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## Psychiatric Morbidity in HIV-infected Male Prisoners

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### Abstract

**Background/Purpose**—The seroincidence of human immunodeficiency virus (HIV) in Taiwan has drastically increased since 2004, particularly among injection drug users and prisoners. The major purpose of this study was to explore the prevalence and correlates of psychiatric morbidity among HIV-infected male prisoners.

**Methods**—In 2006, data were collected from all of HIV-infected male prisoners ( $n = 535$ ) in seven prisons in Taiwan. This collection was performed using a self-administered, anonymous questionnaire in group settings directed by our interviewers. Psychiatric morbidity was measured using the five-item Brief Symptom Rating Scale in 535 participants, which represented an 85% response rate. After excluding incomplete data, 479 participants were included in the analysis.

**Results**—Psychiatric morbidity was present in 46% of participants. Multivariate logistic regression revealed that correlates of the five-item Brief Symptom Rating Scale defined cases included the following: being a recidivist, having poor self-rated health status, and having experienced psychiatric symptoms in one's lifetime (e.g. significant physical pain or discomfort, depression for 2 weeks or longer, serious anxiety or tension, trouble understanding, concentrating, or remembering, and serious thoughts of suicide), with a Nagelkerke  $R^2$  equal to 0.365.

**Conclusion**—Psychiatric morbidity is prevalent among HIV-infected male prisoners. Tailored HIV/AIDS education related to mental health is therefore suggested for inclusion as part of a comprehensive HIV/AIDS training program among incarcerated populations.

### Keywords

HIV; incarcerated population; morbidity; prevalence; psychiatric

Human immunodeficiency virus (HIV)-infected patients have higher rates of psychiatric morbidity compared with the general population.<sup>1-4</sup> Previous studies have shown that approximately 20–52% of people with HIV were identified as suffering from one or more than one psychiatric disorders,<sup>4-6</sup> which is approximately 2–3 times higher than the prevalence found in the general population.<sup>7</sup>

There is evidence that mental illness complicates the HIV epidemic. Psychiatric morbidities increase the risk of contracting HIV, and are associated with decreased highly active antiretroviral therapy utilization, adherence, and virological suppression.<sup>8</sup> Without effective recognition and treatment of mental disorders, HIV treatment outcomes can be expected to decline, and the rates of disease transmission continue unabated.<sup>9</sup> Furthermore, a lack of psychiatric morbidity in HIV-positive individuals is a significant factor for a better quality of life.<sup>10,11</sup>

Consistent findings of co-morbidity between psychiatric disorders and HIV infection in correctional settings have also been reported.<sup>12-16</sup> Factors contributing to increased prevalence of psychiatric morbidities among HIV seropositive individuals are a lack of family or social support and intravenous drug use.<sup>11</sup> Greater attention should be given to HIV-infected inmates with mental health problems. However, since low educational status is common among incarcerated populations, an appropriate short screening instrument needs to be selected to identify psychiatric morbidity.

The seroincidence of HIV in Taiwan has drastically increased since 2004, particularly among injection drug users and prisoners.<sup>17,18</sup> Since 1988, all HIV/AIDS cases in Taiwan have received free medical treatment and highly active antiretroviral therapy was introduced in 1997. Insufficient attention, however, was paid to co-existing mental disorders and HIV infection within the incarcerated population. This study aimed to explore the prevalence and contributing factors of psychiatric morbidity among HIV-seropositive adult male prisoners in Taiwan.

## Materials and Methods

### Data collection

**Settings and sampling procedures**—There are 24 prisons in Taiwan. All prisons were sorted into the Northern, Central, Southern, and Eastern areas. We selected one or two prisons in each area according to prison size. The chosen prisons represented the variety of inmates in that geographic area. A total of seven prisons were selected.

The HIV seropositive status of all inmates is identified by mandatory (as required by law) HIV blood testing upon incarceration. Prisoners identified as being HIV-positive are subsequently separated from the HIV-negative prison population. This separation enabled us to identify the potentially eligible participants. This cross-sectional study was conducted between October and November, 2006.

**Subjects**—All HIV-infected male prisoners in the seven chosen prisons were invited to participate in this study. The survey involved a self-administered anonymous questionnaire; including a five-item Brief Symptom Rating Scale (BSRS-5) conducted in a group setting directed by our interviewers.

A total of 633 HIV-infected adult male prisoners were identified in the chosen prisons during the study period, of which 535 completed the questionnaire, resulting in a response rate of 84.5%. After excluding forms with incomplete data for the BSRS-5, i.e. those who did not answer all five items of the BSRS-5, 479 participants were included in the analysis.

## Measures

**Participants' characteristics**—Participants' major demographic characteristics included age, years of education, and marital status. Other selected characteristics included current crime type, prior recidivism, illicit drug use history, self-rated health status, and year of notification of HIV infection.

**Psychiatric morbidity**—The participants' psychiatric morbidity was measured by the BSRS-5, which contained five symptom items selected from the 50-item BSRS, namely feeling tense or “keyed up”, feeling blue, feeling easily annoyed or irritated, feeling inferior to others, and having trouble falling asleep. The BSRS-5 measure has good internal consistency, with Cronbach's  $\alpha$  ranging from 0.77 to 0.90.<sup>19</sup> Furthermore, these items have been shown to correlate highly with the five dimensions in the 50-item BSRS, namely anxiety, depression, hostility, interpersonal hypersensitivity/sleep disturbance, and additional symptoms/inferiority. Correlations between the BSRS-5 and the dimensions in 50-item BSRS ranged from 0.76 to 0.85.<sup>19</sup> In previous studies, the BSRS-5 has been extensively used as a short screening tool to identify common psychiatric morbidity<sup>19,20</sup> as well as suicide ideation<sup>21</sup> in clinical cases and community residents.

Participants in the present study were asked to indicate how much discomfort they had experienced in each of the five domains during the past week, using a five-point Likert-type scale: “Not at all” (score 0); “A little bit” (score 1); “Moderately” (score 2); “Quite a bit” (score 3); and “Extremely” (score 4). Total BSRS-5 scores ranged from 0 to 20, with a cut-off score of 6 or above considered to be “psychiatric cases”.<sup>19</sup>

To examine whether a single factor could be extracted from the data, we conducted a principal components analysis on the BSRS-5 items. The identified factor accounted for about 74.5% of the variance. The BSRS-5 also showed good internal consistency in the present sample ( $\alpha = 0.91$ ).

**Psychological status**—Based on lifetime experience, the participants were asked to indicate whether they had ever experienced the following: (1) a lot of physical pain or discomfort; (2) serious depression (for  $\geq 2$  weeks at a time); (3) serious anxiety or tension; (4) hallucinations (hearing or seeing things that others thought were imaginary); (5) trouble understanding, concentrating, or remembering; (6) trouble controlling violent behavior; (7) serious thoughts of suicide; and (8) attempts at suicide.

These questions were modified from the “Initial assessment” developed by researchers at the Texas Christian University.<sup>22</sup> These items have been shown to correlate well with more formal diagnostic measures of psychiatric disorders.<sup>22</sup> The internal consistency of the psychological status in this study sample is acceptable ( $\alpha = 0.59$ ).

## Statistical analyses

Data were analyzed using SPSS version 14.0 (SPSS Inc., Chicago, IL, USA). Reliability tests and factor analysis were used to check internal consistency and validity of the BSRS-5. Univariate analysis, independent  $t$  test, Fisher's exact test, and  $\chi^2$  test were applied for between-group comparisons where appropriate. The prevalence of each item from the BSRS-5 was indicated by combining the percentage of “Quite a bit” and “Extremely” responses, i.e. BSRS-5  $\geq 3$ .

Using a cut-off score of 6 or above as the BSRS-defined case group, bivariate analysis was employed to examine the difference and associated factors between case and non-case groups. Those variables with significant differences in bivariate analyses were all included

in the multivariate analyses. A multiple logistic regression was carried out to identify risk factors for BSRS-5 defined cases. Odds ratios (ORs) were presented as estimates for the strength of associations. A *p* value of less than 0.05 was considered statistically significant.

## Results

### Characteristics of participants

According to Table 1, the average age was  $34.2 \pm 7.6$  years, ranging from 19 to 60 years of age. A total of 51.6% of the participants were junior high school graduates, and 13.8% were married or living with someone prior to incarceration.

Participants with BSRS-5 scores  $\geq 6$  were significantly more likely to be recidivists, to have been notified of HIV infection prior to January 2005, and have poor self-rated health status.

### Prevalence of psychiatric morbidity

As illustrated in Table 2, the prevalence of psychiatric morbidity was 46.1%. The mean scores of each BSRS-5 item were significantly different between the BSRS-5 defined cases and their counterparts, with the highest mean scores for sleep disturbance (1.56), followed by those with depression (1.24). The prevalence of each BSRS-5 item, i.e. combining the percentage of “Quite a bit” and “Extremely” responses (BSRS-5  $\geq 3$ ), in the BSRS-5 defined case group was: sleep disturbance (46.6%), depression (31.2%), inferiority (24.0%), anxiety (21.2%), and hostility (21.2%). In comparison, 3.9% of the non-case group had a sleep disturbance, and none had any symptoms of the BSRS-5, i.e. did not have a BSRS-5  $\geq 3$ .

### Factors associated with psychiatric morbidity

As shown in Table 3, all lifetime experiences of psychiatric symptoms (e.g. a lot of physical pain or discomfort, serious depression for  $\geq 2$  weeks, serious anxiety or tension, hallucinations, trouble understanding/concentrating/remembering, trouble controlling violent behavior, serious thoughts of suicide, and attempts at suicide) were significantly correlated with psychiatric morbidity.

Multivariate analysis of factors associated with BSRS-5 defined cases is shown in Table 4. Participants were more likely to be BSRS-5 defined cases than their counterparts if they were recidivists (OR = 2.04), were in poor/very poor health status (OR = 2.04), and in addition, if they reported having experienced substantial physical pain or discomfort (OR = 2.39), depression for  $\geq 2$  weeks (OR=1.86), serious anxiety or tension (OR=4.05), trouble understanding, concentrating or remembering (OR = 2.36), or serious thoughts of suicide (OR = 6.39), with a Nagelkerke  $R^2$  equal to 0.365.

## Discussion

The prevalence of psychiatric morbidity was much higher in the study sample (46.1%) than that reported for the general population (8.8%).<sup>23</sup> Notably, among the five symptoms measured by the BSRS-5, the most prevalent was insomnia (46.6%), followed by depression (31.3%). Insomnia (3.9%) was also the only symptom prevalent among the non-cases group. This may be partly due to the uncomfortable incarceration environment as well as the co-occurring psychiatric symptoms, e.g. depression.

Many factors must be taken into consideration when dealing with prisoners and mental health, e.g. international differences, prison settings, demographics and methodological issues.<sup>24</sup> All inmates (including injection drug users) are screened for HIV upon

incarceration in Taiwan. Individuals found to be seropositive are separated from HIV seronegative prisoners. What impact such segregation has on inmates' psychological well-being has not yet been determined. However, it is reasonable to argue such separation, though effective in the prevention of HIV transmission among inmates, is a form of stigmatization, and can be an additional stressor for HIV-positive prisoners.

Previous research has shown that HIV-related stigma can have a strong negative impact on individual social support, physical health, and psychological well-being.<sup>25,26</sup> Gonzalez et al<sup>27</sup> also found a significant interaction between the awareness of HIV/AIDS-related stigma and anxiety symptoms. Future research is needed to further assess the impact of stigma on inmate mental health.

Furthermore, inmates who had used drugs exhibit more health problems and greater rates of chronic health problems than prisoners who have not used drugs.<sup>28</sup> As 98.1% of inmates in this survey admitted using illicit drugs, this is a critical warning sign. The relationship between drug use, mental disorders, and HIV infection clearly merits further study.

Of the inmates who were in the BSRS-5 defined case group ( $n = 221$ ), 23.1% had serious thoughts of suicide and 8.1% had once attempted suicide, perhaps due to the combined negative impact of imprisonment and HIV-related physical and mental health problems. Furthermore, as indicated in the multivariate analysis (Table 4), suicidal ideation (OR = 6.69) was the strongest predictor of the BSRS-5 defined cases. In other words, after controlling for other variables, those with suicidal ideation were 6.69 times more likely to be BSRS-5 defined psychiatric cases than their counterparts. As previously reported, BSRS-5 could be used as a suicide ideation screening instrument.<sup>21</sup> Lifetime prevalence of serious anxiety or tension (OR = 4.05) was also noted as another strong predictor of the BSRS-5 defined cases. This may also be, in part, due to their incarceration status. Given that people living with HIV are aging,<sup>29</sup> new challenges will arise in the future for those mental health professionals working with incarcerated.

There are several limitations to this study. First, a cross-sectional analysis prevents us from making causal inferences in predicting psychiatric morbidity. Second, the BSRS-5 defined psychiatric morbidity is important for screening but it does not allow us to make diagnostic classifications. Third, this study is based on self-reported data. Recall bias and related factors may affect measurement, although the use of anonymous questionnaires may have minimized the risk of deliberate misreporting. Finally, this study only focused on HIV-infected adult male inmates and therefore lacks the generalizability to reflect female HIV-infected adult inmates, who have been reported to be quite different.<sup>30,31</sup> Despite these limitations, to the best of our knowledge, this study is the first to use extensive samples from various geographic areas to explore the psychiatric morbidity among HIV-infected male inmates in Taiwan.

In conclusion, psychiatric morbidity is prevalent among HIV-infected male prisoners. The present study identified multiple psychosocial factors associated with psychiatric morbidity among HIV-positive inmates in Taiwan. Being a recidivist, having a poor self-rated health status, and having experienced certain psychiatric symptoms in one's lifetime were significantly correlated to a participant's psychiatric morbidity. It is suggested that tailored HIV/AIDS education related to mental health should be included as part of the comprehensive HIV/AIDS training program for those treating incarcerated populations.

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**Table 1**Participants' characteristics by Brief Symptom Rating Scale-5 score ( $n = 479$ )\*

| Variable   | BSRS-5 score |            | Total      | <i>p</i> |
|--|--------------|------------|------------|----------|
|  | < 6          | ≥ 6        |            |          |
| Education level <sup>†</sup>                                     |              |            |            |          |
| Elementary school or under                                       | 37 (14.5)    | 34 (15.4)  | 71 (14.9)  | 0.200    |
| Junior high school   | 124 (48.4)   | 122 (55.2) | 246 (51.6) |          |
| Senior high school or above                                      | 95 (37.1)    | 65 (29.4)  | 160 (33.5) |          |
| Marital status   |              |            |            |          |
| Married or living with partner                                   | 33 (12.8)    | 33 (14.9)  | 66 (13.8)  | 0.498    |
| Single/divorced/widowed  | 225 (87.2)   | 188 (85.1) | 413 (86.2) |          |
| Self-rated health status   |              |            |            |          |
| Poor/very poor   | 19 (7.4)     | 59 (26.7)  | 78 (16.3)  | < 0.001  |
| Fair/good/very good  | 239 (92.6)   | 162 (73.3) | 401 (83.7) |          |
| Current crime type   |              |            |            |          |
| Drug crime   | 219 (84.9)   | 189 (85.5) | 408 (85.2) | 0.845    |
| Others   | 39 (15.1)    | 32 (14.5)  | 71 (14.8)  |          |
| Recidivist   |              |            |            |          |
| Yes  | 177 (68.6)   | 174 (78.7) | 351 (73.3) | 0.013    |
| No   | 81 (31.4)    | 47 (21.3)  | 128 (26.7) |          |
| Use of illicit drugs   |              |            |            |          |
| Yes  | 253 (98.1)   | 217 (98.2) | 470 (98.1) | 0.918    |
| No   | 5 (1.9)      | 4 (1.8)    | 9 (1.9)    |          |
| Notification of HIV infection after January 1, 2005 <sup>†</sup> |              |            |            |          |
| Yes  | 207 (87.3)   | 154 (73.3) | 361 (80.8) | < 0.001  |
| No   | 30 (12.7)    | 56 (26.7)  | 86 (19.2)  |          |
| Mean age   | 33.8 ± 7.7   | 34.7 ± 7.5 | 34.2 ± 7.6 | 0.189    |

\* Data presented as n (%) or mean ± standard deviation;

<sup>†</sup> missing cases were deleted. BSRS-5 = Brief Symptom Rating Scale-5.



**Table 2**

Bivariate analysis of Brief Symptom Rating Scale items\*

| BSRS Item (score range)                                | BSRS-5 score |             |             | <i>p</i> |
|--|--------------|-------------|-------------|----------|
|  | < 6          | ≥ 6         | Total       |          |
| Number of participants                                 | 258 (53.9)   | 221 (46.1)  | 479 (100)   |          |
| 1. Trouble falling asleep/sleep disturbance (0–4)      | 10 (3.9)     | 103 (46.6)  | 113 (23.6)  |          |
|  | 0.77 ± 0.78  | 2.48 ± 1.01 | 1.56 ± 1.23 | < 0.001  |
| 2. Feeling tense or “keyed up”/anxiety (0–4)           | 0            | 47 (21.2)   | 47 (9.8)    |          |
|  | 0.36 ± 0.50  | 1.86 ± 0.99 | 1.05 ± 1.07 | < 0.001  |
| 3. Feeling easily annoyed or irritated/hostility (0–4) | 0            | 47 (21.2)   | 47 (9.8)    |          |
|  | 0.45 ± 0.51  | 1.84 ± 0.93 | 1.09 ± 1.01 | < 0.001  |
| 4. Feeling blue/depression (0–4)                       | 0            | 69 (31.2)   | 69 (14.4)   |          |
|  | 0.47 ± 0.53  | 2.14 ± 0.96 | 1.24 ± 1.13 | < 0.001  |
| 5. Feeling inferior to others/inferiority (0–4)        | 0            | 53 (24.0)   | 53 (11.1)   |          |
|  | 0.30 ± 0.49  | 1.81 ± 1.17 | 1.00 ± 1.15 | < 0.001  |

\* Data presented as n (%) and mean ± standard deviation, The percentages indicate prevalence of “Quite a bit” (score 3) or “Extremely” (score 4).  
BSRS-5 = Brief Symptom Rating Scale-5.

**Table 3**

Participants' psychological statuses by Brief Symptom Rating Scale-5 score\*

| Variable   | BSRS-5 score |            | Total      | <i>p</i> |
|--|--------------|------------|------------|----------|
|  | < 6          | ≥ 6        |            |          |
| Serious of physical pain or discomfort               |              |            |            |          |
| Yes  | 53 (20.5)    | 91 (41.2)  | 144 (30.1) | < 0.001  |
| No   | 205 (79.5)   | 130 (58.8) | 335 (69.9) |          |
| Depression for ≥ 2 wk                                |              |            |            |          |
| Yes  | 33 (12.8)    | 81 (36.7)  | 114 (23.8) | < 0.001  |
| No   | 225 (87.2)   | 140 (63.3) | 365 (76.2) |          |
| Serious anxiety or tension                           |              |            |            |          |
| Yes  | 23 (8.9)     | 79 (35.7)  | 102 (21.3) | < 0.001  |
| No   | 235 (91.1)   | 142 (64.3) | 377 (78.7) |          |
| Hallucinations                                       |              |            |            |          |
| Yes  | 7 (2.7)      | 31 (14.0)  | 38 (7.9)   | < 0.001  |
| No   | 251 (97.3)   | 190 (86.0) | 441 (92.1) |          |
| Trouble understanding, concentrating, or remembering |              |            |            |          |
| Yes  | 56 (21.7)    | 99 (44.8)  | 155 (32.4) | < 0.001  |
| No   | 202 (78.3)   | 122 (55.2) | 324 (67.6) |          |
| Trouble controlling violent behavior                 |              |            |            |          |
| Yes  | 7 (2.7)      | 17 (7.7)   | 24 (5.0)   | 0.013    |
| No   | 251 (97.3)   | 204 (92.3) | 455 (95.0) |          |
| Serious thoughts of suicide                          |              |            |            |          |
| Yes  | 6 (2.3)      | 51 (23.1)  | 57 (11.9)  | < 0.001  |
| No   | 252 (97.7)   | 170 (76.9) | 422 (88.1) |          |
| Attempted suicide                                    |              |            |            |          |
| Yes  | 2 (0.8)      | 18 (8.1)   | 20 (4.2)   | < 0.001  |
| No   | 256 (99.2)   | 203 (91.9) | 459 (95.8) |          |

\* Data presented as n (%). BSRS-5 = Brief Symptom Rating Scale-5.

**Table 4**

Factors associated with Brief Symptom Rating Scale-5 defined cases following multivariate analysis\*

| Variable   | Odds ratio (95% confidence interval) | <i>p</i> |
|--|--------------------------------------|----------|
| Recidivism   | 2.04 (1.20–3.47)                     | 0.009    |
| Notification of HIV infection after January 1, 2005  | 0.60 (0.34–1.07)                     | 0.082    |
| Poor/very poor self-rated health status              | 2.04 (1.06–3.95)                     | 0.034    |
| Serious physical pain or discomfort                  | 2.39 (1.46–3.92)                     | 0.001    |
| Depression for $\geq 2$ weeks                        | 1.86 (1.05–3.29)                     | 0.034    |
| Serious anxiety or tension                           | 4.05 (2.16–7.59)                     | < 0.001  |
| Hallucinations                                       | 1.31 (0.43–3.96)                     | 0.633    |
| Trouble understanding, concentrating, or remembering | 2.36 (1.46–3.81)                     | < 0.001  |
| Trouble controlling violent behavior                 | 1.00 (0.28–3.52)                     | 0.997    |
| Serious thoughts of suicide                          | 6.69 (2.38–18.82)                    | < 0.001  |
| Attempted suicide                                    | 4.04 (0.63–25.91)                    | 0.141    |

\* All the reference groups were those without the stated characteristic.