



US DEPARTMENT OF DEFENSE

BLAST INJURY RESEARCH PROGRAM COORDINATING OFFICE

Health Outcomes Following Extremity Trauma

Increased Prevalence of Metabolic Syndrome among Combat Veterans with Lower Limb Amputation

Studies of World War II Veterans found relatively high rates of cardiovascular disease (CVD), including long-term mortality following combat-related amputations. However, little research has described risk factors for CVD including metabolic syndrome among Service Members who sustained lower limb amputations in the Iraq and Afghanistan conflicts. Approximately 90 percent of these combat amputations were caused by blast injuries. This study, funded by the Extremity Trauma and Amputation Center of Excellence (EACE), described CVD risk factors, including metabolic syndrome for patients with lower limb amputations and those with serious lower extremity injuries without amputation.¹ Researchers at Naval Health Research Center (NHRC) and the Department of Veteran Affairs (VA) at the San Diego VA, with funding from the Navy Bureau of Medicine and Surgery (BUMED) Wounded, Ill, and Injured (WII) Program, identified study patients and injury-specific data in NHRC's Expeditionary Medical Encounter Database (EMED). Patients were injured in Iraq and Afghanistan between 2001 and 2008 and had serious lower limb injury without amputation (n = 162), unilateral (n = 380), or bilateral (n = 134) lower limb amputations. VA national data sources provided CVD measures over an average of five years post-injury. These measures included blood pressure, body mass index (BMI), high- and low-density lipoprotein cholesterol (HDL, LDL), and metabolic syndrome. Researchers found significantly increased likelihood of CVD risk factors, particularly following bilateral amputation compared with no amputation. These elevated risk factors included HDL and metabolic syndrome. Importantly, the association between amputation and increased metabolic syndrome was significant only for patients with high BMI (greater than 28 kilograms per meter²). For patients with high BMI, the prevalence of metabolic syndrome was 11.5 percent among Veterans without amputation versus 25.9 percent and 32.7 percent for Veterans with unilateral or bilateral amputation, respectively. The present study indicates that lower limb amputation, and particularly bilateral lower limb amputation, is associated with increased CVD risk. The study identifies an important modifiable variable, namely bodyweight or BMI, which is associated with increased likelihood of metabolic syndrome for patients with lower limb amputations. The results support the need for primary care and lifestyle interventions to manage weight and lipid levels, particularly following combat-related amputations.

¹ Bhatnagar V., Richard E., Melcer T., Walker J., Galarneau M.R. (2016). Increased prevalence of metabolic syndrome among combat veterans with lower limb amputation. Presented at the Academic Research Conference, San Diego, CA.

