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Risk Factors for Abdominal Surgical Site Infection after Exploratory Laparotomy among Combat Casualties

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INTRODUCTION: Surgical site infections (SSI) are well recognized complications after exploratory laparotomy for abdominal trauma; however, less is known about the development of SSIs after exploration for battlefield abdominal trauma. We examined SSI risk factors after exploratory laparotomy among combat casualties.

METHODS: Military personnel with combat-related injuries sustained in Iraq and Afghanistan (6/2009-5/2014) were included if they required a laparotomy and were Medevac'd to Landstuhl Regional Medical Center (LRMC, Germany) before being transferred to participating US military hospitals. We analyzed demographics, perioperative characteristics, and SSI outcomes. We also examined the association between LRMC admission Sequential Organ Failure Assessment (SOFA) and presence of SSI by severity strata.

RESULTS: Of 4,304 combat casualties, 341 underwent a total of 1,039 laparotomies. Median Injury Severity Score was 33 (interquartile range: 26-45). Most patients (72.4%) were injured in a blast, with large-volume (≥ 10 units) blood transfusions required by 53.4% of patients, and 89.1% were admitted to an ICU. Abdominal SSIs were diagnosed in 49 (14.4%) patients. Patients with abdominal

SSIs had greater injury severity ($p=0.045$), higher LRMC SOFA admission scores ($p<0.001$), and prolonged open abdomen ($p=0.004$), as well as more colon ($p<0.001$), rectum ($p=0.004$), small bowel ($p=0.001$), duodenum ($p=0.006$), pancreas ($p=0.032$), and abdominal vascular injuries ($p=0.001$). Furthermore, after adjusting for injury severity, association between LRMC admission SOFA and SSI remained strong ($p=0.03$).

CONCLUSION: Despite the severity of injuries and the battlefield environment, the rate of SSI in combat casualties is comparable to that in civilian trauma, with similar risk factors for SSI after laparotomy.

Strong Military-Civilian Partnerships Are Key to Combat Casualty Care Readiness

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INTRODUCTION: Army Forward Resuscitative Surgical Teams (FRST) cannot maintain combat readiness because combat trauma represents $<0.5\%$ out of more than 1 million annual military hospital admissions. Surgeon case volumes have been described, but no data exist for other members of the FRST. We test the hypothesis that the clinical experience of nonphysician FRST members varies between active duty (AD) and Army reservists (AR).

METHODS: Over a 3-year period, all FRSTs were surveyed at 1 civilian center.

RESULTS: There were 499 surveys distributed, with 483 responses (97%), including 208 AR and 275 AD. Age was 34 ± 11 years, with 70% male. Rank ranged from Private to Colonel, with officers accounting for 41%. For AD vs AR, combat experience was similar: 50% vs 52% had ≥ 1 combat deployment, 52% vs 60% of the peri-deployment patient load was trauma-related, and 31% vs 32% had ≥ 40 patient contacts during the most recent deployment, all $p>0.15$. However, medical experience differed between AD and AR: 18% vs 29% had >15 y experience in practice, and 4% vs 17% spent $>50\%$ of their time treating critically injured patients, all $p<0.001$. Differences persisted across all specialties, including perioperative nurses, certified registered nurse anesthetists, operating room technicians, critical-care nurses, emergency room nurses, licensed practical nurses, and combat medics.

CONCLUSION: This is the first study of clinical practice patterns in active duty vs Army reservists, nonphysician members of Army FRSTs. Taken in conjunction with previous studies of military surgeons, the entire FRST may be lacking in clinical experience. To maintain readiness and provide optimal care for our injured warriors, trauma teams—not just individuals—must embed within civilian centers.