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Improvements in depression and changes in quality of life among HIV-infected adults

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Abstract

Improving QOL for HIV-infected individuals is an important objective of HIV care, given the considerable physical and emotional burden associated with living with HIV. Although worse QOL has been associated with depression, no research has quantified the potential of improvement in depression to prospectively improve QOL among HIV-infected adults. We analyzed data from 115 HIV-infected adults with depression enrolled in a randomized controlled trial to evaluate the effectiveness of improved depression care on antiretroviral drug adherence. Improvement in depression, the exposure of interest, was defined as the relative change in depression at 6 months compared to baseline and categorized as full response (≥50% improvement), partial response

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(25%–49% improvement) and no response (<25% improvement). Multivariable linear regression was used to investigate the relationship between improvement in depression and four continuous measures of QOL at 6 months: physical QOL, mental QOL, HIV symptoms, and fatigue intensity. In multivariable analyses, physical QOL was higher among partial responders (MD=2.51, 95% CI −1.51, 6.54) and full responders (MD=3.68, 95% CI −0.36, 7.72) compared to individuals who did not respond. Mental QOL was an average of 4.01 points higher (95% CI −1.01, 9.03) among partial responders and 14.34 points higher (95% CI 9.42, 19.25) among full responders. HIV symptoms were lower for partial responders (MD=−0.69; 95% CI −1.69, 0.30) and full responders (MD=−1.51; 95% CI −2.50, −0.53). Fatigue intensity was also lower for partial responders (MD=−0.94; 95% CI −1.94, 0.07) and full responders (MD=−3.00; 95% CI −3.98, −2.02). Among HIV-infected adults with depression, improving access to high-quality depression treatment may also improve important QOL outcomes.

Keywords

HIV; depression; quality of life; patient-centered outcomes

Introduction

The scale-up of antiretroviral (ARV) treatment to >8 million individuals (Joint United Nations Programme on HIV/AIDS (UNAIDS) & World Health Organization, 2012) has transformed HIV from an acute illness to a chronic condition. With early diagnosis and access to treatment, the average life expectancy for HIV-infected adults is now ~75 years. (Nakagawa et al., 2012) As individuals continue to live longer with HIV, quality of life (QOL) becomes an increasingly important patient-centered outcome for this population. (Sherbourne et al., 2000)

HIV-infected individuals face a range of issues impacting QOL, including HIV-related stigma, loss of social support, HIV symptom burden, and physical and mental health comorbidities.(Charles et al., 2012; Herrmann et al., 2013; Rao et al., 2012) When assessed, aspects which have the greatest impact on HIV-infected individuals' daily lives, such as fatigue (Barroso, Harmon, Madison, & Pence, 2013) and HIV symptoms,(Webb & Norton, 2004a) are rarely included.

For people living with HIV, depression may play an important role in influencing QOL. Depression affects 20–30% of people living with HIV and is the most common mental health disorder among patients engaged in HIV medical care.(Bing et al., 2001) Although depression has been associated with lower QOL among HIV-infected individuals in cross-sectional studies,(Reis et al., 2011; Zimpel & Fleck, 2013) little research has focused on whether changes in depression have the potential to improve QOL.

Accordingly, we report on the relationship between improvement in depression and QOL over six months of prospective follow-up among HIV-infected individuals.

Methods

Data come from an ongoing randomized controlled trial to evaluate the effect of depression treatment on ARV adherence (*the SLAM DUNC Study*), described elsewhere.(Pence et al., 2012) Briefly, HIV-infected patients receiving medical care were eligible if they were English speaking, ages 18–65, screened positive for depression (score ≥10) on the Patient Health Questionnaire-9 (Spitzer, Kroenke, & Williams, 1999), and had a confirmed current major depressive disorder on the Mini International Neuropsychiatric Interview.(Sheehan et al., 1998) Exclusion criteria included history of bipolar or psychotic disorder, failure of ≥2 adequate antidepressant trials, or psychiatric presentation requiring acute intervention. (Pence et al., 2012) Participants were randomized to receive either enhanced usual care or a depression treatment model called Measurement-Based Care.(Adams et al., 2012) All participants provided written informed consent, and ethical approval was provided by Duke University and all study sites.

Measures

Change in depression, the exposure of interest, was defined as the relative change in depressive symptom severity at 6 months compared to baseline on the Hamilton Depression Rating Scale (HAM-D),(Hamilton, 1967; Leucht et al., 2013) which was administered by trained assessors blinded to study arm. The change between baseline and six months was categorized into clinically meaningful response categories (Nierenberg & DeCecco, 2001): full response (≥50% improvement), partial response (25%–49% improvement) and no response (<25% improvement).

As outcomes, we considered four continuous measures of QOL at six months: physical QOL, mental QOL, HIV symptoms, and fatigue intensity. Physical and mental QOL were measured using the Short Form-12 and scored following standard methodology to yield scores on a 0–100 scale (higher numbers indicate greater functionality; mean=50 and one standard deviation=10 in the normative US population).(J. Ware, Kosinski, Turner-Bowker, & Gandek, 2002; J. Ware Jr, Kosinski, & Keller, 1996) The number of HIV symptoms was measured by asking about the presence of 12 symptoms (headaches; fever, sweats or chills; pain in the mouth; white patches in the mouth; painful rashes or sores; nausea or loss of appetite; eye trouble; sinus infection; numbness in hands or feet; persistent cough; diarrhea) in the past six months.(Bing et al., 2001) Fatigue was measured with the fatigue intensity subscale of the HIV-Related Fatigue Scale (range: 1–10).(Barroso & Lynn, 2002; Pence, Barroso, Leserman, Harmon, & Salahuddin, 2008)

Analysis sample

Participants included here had passed the study's six-month time point, scored ≥8 on the baseline HAM-D (indicating depressive symptoms not in remission), and completed the six-month research assessment. Of 176 study participants with a baseline HAM-D at the time of analysis, 169 (96%) had a baseline HAM-D score ≥8 and 115 (68%) of those had completed the six-month research interview.

Statistical analysis

We used linear regression to estimate the mean difference (MD; improvement or decline) on each outcome at six months comparing those demonstrating full, partial, or no depression response. Model assumptions were assessed. Final models were adjusted for age (≤45 years or >45 years)(Balderson et al., 2013), current gender (Mrus, Williams, Tsevat, Cohn, & Wu, 2005) and the baseline value of the outcome measurement. Based on literature review and sample size considerations, a parsimonious set of additional included confounders were baseline HIV symptoms (Hays et al., 2000) (physical QOL model), baseline primary partner status (Peter, Kamath, Andrews, & Hegde, 2014) (yes or no; mental QOL model), and baseline CD4 count (Jia, Uphold, Wu, Chen, & Duncan, 2005) (>350/≤350; HIV symptoms model). The functional form of each confounder (i.e. baseline age) with the outcome was assessed to determine variable coding choices. Statistical analyses were performed using Stata 11 (StataCorp, College Station, TX).

Results

The 115 participants included in this analysis were predominately of older age (median age 44), male (69%) and African American, non-Hispanic (63%). Less than a quarter of study participants were employed (24%) and the mean income in the past month was under $1,500. Participants reported being HIV-infected for a mean of 11.6 years and exhibited good clinical HIV indicators at baseline (mean CD4 count 616; 71% virally suppressed (<48 c/mL) (Table 1).

Baseline HAM-D measurements indicated severe or very severe depression (mean HAM-D 20.6; range 9–36). Just under half (47%) of participants experienced either partial depression response or full depression response (Table 2). At six months, mental QOL improved on average 8.1 points, the number of HIV symptoms decreased by an average 0.2 symptoms and fatigue improved on average 1.2 points. Physical QOL declined by an average of 1.6 points (Table 2). Those demonstrating partial or full depression response by six months showed greater improvements in mental QOL, HIV symptoms, and fatigue intensity than those who demonstrated no response (Figure 1).

In multivariable analyses, improvement in depression was generally associated with better six-month QOL, with full responders faring better than partial responders. Despite the overall decline in physical QOL, physical QOL was higher among partial responders (MD=2.51, 95% CI −1.51, 6.54) and full responders (MD=3.68, 95% CI −0.36, 7.72) compared to individuals who did not respond. Mental QOL was an average of 4.01 points higher (95% CI −1.01, 9.03) among partial responders and 14.34 points higher (95% CI 9.42, 19.25) among full responders. HIV symptoms were lower for partial responders (MD= −0.69; 95% CI −1.69, 0.30) and full responders (MD=−1.51; 95% CI −2.50, −0.53). Fatigue intensity was also lower for partial responders (MD=−0.94; 95% CI −1.94, 0.07) and full responders (MD=−3.00; 95% CI −3.98, −2.02)(Table 3).

Discussion

In our analysis of HIV-infected adults with depression, improvement in depression over six months was associated with better QOL on a range of measures, including mental health-related functional impairment, fatigue, and HIV symptoms. Physical QOL showed the least improvement associated with changes in depression, possibly due to the overall decline in physical QOL among non-responders and the fact that over half of study participants were above age 45. For each outcome evaluated, greater improvements in depression were associated with better QOL. Overall, our results suggest that improvement in depression over time can lead to meaningful improvements in a range of important QOL measures for people living with HIV.

Improving QOL for HIV-infected individuals is an important objective of HIV care. HIV-infected individuals consistently report lower QOL compared to the general public (Hays et al., 2000). In our sample, the mean physical health QOL score at baseline was over half a standard deviation below the US population and the mean mental health QOL score was nearly two standard deviations below.(J. Ware et al., 2002) For people living with HIV, fatigue and HIV symptom burden also greatly affect daily functioning.(Barroso et al., 2013; Webb & Norton, 2004b) Participants reported a mean of 5 out of 12 HIV symptoms at baseline and a fatigue intensity of nearly 7 on a 1–10 scale. The frequency and intensity of fatigue and HIV symptoms among participants suggests that these factors should be considered, along with traditional measures such as mental and physical QOL, when assessing QOL in HIV-infected patients.

Depression is an essential determinant of QOL (Brettschneider et al., 2013), and may be particularly important for HIV-infected individuals. The prevalence of depression among people living with HIV is as much as 15% higher than in the general public.(Bing et al., 2001; Kessler et al., 2003) and is often unrecognized, untreated or inadequately treated (Asch et al., 2003; Kessler et al., 2003; Weaver et al., 2008). In our analysis, both partial and full depression response were associated with improvements in QOL. The overall trend of improvements in depression associated with better QOL suggests an opportunity to enhance QOL for HIV-infected individuals by treating depression more effectively.

Strengths of this study include prospective measures of depression with the widely used and validated HAM-D and a broad range of QOL measures. Limitations include the inability to control for potential confounding by comorbid chronic conditions, which were not measured in the study. Chronic conditions such as diabetes are associated with both depression (Egede, Zheng, & Simpson, 2002; Katon & Sullivan, 1990; Massie, 2004; Ormel et al., 2007) and lower QOL.(Alonso et al., 2004; Bayliss et al., 2012) Information on study arm and antidepressant prescription was also not available at this stage of the study. However, these variables would affect QOL by affecting depression response, thus the present analysis remains clinically relevant.

Quality of life is an important and multifaceted patient-centered outcome for people living with HIV. In our analysis, both partial depression response and full depression response led to improvements in mental health, fatigue and HIV symptom burden aspects of QOL.

Further, the trend towards greater improvements in depression leading to larger improvements in QOL suggests that improving access to effective depression treatment for HIV-infected individuals may provide an opportunity to improve QOL as well.

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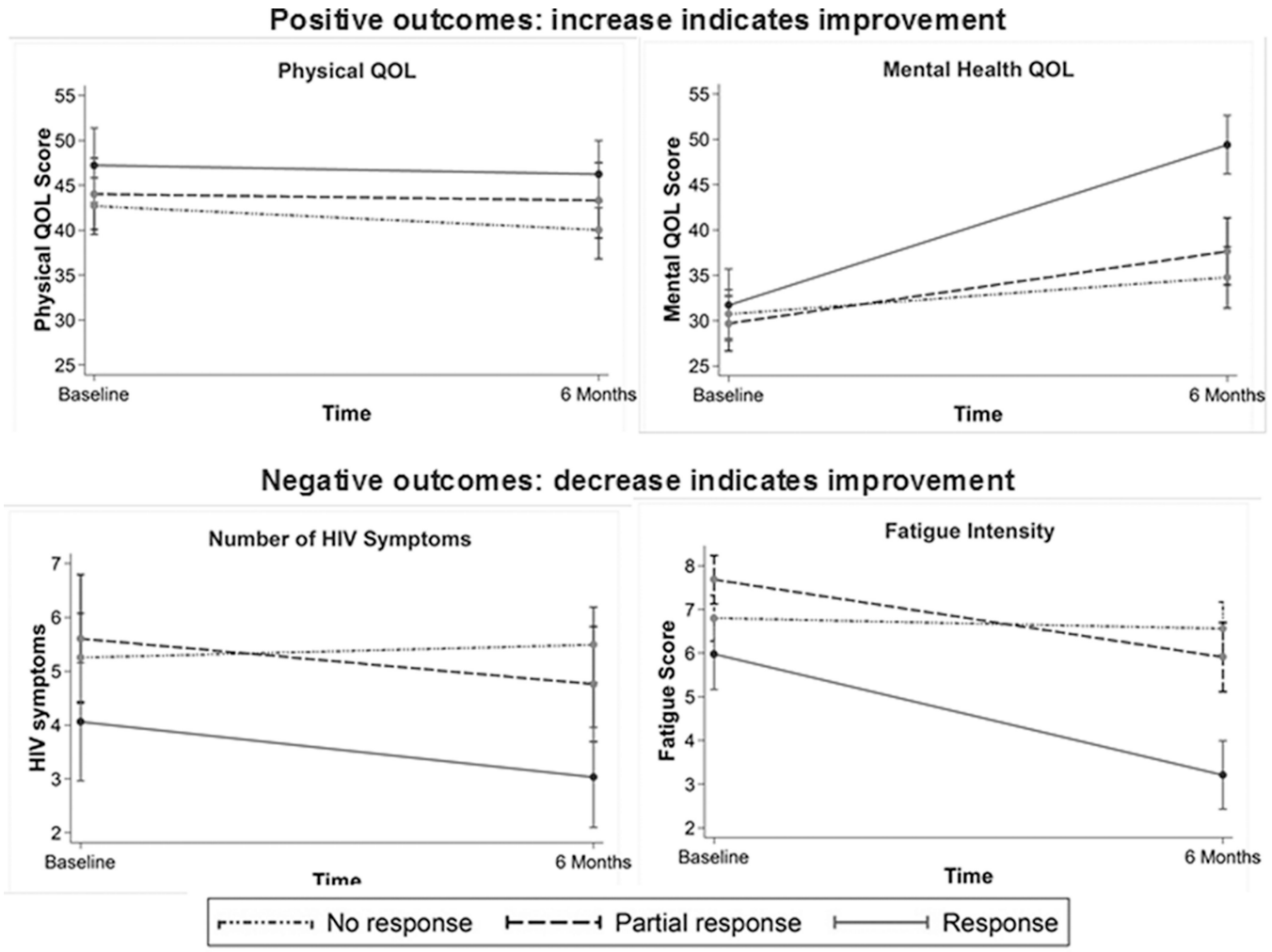

Figure 1.

Table 1

Baseline characteristics of 115 HIV-infected adults with depression.

Characteristic	Mean (SD) or n (%)	Missing
Age, years (range: 20–61)	43.5 (9.8)	
Current gender		
Male	79 (69.3)	
Female	32 (28.1)	
Transgender / Other	3 (2.6)	
Race / Ethnicity		
Caucasian non-Hispanic	35 (30.4)	
African American non-Hispanic	73 (63.4)	
Hispanic	2 (1.7)	
Other	5 (4.3)	
Education, years (range: 7–28)	13.5 (2.9)	*1*
Income, past month (range:0–10,000)	1,435.30 (1,676.73)	*10*
Employment status		
Employed full-time	17 (14.8)	
Employed part-time	10 (8.7)	
Unemployed	88 (76.5)	
Time since infection, years (range: 0–40)	11.6 (8.6)	*3*
Sexual orientation		*2*
Male heterosexual	17 (15.0)	
Male gay or bisexual	58 (51.3)	
Female heterosexual	31 (27.4)	
Female lesbian or bisexual	2 (1.8)	
Other	5 (4.4)	
CD4 count, cells/mm^3 (range: 5–1,963)	615.8 (354.9)	*3*
HIV RNA viral load suppressed (<48 c/mL) (range: 0– 415,000)	79 (71.2)	*4*

Table 2

Depression and QOL outcomes between baseline and 6 months.

	Baseline		6 months		Change	
Characteristic	**Mean (SD)**	**Range**	**Mean (SD)**	**Range**	**Mean (SD) or n(%)**	**Range**
Depressive severity (H0041M-D)	20.6 (6.2)	9–36	15.9 (8.1)	0–33	−4.7 (8.1)	−22 – 16
No response (<25% improvement)	---	---	---	---	61 (53.0)	---
Partial response (25–49% improvement)	---	---	---	---	26 (22.6)	---
Full response (≥50% improvement)	---	---	---	---	28 (24.4)	---
Positive outcomes (increase indicates improvement)						
Physical health-related quality of life (SF-12)	44.1 (11.7)	18.9–69.8	42.4 (11.7)	13.3–63.6	−1.6 (9.4)	−22.0 – 20.0
Mental health-related quality of life (SF-12)	30.7 (10.0)	5.1–54.7	38.8 (13.0)	9.7–71.1	8.1 (13.0)	−22.7 – 38.5
Negative outcomes (decrease indicates improvement)						
Number of HIV symptoms	5.1 (3.1)	0–11	4.8 (2.8)	0–11	−0.2 (2.6)	−5 – 8
Fatigue intensity (HRFS)	6.8 (2.0)	1–10	5.6 (2.6)	1–10	−1.2 (2.6)	−9 – 5.4

Table 3

Multivariable associations between depression response and QOL outcomes at 6 months, adjusted for baseline measures.

	Increase indicates improvement				Decrease indicates improvement			
	Physical QOL*		Mental QOL**		HIV symptoms†		Fatigue intensity	
Depression response at 6 months	**Mean difference**	**95% CI**	**Mean difference**	**95% CI**	**Mean difference**	**95% CI**	**Mean difference**	**95% CI**
No response (ref)	-	-	-	-	-	-	-	-
Partial response	2.51	(−1.51, 6.54)	4.01	(−1.01, 9.03)	−0.69	(−1.69, 0.30)	−0.94	(−1.94, 0.07)
Full response	3.68	(−0.36, 7.72)	14.34	(9.42, 19.25)	−1.51	(−2.50, −0.53)	−3.00	(−3.98, −2.02)

All mean differences adjusted for age (≤45/>45), gender (male/female) and baseline outcome measure.

*Further ajusted for baseline HIV symptoms (continuous).

**Further adjusted for baseline primary partner status (no/yes).

†Further adjusted for baseline CD4 count (>350/≤350).