Can Leukocyte Basal Gene Expression in Adults with Early Childhood Adversity be Improved through Meditation Interventions?

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Introduction

• People raised in low socio-economic status (SES) households are at an increased risk for physical problems in adulthood (Miller, Chen, Parker, 2011).

• Shifts in gene expression profiles in the immune system is one biological mechanism thought to account for elevated disease susceptibility.

• The Conserved Transcriptional Response to Adversity (CTRA) is a genetic profile marked by increased expression of proinflammatory genes and decreased expression of antiviral and antibody-related genes.

• Reduced CTRA gene expression has been linked to eudaimonic well-being and engaging in pro-social behavior for 4 weeks reversed CTRA gene expression (Fredrickson et al., 2013; Cole et al., 2015; Nelson-Coffey et al., 2017).

• Positive emotions may promote health through biological pathways, including reducing inflammation (Steptoe et al., 2005).

RESEARCH QUESTION
In a group of at-risk mid-life adults, can improved positive emotions, through loving-kindness meditation ‘reverse’ CTRA gene expression, compared to a mindfulness group?

Methods

Participants were pre-screened for childhood SES, then randomized (N = 89; 56% white; 86% female) to a 6-week loving kindness or mindfulness meditation intervention.

Week 0 Week 1-2 Week 3-8 Week 11
Lab 1 Baseline Intervention Lab 2

Figure 1. Weekly averaged reports from daily assessments using the modified Differential Emotions Scale.

Figure 2. Descriptive Mean and SE of CTRA change

Results

• The mindfulness group showed a significantly greater reduction of their CTRA gene expression profiles compared to loving-kindness, \(b=-.15, p = .02\).

• For both groups, positive emotions increased over time, \(b=.02, p < .001\), while negative emotions decreased, \(b=-.03, p < .001\).

• Emotion changes did not explain group effects on CTRA.

TAKEAWAY POINTS
Whereas both types of meditation training raised positive emotions and lowered negative emotions, only mindfulness reversed CTRA gene expression. Contrary to our hypothesis, loving-kindness did not.