Comparison of Pain in Male Drug Rehabilitees with and without Human Immunodeficiency Virus in Yunnan Province, China

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Background: The purpose of this study was to compare pain symptoms in drug rehabilitees with or without human immunodeficiency virus (HIV) in Yunnan Province, China.

Material/Methods: This was a retrospective single-center cohort study. A total of 120 male substance users, including 65 with HIV, were enrolled after admission to the Fifth Drug Rehabilitation Center in Yunnan Province. Individuals who were >18 years of age and who had illicit drugs detected in their urine, despite not having used drugs for at least 2 months, were included. The patients evaluated their average pain intensity for the previous 4 weeks using a visual analog scale. PainDETECT questionnaire scores were used to classify pain into nociceptive and mixed component subgroups. Sleep quality was also evaluated using the Pittsburgh Sleep Quality Index scale.

Results: The prevalence and intensity of the pain symptoms were higher for the drug rehabilitees with HIV than for those without HIV. Moreover, the rehabilitees with HIV were more likely to experience neuropathic and nociceptive pain, whereas those without HIV reported only nociceptive pain. The sleep quality of the rehabilitees with HIV was also lower, regardless of the pain symptoms.

Conclusions: Our results showed that the drug rehabilitees with HIV in Yunnan Province, China, experienced more frequent and stronger pain (both nociceptive and neuropathic) than those without HIV. They also experienced poorer sleep quality, although it was unrelated to pain. Our results provide data to support clinical diagnosis and treatment.

Keywords: Drug Users • HIV • Neuralgia • Pain Measurement • Sleep Disorders, Intrinsic

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Background

In recent decades, the total number of people who use illicit drugs (PWUD) has increased worldwide. Yunnan Province, which is located in southwestern China, is adjacent to the notorious “Golden Triangle”, which is one of the most prolific drug-producing areas in the world. People who live in Yunnan have much easier access to drugs, resulting in Yunnan Province having the most drug users in China. Drug use leads to numerous negative outcomes, such as drug use disorders, mental health disorders, human immunodeficiency virus (HIV) infection, hepatitis-related liver cancer and cirrhosis, overdose, and premature death. Drugs are known to modulate the immune system, and drug abusers often face a higher risk of HIV-1 infection, as drugs augment user susceptibility by increasing the number of chemokine receptors present on the cell surface or increasing viral replication [1]. As the dangers of illicit drugs are well-known, many PWUD are voluntarily attempting to discontinue such drug use; therefore, the health of drug rehabilitees is a major public health concern in Yunnan.

Pain is one of the most common problems among drug users [2]. In the United States, the prevalence of pain among drug users is lower in Texas (18%) and higher in Boston (87%) [3,4]. Further, pain intensity in PWUD has been reported to range from mild to severe, and PWUD with greater pain intensity are at a higher risk of being unable to access addiction treatment [4,5]. Because pain prevalence and intensity data have not been published, there is no guide to determine the exact clinical diagnosis and treatment. Substance abuse damages the nervous system; indirect clinical evidence from surgical and pain patients and former opioid addicts suggests that drug-associated pain may be an unavoidable clinical problem. Drug abuse can also lead to neurotoxicity, resulting in inflammatory demyelinating polyneuropathy and manifesting as paresthesia, hypoesthesia, and proprioceptive ataxia, among other manifestations [6].

The neuro-immune system plays a regulatory role in the occurrence of pain, and the neuro-immune mechanism of selective natural killer (NK) cell-mediated degeneration of damaged but intact sensory axons suggests that modulating NK cell function has therapeutic potential to resolve painful neuropathy [7]. Pain is classified as nociceptive, neuropathic, and mixed (nociceptive and neuropathic) according to its pathogenesis. The classification of pain directly contributes to clinical treatment: nonsteroidal anti-inflammatory medicine is prescribed for nociceptive pain and voltage-dependant calcium channel blockers are administered for neuropathic pain. HIV infection and treatment, as well as amyloidosis, induce HIV-associated distal sensory polyneuropathy (HIV-DSP) owing to central or peripheral nervous system injury caused by direct viral infection, infection with secondary pathogens, or medication adverse effects; HIV-DSP is a painful condition that is difficult to treat and affects 29% to 62% of patients with HIV and acquired immunodeficiency syndrome (AIDS) [8]. HIV-DSP belongs to the category of neuropathic pain and is treated with voltage-dependant calcium channel blockers. The biopsychosocial model of pain defines pain symptoms as the denouement of the dynamic interaction between biological, psychological, and social factors [9]. Sleep disorders are commonly experienced by those who abuse alcohol (80%) and narcotics (40%) [10]. Furthermore, 26.6% of methadone-maintained patients experience poor sleep quality [11]. Pain induces psychological problems and sleep disorders; however, few reports have described the characteristics of pain and its relationship to sleep quality among drug rehabilitees. Although the pervasive view is that a full and healthy life is one without pain [12], the data regarding pain symptoms in substance users or patients with HIV are inadequate, leading to severely limited prevention and treatment services [2]. Importantly, the successful management of drug addiction should address pain symptoms and sleep problems. Therefore, in this exploratory study, we aimed to examine the pain characteristics of drug rehabilitees with and without HIV and assess the effects of pain and HIV on sleep quality to provide support for clinical diagnoses and treatments.

Material and Methods

Study Design and Participants

In this retrospective single-center cohort study, we enrolled 120 male substance users, including 65 with HIV, after they were admitted to the Fifth Drug Rehabilitation Center in Yunnan Province, China. Ethics approval for this study was obtained from the Clinical Research Ethics Committee of the First Affiliated Hospital of Kunming Medical University (2018-L-34); the study protocol was also approved by the First Affiliated Hospital of Kunming Medical University (2018-1103), and all the methods were performed according to the protocols approved by the Institutional Review Board. All participants were from cities and counties in Yunnan Province. Cluster stratified sampling method was adopted to number patients’ wards. Ten wards were randomly selected by drawing lots, and all patients in the 10 wards were selected as the respondents. A trained investigator helped all participants to finish the questionnaire. We included substance users according to the following criteria: illicit drug ingredients detected in their urine upon entry into the rehabilitation center; no drug use for at least 2 months; and age ≥18 years. All participants provided written informed consent for inclusion in the study. HIV infections were diagnosed in the included individuals using a blood enzyme-linked immunosorbent assay. Exclusion criteria for the study were as follows: no drug use for less than 1 month to...
exclude the acute pain of early drug withdrawal period; age ≤18 years; and patients who did not finish the questionnaire owing to a language barrier, mental disease, or comprehension problem or with incomplete data were excluded from the study.

Collection of Demographic Data Center

Age, ethnicity, educational level, substance type, route of HIV infection, duration of drug use, and withdrawal time were determined based on data from the participants’ medical charts and questionnaires that were filled out by the participants upon admission.

Intensity of Pain

The primary outcome was average pain intensity, as assessed using a visual analog scale (VAS), which has been proven as a valid, reliable, and appropriate option for reporting pain intensity in Chinese adults [13]. The main arguments in favor of VAS are its ease of use and comprehension, particularly for less educated participants. The VAS is presented as a 10-cm line, anchored by verbal descriptors, usually “no pain” and “worst imaginable pain” [14]. The patients were asked to evaluate their average continuous pain intensity for the previous 4 weeks on a 100-mm electronic VAS, in which 0 mm indicated no pain and 100 mm indicated maximal pain. The score was measured from 0 mm to the patient’s mark. This measurement is a form of cross-modality matching in which line length is the response continuum.

Efficacy Evaluation of Neuropathic Components

The secondary outcome was the frequency of pain over the course of 30 days as measured with scores obtained from the Chinese version of the painDETECT questionnaire (PD-Q) [15]. Accurate pain evaluation before and during treatment is essential because different characteristics require different pain management strategies. The PD-Q is a simple and reliable tool for the screening and identification of chronic pain, and it has predictive value for distinguishing neuropathic from nociceptive pain. The PD-Q has been used in different patient populations; it was developed in individuals with back pain in Germany in 2004 and is currently used for clinical and research purposes worldwide [16]. In addition to the characteristic symptom description items, the scale includes a special visual map to describe the type and nature of the pain onset, with radiation pain as one of the scoring items. The global PD-Q score from 1 to 38 was used in this study to classify pain into the following subgroups: nociceptive (neuropathic component unlikely; total PD-Q score ≤12), neuropathic (neuropathic component likely; total PD-Q score ≥19), and mixed (mixed component; total PD-Q score 13-18).

Evaluation of Sleep Quality

The sleep quality from the previous 4 weeks was evaluated using the Pittsburgh Sleep Quality Index (PSQI) [17]. The PSQI evaluates the quality and pattern of sleep and differentiates “poor” from “good” sleep by measuring 19 self-reported characteristics related to subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleep-inducing medication, and daytime dysfunction within the previous month. The sum of the total scores for each factor ranges from 0 to 21 points on the PSQI scale. Scores of 0 to 5 indicate very good sleep quality; scores of 6 to 10 indicate good sleep quality; scores of 11 to 15 indicate normal sleep quality, and scores of 16 to 21 indicate poor sleep quality. A global score greater than 5 indicates a “poor” sleeper.

Statistical Analysis

EpiData 3.0 (Odense, Denmark) was used to establish a database, and SPSS 23.0 software (IBM Corp, USA) was used for the statistical analyses. Variate frequency analyses (chi-squared and Fisher’s exact tests) and the t test were used to assess various demographic and medical variables, such as age, ethnicity, infection route, and the relationship between the risk transmission factors (PWUD with HIV vs PWUD without HIV). Correlations between variables were quantified by Pearson correlation coefficients. The r value showed a linear correlation between 2 variables. Potential collinearity was assessed by calculating the correlation between the independent variables and the covariates. Final models were adjusted for all the covariates. An alpha error of 5% was considered to be a valid cut-off for all significance testing.

Results

Baseline Characteristics of the Substance-Dependent Study Participants

The patient inclusion flowchart is shown in Figure 1. In total, 120 drug rehabilitees were surveyed. Using the inclusion and exclusion criteria, 102 valid questionnaires were collected. A total of 58 of the final participants were diagnosed with HIV. The participant age range was 20 to 55 years (average age: 34.41 years). Han Chinese was the predominant ethnicity (72.54%), and most of the participants (90.19%) had less than a junior high school education (Table 1). The minimum drug use duration was 1 month, and the longest duration was 31 years. The shortest withdrawal time was 2.08 months, and the longest was 21.75 months. There were no differences in age, ethnicity, education, or years of drug use. However, the results of the calibrated chi-squared tests showed that drug rehabilitees with HIV had longer withdrawal times. Most rehabilitees with HIV were heroin abusers (87.93%), whereas those without HIV...
were inclined to use both heroin (52.27%) and methamphetamines (34.09%). Additionally, the rehabilitees with HIV were infected through sexual intercourse (Table 1).

### Intensity of Pain

The pain incidence rate for the drug rehabilitees with and without HIV was 91.38% and 63.63%, respectively. There was a significant difference in the pain prevalence scores between the drug rehabilitees with and without HIV ($P<0.0001$; Table 2). A statistically significant difference in pain intensity was also observed between the groups, with the average VAS scores in the past 4 weeks for the rehabilitees with and without HIV being $40.18\pm3.03\,\text{mm}$ (range: 0-10) and $25.45\pm3.61\,\text{mm}$ (range: 0-8; $P=0.0022$; Figure 2), respectively. Additionally, a higher percentage of the rehabilitees with HIV experienced severe pain (41.51% mild, 35.85% moderate, and 22.64% severe pain) compared with the rehabilitees without HIV (60.71% mild, 28% moderate, and 14.29% severe pain) ($P<0.05$; Table 3).

### Table 1. Baseline characteristics of the substance-dependent study participants.

| Demographics                  | Drug rehabilitees without HIV (n=44) | Drug rehabilitees with HIV (n=58) | $P$ value |
|-------------------------------|-------------------------------------|----------------------------------|-----------|
| Age (years)                   | $38.91\pm1.34$                      | $40.92\pm1.03$                   | 0.227     |
| Minimum                       | 20.25                               | 26.17                            |           |
| Maximum                       | 45.42                               | 55.66                            |           |
| Ethnicity                     |                                     |                                  | 0.577     |
| Han                           | 32.00                               | 42.00                            |           |
| Minority                      | 12.00                               | 16.00                            |           |
| Nine-year compulsory education|                                     |                                  | 0.2613    |
| Unfinished                    | 38.00                               | 54.00                            |           |
| Finished                      | 6.00                                | 4.00                             |           |
| Years since drug use          | $12.42\pm1.53$                      | $14.38\pm1.03$                   | 0.2728    |
| Shortest                      | 0.08                                | 0.17                             |           |
| Longest                       | 31.58                               | 30.33                            |           |
| Rehabilitation time (months)  | $8.84\pm0.88$                       | $11.88\pm0.98$                   | 0.0277    |
| Shortest                      | 4.25                                | 2.08                             |           |
| Longest                       | 20.66                               | 21.75                            |           |
| Substance type                |                                     |                                  | 0.001     |
| Heroin                        | 23.00                               | 51.00                            |           |
| Methamphetamine              | 15.00                               | 3.00                             |           |
| Ephedrine                     | 3.00                                | 3.00                             |           |
| Mix                           | 3.00                                | 1.00                             |           |
| HIV infection route           |                                     |                                  |           |
| Blood transmission            | 19.00                               |                                  |           |
| Sex                           | 39.00                               |                                  |           |

Figure 1. Flow chart of enrolled patients. (Microsoft Office PowerPoint, 2007, Microsoft.)
Characteristics of Pain

The PD-Q score for the rehabilitees without HIV in the center was 6.841±0.9705 (range: 0-21), whereas it was 13.16±0.8427 for the rehabilitees with HIV (range: 0-24); this difference was statistically significant for neuropathic pain \( (P<0.0001; \text{Table 4}) \).

The pain in the drug rehabilitees with HIV was more likely a combination of nociceptive and neuropathic pain; however, that of most of the drug rehabilitees without HIV was primarily nociceptive pain. The possibility of neuropathic pain in the rehabilitees with HIV was much higher than that of those without HIV. In addition to pain intensity, the location of the pain also differed. The pain was primarily located in the neck, nape, left shoulder, left side of the head, thorax, and lumbar back for the patients with HIV.

Sleep Disorders

The overall sleep quality scores were 4.886±0.4759 for the rehabilitees without HIV and 6.778±0.6395 for the rehabilitees with HIV \( (\text{Table 5}) \), indicating that the rehabilitees with HIV experienced sleep disturbances (total score of 5 points or higher). There were statistically significant differences between the participants with and without HIV in terms of sleep disturbances, sleep medication use, and daytime dysfunction, with sleep medication use being significantly higher among the drug rehabilitees with HIV; this behavior was absent in the drug rehabilitees without HIV \( (P=0.0002) \). However, there were no significant differences in sleep quality, sleep onset latency, sleep duration, and sleep efficiency between the 2 groups. The results suggest that although both groups experienced good sleep quality, the rehabilitees with HIV and insomnia were more likely to seek drug treatment to achieve better sleep quality than were those without HIV.

Correlations

We calculated the pain prevalence, intensity, characteristics, and sleep quality for the rehabilitees and compared the relationships between these factors. The correlation analysis showed that the VAS score for the rehabilitees with HIV showed a strong positive correlation with neuropathic pain \( (P=0.013, r=0.927) \), but there was not a correlation with sleep quality \( (P=0.621, r=0.076) \). Multiple linear regression analysis showed that the VAS score for the rehabilitees with HIV was associated with rehabilitation time \( (P=0.031; \text{Figure 2}) \).
The logistic regression equation was \( Y = 4.262 - 0.353X \) (\( X \): rehabilitation time). No correlations were found among age \( (P=0.221) \), drug use duration \( (P=0.052) \), sleep quality \( (P=0.583) \), or education level \( (P=0.146) \) for the rehabilitees with HIV.

**Discussion**

The World Drug Report 2021 indicates that poverty, limited education, and social marginalization increase the risk of drug use and that 1 in 8 people worldwide is diagnosed with HIV. Yunnan Province has a high rate of drug abuse, as the economy and culture are relatively undeveloped, and the region is surrounded by areas with high drug availability. Globally, most registered drug abusers (nearly 60%) use synthetic drugs [2]; however, most drug rehabilitees in the Yunnan drug rehabilitation center are heroin abusers. In this study, the drug rehabilitees with HIV tended to use heroin, whereas those without HIV were inclined to use methamphetamines. Given the same intake method between PWUD with HIV and PWUD without HIV and the increasing awareness that HIV can spread through needle sharing, it is likely that most drug rehabilitees with HIV in Yunnan Province were infected through sexual intercourse, rather than needle sharing.

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**Table 4. PainDETECT questionnaire (PD-Q) mean scores for the drug rehabilitees with and without HIV.**

| Pain Type                          | Drug rehabilitees without HIV (n=44) | Drug rehabilitees with HIV (n=58) | P value |
|------------------------------------|-------------------------------------|----------------------------------|---------|
| Number of pain parts               | 70.84±1.16                          | 2.3±1.93                         | 0.006   |
| Referred pain, n (%)              | 6.00 (13.64)                        | 22.00 (37.93)                    | 0.0061  |
| Paresthesia                        |                                     |                                  |         |
| Burning pain                       | 2.40±0.30                           | 3.04±0.18                        | 0.0561  |
| Stabbing pain                      | 2.00±0.28                           | 2.76±0.16                        | 0.0126  |
| Tenderness                         | 1.37±0.17                           | 2.32±0.14                        | <0.0001 |
| Lightening pain                    | 1.40±0.18                           | 2.76±0.18                        | <0.0001 |
| Crymodynia                         | 1.60±0.25                           | 2.43±0.16                        | 0.0036  |
| Numbness                           | 1.87±0.27                           | 2.59±0.16                        | 0.0193  |
| Tenderness                         | 2.00±0.25                           | 2.11±0.10                        | <0.3003 |
| Pain type, n (%)                   |                                     |                                  | <0.0001 |
| Nociceptive (PD-Q score ≤12)       | 34 (77.27)                          | 28 (28.57)                       |         |
| Mixed (PD-Q score 13-18)           | 7 (15.90)                           | 25 (43.10)                       |         |
| Neuropathic (PD-Q score ≥19)       | 3 (6.81)                            | 5 (8.62)                         |         |

* P values for the continuous variable comparisons were determined using the Wilcoxon rank sum test. P values for the neuropathic pain category (likely/not likely) comparisons were determined using Pearson’s \( \chi^2 \) test or Fisher’s exact test if ≥25% of the expected counts were <5.

**Table 5. Pittsburgh Sleep Quality Index scores for the drug rehabilitees with and without HIV.**

| Sleep Quality                          | Drug rehabilitees without HIV (n=44) | Drug rehabilitees with HIV (n=58) | P value |
|----------------------------------------|-------------------------------------|----------------------------------|---------|
| Quality                                | 0.82±0.11                           | 1.11±0.11                        | 0.0709  |
| Sleep onset latency                    | 1.16±0.17                           | 1.02±0.15                        | 0.5301  |
| Sleep duration                         | 0.27±0.11                           | 0.09±0.05                        | 0.1306  |
| Efficiency                             | 0.61±0.15                           | 0.36±0.10                        | 0.1501  |
| Sleep disturbances                     | 1.11±0.05                           | 1.37±0.10                        | 0.0481  |
| Sleep medication use                   | 0.00                                | 0.59±0.17                        | 0.0002  |
| Daytime dysfunction                    | 1.93±0.29                           | 1.56±0.12                        | 0.2060  |
| Overall sleep quality                  | 4.89±0.48                           | 6.78±0.64                        | 0.0203  |

* P values for the continuous variable comparisons were determined using the Wilcoxon rank sum test.
Our investigation showed that drug rehabilitees with HIV were more likely to experience neuropathic pain, as well as a higher pain prevalence and intensity. This is compatible with the results of a previous report indicating that prevalence estimates of pain among individuals with HIV are high, ranging from 39% to 85% [18]. In the present study, the VAS scores for the rehabilitees with and without HIV were 40.18±3.031 mm and 25.45±3.613 mm, respectively. Furthermore, 60.71%, 28%, and 14.29% of the rehabilitees without HIV experienced mild, moderate, and severe pain, respectively. This is similar to a report that demonstrated that 87% of PWUD experienced chronic pain, with 13%, 24%, and 50% experiencing mild, moderate, and severe pain, respectively [5]. Most of the rehabilitees in the current study experienced mild pain; however, HIV infection aggravated the pain intensity, with 41.51%, 35.85%, and 22.64% of the rehabilitees with HIV experiencing mild, moderate, and severe pain, respectively. It has been reported that pain in the lower extremities and lower back is more common than pain in the upper extremities in heroin users [19]. We observed similar results, in that pain among the rehabilitees in the present study was mostly located in the lower back. Despite the high prevalence of people living with HIV, pain is often overlooked as a symptom requiring intervention.

Patients with HIV are subjected to a greater disease burden, which can predict greater adversity. Our survey found that drug rehabilitees with HIV had higher pain scores and were more prone to severe pain, which is in line with this assumption. The finding of HIV-related pain is consistent with several other studies, as the sources of HIV-DSP include disease progression, opportunistic infections, adverse effects of anti-retroviral therapy, and the development of non-specific chronic pain [20]. Many patients with HIV develop chronic pain and use opioid-derived medicines as primary analgesics. However, chronic use of opioid analgesics paradoxically heightens pain states in patients with HIV [21]. Frequently, patients with HIV have comorbidities of substance abuse histories, leading to challenges for pain management; in particular, prescription opioid abuse appears to be more common among patients with HIV, possibly because of the comorbidity of HIV or previous history of substance abuse [22].

Pain is the second most common symptom in ambulatory settings in which HIV disease is treated [23]. HIV-associated neuropathic pain has a prevalence of 13% to 50% and is characterized by pain, numbness, and a burning sensation primarily in the back and soles of the feet [24]. This finding is in line with our results, which indicated that the classification of chronic pain among the drug rehabilitees with HIV was more likely to be mixed, namely a combination of nociceptive and neuropathic pain. The drug rehabilitees with HIV had more body parts that were affected by pain as well as more referred pain.

Stabbing pain, tenderness, lightning pain, crnymodynia, and numbness or paresthesia were more common in the rehabilitees with HIV than in those without HIV, although there were no differences in burning pain or pressure. Our investigation suggests that doctors should consider prescribing medicines to treat both nociceptive and neuropathic pain (eg, pregabalin) in drug rehabilitees with HIV.

In the present study, the drug rehabilitees with HIV had higher PSQI scores and experienced poorer sleep quality than those without HIV. Other studies have yielded parallel results, where-in substance abuse patients showed a high prevalence of poor sleep quality due to sleep disturbances (70.2-84%) [25]. Moreover, pain and depression are correlated with poorer sleep quality in HIV-positive patients [26]. However, no association was found between pain intensity and sleep quality for the rehabilitees with HIV in the present study.

There are differing opinions regarding the impact of persistent pain on sleep and whether disturbed sleep affects pain perception by lowering the pain threshold [27]. The difference may be because the participants in our investigation used a variety of drugs, rather than just morphine. Additionally, other factors, such as illicit drug use or psychological distress, may explain the reduced sleep quality for these patients, as these factors have been reported to affect sleep [28,29]. These reports indicate that pain is significantly related to sleep quality, suggesting that analgesic treatment for drug addicts in drug rehabilitation centers may be effective. The results of our study show that pain in the drug rehabilitees correlated with drug duration time and rehabilitation time, but not age, ethnicity, sleep quality, or education level. These results may be related to the unique geographic location of the study (Yunnan Province), and further investigation is warranted.

Limitations

The limitation of this study was that we included only male patients. The prevalence of drug use continues to be higher among men than women, as an estimated 2 in 3 people who use drugs globally are men [2]. This situation is true for Yunnan Province as well. The circumstances leading to drug use initiation, social factors, characteristics that affect people who use drugs, biological factors, and circumstances that lead to the development of drug use disorders vary considerably between men and women [30]. Additionally, sex is an important factor that influences feelings of pain; indeed, significant differences in pain have been noted between men and women across Europe, with studies showing that women experience more pain than men [31]. For the above reasons, we included only men in this investigation to eliminate sex as a confounder; however, we plan to include women in future studies.
Conclusions

We demonstrated that more than half of the drug rehabilitees at the Fifth Drug Rehabilitation Center in Yunnan Province, China, during the study period had an HIV infection. In this population, the rehabilitees with HIV experienced more frequent and stronger pain than those without HIV. Furthermore, the pain characteristics of the drug rehabilitees with HIV were mixed nociceptive and neuropathic pain, whereas the rehabilitees without HIV were more likely to experience only nociceptive pain. The rehabilitees with HIV also experienced poorer sleep quality, although it was not related to pain. Although drug rehabilitees typically take nonsteroidal anti-inflammatory medicines and other analgesics, drug rehabilitees with HIV might also choose neuropathic pain medicines. To the best of our knowledge, this is the first study comparing the pain differences among drug rehabilitees with and without HIV, and our results provide insights into the appropriate treatment of pain for drug rehabilitees during the recovery period.

Department and Institution Where Work Was Done

Clinic of the Kunming 5th Drug Rehabilitation Center, Kunming, Yunnan, China.

Declaration of Figures' Authenticity

All figures submitted have been created by the authors, who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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