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EN ROUTE CARE RESEARCH CENTER
EVIDENCE TO GUIDE PRACTICE

Prehospital Interventions Performed in Afghanistan between November 2009 and March 2014

Gaps Addressed: 2015 ICL: AFMS(AMC) 13 - Advanced POI and ERC Resuscitation; 2017 ICL: AFMS(AMC) 137 - Research on Advanced Point of Injury through ERC

Modified Abstract

Background: Care provided to a casualty in the prehospital combat setting can influence subsequent medical interactions and patient outcomes. Both historical and recent published data reveal that most combat related deaths occur in the prehospital setting before the casualty reaches a surgical facility. A key component of combat casualty care performance improvement includes evaluating prehospital medical performance, particularly in the combat setting. This requires data regarding the interventions performed, the assessment of whether the intervention was performed correctly, and the determination if there was a missed opportunity to perform an intervention in the field.

The purpose of our study was to describe the incidence of specific prehospital interventions performed to include the number of incorrectly performed or missed prehospital interventions.

Methods: Casualties were enrolled as they were treated at nine medical facilities in Afghanistan between November 2009 and March 2014. Casualties who were transported to a participating facility from the field were included. Casualties were excluded if they were transferred from another medical facility or were detainees. Subject data were collected by the Joint Combat Casualty Research Team (JC2RT) using a standardized collection form to include descriptive data and specific prehospital, lifesaving interventions (LSIs). The JC2RT is a multidisciplinary team composed of clinical researchers from the Army, Air Force, and Navy utilized to perform human research in Iraq and Afghanistan. As the casualty arrived, the receiving provider at the medical facility treating the casualty determined if an intervention was performed correctly and if an indicated intervention should have been performed in the field, but was not (missed LSI).

Results:

- 2,106 patients met inclusion criteria. The majority (98%) were male with a mean age of 25 years (SD ±8.8). The mechanism of injury was explosion in 1191 (57%), penetrating in 614 (29%), blunt in 284 (13%) and isolated burn in 27 (1%) of casualties.
- Airway management interventions: nasal/oral airway placement (4%, n=81); endotracheal intubation (5%, n=114); and cricothyroidotomy (2%, n=41).
- Chest interventions: 69 (3%) needle decompressions, 27 (1%) chest tube thoracostomies, and 87 (4%) chest seal applications.
- Hemorrhage control interventions: 515 casualties (24%) had a total of 805 tourniquets applied, 783 (37%) received pressure packing without a hemostatic agent, and 85 (4%) were administered pressure packing with a hemostatic agent applied.
- After study amendment to include capture of vascular access: 1463 (79%) of 1849 total casualties had documented vascular access attempts. There were 1698 total attempts to

gain vascular access; some casualties had multiple attempts documented to include both peripheral intravenous (IV) and interosseous (IO) attempts. There were 1413 peripheral IVs and 285 IOs attempted.

- Prehospital hypothermia prevention was employed in 1066 (58%) casualties.
- Incorrectly performed interventions in the prehospital setting included: 21 (8.9%) airway interventions, 10 (5.5%) chest procedures, 35 (2.1%) hemorrhage control (of which 28 were incorrectly placed tourniquets), 70 (4.1%) vascular access, and 6 (0.6%) hypothermia prevention measures.
- Three hundred and sixty missed LSIs were identified by providers at the receiving facility including 56 (19.2%) airway interventions, 24 (11.6%) chest procedures, 57 (3.3%) hemorrhage control (of which 6 were tourniquets), 160 (8.6%) vascular access, and 63 (5.6%) hypothermia prevention opportunities.
- The highest rate of missed LSIs included airway interventions (19.2%) and chest procedures (11.6 %), while the lowest rate of incorrectly performed interventions involved hemorrhage control (3.3%).
- The less frequently performed procedures were correlated with higher rates of incorrect performance and higher rates of missed LSIs.

Note: A comparison of the first 1,003 patients (before 2012) to the second 1,103 patients found a decrease in missed airway interventions, chest procedures, vascular access, and hemorrhage control in the second set of patients. In addition, there was a significant improvement (2.9% vs 8%) in correct performance of vascular access in the second set of patients. The authors attribute this to increased focus on Tactical Combat Casualty Care and educational initiatives provided to prehospital providers.

Conclusions: The most commonly performed interventions in our cohort were for vascular access and hemorrhage control. The most common incorrectly performed interventions as well as missed LSIs included airway interventions and chest procedures.

Evidence Based Recommendations:

- Continued emphasis onTactical Combat Casualty Care training for all military prehospital providers.
- Institution of focused continuous educational programs on perishable skills that could improve the success rates of interventions that are not performed often, to include airway and chest procedures.

Publication

The views expressed are those of the authors and do not reflect the official views or policy of the Department of Defense or its components. The voluntary, fully informed consent of the subjects used in this research was obtained as required 32 CFR 219 and DODI 3216.02_AFI 40-402