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Post-traumatic Stress Disorder Symptoms and Aversive Cognitions Regarding Physical Activity in Patients Evaluated for Acute Coronary Syndrome

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Post-traumatic stress disorder (PTSD), a psychological disorder characterized by avoidance of reminders of a particular traumatic event, is an emerging risk factor for cardiac event recurrence.¹ The mechanisms by which PTSD worsens prognosis in ACS patients, however, remain poorly understood. Physical activity is considered an essential element in recovery from ACS and is recommended immediately after discharge.² A hallmark of PTSD is behavioral and emotional avoidance of reminders of the traumatic event. Patients avoid going near places where the event occurred, news reports about similar events, or other sights, sounds, or sensations that are reminders of the event.³ The Enduring Somatic Threat (EST) model suggests that when PTSD is induced by an ACS event, survivors may avoid physical activity due to fear of trauma-related bodily sensations (e.g. increased heart rate, shortness of breath), as these feelings could trigger distressing reminders of the acute event.^{4, 5} The purpose of this study was to test our hypothesis that patients with ACS-induced PTSD symptoms avoid physical activity due to fear of trauma-related bodily sensations.

We studied 132 patients (53% male, 54% Hispanic, mean age: 63 ± 13 years) who presented to the emergency department of a Manhattan hospital for evaluation of suspected ACS.⁶ PTSD Symptoms were evaluated 1-month post-hospitalization using the 17-item PTSD Checklist for a Specific Stressor (PCL-S).^{7–9} Aversive cognitions about physical activity were measured with the following items: 1) “It scares me when my heart beats rapidly during physical activity;” 2) “When I notice my heart beating rapidly during physical activity, it reminds me of my heart event;” 3) “When I become short of breath during physical activity, it reminds me I’m at risk of having another heart event;” 4) “I sometimes avoid physical activity because I’m afraid it will cause me to have a heart event.” Patients responded using a five-point Likert scale and those who reported “often” or “very often” were classified as having aversive cognitions for each item. Items were based on the EST framework⁴ and were adapted from the Anxiety Sensitivity Index.¹⁰

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Among the 132 patients, 40 (30.3%) reported 1 aversive cognition about physical activity. In unadjusted and multivariable-adjusted models, higher PCL-S scores (e.g. PTSD symptoms) were significantly associated with a higher likelihood of reporting each aversive cognition towards physical activity (Table 1).

This study is the first to demonstrate an association between PTSD symptoms after suspected ACS and aversive cognitions about physical activity. We found that patients with elevated PTSD symptoms after a suspected ACS event were more likely to report that physical sensations during physical activity (e.g. rapid heartbeat, shortness of breath) scared them or reminded them of their traumatic event/future risk and were more likely to report avoidance of physical activity because of this fear. These results support the hypothesis that physical activity can serve as a trigger for the distressing re-experiencing that defines PTSD, and suggest that exercise avoidance may be an underlying mechanism by which PTSD worsens prognosis in ACS patients.

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Table 1

Association of PTSD symptoms with aversive cognitions about physical activity (n=132).

Aversive Cognitions about Physical Activity	Unadjusted OR (95% CI) per 5 points on PCL-S	P-Value	Adjusted^a OR (95% CI) per 5 points on PCL-S	P-Value
“When I notice my heart beating rapidly during physical activity, it reminds me of my heart event.”	1.53 (1.30–1.85)	<0.001	2.02 (1.49–2.99)	<0.001
“When I become short of breath during physical activity, it reminds me I’m at risk of having another heart event.”	1.46 (1.25–1.76)	<0.001	1.83 (1.41–2.53)	<0.001
“It scares me when my heart beats rapidly during physical activity.”	1.37 (1.19–1.61)	<0.001	1.73 (1.30–2.52)	0.001
“I sometimes avoid physical activity because I’m afraid it will cause me to have a heart event.”	1.32 (1.14–1.53)	<0.001	1.35 (1.10–1.73)	0.008

CI, confidence interval; PCL-S; post-traumatic stress disorder checklist for acute coronary syndrome; PTSD, post-traumatic stress disorder; OR, odds ratio.

Logistic regression model adjusted for age, gender, race/ethnicity, education, partner status, depression, GRACE risk score, Charlson comorbidity index, history of coronary heart disease, and ACS diagnosis.