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IMPACT OF ANTIDEPRESSANT THERAPY ON COGNITIVE ASPECTS OF WORK, CONDOM USE, AND PSYCHOSOCIAL WELL-BEING AMONG HIV CLIENTS IN UGANDA*

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Abstract

Objective—Depression has been found to impede several health outcomes among people living with HIV, but little research has examined whether depression treatment mitigates this influence. We assessed the impact of antidepressant therapy on measures of work, condom use, and psychosocial well-being among depressed HIV clients in Uganda.

Methods—Paired *t*-tests and McNemar tests were used to assess change in survey data collected from participants at initiation of antidepressant therapy (baseline) and 6 months later.

Result—Ninety-five participants completed the 6 month assessment, of whom 82 (86%) responded to treatment (defined as Patient Health Questionnaire-9 score < 5). Among study completers, work functioning improved significantly, as did measures of self-efficacy related to condom use and work (as well as general self efficacy) and internalized HIV stigma declined; however, actual engagement in work activity and consistent condom use did not show significant change. Similar findings were observed among treatment responders.

Conclusion—Antidepressant treatment benefits functional capacity, psychological well-being, and cognitive intermediary factors that may be essential for behavioral change related to work and condom use, but supplementary therapeutic strategies may be needed to impact more direct behavioral change.

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Keywords

HIV; depression; antidepressants; work; condom use Uganda

INTRODUCTION

Sub-Saharan Africa (SSA) has undergone dramatic scale-up of HIV care and antiretroviral therapy (ART), with over 3 million on treatment in the region and nearly 300,000 in Uganda [1]. From a public health perspective, it is important that HIV treatment not only helps individuals to survive, but also enables them to work and function so that they can provide for themselves and their family, and engage in behavior that prevents viral transmission to others. In fact ART has led not only to dramatic reductions in mortality and morbidity [2], but treatment and its associated improvements in physical health and functioning have also been associated with improved work productivity and greater likelihood of working [3], reduced infectiousness [4], and a 50–70% reduction in unprotected sex [5, 6]. However, research reveals depression to be a key threat to these critical public health benefits of HIV treatment.

Depression has been associated with several negative HIV clinical outcomes including lower CD4 [7], higher viral load [8], greater likelihood of mortality [9, 10], and worse immunologic and virologic response to ART [11, 12]. Aside from the physical health consequences of depression, it also has a role in the economic and prevention impact of HIV treatment. Depression is associated with lower work productivity and unemployment in people living with HIV/AIDS (PLHA) [13, 14]. Depression has been associated with sexual risk taking [15], and our research in Uganda found that not only was depression at entry into HIV care predictive of less condom use over time, but that the beneficial effects of HIV treatment on increased condom use were diminished in patients whose mood worsened [16].

Drawing on Social Cognitive Theory [17], we postulate that depression mediates the impact of HIV care on work status and condom use not only through adherence, but also via effects on self-efficacy and expected outcomes of behavior. Consistent with depression being one of the most disabling medical diseases [18], depressive features such as lack of motivation, hopelessness, poor concentration, and fatigue diminish self-efficacy and make it difficult to work perform productively, and have the confidence to negotiate safe sex.

Rates of clinical depression generally range from 10–20%, among PLHA in SSA [19–21], while rates of elevated depressive symptoms range from 30–50% [19, 20, 22]. A wide range of interventions are effective in treating depression in PLHA [23], including antidepressants which have response rates as high as 70% [24, 25]. In addition to improving mental health, depression treatment has been associated with greater ART utilization, adherence, and outcomes [26, 27]. Furthermore, it is reasonable to hypothesize that by alleviating depression, depression treatment increases motivation and self-efficacy to engage in self-care behaviors such as safe sex, resuming work and productivity, and caring for family.

We report findings from a study of antidepressant treatment for clinical depression among HIV clients in Uganda. The sample from this study was included in an analysis that merged

this sample with that of another study to evaluate the efficacy of antidepressants in treating depression among PLHA in Uganda, the results of which revealed a 79% response rate [28]. In this article we report on analyses that examined the effects of treatment and treatment response on measures of work, condom use and psychosocial functioning and well-being.

METHODS

Study Design

The study was conducted at Mildmay Centre, the headquarters clinic of Mildmay Uganda, on the outskirts of Kampala. Mildmay Uganda provides HIV care in a number of clinics across the country to clientele in primarily low socioeconomic strata. Patients for whom their provider had diagnosed depression and were planning to prescribe antidepressants were referred to the study coordinator for study screening. Enrolled participants were followed for 6 months and administered assessments at baseline (prior to antidepressants being prescribed) and month 6. Either fluoxetine (starting dose of 20 mg/day, with dosage increments of 20 mg as warranted) or imipramine (starting dose of 50 mg/day, increased to 75 mg after 2 weeks, followed by increments of 25 mg as warranted) was used to treat depression, as selected by the provider, starting after the baseline interview. The protocol was approved by the Institutional Review Boards at RAND and Mildmay Uganda, as well as the Uganda National Council for Science and Technology.

Eligibility Criteria

Recruitment took place between March and July 2011. Patients were eligible if they were age 18 years or older, has been prescribed antidepressant therapy by their provider (though treatment had not yet started), were medically stable (defined as having no current acute opportunistic infections, having been in care at the clinic for at least 6 months, and not planning to start ART not within the first 3 months of having started ART), and had a diagnosis of Major Depression as confirmed using the Mini International Neuropsychiatric Interview (MINI) at screening [29]. The study was described in detail to participants prior to obtaining written informed consent.

Measures

The survey instruments included measures of demographics and background characteristics, depression, work and condom use related outcomes, and psychosocial functioning and well-being. All measures were translated into Luganda using standard translation and back-translation methods, and were interviewer-administered by trained Masters level psychologists at baseline and month 6. Participants were paid 10,000 Uganda Shillings (\$4 USD) after each assessment to cover costs of transportation.

Demographic and Background Characteristics—Characteristics included age, gender, education level (classified as primary school or less vs. at least some secondary education), and relationship status (marriage or committed relationship) or presence of a regular sex partner (in the absence of being in a relationship) in the past 6 months. CD4 count was abstracted from the client's medical chart.

Depression—The nine-item Patient Health Questionnaire (PHQ-9) was used to measure the presence of *depressive symptoms* over the past 2 weeks [30]. The nine items correspond to the symptoms used to diagnose depression according to DSM-IV (Diagnostic and Statistics Manual of Mental Disorders, 4th Edition) [31]; responses to each item range from 0 “not at all” to 3 “nearly every day.” Item scores are summed with a possible range of 0–27 for the total score, which are categorized into the following severity levels of depression: none (0–4), mild (5–9), moderate (10–15), moderately severe (16–20), and severe (21–27). A total score > 9 has been found to correspond highly to Major Depression as determined by a diagnostic clinical interview [30]. The PHQ-9 has been used successfully with HIV-infected individuals in other studies within sub-Saharan Africa [32]. The PHQ-9 total score at month 6 was used to rate *antidepressant treatment response*, with scores less than 5 representing full response. This method for determining antidepressant response has been used in other antidepressant research [33]

Work Outcomes—To assess current *work status*, respondents were asked whether or not they engaged in work activity that generated income or food in the last 7 days. Work could include a range of jobs from salaried employment, running a small business (e.g., selling things), or working on the family farm (or subsistence farming and planting) or in the family business. House chores or homemaking were not considered work. *Work functioning* was assessed with the two-item role functioning subscale of the Medical Outcomes Study HIV Health Survey (MOS-HIV), which has been validated in Uganda with the use of a Lugandan translation [34]. These two items ask the respondent to indicate whether their health a) keeps them from working, or b) renders them unable to do certain kinds or amounts of work, either at their job or at home or school. Response options are Yes or No, and the scores were summed and transformed to a standardized score of 0–100. *Work self-efficacy* was assessed by asking respondents to rate their level of confidence in being able to “find work to provide enough food or money for yourself (and your family)?” using a scale of 0–10 with 10 indicating high confidence.

Condom Use Outcomes—*Condom use* during sexual intercourse with one’s primary partner over the past 6 months was measured using a 5-point rating scale from “never” to “always,” which was converted to a binary variable representing whether or not condoms were always used (consistent condom use). *Condom use self-efficacy* was assessed by asking respondents to rate their level of confidence in being able to “always use a condom during sexual intercourse?” using a scale of 0–10 with 10 indicating high confidence.

Psychosocial Well-Being—To measure *general self-efficacy*, in addition to the items related to work and condom use described above, respondents were asked to rate their level of confidence in being able to perform five other behaviors such as taking their HIV medication as prescribed, attending clinic appointments as scheduled, and interacting well with others in social situations. Each item used a rating scale of 0–10 with 10 representing high confidence, and a mean item score was calculated. *Internalized HIV stigma* was assessed with an eight-item scale developed by Kalichman et al. [35]. Examples of items include “Being HIV positive makes me feel damaged” and “I am ashamed that I am HIV positive”; response options range from 1 “disagree strongly” to 5 “agree strongly,” and a

mean item score is calculated. Higher scores represent greater stigma. We assessed *alcohol use* by asking participants if they had used any alcohol in the past 30 days.

Data Analysis

Descriptive statistics were used to describe the baseline characteristics of the sample and the frequency distributions of the main outcome variables. Paired *t*-tests and McNemar tests were used to compare change from baseline to month 6 within the sample on the various outcome variables. Analyses were conducted with SPSS 18.0 statistical software.

RESULTS

Sample Characteristics

A sample of 105 clients were diagnosed with Major Depression and agreed to start antidepressants. Mean age was 37 years ($SD = 9$), 82% were female, 56% had no secondary education, 51% had a primary sex partner (including 46% who were married or in a committed relationship), and 68% reported having worked in the last 7 days. Average CD4 count was 346 cells/mm³ ($SD = 243$), and 77% had a WHO disease stage of III or IV (or AIDS diagnosis); 80% were on ART at study baseline (none initiated ART between baseline and month 6). Of the 105 participants, 95 (90%) completed the 6-month follow-up interview, and the other 10 were lost to follow-up. There were no significant differences between completers and dropouts with regard to demographics, CD4 count, and ART status.

Baseline Depression

Mean PHQ-9 total score for the sample was 16.7 ($SD = 5.2$); 9% had scores between 5–9, which signified mild depressive symptoms (although these participants met criteria for Major Depression on the MINI), 27% scored between 10–14 (moderate symptoms), 33% scored between 15–19 (moderately severe symptoms), and 31% had severe depressive symptoms (scores of 20 or greater). The most common depressive symptoms present at least “more than half the days” during the 2 weeks prior to baseline were loss of interest (84%), depressed mood (88%), trouble sleeping (74%), feeling tired (72%), and having poor appetite (69%). Just over half (55%) the patients reported any thoughts of being better off dead or hurting themselves, and 25% reported feeling this way at least more than half the days.

Depression Treatment Response

The majority (93%) of patients were treated with fluoxetine, and only one patient had their antidepressant switched (from fluoxetine to imipramine due to nonresponse) during the course of the study. Of the 95 clients who completed the month-6 assessment, mean PHQ-9 score was 1.9 ($SD = 3.6$) and 82 (86%) had scores < 5 and were categorized as treatment responders. Adherence to antidepressants was good, as 83% reported no missed antidepressant doses in the prior to month 6.

Depression Treatment Effects on Work, Condom Use, and Psychosocial Well-Being

To assess the effects of antidepressant therapy, baseline and month 6 measures were compared within the 95 participants who completed the 6-month study (see Table 1). With regard to work outcomes, work self-efficacy and work functioning both improved significantly from baseline to month 6, but the proportion of the sample that was working did not change significantly. Internalized HIV stigma decreased significantly from baseline to month 6 within the sample, and general self-efficacy increased significantly, but there was no change in alcohol use.

Analysis of condom use was performed with data from the subgroup of 40 participants who had a main partner at both baseline and month 6. Among these participants, 23 were in HIV seroconcordant relationships, while 8 had an HIV-negative partner and 6 did not know the HIV status of their partner (3 had missing data on this variable). At baseline, 30% reported never using a condom with their partner in the past 6 months, while 40% reported always using a condom (which is defined as consistent condom use). Consistent condom use did not differ significantly between those in concordant relationships (44%) versus those with an HIV-negative or unknown status partner (36%; $p = .64$). Consistent condom use increased to 55% at month 6, but this increase was not statistically significant; however, condom use self-efficacy increased significantly (see Table 1).

To assess the impact of effectively treated depression or improved mood, we repeated this analysis in the subgroup of 82 participants who responded to antidepressant treatment; this analysis resulted in the same variables showing significant change from baseline to month 6 (data not shown) as was found in the analysis of study completers described above.

DISCUSSION

Study findings revealed benefits of antidepressant treatment with regard to improved capacity to work, reduced internalized stigma and improved self-confidence related to being able to find work, use condoms consistently, and overall general agency. However, aside from improved work functioning, effects were not found with regard to most behavioral outcomes, such as work status, consistent condom use, and alcohol use. These results suggest that depression treatment and its effects on restored psychological and emotional health may be important for cognitive intermediaries that are known to be associated with behavior, but may not itself be sufficient to promote behavior change, at least with regard to the behaviors studied in this investigation.

The negative findings with regard to work status and condom use may be attributed to the small sample size and resultant low statistical power; indeed, there was nearly a 10 percentage point improvement in the rate of employment and 15 percentage point improvement in consistent condom use, from baseline to month 6. Furthermore, our other research in Uganda revealed that depression at the outset of HIV treatment, and change in depression over the first year of treatment, were both significantly related to work status and consistent condom use with primary partners in multivariate analysis controlling for physical health functioning, CD4 count and demographic covariates [16, 36]. The depressed participants in this prior research did not receive depression treatment. Alternatively,

antidepressant therapy may help to improve cognitive and emotional factors such as self-acceptance and self-confidence, but supplementary therapeutic strategies related to cognitive behavioral therapy (e.g., behavioral activation, problem solving) may be needed to promote behavioral change for some individuals. Also, the somatic symptoms of depression (e.g., fatigue, trouble sleeping, loss of appetite) may also be related to HIV disease or use of ART, so the extent to which these symptoms are not a manifestation of depression could impact the ability of depression treatment to affect these symptoms and their impact on behavioral outcomes. Further research is needed to better understand the potential impact of depression treatment and other mental health services on work, condom use, and other health behaviors. Specifically, a large sample and a control group is needed to assess for treatment effects and to rule out changes that naturally occur over time or in the context of receiving HIV care.

When considering the merits and benefits of depression treatment for PLHA, it is important to consider the context of mental health services in SSA. Despite the high prevalence of depression [19–22], the public health consequences of depression [7–16], and the availability of effective treatment [24–26], depression treatment and mental health care in general are rarely integrated into HIV care programs in Uganda or most other parts of SSA [37]. Evidence of the public health benefits of depression treatment is futile without ready access to such treatment, though such evidence may be key to moving the policy debate regarding allocation of mental health resources. A major barrier to provision of depression treatment and other mental health services is the severe shortage of highly trained mental health professionals in SSA [37]; but task shifting approaches, including algorithm based, nurse-driven management of antidepressant treatment has been shown to be effective in overcoming such challenges in developing countries [38, 39].

While limited by a small sample size, the lack of a control group, and self-report measures, our findings provide evidence of moderate benefits of antidepressant treatment on public health outcomes related to work and consistent condom use among PLHA receiving HIV care in Uganda. These benefits are particularly with regard to cognitive intermediary factors that may be essential for the behavioral outcomes that are the ultimate goal of health promotion. Further research with larger samples is needed to further examine the merits of antidepressant treatment in this regard, including the need for supplementary therapeutic strategies that more directly target behavioral change.

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Table 1

Change in Measures of Work, Condom Use, and Psychosocial Well-Being in the Context of Antidepressant Treatment ($N = 95$)

	Baseline	Month 6	<i>p</i> -Value
Work outcomes			
Worked in past 7 days	66.3%	74.7%	.268
Work self-efficacy	5.78	7.27	.000
Work functioning	48.9	92.6	.000
Condom use outcomes			
Condom use with primary sex partner ^a	40%	55%	.210
Condom use self-efficacy	5.57	6.94	.002
Psychosocial well-being			
Internalized HIV stigma	3.08	1.99	.000
Any alcohol use	17.6%	17.0%	1.00
General self-efficacy	6.92	8.02	.000

^a $N = 40$ with a primary sex partner at both time periods.