Early Life Adversity is Associated With Biomarkers of Endothelial Dysfunction in Women Veterans

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**Purpose:**

Early life adversity, such as childhood maltreatment, has been demonstrated to promote inflammation that can lead to endothelial dysfunction, a precursor of cardiovascular disease (CVD) (Ehrlich, Ross, Chen, & Miller, 2016; Hostinar, Lachman, Mroczek, Seeman, & Miller, 2015; Packard et al., 2011). Veterans have higher levels of childhood maltreatment than do civilians (Aversa, Lemmer, Nunnink, McLay, & Baker, 2014) and therefore may be at risk for CVD (Johnson et al., 2010). Furthermore, studies demonstrate that women veterans report high levels of childhood abuse (Lang et al., 2008; Yaeger, Himmelfarb, Cammack, & Mintz, 2006) making them particularly vulnerable to CVD. Despite this evidence, little is known about the relationship between early life adversity and endothelial dysfunction in women veterans.

Soluble vascular cellular adhesion molecule-1 (sVCAM-1) plays an important role in the development of atherosclerosis by promoting migration of inflammatory molecules through the endothelium that results in an inflammatory response (Libby, 2012). Evidence demonstrates that high levels of sVCAM-1 are strongly associated with endothelial dysfunction and greater CVD risk (Mulvihill, Foley, Crean, & Walsh, 2002). Therefore, sVCAM-1 serves as an important biomarker of endothelial function.

Therefore, the purpose of this study was to evaluate early life adversity and sVCAM-1 in women veterans.

**Methods:**

A cross sectional sample of women veterans in the United States (N=109) (mean age=50.54 SD=11.03) participated in the study. Participants completed the Childhood Trauma Questionnaire (CTQ) (Bernstein et al., 2003) to assess early life adversity. Blood samples were collected in the morning to measure sVCAM-1.

**Results:**

Participants had an average total CTQ score of 52.28 (SD=19.71). In a community sample of women, a total CTQ score of 43 ranked in the 90th percentile (Scher, Stein, Asmundson, McCreary, & Forde, 2001) suggesting that participants in this sample had higher levels of early life adversity than those in a community sample. Higher levels of sVCAM-1 were associated with higher CTQ early life adversity subscales of emotional abuse ($r=.231$, $p=.025$), emotional neglect ($r=.332$, $p=.001$), and physical neglect ($r=.213$, $r=.039$), controlling for age, body mass index, and smoking status.

**Conclusion:**
Results demonstrate that women veterans have experienced high levels of early life adversity and that levels of early life adversity are associated with a biomarker of endothelial dysfunction. Measurement of early life adversity and circulating sVCAM-1 may be important markers of cardiovascular risk in women. Additional research is needed to assess the association of early life adversity and endothelial dysfunction in civilian populations.

Title:
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Abstract Summary:
Childhood maltreatment is strongly associated with inflammatory related disease, such as cardiovascular disease (CVD). Our study demonstrates that women veterans report high levels of childhood maltreatment as compared to civilians and childhood maltreatment is associated with a serum biomarker of endothelial dysfunction, a precursor of CVD

Content Outline:

I. Background
   A. Relationship of early life adversity and inflammation
   B. Relationship of early life adversity and physical and mental disease
   C. Biomarkers of endothelial dysfunction and cardiovascular disease

II. Study methods
   A. Cross-sectional descriptive study
   B. Measurements
      a. Childhood maltreatment
      b. Serum biomarker of endothelial dysfunction

III. Findings
   A. Women veterans and high levels of childhood maltreatment
   B. Childhood maltreatment and endothelial dysfunction

IV. Implications
   A. Childhood maltreatment as risk factors for CVD
   B. Future research

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