

Preliminary outcomes of a pilot physical therapy program for HIV-infected patients with chronic pain

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Chronic pain in HIV-infected individuals is common and often undertreated. Physical therapy (PT) is an evidence-based nonpharmacologic treatment for chronic pain. Our objective is to present the results of a pilot PT program in an HIV pain/palliative care clinic, which is embedded within a Ryan White-funded multidisciplinary HIV primary care clinic. Medical records of HIV-infected patients participating in a PT program between November 2012 and July 2013 were retrospectively reviewed. Pain scores on a 0–10 scale and cost data were collected and analyzed. Among 43 patients referred, 27 collectively attended 86 sessions. Median age of enrolled patients was 54 (IQR 49–58). Sixteen (59%) were African-American and 20 (77%) had an undetectable HIV viral load. Mean pain score at initial visit was 6.5 (SD = 1.1). The average session-level decrease was 2.6 (SD = 1.7) and patient-level decrease was 2.5 (SD = 1.2). The largest payors were Medicare managed care (28%), Medicaid (21%), and Ryan White grant-related funds (18%). When the first four months of the program are excluded to account for slow start-up, the program's monthly net revenue during the remaining five months was \$163. We present preliminary data from a low-cost pilot PT program integrated into an HIV clinic in a primary care setting associated with clinically significant improvements in pain. Further investigation into the implementation of such programs is essential.

Keywords: HIV; chronic pain; physical therapy; nonpharmacologic treatment; Ryan White program

Introduction

Chronic pain – pain of greater than three months duration without ongoing injury (Vellucci, 2012) – is an important challenge for HIV-infected individuals. It is common, with prevalence estimates ranging from 30% to 85% (Aouizerat et al., 2010; Merlin, Cen, et al., 2012; Merlin, Westfall, et al., 2012; Miaskowski et al., 2011). In a study of HIV-infected patients referred to a chronic pain clinic, only 12% had neuropathic pain, 21% had low back pain, and the remainder had other regional musculoskeletal pain (e.g., leg, hip, <10% each; Perry et al., 2013). Chronic pain in HIV-infected patients is associated with up to 10 times greater odds of impaired physical function, suggesting a high degree of pain-related disability (Merlin, Westfall, et al., 2013).

Given safety and efficacy limitations of pain medications such as opioids (Noble et al., 2010), nonpharmacologic therapies are an important area of investigation. Physical therapy (PT) is emerging as an evidence-based nonpharmacologic approach for the treatment of chronic musculoskeletal pain in the general population (Bokarius

& Bokarius, 2010; Camarinos & Marinko, 2009; Wang et al., 2012), and is included in treatment guidelines (Chou et al., 2009; Richard & Hooten, 2011). To our knowledge, PT has not been studied in HIV-infected patients with chronic pain. The 1917 Clinic at the University of Alabama at Birmingham (UAB) is a Ryan White-funded multidisciplinary HIV clinic which provides primary care, subspecialty medical care including an HIV pain/palliative care clinic, and mental health services to 2500+ HIV-infected patients. Our objective is to present the results of a pilot project to integrate a PT program into the HIV pain/palliative care clinic.

Methods

Patients referred to PT at the 1917 Clinic during the study period (November 2012–July 2013) were identified. Informed consent was waived, and the study was approved by the UAB's Institutional Review Board. PT services were provided by a licensed manual physical therapist. In participants with a payor source that covers

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PT (e.g., private insurance, Medicare), that source was billed. In other cases, Ryan White grant-related funds were used. Demographic and clinical data were collected (e.g., age, race, sex, CD4+ T-cell count, payor source). Patient-reported outcome data are routinely collected on consenting patients every six months on the following: depression (PHQ-9 ≥ 10 [Kroenke, Spitzer, & Williams, 2001]); anxiety (PHQ-A [Spitzer, Kroenke, & Williams, 1999]: 0 no anxiety symptoms, 1–4 anxiety symptoms, ≥ 5 panic; GAD-7 [Spitzer, Kroenke, Williams, & Löwe, 2006]: 0–4 none, 5–9 mild, 10–14 moderate, 15–19 moderately severe, ≥ 20 severe); current substance use (Alcohol, Smoking and Substance Involvement Screening Test [ASSIST; Newcombe, Humeniuk, & Ali, 2005] report of use of nonprescription opioids, cocaine, amphetamines, or intravenous drug use within the past three months, prior use, or never used); and pain interference (Brief Pain Inventory interference subscales, 0–10 [Cleeland & Ryan, 1994]). Chart review was conducted on patients who attended PT. This included pain scores on a scale of 0–10 obtained before and after each PT session, primary pain location, secondary pain location, and modalities of treatment provided during PT.

Characteristics of individuals who were referred to and attended PT were summarized and compared to those of patients who were referred to but did not attend PT using Fisher's exact tests for categorical variables and Wilcoxon rank-sum tests for continuous variables. Preliminary PT impact was evaluated using changes in pain scores in three ways. First, we determined the session-level effect by calculating the difference in pain score before and after each session, each session contributing equally and calculating the mean. Second, we determined the patient-level effect by averaging the differences in pain score before and after each session for each patient, and then averaging those values so that each patient contributes only one value to the analysis. Finally, we calculated the preliminary effect of the full course of PT for each patient. For those patients who completed at least two PT sessions, we calculated the difference in scores at the beginning of the first session and at the beginning of the last session. A signed rank test was used to determine whether the difference was statistically different from 0. We also collected data on PT program cost and collections to evaluate our program's financial sustainability.

Results

Forty-three HIV-infected patients diagnosed with chronic musculoskeletal pain were referred to PT, and 27 (63%) were enrolled. Median age of patients enrolled in PT at the 1917 Clinic was 54 (IQR 49–58). Sixteen (59%) were African-Americans and six (22%) were females. Fifteen (56%) were publicly insured (Medicaid or Medicare). Median CD4+ T-cell count was 637 cells/mL (IQR

333–1090), and 20 (77%) had an undetectable HIV viral load. Comorbidities included depressive symptoms based on the PHQ-9 (9, 35%); anxiety symptoms/panic on the PHQ-anxiety module (9, 50%); anxiety on the GAD-7 (3, 43%); and current substance use based on the ASSIST (3, 17%). Characteristics of patients who enrolled were similar to those of patients who did not enroll ($p > 0.05$ for all characteristics in Table 1).

Enrolled patients collectively attended 86 sessions, ranging from 1 to 8 sessions/patient, with a median of 2 PT sessions/patient (IQR 1–5). The most common primary pain location was back pain (34, 40%); other common pain locations included neck (25, 29%), extremity (16, 19%), and hip (8, 9%). Most (25 of 27) initial visits included patient education, typically regarding a home exercise program, posture training (24 of 27), and balance training (23 of 27). Nearly all sessions (81 of 86) included manual treatment, and most subsequent visits (32 of 59) included therapeutic exercise. Average pain score at initial visit was 6.5 (SD = 1.1) on the 0–10 scale.

Table 1. Characteristics of patients enrolled in a pilot PT program.

Variable	Enrolled (N = 27)
Age (median, IQR)	54 (49–58)
African-American	16 (59%)
Female	6 (22%)
<i>Transmission risk factor</i>	
Heterosexual	6 (24%)
IVDU	4 (16%)
MSM	15 (60%)
<i>Insurance</i>	
Private	9 (33%)
Public	15 (56%)
None	3 (11%)
CD4 (median, IQR)	637 (333–1090)
VL undetected	20 (77%)
Depression (PHQ9 ≥ 10)	9 (35%)
Anxiety symptoms/panic (PHQ-A)	9 (50%)
Anxiety (GAD-7)	3 (43%)
Brief Pain Inventory Interference (mean, SD)	6 (1.9)
<i>Substance use (ASSIST)</i>	
Current	3 (17%)
Prior	9 (50%)
Never	6 (33%)
<i>EuroQOL</i>	
Impaired mobility	10 (56%)
Impaired self-care	1 (6%)
Impaired usual activities	9 (50%)

IVDU, intravenous drug use; MSM, men who have sex with men. Missing values: transmission risk factor, 8; CD4, 8; VL, 5; depression, 7; panic disorder, 20; anxiety (GAD-7), 30; Brief Pain Inventory Interference, 16; substance abuse (ASSIST), 20; EuroQOL, 20.

The mean session-level difference in pain was a decrease by 2.6 (SD = 1.7, $N = 55$). The average patient-level difference in pain was a decrease by 2.5 (SD = 1.2, $N = 19$). The average difference in pain after a course of PT was 1.7 (SD = 2.8, $N = 17$). Each of these differences was statistically significantly different from 0 ($p < 0.001$, $p < 0.001$, and $p = 0.03$, respectively).

Due to slow start-up, only four PT sessions occurred in the first month. Visits increased and peaked at 17 visits/month within the first six months of operation. The payors accounting for the largest number of patients were Medicare managed care (28%), Medicaid (21%), and Ryan White (18%). Since we already owned a low-rise table, start-up costs totaled \$450 (for therapy bands, exercise balls, and a bosu balance ball). Monthly costs were a physical therapist (\$50/hour for ~4 hours per week plus 9% fringe) and administrative overhead (30.4% of the collections). As a program embedded in a primary care clinic, we do not actualize any other administrative overhead (e.g., space, administrative support). During the first nine months, total charges were \$30,291, and total collections were \$10,262, a 34% insurance collection rate. Collections less overhead were \$7142. Ryan White accounted for the largest proportion of collected charges. To calculate the net cost over nine months, we took collections less overhead (\$7142) and subtracted ongoing program costs (\$7479). This resulted in a net loss of \$337 or an average net monthly loss of \$37. When the first four months of the program are excluded to account for slow start-up, the program had a monthly net revenue of \$163.

Discussion

Our study provides preliminary evidence that our pilot program improved musculoskeletal pain scores in HIV-infected individuals – notably more than the difference in pain scores observed in the studies of opioids (Noble et al., 2010). In addition to this clinical benchmark, the program was low cost.

We are unaware of any other descriptions of PT programs integrated into primary care settings in general, or for patients with HIV. However, models for incorporation of PT into chronic pain treatment have been published previously. Interdisciplinary pain rehabilitation programs integrate medical management of chronic pain, behavioral therapies, mind-body techniques such as relaxation or biofeedback, and PT. While the results of these programs are promising, they are intensive, costly, and poorly reimbursed (Stanos, 2012). “Physician-owned ancillary service” models have also been described, in which an ancillary service such as PT is owned by a physician, which is often a subspecialty clinic such as an orthopedics practice (Duxbury, 2008). As has been suggested with such programs, it is possible that co-location of our PT

program could drive up the demand for PT beyond what is medically necessary due to the ease of referral; however, we argue that the cost and potential harm of PT are likely to be outweighed by that of other competing services (e.g., referral for a radiologic or interventional procedure, or to a surgeon).

Our study has limitations. How this program would work at other Ryan White or non-HIV primary care settings, or settings where infrastructure costs are high, is unknown. Also, patients were followed for only nine months or until the end of the study, rather than over the course of years – the time it often takes for patients with chronic pain to achieve substantial improvement. Additionally, although anecdotally this program was well received, we did not systematically collect data on its feasibility/acceptability.

Our findings are an encouraging step toward understanding integration of PT into pain care in a primary care setting. Future investigation into the efficacy of PT treatment components in individuals with HIV, and the effectiveness and implementation of such programs, is essential.

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