

Quadrимodal Distribution of Death after Trauma: Predictors of Death in the Fourth Peak

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Introduction

Patterns of death after trauma are changing due to diagnostic and treatment advances. We examined mortality in critically injured patients at risk of death after discharge.

Methods

We reviewed all critically injured (Injury Severity Score \geq 25 AND death in Emergency Room, death within 24hrs, OR ICU admission $>$ 24hrs) adults (age \geq 18) admitted to a Level 1 trauma center (01/01/2000-12/31/2010) and determined death post-discharge (Social Security Death Index) of patients discharged alive. We compared demographics, injury data, and critical care resource utilization between those who died during follow-up and survivors using univariate tests and Cox proportional hazards models.

Results

Of 1,695 critically injured patients, 1135 (67%) were discharged alive. As of 05/1/2012, 977 (58%) index survivors were alive (median follow-up 62mos (IQR35,96)). Of 158 deaths post-discharge, 75 (47%) occurred within the first year. Patients who died post-discharge had longer hospital (24dys (IQR13,38) vs. 17dys (IQR10,27)) and ICU LOS (17dys (IQR6,29) vs. 8dys (IQR4,19)) and were more likely to undergo tracheostomies (36.1% vs. 15.6%, $p<0.0001$) and gastrostomies (39.2% vs. 16.0%, $p<0.0001$) and be discharged to rehabilitation (75.7% vs. 62.5%, $p=0.0001$) or skilled nursing (13.1% vs. 5.8%, $p=0.001$) than survivors. In multivariable models, male sex, increasing age, and increasing ICU LOS predicted 1-year and overall mortality. ICU LOS $>$ 16dys increased risk of death at one year (HR1.94 (1.22,3.06)) and by the end of follow-up (HR2.19 (1.58,3.04)) compared to shorter ICU stays.

Conclusion

We propose the first year after discharge as the fourth peak of trauma related mortality. Duration of ICU LOS during index hospitalization is associated with post-discharge mortality.

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