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Association of Prehospital Time to In-Hospital Trauma Mortality in a Physician-Staffed Emergency Medicine System.

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Abstract

IMPORTANCE: The association between total prehospital time and mortality in physician-staffed trauma systems remains uncertain.

OBJECTIVE: To describe the association of total prehospital time and in-hospital mortality in prehospital, physician-staffed trauma systems in France, with the hypothesis that total prehospital time is associated with increased mortality.

DESIGN, SETTING, AND PARTICIPANTS: This cohort study was conducted from January 2009 to December 2016. Data for this study were derived from 2 distinct regional trauma registries in France (1 urban and 1 rural) that both have a physician-staffed emergency medical service. Consecutive adult trauma patients admitted to either of the regional trauma referral centers during the study period were included. Data analysis took place from March 2018 to September 2018.

MAIN OUTCOMES AND MEASURES: The association between death and prehospital time was assessed with a multivariable model adjusted with confounders. Total prehospital time was the primary exposure variable, recorded as the time from the arrival of the physician-led prehospital care team on scene to the arrival at the hospital. The main outcome of interest was all-cause in-hospital mortality.

RESULTS: A total of 10216 patients were included (mean [SD] age, 41 [18] years; 7937 men [78.3%]) affected by predominantly nonpenetrating injuries (9265 [91.5%]), with a mean (SD) Injury Severity Score of 17 (14) points. Of the patients, 6737 (66.5%) had at least 1 body region with an Abbreviated Injury Scale score of 3 or more. A total of 1259 patients (12.4%) presented in shock (with systolic pressure <90 mm Hg) and 2724 (26.9%) with severe head injury (Abbreviated Injury Scale score ≥3 points). On unadjusted analysis, increasing prehospital times (in 30-minute categories) were associated with a markedly and constant increase in the risk of in-hospital death. The odds of death increased by 9% for each 10-minute increase in prehospital time (odds ratio, 1.09 [95% CI, 1.07-1.11]) and after adjustment by 4% (odds ratio, 1.04 [95% CI, 1.01-1.07]).

CONCLUSIONS AND RELEVANCE: In this study, an increase in total prehospital time was associated with increasing in-hospital all-cause mortality in trauma patients at a physician-staffed emergency medical system, after adjustment for case complexity. Prehospital time is a management objective in analogy to physiological targets. These findings plead for a further streamlining of prehospital trauma care and the need to define the optimal intervention-to-time ratio.