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Quality of Life among Injection Drug Users Living with or without HIV/AIDS in Taiwan: A Case Control Group Design

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Abstract

Background: For most HIV/AIDS patients who adhere to their medication regimens, Highly Active Antiretroviral Therapy (HAART) effectively controls viral load, reduces the incidence of AIDS diagnoses, and lowers HIV-associated mortality. Despite strong evidence that HAART effectively increases survival in people living with HIV/AIDS, HIV-infected individuals not only need to endure the physiological changes that occur during therapy, but they may also face social and psychological problems. However, few research studies have paid attention to the quality of life of injection drug users (IDUs) living with HIV. This paper examines quality of life among IDUs living with HIV/AIDS relative to IDUs without HIV/AIDS.

Methods: A total of 71 HIV-infected IDUs from 4 methadone clinics in northern Taiwan completed a structured questionnaire that included demographics and the World Health Organization Quality of Life Scale brief version (WHOQOL-BREF). Another 71 HIV-negative IDUs were randomly sampled from 528 available methadone patients at the same 4 clinics as the control group. Scores from the WHOQOL-BREF were compared between HIV-positive and HIV-negative IDUs.

Results: Results from multivariate multiple linear regression indicated that after controlling for all other demography and clinical factors, average scores in these four domains of WHOQOL-BREF were significantly higher among HIV-negative patients compared with those in HIV-positive patients. The greatest group difference appeared in the social relations domain, followed by the psychological domain and then the environmental domain, with the least difference found in the physical domain.

Conclusion: The findings suggest that social relations and psychological issues are of great concerns for IDUs, especially HIV-positive patients. This indicates that understanding the impact of HIV infection on the quality of life particularly in the psychological and social relations realms is an important topic of future research.

Keywords: HARRT; HIV/AIDS; Injection drug users; Quality of life

Introduction

Drug injection and related human immunodeficiency virus (HIV) infection pose great challenges to health professionals worldwide. In Taiwan, the number of people using heroin increased during the years 2003 to 2009, and the incidence of contracting the human immunodeficiency virus (HIV) and/or the hepatitis C virus (HCV) increased tenfold during the same time period [1]. Specifically, from 2003 to 2005 newly reported HIV-positive cases increased from 860 to 3,381, and the percentage attributed to injection drug users (IDUs) markedly increased from 2.1% to 72.4% [2,3]. At the end of 2012, the proportion of HIV cases related to Taiwanese IDUs was 27.58% of 24,239 HIV cases [3]. HIV prevalence was estimated to be between 12.3% and 25.5% among IDUs, compared with 0.08% among the general population [2-4].

For most patients who adhere to their medication regimens, HAART effectively controls viral load, reduces the incidence of AIDS diagnoses, and lowers HIV-associated mortality [5,6]. HAART was introduced into Taiwan in April 1997 and was freely offered to all identified HIV-positive citizens through the National Health Insurance system [7], resulting in a dramatic decline in mortality in HIV patients from 64% prior to the introduction of HAART to 8.9% in 2005 [8]. A Taiwan study [9] conducted a survival analysis of 2,633 HIV-positive Taiwan patients without AIDS and concluded that the estimated lifespan was 21.5 years after diagnosis. Another study [10] from the Danish HIV Cohort Study found that newly diagnosed young persons with HIV (25 years old) demonstrated a marked extension of average life expectancy (ALE) following the introduction of HAART. In this study, ALE increased from about 8 years in 1995-1996 to 23 years in 1997-1999. By 2000-2005, ALE had increased to 33 years, which was three times longer than that of HIV-positive individuals not receiving such therapy and equal to ALE of young persons with diabetes. Therefore, it is well established that early treatment and proper care for persons with HIV/AIDS can extend their ALE.

Despite strong evidence that HAART effectively increases survival in people living with HIV/AIDS, consequently increasing the cumulative number of persons living with HIV/AIDS, these HIV-positive individuals not only need to endure the physiological changes that occur during therapy, but studies found that they also face social stigma [11,12] and psychological problems [13-16], resulting in depression and suicide. For example, a study [17] provided evidence that from 1994 to 2002, the number of people with HIV/AIDS committing suicide increased by more than three times in Taiwan, from 1.5% in 1994 to 1996 to 4.8% in 2000 to 2002. In other words, although ALE of individuals living with HIV/AIDS has increased as a result of HAART, their suicide rate has also increased. Previous studies have documented the same phenomenon that the number of HIV-positive persons dying from HIV-related diseases has decreased, whereas deaths from suicide-related causes have increased [18-21].

Quality of life is frequently used in general medicine and has become an important indicator for estimating the burden of HIV, but this analysis is not often applied in studying HIV-positive IDUs. Drug injection is associated with HIV infection and multiple negative consequences in a broad range of areas of functioning including physical or psychological problems, personal safety, social relations, roles and obligations, and work [22]. Therefore, although HAART and methadone can alleviate the physical symptoms of HIV/AIDS [13] and opioid dependence [23], respectively, QoL, as a continuous process, can remain a critical issue for IDUs with HIV. Although studies have suggested that dual diagnosis of dependence and HIV is harmful to health-related QoL [16,24], there is a lack of investigation into the impact on QoL for HIV-infected IDUs [25,26]. Moreover, the extension to life resulting from HAART enhances the importance of the maintenance and optimization of QoL during this extended lifespan.

Compared with other chronic disease patients, health of HIV-positive IDUs is threatened by the extensive complications and comorbidity of HIV and drug addiction across the therapy process. Some studies have documented that individuals with either HIV infection or dependence per se had significantly lower QoL than patients with other chronic medical conditions [27,28], but no study has been conducted to examine the difference between HIV-positive and HIV-negative IDUs [24]. This study compares the QoL scores in IDUs with and without HIV. We hypothesize that IDUs with HIV are more likely to have lower QoL compared with those without HIV, especially in the psychological and social relation domains.

Methods

Participants

A case-control sample of HIV-positive and HIV-negative IDUs was selected from a study evaluating the impact of methadone treatment on heroin lapse, risk behaviours, and QoL, from four hospitals in northern Taiwan. The criteria for IDU inclusion in the present study were as follows: 18 years of age or older, literate, morphine positive, and self-reported heroin injection in the past six months. This research was approved by the Institutional Review Board of Human Subject Protection at the Taipei Medical University (approval number P960205). After an explanation of the purpose of the research to potential IDU participants, participants signed consent forms, received HIV testing, and completed a self-administered questionnaire. A total of 599 available methadone treatment patients were invited to participate in this study. All data were collected between August and November 2008.

Measures

A semistructured questionnaire asked for background information and quality of life. The solicited demographic information included age, gender, age at first heroin use, education, marital status, and employment status. Because a minimum of nine years education is compulsory in Taiwan, education was categorized as less than nine years and at least nine years in school. Marital status was categorized as married, single, and other (divorced/widowed). Employment status was categorized as jobless, seasonal labor, and full time. After we obtained patient consent, records for the clinical characteristics examined in the study were retrieved from patient files in the hospital's computer systems. The data included confirmed HIV status, HCV status, morphine detected by urine tests, and methadone dosage at intake.

Quality of life: For this study, quality of life was defined as "an individual's perception of their position in life, in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" [29]. This study used the World Health Organization Quality of Life Scale brief version (WHOQOL-BREF), which was developed to measure overall QoL and ordinary health states [29-31]. The WHOQOL-BREF includes 4 domains (physical, psychological, social, and environmental) and has a total of 26 questions: 7 items for the physical domain (energy and fatigue; pain and discomfort; sleep and rest; mobility; activities of daily living; dependence on medicinal substances; work capacity), 6 items for the psychological domain (body image and appearance; negative feelings; positive feelings; self-esteem; thinking, learning, memory, and concentration; religion/spirituality/personal beliefs), 3 items for the social domain (personal relationships; social support; sexual activity), and 8 items for the environmental domain (financial resources; freedom, physical safety, and security; accessibility and quality of health and social care; home environment; opportunities for acquiring new information and skills; participation in and opportunities for recreation/leisure; pollution/noise/traffic/climate; transport), as well as 2 additional questions on overall quality of life and general health.

Scoring: The WHOQOL-BREF questionnaire uses a five-point Likert scale and is coded from 1–5 points. Four types of scale descriptors (capacity, frequency, intensity, and evaluation) for Taiwan were specially selected. Participants responded to questions according to their experience in the previous two weeks. Reverse items (items 3, 4 and 26) were scored reversely. After adding up the scores for items in corresponding domains, the original domain scores were transformed to a scale of 0-100. Higher scores for a particular domain indicated better quality of life in that domain [31].

Reliability and validity of WHOQOL-BREF: The WHOQOL-Taiwan Group [31] collected data from 848 patients and 212 healthy controls from 17 hospitals in Taiwan for assessment of the scale's validity and reliability and concluded that the coefficients indicate that measures of the WHOQOL-BREF have adequate reliability and validity. The internal consistency (Cronbach's α) coefficients in this study for physical, psychological, social relations, and environmental domains were 0.80, 0.77, 0.7, and 0.82, respectively. Results of confirmatory factor analysis found that items from the four domains all had factor loadings greater than 0.30. The correlations between the four domains were 0.62 (physical and psychological), 0.65 (physical and social relations), 0.72 (physical and environmental), 0.76 (psychological and social relations), 0.70 (psychological and environmental), and 0.74 (social relations and environmental).

	Sample Characteristics	HIV Status		P value
		HIV +	HIV -	
	Mean (SD)	Mean (SD)	Mean (SD)	
Age	40.19 (7.99)	39.61 (7.82)	40.73 (8.16)	0.4119
Years of heroin use	13.36 (7.85)	13.85 (6.65)	12.85 (8.94)	0.4813
Quality of life				
Physical	62.35 (16.25)	58.22 (17.57)	66.20 (13.96)	0.0040
Psychological	52.92 (15.59)	45.27 (15.91)	60.04 (11.43)	0.0000
Social relations	59.12 (17.02)	50.18 (18.61)	67.43 (9.79)	0.0000
Environmental	60.37 (15.08)	54.89 (16.15)	65.45 (12.05)	0.0000
	Percentage	Percentage	Percentage	
Gender				
Male	89.05	89.39	88.73	0.901
Female	10.95	10.61	11.27	
Education				
< HS	26.67	30.77	22.86	0.299
≥ HS	73.33	69.23	77.14	
Marital status				
Married	26.77	15.63	38.1	0.011
Single	52.76	64.06	41.27	
Other	20.47	20.31	20.63	
Occupation				
Jobless	50.00	55.74	44.44	0.049
Seasonal labor	10.48	14.75	6.35	
Full time	39.52	29.51	49.21	
Study sites				
Taipei	44.37	46.48	42.25	0.67
Keelung	42.25	43.66	40.84	
Banqiao	9.86	7.04	12.68	
Lotung	3.52	2.82	4.23	
Hepatitis C				
Negative	4.62	0	8.7	0.029
Positive	95.38	100	91.3	
Morphine Status				
Negative	34.85	47.69	22.39	0.002
Positive	65.15	52.31	77.61	

Table 1: Sample Characteristics and Bivariate Analysis between HIV Status and Independent and Outcome Variables.

Statistical analysis

Descriptive statistics were used to identify the characteristics of the entire sample and the two HIV groups. Bivariate analysis was conducted to evaluate differences between the two groups regarding the demography and clinical factors, as well as the four domains of quality of life. Chi-square tests, Fisher exact tests, and two independent sample t-tests were applied when appropriate. Continuous variables in this study met the normality assumption. To better estimate the differences among the four domains of the quality of life between the two groups, multivariate multiple linear regression was performed to compare the two groups on the four domains simultaneously while controlling for all the other demography and clinical factors. This was possible because the four domains were subscales of the WHOQOL-BREF and moderately correlated with each other. Finally, because missing values were substantial (20%), we checked potential missing mechanisms

and decided to conduct multiple imputations to handle missing data. However, as the estimations from the imputed data were very close to those from the complete-case data, we then adapted the latter. All the statistical analysis was conducted in STATA 12 [32].

Results

Participants' characteristics

Of available patients, 71 IDUs were tested HIV positive. Participants all agreed to participate in this study and were not receiving HAART at the time of data collection. Another 71 control cases of HIV-negative IDUs were randomly sampled from the remaining patients. As shown in Table 1, for the entire sample, the participants were on average 40.19 years old (SD = 7.99) and had used heroin for 13.36 years (SD = 7.85). About 11% of the entire sample was female; about half of the sample were still single and only a quarter were married; 73.33% had completed high school education; about 40% worked full time while another 50% were unemployed; about 95% were co-infected with hepatitis C; and finally, about two thirds of the sample had detectable morphine levels in their urine during the treatment intake. In bivariate analysis as shown in Table 1, age, gender, years using heroin, study sites, and education levels did not differ between the two groups. However, compared with those without HIV, those IDUs with HIV were less likely to be married, less likely to be working full time, less likely to have detectable morphine levels, but more likely to have co-infection with hepatitis C. Finally, HIV-positive participants ranked significantly lower than HIV-negative participants on all four domains of the quality of life.

Using multivariate multiple linear regression to examine the mean scores of QoL domains between HIV-positive and HIV-negative IDUs

When controlling for all other demography and clinical factors, HIV status was still significantly related to all four domains of quality of life (Wilks's lambda, Lawley-Hotelling's trace, Pillai's trace, and Roy's largest root all reached significant levels at 0.001 levels, not shown in the table). The comparisons among groups in the domains of quality of life are summarized in Table 2. HIV-positive IDUs scored on average 7.631 (95% CI 0.669, 14.592), 12.270 (95% CI 6.156, 17.257), 17.997 (95% CI 11.752, 24.243), and 9.700 (95% CI 3.646, 15.747) units lower than their HIV-negative counterparts on the physiological, psychological, social relations, and environmental domains of QoL, respectively. The greatest group difference appeared in the social domain, followed by psychological, then the environmental domain, with the least difference in the physical domain.

	Observed data (N = 111)			
	Coef.[1]	Std. Err.	P>t	[95% Conf. Interval]
Physical Domain				
HIV + (vs. HIV -)	-7.631	3.505	0.032	-14.592 – -0.669
Psychological Domain				
HIV + (vs. HIV -)	-12.270	2.794	0.000	-17.257 – -6.156
Social Relations Domain				
HIV + (vs. HIV -)	-17.997	3.144	0.000	-24.243 – -11.752
Environmental Domain				
HIV + (vs. HIV -)	-9.700	3.046	0.000	-15.747 – -3.646

[1] The coefficients were all adjusted further for age, gender, marital status, education, years of heroin use, study sites, and two biomarkers. Residuals met the normality assumption

Table 2: Average Group Differences in Four Domains of Quality of Life between HIV-positive and HIV-negative Methadone Patients Using Multiple Multivariate Linear Regression.

Discussion

Our study findings showed that HIV-positive IDUs had lower QoL than IDUs without HIV. Though previous studies have documented that HAART treatment increases the ALE and accessibility of people living with HIV/AIDS [9,10], our study findings bring attention to the concept that HIV/AIDS has become for many a chronic disease, but few studies have attempted to understand the QoL and life experiences of HIV-positive IDUs. Furthermore, a few studies [33-35] have suggested that good QoL can lead to better health outcomes in disease sufferers and that health-related QoL can predict survival among individuals living with HIV/AIDS [14].

The results pertaining to employment and marital status, and the magnitudes of the differences of QoL scores among HIV-positive IDUs in the psychological and social domains were consistent with those of another study on QoL in people living with HIV/AIDS following treatment with HAART. Yen et al. [36] found low scores in the psychological and social domains of QoL in people living with HIV/AIDS, who faced a range of problems including depression, deteriorating work function, inconvenience of follow-up visits, lack of social support, and negative stress. The results indicate that regardless of the mode of infection, people living with HIV/AIDS have worse QoL in the domains of psychological health and social relationships. However, a study [37] has suggested that people living with HIV/AIDS who also use drugs face more severe social stress and isolation. In addition, a study has found that people living with HIV/AIDS who are also drug users have lower QoL than those who do not use drugs [16]. This is because IDUs living with HIV/AIDS not only face potential harms from HIV but also must deal with the problem of drug addiction and the social stigma associated with both conditions.

The lower scores observed in the psychological and social relations domains indicate that the assistance and care provided in these two domains can be enhanced. Although many case managers in Taiwan hospitals may provide brief counselling and education services to HIV-positive IDUs, there is a lack of professional and continuous support of this kind. Our findings may indicate that psychological interventions, consultation, and education currently provided to IDUs with HIV/AIDS are probably insufficient in northern Taiwan. Therefore, psychological health should be considered one of the priorities for enhancement of QoL, as well as the physical threat posed by HIV. The lower scores reported by the HIV-positive IDU group for the social relations and psychological domain warrant further study.

In this study, results showed that not only did IDUs with HIV have lower physical QoL scores compared with the IDUs without HIV, but they also had lower scores in the environmental domain. That the score differences were significant but smaller in the physical and environmental domains could be a reflection of the facets measured and the large amount of personnel and resources invested in addiction-related medical services through low-threshold methadone treatment [38].

Research limitations and conclusions

This study has some limitations. The HIV-positive participants in our sample were not randomly selected from a nationwide pool and may be associated with unspecified selection biases, limiting our ability to generalize conclusions to the larger population of HIV-positive IDUs. It is also noteworthy that our sample consisted of heroin-dependent patients in only four methadone clinics, limiting the extent of generalizability. Moreover, we did not have data on participants' duration of HIV infection, which can affect QoL. Additionally, there

is potential for response bias to occur given that the questionnaire was self-administered. Despite these research limitations, there are a limited number of studies on QoL among IDUs with HIV from a chronic disease perspective, and this study attempts to makes an important contribution to the field.

In conclusion, IDUs with HIV have lower scores for every aspects of QoL and, in particular, much lower scores for the psychological and social relations domains compared with IDUs without HIV in Taiwan. These findings indicate that IDUs with HIV may benefit from increased counselling, health education and intervention aimed at their mental health and social relations, in order to enhance their QoL.

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