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Written emotional disclosure and processing of trauma are associated with protected health status and immunity in people living with HIV/AIDS

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Abstract

Objective—This study compared written emotional disclosure and processing of trauma among a relatively rare group of people with AIDS with atypically favourable disease status with an HIV+ comparison group. The study also examined the mediational role of emotional/cognitive processing and natural killer (NK) cells.

Design—This study utilized a cross-sectional group comparison design.

Method—Two HIV+ groups, the Healthy Survivors ($N = 37$; > 9-months with <50 CD4 cells/mm³ and asymptomatic), and an HIV+ comparison groups ($N = 100$) wrote essays describing their reactions to past traumas; these were scored for emotional disclosure/processing.

Results—Healthy survivors had higher levels of emotional disclosure and emotional/cognitive processing than the comparison group. Emotional/cognitive processing mediated the relationship between emotional disclosure and group membership. NK cell number mediated the relationship between emotional/cognitive processing and ‘healthy survival’.

Conclusions—The results suggest that higher levels of emotional disclosure and processing of trauma may confer health and immunological benefits to people living with HIV/AIDS.

As people living with HIV confront many disease-related stressors, it is possible that an individual’s ability to express and process their emotions in relation to these stressors may confer health or immune benefit (O’Cleirigh *et al.*, 2003) and may account for some of this observed variation.

We hypothesized that higher levels of emotional expression and processing would be characteristic of a relatively rare group of patients with AIDS who in spite of very low CD4 cell (<50) remained asymptomatic of AIDS-related symptoms for more than 9 months (without the benefit of protease inhibitor medication) as compared with an HIV + comparison group at an earlier stage of disease. This rare group of survivors have been previously identified with distinct psychosocial (Solomon, Benton, Harker, Bonavida, & Fletcher, 1993) and immunological (Ironson *et al.*, 2001) profiles. Consistent with this research, we further hypothesized that emotional/cognitive processing would mediate the relationship between emotional disclosure and group membership and further that natural killer (NK) cell number would mediate the relationship between emotional/cognitive processing and group membership.

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Methods

Participants

The Healthy Survivors group ($N = 37$) had a period of 9 months in which they had less than 50 CD4 cells/mm³ and were asymptomatic (confirmed by doctor records) during that time, without the use of protease inhibitor medications. The HIV+ comparison group ($N = 100$) had CD4 counts between 150 and 500/mm³, no history of CD4 cell <75/mm³, or AIDS symptoms (e.g. toxoplasmosis) and was systematically chosen from a larger comparison group described elsewhere (Ironson *et al.*, 2005) to be equivalent to the Healthy Survivors group on demographic/background variables.

Procedures

At study entry participants signed an informed consent form, completed psychosocial assessments, a 20-minute essay describing their thoughts and feeling regarding a stressful life-event, and underwent blood draw and brief physical exam. All study procedures were approved by the IRB.

Measures

CD4 lymphocyte count (CD3+ CD4+) was determined by whole blood four-colour direct immunofluorescence using a Coulter XL-MCL flow cytometer. Viral load (VL) was measured by the Roche Amplicor RT/PCR assay sensitive to 400 copies of plasma RNA.

Essays were evaluated for total number of words and positive and negative emotional words. Emotional/cognitive processing ratings were assigned according to previously developed procedures (O'Cleirigh *et al.*, 2003) on four specific processes (*realistic cognitive appraisal*, *experiential involvement*, *positive self-esteem*, and *adaptive problem solving*). Reliability for the disclosure and processing variables ranged from $r = .83$ to $r = .95$, (all p values < .01).

Results

Sample characteristics and group differences

The groups did not differ significantly on gender ($\chi^2(1) = 0.804$), age ($t(135) = -0.413$), educational experience ($\chi^2(3) = 5.25$), employment status ($\chi^2(4) = 4.82$) or income ($\chi^2(3) = 0.37$, $p > .1$), or ethnicity ($\chi^2(3) = 4.72$) (all p values > 1) with approximately one-third women in each group and an average age of 37 years. Neither did the groups differ significantly on HIV-viral load ($t(135) = -1.41$), although healthy survivors were taking antiretroviral medications the comparison group ($\chi^2(3) = 8.82$, $p < .05$).

Multivariate analysis

Group differences on the word count, emotional disclosure, and processing variables were assessed using the Hotelling's Trace Test which was significant ($F(7, 129) = 2.23$, $p < .05$). The Healthy Survivor group wrote significantly more words ($t(135) = 3.20$, $p < .01$), more positive ($t(135) = 2.47$, $p < .05$) and negative ($t(135) = 2.16$, $p < .05$) emotion words, and displayed significantly more *realistic cognitive appraisal* ($t(135) = 3.22$, $p < .01$), *positive self-esteem* ($t(135) = 2.31$, $p < .05$), *adaptive problem solving* ($t(135) = 2.80$, $p < .01$), and *experiential involvement* ($t(135) = 3.25$, $p < .01$) than the HIV+ comparison group. The groups did not differ significantly on *seriousness* of the trauma discussed ($t(135) = -1.16$, $p > .1$).

Hierarchical linear regression models were used to test the mediational hypotheses. The emotional/cognitive processing variables were combined into one factor ($\alpha = .92$; 80.5% of the variance explained). When group membership was regressed on both total emotional

disclosure (positive + negative) and emotional/cognitive processing, emotional/cognitive processing emerged as a mediator. Similarly, NK cell number was also tested and emerged as a mediator of the relationship between emotional/cognitive processing and healthy survival, controlling for antiretroviral medication. These relationships and significance tests are depicted in Figure 1.

Discussion

As hypothesized, a rare group of individuals with AIDS who, in spite of very low CD4 cell counts, remained symptom free for an extended period of time without the aid of protease inhibitors displayed higher levels of emotional disclosure and emotional/cognitive processing in a written essay describing their responses to a traumatic experience than an HIV-seropositive comparison group. These differences are not attributable to differences between the groups based on age, gender, education, ethnicity, income, employment, sexual orientation, seriousness of topic disclosed, or HIV-1 viral load, on which the groups were equivalent, although important groups differences may not have been detected. These results are consistent with recent research relating emotional disclosure to long-term survival status in patients living with AIDS (O'Cleirigh *et al.*, 2003). The emotional disclosure measures provide us with a snapshot of our participants' emotional expression and within the context of the cross-sectional design, the mediational role of emotional/cognitive processing suggests that the association of emotional disclosure with protected health status, in this patient population, is governed by the extent to which written emotional disclosure may facilitate emotional/cognitive processing of the traumatic experience. NK number mediated the relationship between emotional/cognitive processing and symptom-free status. Previously, Ironson *et al.* (2001), found that higher NK cells and cytotoxicity were associated with protected health status in patients with HIV/AIDS. The antitumour and antiviral effects of NK cells may help explain the absence of symptoms among the healthy survivors. These results suggest that emotional disclosure and processing of traumatic experiences may provide health and immune benefit to people living with HIV.

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Figure 1.

(a) Emotional/cognitive processing as a mediator of the relationship between emotional expression and healthy survival with AIDS and (b) natural killer cell number as mediator of the relationship between emotional/cognitive processing and healthy survivor status. Path diagram model testing direct and indirect effects of (a) emotional expression on membership in the Healthy Survivor or HIV+ comparison group with emotional/cognitive processing as a mediator and (b) an examination natural killer cell number as a mediator of the relationship between emotional/cognitive processing and group membership. (The numbers in parentheses are correlations: the numbers outside parentheses are standardized Beta coefficients in the model with group membership as the dependent variable. In Figure 1b the numbers in parentheses are partial correlations controlling for antiretroviral medications).