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Collaborative Operations Military Surgical Team Care in Civilian Hospitals during Russia's Hybrid War against Ukraine: Injury Patterns and Care Practices

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Study/Objective: The armed aggression of Russian proxy forces started in April 2014 and targeted densely-populated areas of Eastern Ukraine. New hybrid warfare demands an effective response, especially in military medical care. We report on the results of a 12-month service of a Military Mobile Surgical Team (MST) in a near-frontline Local Civilian Hospital (LCH).

Background: Casualty care was provided in Military Mobile Hospitals (MMHs) deployed in the conflict zone. Intense shelling in the summer 2014, forced the MMHs to be relocated to a safe distance from the frontline, thus increasing evacuation time. Later, MSTs (a sub-divisions of MMH) were stationed in LCHs close to the war theater, cooperating with domestic personnel and utilizing existing facilities and equipment.

Methods: We reviewed case reports and outpatient records, performed by specialized MSTs of the 59th MMH and local physicians in Severodonets'k Municipal Hospital, Luhans'k region, from April 1, 2015 to April 20, 2016. MST was staffed with anesthesiologists, neurosurgeons, thoracic and vascular surgeons, and engaged LCH's general and orthopedic surgeons.

Results: In the study period 248 servicemen were presented to the trauma bay. Among them, 76 were injured due to mortar shelling and mine traps, and 7 had gunshot wounds (GSW). In total, 83 casualties required 212 surgical procedures with an average of 2.55 per case. Additionally, 165 patients were admitted with various traumas and had 73 surgeries performed. Availability of a CT-scanner has allowed 27 craniotomies (12 due to penetrating brain injuries, 15 to trauma). There were 17 patients who received transfusions in total; of 18 175 ml of FFP and 17 515 ml of pRBCs. The in-hospital mortality was 2.82%. Ambulatory trauma care was provided to 513 servicemen.

Conclusion: Cooperation of MSTs with LCHs in non-occupied Eastern Ukraine is effective for providing specialized medical care to Ukrainian servicemen. Deployment of MSTs in frontline LCHs shortens time for casualties to reach surgical care, thus essentially influencing outcomes.

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Outcome for Patients with Extremity Wound Infection Following War-Associated Injuries

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Study/Objective: To assess whether 'wound infection' is an independent risk factor for amputation or death.

Background: Data on the epidemiology of wound infection in patients with war-associated injuries is limited and mainly describes military combatants. It is unknown to what extent wound infection itself is a factor contributing to serious complications. This is an analysis of data containing both civilians and combatants of both sexes and all ages, originating from an International Committee of the Red Cross Hospital in Peshawar, Pakistan.

Methods: We included consecutive patients treated between September 27, 2010 and May 9, 2012 that presented with extremity injuries within two weeks after injury. Wounds with pus discharge were defined as infected. To adjust for trauma severity Revised Trauma Score (RTSc) was calculated by using systolic blood pressure, respiratory rate and Glasgow coma scale. We used binary logistic regression models to evaluate the independent effect of wound infection on outcome. P-values < 0.05 were considered significant.

Results: Wounds were infected in 108/1,033 (10.5%) patients treated during the study period. Of patients with wound infection 15/108 (13.9%) died, compared to 24/925 (2.6%) of patients without infection, crude relative risk (RR) = 5.4; $p < 0.001$. Amputation frequency was 16/108 (14.8%) in patients with infection, and 79/925 (8.5%) in patients without infection, RR = 1.7; $p = 0.037$. RTSc was missing for 31 patients. Mean RTSc was similar in patients with (7.74; 95% CI 7.72-7.76), and without infection (7.68; 95% CI 7.58-7.79). Wound infection was associated with death and amputation after adjustment for age, sex and RTSc, odds ratio = 9.23; (95% CI 4.17-20.44), $p < 0.001$ and 1.90; (95% CI 1.03-3.52), $p = 0.040$ respectively.

Conclusion: Extremity wound infection following war-associated extremity injuries seems to be associated with an increased risk of amputation and death, even after adjusting for sex, age and RTSc. We aim to develop models to