et al.⁴⁷ elicited injection histories among 98 psychiatric outpatients with SMI; none reported even a single occasion of injection drug use.

Psychiatric conditions and risk of HIV and STI

Investigators in both developed and developing countries have found that patients diagnosed with a schizophrenia-spectrum disorder are less sexually active than patients with any other category of psychiatric diagnoses^{36,42,53,69}. However, it is not clear whether or how sexuality or sexual risk-taking is affected by psychiatric illness, and it cannot be assumed that all aspects of the sexual lives of psychiatric patients are only expressions of their mental disorders. No data on normative sexuality in this population has been published. Studies on the effects of psychiatric conditions on sexual risk behavior have not been undertaken in developing countries.

In the United States, individuals diagnosed with a schizophrenia-spectrum disorder were less likely than patients with a mood disorder to engage in sexual risk behavior³². However, trading sex was more than three times as likely among patients with schizophrenia than among those with others diagnoses⁴².

It has been theorized that patients with bipolar disorder may experience hypersexuality during the acute phase of their illness⁸¹. Other authors described heightened sexuality among patients with bipolar disorder during the manic phase^{41,80}. In addition, patients diagnosed with personality disorders appear to be at higher risk of HIV infection than patients diagnosed only with an Axis I clinical syndrome^{60,80}. Moreover, persons in whom both Axis I and Axis II disorders are diagnosed as well as those presenting with positive symptoms appear to be at greater HIV behavioral risk⁸⁶.

According to a review by Otto-Salaj & Stevenson⁸⁶, bipolar disorder and schizophrenia appear to be related to increased HIV risk. However, in a review by Cournos & Mckinnon⁶⁵, di-

agnosis was not consistently associated with HIV serostatus. Moreover, psychiatric diagnosis has been shown consistently to be unrelated to condom use^{42,55,56,59,87,88,89}, multiple sexual partners^{53,58,59,77,88}, history of STI⁷⁷, or risk of HIV infection^{10,35,36,49,69,80,90,91,92}.

Although psychiatric diagnosis per se has not been associated with sexual risk behavior³⁹, the presence of psychiatric symptoms appears in several studies to be more predictive of higher rates of sexual risk behavior compared to psychiatric diagnoses. Cournos et al.⁵⁸ investigated a group of 95 patients with schizophrenia and found that higher levels of positive symptoms were associated with multiple sexual partners, and greater overall psychopathology was significantly correlated with sexual activity. McKinnon et al.⁴², in their sample of 178 patients with SMI, reported that increased occurrence of positive symptoms was significantly associated with multiple sexual partners. Also, trading sex was more than five times as likely among those with more excitement symptoms, and the presence of more excitement symptoms and fewer cognitive symptoms predicted increased sexual activity. However, no association could be demonstrated between any specific symptom and condom use. Similarly, Rosenberg et al.⁸ reported that greater psychiatric distress, assessed by the Symptom Checklist-90-R, predicted a higher risk of HIV infection. Findings from different studies are not easily comparable, because measures of psychiatric diagnoses and specific risk behaviors were often non-standardized⁸. Carey et al.⁴¹ have discussed the use of psychiatric diagnosis based on information registered in medical charts rather than the use of structured interviews or standardized research criteria as well as the use of convenience samples, which can produce inconsistent data.

HIV/AIDS knowledge and risk of HIV and STI

Studies evaluating the level of knowledge on HIV/AIDS in psychiatric populations have been conducted primarily in developed countries. Overall knowledge scores ranged from 63% to 80%, which appear to be relatively good, and even comparable to those found in the general population^{12,42,67}. However, specific knowledge deficits also have been found^{32,41,70,93,94}. For example, Kelly et al.⁸² reported that many individuals with SMI were uninformed about practical aspects of HIV risk reduction: for example, 43% believed that heterosexual women could not get AIDS. Bear et al.⁹⁵ found that knowledge deficits

concerning HIV/AIDS were relatively common in the psychiatric setting. Carey et al.⁴¹ found that many psychiatric patients were misinformed regarding HIV transmission, risk reduction, and AIDS. Strauss⁹⁶ reported high rates of inaccurate HIV knowledge among American veterans with SMI, with 40% of patients demonstrating some inaccuracies.

Despite clear instances where knowledge in this population could be improved, to date there is little evidence that deficits in AIDS knowledge are associated with risk behavior or risk reduction. Zafrani & McLaughlin⁸⁴ found an association between lower AIDS knowledge and greater risk behavior, although other authors have not corroborated this finding^{90,92}. McKinnon et al.⁴² found that knowledge alone did not predict any risk behavior. Meanwhile, some authors have reported that individuals that engaged in high-risk sexual behaviors correctly perceived themselves to be at higher risk of HIV infection^{39,41,67,68}, and that risk behavior often occurs in the context of misinformation about HIV/AIDS⁶⁰. Nevertheless, Venable et al.⁹⁷ found a higher level of knowledge on HIV/AIDS among psychiatric patients who reported a history of any STI.

Other associations with lower knowledge on HIV/AIDS among psychiatric patients have been described in the literature, including being diagnosed with schizophrenia-spectrum diseases^{62,89,91}, impaired cognitive function⁴², more than six years of mental illness⁹³, history of more than four psychiatric hospitalizations⁹³, and negative symptoms^{42,98}. Although McKinnon et al.⁴² found no association between knowledge and socioeconomic variables, another study with American veterans reported that psychiatric patients with less than 12 years of education, older age, unmarried, or with no history of homelessness in the previous six months showed lower knowledge about HIV/AIDS⁹⁶.

In the only two developing countries where HIV knowledge has been assessed among psychiatric patients, researchers in Nigeria found that knowledge among psychiatric patients was worse than in the general population⁹⁴, and in Brazil Wainberg et al.⁴⁷ found a mean (\pm SD) HIV knowledge score of 10.4 \pm 3.3, corresponding to a 61.2% correct response rate.

Despite many conflicting reports in the literature, well-designed studies are needed to further clarify the role of knowledge on HIV/AIDS among psychiatric patients, since some intervention models have proposed to offer information on HIV/AIDS as a potential tool for reducing risk behaviors for acquisition of HIV and other STI⁹⁹. Our position is that improving the knowledge on HIV/AIDS in this population is a prerequisite for

changing risk behaviors and an important initial step towards HIV/AIDS prevention.

Conclusions

This review highlights the lack of information regarding STI prevalence and associated factors among person with chronic mental illness worldwide, but especially in developing countries. Most of the published studies on this population are from developed countries and are based on relatively small and non-representative samples. Overall, the prevalence rates warrant more rigorous studies in order to understand whether and why people with SMI are at particular risk for STI acquisition or transmission and how to address the particular prevention and sexual health needs individuals with chronic mental illness. HIV, which has been shown to disproportionately affect certain psychiatric subgroups in both developed and developing countries, has been the impetus for understanding other infections in the psychiatric population with similar

routes of transmission. HBV is often neglected because of its largely asymptomatic course, but its long-term complications and the availability of safe, effective, and cost-effective vaccines for nearly 20 years argue for more rigorous research on infection rates in the psychiatric population worldwide. HCV, discovered in 1989, has similar risk factors and is also a cause of chronic hepatitis. A similar paucity of prevalence data in the psychiatric population outside the United States, where rates are alarmingly high, represents an urgent public health problem. Given the existence of effective treatment and the possibility of cure for syphilis, we strongly recommend systematic testing for this disease among all psychiatric patients in order to rule out this biological cause of symptoms and to treat positive cases to reverse dementia.

Finally, the available evidence, although incomplete, suggests that the sexual health and well-being of psychiatric patients require greater attention. It is time to effectively include this population in our public health endeavors.

Resumo

Os portadores de doenças mentais crônicas encontram-se em risco para a infecção pelo HIV e outras infecções sexualmente transmissíveis. Entretanto, a prevalência dessas infecções entre portadores de doença mental crônica ainda não está claramente estabelecida nesta população. A maioria dos trabalhos sobre o tema foi conduzida em países desenvolvidos, com amostras relativamente pequenas e não representativas. Foi realizada uma revisão sistemática da literatura para identificar estudos sobre a prevalência do HIV, sífilis, hepatite B e C entre pacientes com doença mental crônica no Brasil e no mundo. De um modo geral, as prevalências variaram de 0% a 29%, 3 a 66%, 0,4 a 38% e 3,3% a 7,6% para HIV, hepatite B, hepatite C e sífilis, respectivamente. Vários fatores de risco foram identificados e discutidos, embora a literatura atual não demonstre achados significativos gerados por estudos representativos. Tal revisão destaca a escassez de informação sobre a prevalência de infecções sexualmente transmitidas e seus fatores associados entre portadores de doenças mentais crônicas e identifica lacunas no conhecimento atual em países desenvolvidos bem como em desenvolvimento.

Pessoas Mentalmente Doentes; Doenças Sexualmente Transmissíveis; HIV

Contributors

L. N. Campos was responsible for supervising and coordinating the teamwork, revising and editing the text, and writing the section on sociodemographic risk factors. M. D. C. Guimarães revised the entire manuscript. R. A. Carmo was responsible for writing the section on HBV, HCV, syphilis, and HIV seroprevalence rates. A. P. S. Melo was responsible for writing the section on psychiatric conditions and knowledge on HIV/AIDS. H. N. Oliveira was responsible for writing the section on substance use disorders. K. Elkington was responsible for writing the section on sexual behavior. K. McKinnon revised the entire manuscript.

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