

2009 Scientific Program Abstracts — Tuesday

(An asterisk (*) by an author's name indicates the presenter.)

Tuesday, December 15, 2009

GENERAL SESSION I — MILITARY TRAUMA

Moderators: MAJ Joseph R. Hsu, MD, Army
CDR Michael Mazurek, MD, Navy
MAJ Michael T. Charlton, MD, Air Force
Cory A. Collinge, MD, Andrew N. Pollak, MD, and Anthony S. Rhorer, MD, Civilian Moderators

0855-0900

The Impact of the Wearing of Modern Body Armor on the Prevalence of Extremity Injury and Changes in Distribution of Injury Pattern and Combat Fatality Rate in Military Personnel Wounded in Combat

FLTLT Peter Ross Watson, MBBS

Objective: To demonstrate the changing pattern of distribution of injury in the combat soldier over the last 150 years; To demonstrate the increased prevalence of extremity injury in the modern combatant as a result of the wearing of body armour; To demonstrate the decreased combat fatality rate with the introduction of modern protective body armour.

Method: Retrospective study using data collected the U.S. Department of Defense and other Historical sources and Peer reviewed journals. Comparison of location and prevalence of injury patterns of combatants wounded in action in the American Civil War, World war I, World War II, Korean War, the Vietnam Conflict, the Gulf War, the Iraq War (Operation Iraqi Freedom), and the War in Afghanistan (Operation Enduring Freedom). Correlation with injury pattern and the use of protective body armour and helmets during these conflicts.

Results: The prevalence of Upper limb injury in those wounded in action has increased from 6% during the American Civil War to 27% for the Iraq War (OIF), and the prevalence of lower limb injury increased from 13% during the

American Civil War to 33% for the Iraq War (OIF). Torso injury has decreased from 55% during the American Civil War (57% WWI) to 9% for the IRAQ War. Head (Face and Neck) Injury prevalence had increased from 9% American Civil War to 25% for the Iraq War. Eye injury has increased from 2.14% WWI to 13% Gulf War. Combat Fatality rates have decreased from 20.75%-30.26% (American Civil War to The Gulf War) to 10.12%-14.68% the Iraq War (Operation Iraqi Freedom), and the War in Afghanistan (Operation Enduring Freedom).

Conclusion: The Universal introduction of the Helmet in WWI and the adoption of modern Protective body armour in the 21st century has lead to an increased survivability from wounding in combat and a subsequent increase in the prevalence of extremity and head wounds in those wounded in action.

Notes:

0900-0905

Wounding Patterns and Demographics of Those Injured in "The Surge"

MAJ Scott M. Waterman, MD
Joseph C. Wenke, PhD

Objective: The "surge" strategy was implemented to provide stability and security to Iraq in late 2006 in response to the increased violence in Southwest Asia. Increased activity in the region resulted with a higher number of soldiers in the United States Armed Forces that were wounded and killed in action. During this time, the military also introduced an improve trauma registry to augment injury surveillance on those evacuated secondary to their injuries.

Methods: The Joint Theater Trauma Registry was queried for all U.S. service members receiving treatment for wounds (ICD-9 codes 800-960) sustained in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) from December 2006 to November 2007. Only service members entered and evacuated as part of trauma system were included in this

study, therefore those killed in action, returned to duty, and those evacuated as outpatients were excluded.

Results: This query resulted in 1,572 service members sustaining 7265 wounds. Out of this total 81% were sustained in combat while 19% were classified as non-battle injuries. Of those wounded in combat 68% were injured with explosives. The locations of these wounds were as follows: head (6%), eyes (4%), ears (2%), face (7%), neck (1%), thorax (6%), vertebral/ spine (6%), abdomen (8%), urological (1%), brain (9%), miscellaneous burns (5%), and extremity (45%). The average age was 25y/o with 65% Caucasian, 8% African-American, and 25% other.

Conclusion: Secondary to the counter-insurgency combat in which the United States military is engaged and current body armor, the majority of wounds sustained are in the extremity and head/neck regions from an explosive mechanism. The wounding patterns during the "surge" have remained relatively consistent with those seen earlier in this conflict, and differing from previous wars due to the greater percentage of head/neck wounds, and a lower incidence of thoracic wounds. This is the first study detailing the wounding patterns of the current conflicts beyond generalized body regions as well as demographic information.

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0905-0910

Disease and Non-Battle Injuries Sustained by a U.S. Army Brigade Combat Team During Operation Iraqi Freedom

CPT Gens P. Goodman, DO
LTC Philip J. Belmont Jr., MD
LTC Rob Burks, PhD
LTC Kent DeZee, MD
MAJ Brett D. Owens, MD
CPT Brian Waterman, MD

Objective: To date, a longitudinal cohort analysis of disease and non-battle injuries sustained by a large combat-deployed maneuver unit has not been performed. Our objective was to assess the impact of disease and non-battle injuries on a Brigade Combat Team during a wartime environment.

Methods: A descriptive analysis was undertaken to evaluate for disease and non-battle injuries incurred by members of a U.S. Army Brigade Combat Team (n=4122) during the coun-

terinsurgency campaign of Operation Iraqi Freedom utilizing a centralized casualty database and an electronic medical record system. Documented clinical visits for disease and non-battle injuries with subsequent casualty deaths, medical evacuations, or those returned to duty were used as main functional measurements.

Results: A total of 1,324 disease and non-battle injuries were identified with 5 (0.38%) deaths, 208 (15.7%) medical evacuations, and 1,111 (83.9%) returned to duty. The disease and non-battle injury casualty rate for the Brigade Combat Team was 257.0/1,000 soldier combat-years. Females, compared with males, had a significantly increased incidence rate ratio for becoming a disease and non-battle injury casualty 1.67 (95% CI 1.43, 1.99). Of 47 female soldiers who were medically evacuated, 35 (74%) were for pregnancy-related issues. Musculoskeletal injuries (50.4%) and psychiatric disorders (23.4%) were the most common body systems involved. The psychiatric casualty rate and suicide rate were 59.8 and 0.58 per 1,000 soldier combat-years, respectively. The‰-years were as follows: ankle sprain 15.3, anterior cruciate ligament rupture 3.3 and shoulder dislocation 1.2.

Conclusions: Musculoskeletal injuries and psychiatric disorders accounted for 74% of all disease and non-battle injury casualties and 43% of the disease and non-battle injury casualties requiring subsequent medical evacuation. The Brigade Combat Team cohort had a suicide rate nearly four times greater than previously reported, and selected musculoskeletal injury incidence rates were five-fold greater than in the general population.

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