WG 5 (Combat Casualty Care)

Preventability, Survivability and Causes of Battlefield Deaths During the Swords of Iron War

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Introduction:
Understanding combat fatalities is crucial for enhancing battlefield survivability and minimizing preventable deaths. This study examined the causes of death and potential survival opportunities among Israel Defense Forces (IDF) personnel during the Swords of Iron War.
Materials and Methods:
All IDF fatalities from October 27, 2023, to September 17, 2024, were processed at the Victim Identification Center. Cases underwent external examinations, written and visual documentation, and post-mortem computed tomography. The data were integrated into the IDF Trauma Registry, and a multidisciplinary expert review panel evaluated the causes of death, preventability, and survivability. Based on injury patterns and the medical interventions available at the time of injury, fatalities were categorized as either non-survivable/non-preventable or potentially survivable/preventable.
Results:
A total of 310 fatalities were analyzed, with 227 (73.2%) cases fully examined and 83 (26.8%) pending review. The vast majority of cases, 295 (95%), were classified as KIA, while 15 (4.8%) were categorized as DOA. Among the examined cases, 216 (95%) were deemed non-survivable or non-preventable, while 11 (4.8%) were identified as potentially survivable or preventable. Explosive trauma accounted for 64% of cases, followed by firearm injuries at 30%. The injury severity was high, with 199 fatalities (71%) having an Injury Severity Score (ISS) of 25 or higher. The leading causes of death were devastating head injuries (44%), total disintegration or severe burns (21%), and major thoracic vascular injuries (15%). Although rare, potentially preventable causes include airway injuries and tension hemopneumothorax, with one case identified in each category.
Conclusions:
In the past decade, the IDF Medical Corps has implemented a strategic force buildup plan that reduced preventable death rates from 25% to 4.8%. This is shown by decreased battlefield mortality and case fatality rates (CFR), highlighting effective combat medical interventions and strategies. While these gains have saved lives, more can be done to reduce preventable deaths. Key focus areas are refining trauma protocols, improving medical training in hemorrhage control, airway management, and resuscitation, and enhancing protective equipment against trauma. This study underlines the need for ongoing research, data-driven policy updates, and operational enhancements to improve battlefield survivability care.

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Optimizing Aeromedical Evacuation in Combat: Balancing Trauma System Efficiency and Patient Outcomes During the Swords of Iron War

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Introduction:
The multi-arena conflict resulted in multiple casualties evacuated by aeromedical platforms to civilian level 1 trauma centers. To avoid specific center from being over-whelmed, the Israeli Defense Force Medical Corps (IDF-MC) regulates evacuation destination to balance casualty clinical status, evacuation times and trauma center burden. Near Front Line Medical Centers (NFMCs) are reserved for high-risk casualties rather than default destinations. This study evaluates the impact of this strategy on quality of care and patient outcome.
Methods:
This retrospective analysis included all helicopter-evacuated casualties during the Swords of Iron War (October 27, 2023 – January 22, 2025). Prehospital data were extracted from the IDF-Trauma Registry, and in-hospital data from the Israeli National Trauma Registry (INTR). Destination accuracy (Default vs. NFMC) was assessed using prehospital and injury attributes (signs of shock: systolic blood pressure [BP] < 90 mmHg or non-palpable radial pulse or depressed consciousness without traumatic brain injury, injury severity score [ISS], prehospital interventions) and trauma bay indices (BP, heart rate, transfusion, surgery).
Results:
Overall, 1,714 casualties were evacuated: 595 (34.7%) to NFMCs and 1,119 (65.3%) to default centers. In both groups, the predominant mechanism of injury was penetrating trauma (83%). NFMC casualties had higher proportion of critical injuries (ISS ≥ 25: 29% vs. 9.5%, p<0.001), signs of profound shock (29% vs 8.9%, p<0.001), more likely to receive blood products and prehospital interventions. In the ED, NFMC casualties had higher rates of hypotension (7.3% vs. 2%, p<0.001), blood product usage (32% vs. 10%, p<0.001) and surgery in the first hour (laparotomy/thoracotomy: 12% vs. 4.3%, neurosurgery: 3.4% vs. 0.4%, both p < 0.001). Overall mortality was higher in NFMCs (11% vs. 2.9%, p<0.001).
Conclusions:
The increased severity of prehospital and trauma bay indices among casualties evacuated to NFMCs is consistent with an aeromedical evacuation strategy that successfully prioritized high-risk casualties, ensuring that less critically injured patients were appropriately triaged to default trauma centers. This strategy likely reduced hemodynamic compromise upon admission, optimized trauma bay resource utilization, and maintained quality of care without overwhelming individual hospitals. This offers a well-balanced aeromedical evacuation strategy applicable to future conflicts.