



US DEPARTMENT OF DEFENSE
BLAST INJURY RESEARCH PROGRAM
COORDINATING OFFICE

Health Outcomes and Long-Term Care Following Extremity Injury

Incidence and Clinical Correlates of Venous Thromboembolism After Combat-Related Amputation

Deep Venous (Vein) Thrombosis (DVT) and pulmonary embolism are potentially life-threatening complications that have not been well-studied after traumatic limb amputations caused by combat injury. This is particularly true for US Service Members who sustained severe blast injuries causing high-level and often multiple limb amputations during the recent Afghanistan conflicts, 2009–2011. The research team's objective was to determine the incidence, post-injury timing, and risk factors for DVT and pulmonary embolism following combat-related amputations. Researchers at the NHRC and NMCS, with funding from the BUMED Wounded, Ill and Injured program, reviewed casualty records in NHRC's EMED. Injuries and treatments documented by providers at Role 2 or 3 facilities in Iraq or Afghanistan were reviewed for 366 patients who sustained traumatic limb amputation proximal to the wrist or ankle. Researchers recorded the ISS, number of blood transfusions during the initial 24 hours, duration of mechanical ventilation, and intensive care unit length of stay. Researchers also recorded the primary outcome, diagnoses of DVT or pulmonary embolism, through 12 months post-injury. The team found that 28 percent of patients had DVT and/or pulmonary embolism diagnoses, including 16 percent who had a pulmonary embolism. Approximately two-thirds of DVT/pulmonary embolism cases occurred within 10 days of injury and nearly 90 percent occurred during the first 60 days post-injury. Increased number of ventilator days and units of blood transfused were significantly associated with increased likelihood of DVT. Increasing units of fresh frozen plasma transfused was significantly associated with increased likelihood of pulmonary embolism. Prophylactic medication significantly decreased the likelihood of DVT and pulmonary embolism. The present study helps providers identify early treatment factors that increase patient risk for the life-threatening complications of DVT and pulmonary embolism. The prevalence of pulmonary embolism and DVT was relatively high after traumatic amputation. Therefore, post-injury surveillance and use of prophylactic medication is indicated for this population. Identifying risk factors for DVT and pulmonary embolism helps focus acute care resources on patients who are most likely to develop these complications.