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TITLE PAGE: Warfighter Personal Protective Equipment and Combat Wounds

SHORT TITLE: Body armor on casualties at Role 1

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ABSTRACT

Background

Personal protective equipment (PPE) is crucial to force protection and preservation. Innovation in PPE has shifted injury patterns, with protected body regions accounting for decreased proportions of battlefield trauma relative to unprotected regions. Little is known regarding the PPE in use by warfighters at the time of injury.

Methods

We queried the PHTR for all encounters from 2003-2019. This is a sub-analysis of casualties with documented personal protective equipment at the time of medical encounter. When possible, encounters were linked to the Department of Defense Trauma Registry (DODTR) for outcome data. Serious injuries are defined as an abbreviated injury scale of 3 or greater.

Results

Of 1357 total casualty encounters in the PHTR, 83 were U.S. military with documented PPE. We link 62 of this cohort to DODTR. The median composite Injury Severity Score (ISS) was 6 (IQR 4-21), and 11 casualties (18%) had an ISS >25. The most seriously injured body regions were the extremities (21%), head/neck (16%), thorax (16%), and abdomen (10%). PPE worn at time of injury included helmet (91%), eye protection (73%), front (75%) and rear plates (77%), left/right plates (65%), tactical vest (46%), groin protection (12%), neck protection (6%), pelvic shield (3%), and deltoid protection (3%).

Conclusions

Our data set demonstrates that the extremities were the most commonly injured body region, followed by head/neck, and thorax. PPE designed for the extremities and neck are also among the least commonly worn protective equipment.