

Short Communication

Mindfulness meditation training effects on CD4+ T lymphocytes in HIV-1 infected adults: A small randomized controlled trial

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ABSTRACT

Mindfulness meditation training has stress reduction benefits in various patient populations, but its effects on biological markers of HIV-1 progression are unknown. The present study tested the efficacy of an 8-week Mindfulness-based stress reduction (MBSR) meditation program compared to a 1-day control seminar on CD4+ T lymphocyte counts in stressed HIV infected adults. A single-blind randomized controlled trial was conducted with enrollment and follow-up occurring between November 2005 and December 2007. A diverse community sample of 48 HIV-1 infected adults was randomized and entered treatment in either an 8-week MBSR or a 1-day control stress reduction education seminar. The primary outcome was circulating counts of CD4+ T lymphocytes. Participants in the 1-day control seminar showed declines in CD4+ T lymphocyte counts whereas counts among participants in the 8-week MBSR program were unchanged from baseline to post-intervention (time \times treatment condition interaction, $p = .02$). This effect was independent of antiretroviral (ARV) medication use. Additional analyses indicated that treatment adherence to the mindfulness meditation program, as measured by class attendance, mediated the effects of mindfulness meditation training on buffering CD4+ T lymphocyte declines. These findings provide an initial indication that mindfulness meditation training can buffer CD4+ T lymphocyte declines in HIV-1 infected adults.

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1. Introduction

Although great advances have been made in antiretroviral (ARV) treatment of HIV-1 infection, there is still variability in treatment outcome (May et al., 2006). Psychological stress may account for some of this variability, as animal and human studies have demonstrated that stress accelerates HIV-1 disease pathogenesis and impairs the biological impact of ARV treatment (for review, see Cohen et al., 2007; Cole et al., 2001; Ironson et al., 2005). Consistent with this, recent studies indicate that behavioral stress management interventions may improve biological indicators of HIV-1 pathogenesis (Antoni et al., 2006; Petrie et al., 2004, cf. Crepaz et al., 2008), but it is unknown whether mindfulness meditation impacts HIV-1 progression (Ospina et al., 2007; Robinson et al., 2003).

The Mindfulness-based stress reduction (MBSR) program (Kabat-Zinn, 1982) is a standardized and manualized 8-week mindfulness meditation training intervention that has been shown

to reduce stress and improve self-reported health outcomes in a variety of patient populations (Brown et al., 2007). In the MBSR program, participants practice a series of guided mindfulness meditation exercises in weekly classes and at home daily (e.g., body awareness, mindful stretching, sitting meditation, and mindfulness in daily life practices). It is thought that the MBSR program helps participants bring a more open and receptive awareness to their present moment experiences in daily life, facilitating a greater recognition and regulation of stress (Brown et al., 2007). Currently, few investigations have examined the effects of MBSR on immune outcomes or biological stress pathways, but initial studies in this area indicate that MBSR may have salutary effects on antibody titer response to influenza vaccination (Davidson et al., 2003), cytokine signaling in cancer patients (Carlson et al., 2007, 2003), and NK cell numbers and cytotoxic activity in HIV patients (Robinson et al., 2003). Further, some recent evidence suggests that MBSR may reduce total daily salivary cortisol output at follow-up (Carlson et al., 2007), an effect that may be consistent with stress reduction. An initial pilot study of MBSR in HIV-1 indicated that mindfulness meditation training can impact immune system function (Robinson et al., 2003), but did not assess markers of HIV-1 pathogenesis, such as CD4+ T lymphocytes and HIV viral load. Thus,

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a single blind randomized controlled trial was conducted to test whether an 8-week MBSR program buffers CD4+ T lymphocyte declines in a community sample of HIV-1 infected adults.

2. Methods

2.1. Participants

Study participants were recruited through HIV/AIDS community agencies in Los Angeles. To qualify for the study, participants had to be diagnosed HIV-positive for >6 months, English-speaking, and over age 18. In order to recruit a sample who was at risk for stress-associated CD4+ T lymphocyte declines (Cohen et al., 2007), participants had to report at least minimal symptoms of psychological distress at baseline as measured by depressive symptomatology (>4 on the Patient Health Questionnaire-9(PHQ-9)) (Spitzer et al., 2000). Participants were excluded for any substance abuse or psychiatric treatment in the past 30 days, were currently diagnosed with AIDS (or had CD4+ T lymphocytes <200 cells/mm³), had

hepatitis, or indicated a regular mind-body practice (e.g., tai chi, meditation) in the past six months. A CONSORT flowchart (Fig. 1) depicts the flow of participants retained at each phase of the trial.

2.2. Procedure

All study procedures were approved by the UCLA IRB, and written informed consent was obtained from all participants prior to baseline. Participants were enrolled and completed the baseline assessment over a four-month period, and were then randomized to either the 8-week MBSR or 1-day control intervention.

The 8-week MBSR program (Kabat-Zinn, 1990) included eight weekly 120-min group sessions, a day-long retreat in the seventh week, and daily home mindfulness meditation practice. The group sessions consisted of instructor-guided mindfulness body awareness activities, mindfulness meditations, mindful stretching, and group discussions. A six-hour day-long retreat in week 6–7 of the MBSR program focused on integrating and elaborating on the exercises the participants learned during the 8-week

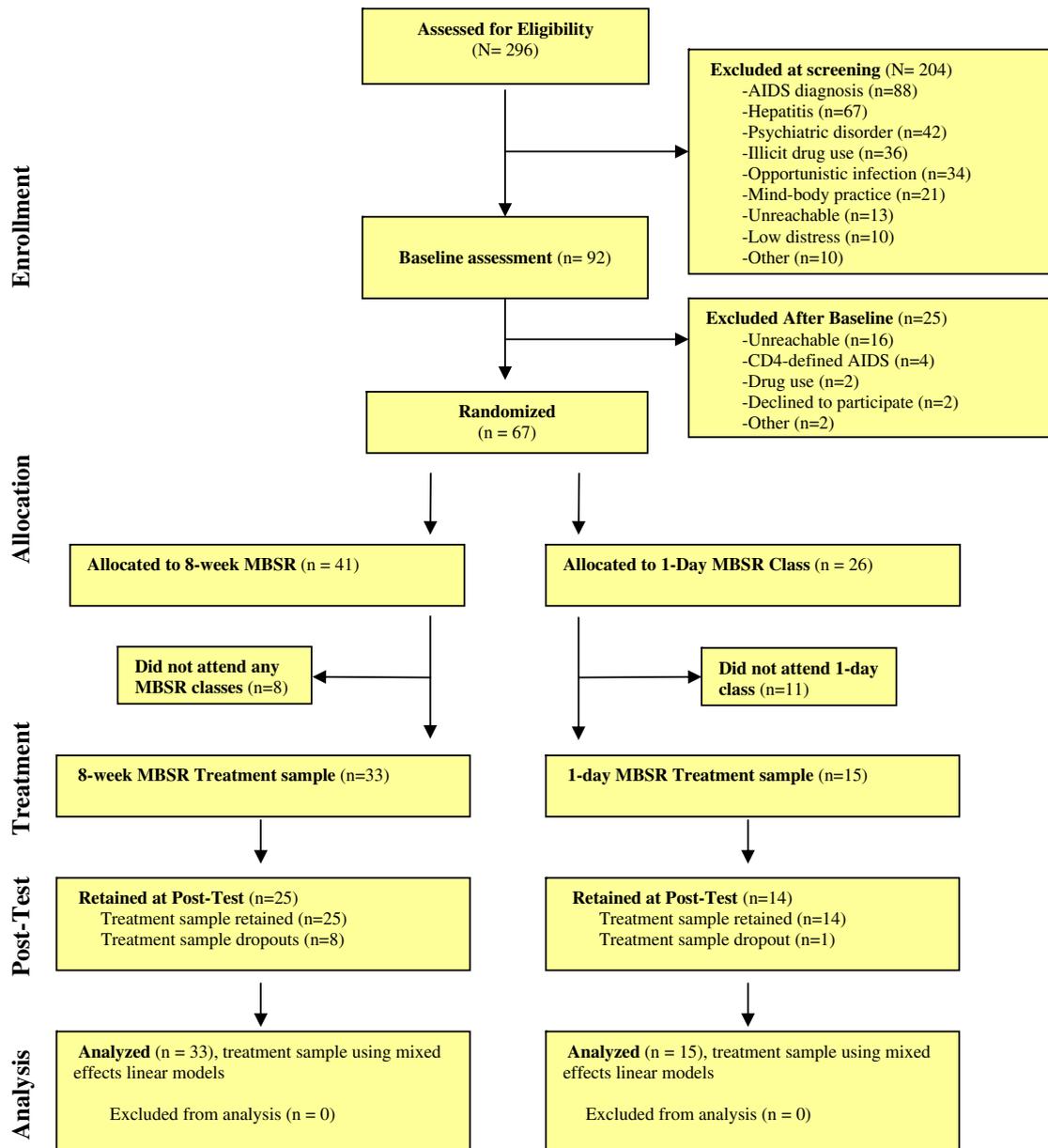


Fig. 1. CONSORT flowchart of participants retained at each stage of the trial.

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