Paper - Annual Meeting

Paper Session: Geriatrics

Predicting Early Mortality in High-Risk Hip Fracture Patients Based on Time to OR: A Multicenter Study

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Purpose: Despite increasing incidence, the morbidity and mortality of geriatric hip fractures are decreasing secondary to structured protocols followed by orthopaedic surgery and medical specialists. Current protocols attempt to minimize time to surgery because all comers have improved outcomes with early surgery. However, it remains unclear whether high-risk patients benefit more from a shorter time to surgery or medical optimization. The purpose of this study is to determine the effect of time to surgery on mortality in high-risk patients, who might benefit from medical optimization prior to surgery.

Methods: A retrospective analysis was conducted on prospectively collected data from adult hip fracture patients admitted to 5 hospitals in a single health system from 2013 to 2017. Demographic and comorbidity data were collected upon admission to the emergency department and mortality risk scores were prospectively calculated. Patients with Charlson Comorbidity Index (CCI) ≥3 were considered high risk. Postoperative mortality rate at 30, 60, and 90 days was regressed against time to operating room (OR), age, and common comorbidities to isolate the independent effect of time to surgery on mortality. Mortality rates at time to OR <12 hours were compared to all others using Pearson's $\chi 2$ test.

Results: Of 2300 patients identified, 437 patients qualified as high risk. The odds ratios for in-hospital, 30-, 60-, and 90-day mortality for time to surgery under 12 hours were 0.96 (P = 0.943), 0.57 (P = 0.24), 0.37 (P = 0.016), and 0.42 (P = 0.024). In contrast, the odds ratios for mortality at the same time points in patients undergoing surgery under 48 hours were 5.2 (P = 0.175), 3.2 (P = 0.09), 3.18 (P = 0.071), and 4.45 (P = 0.014). The rate of in-hospital mortality among all patients under 12 hours was 1.1% versus 3.4% for all others (P = 0.326). The rate of mortality at 30 days for patients under 12 hours was 3.0% versus 10.5% all others (P = 0.022). The mortality rate at 60 days for patients under 12 hours was 4.6% versus 15.8% for all others (P = 0.005). The mortality rate at 90 days for patients under 12 hours was 6.4% versus all others 17.6% (P = 0.035).

Conclusion: Among patients with geriatric hip fractures at high risk for mortality, time to surgery under 12 hours confers a mortality benefit at 60 and 90 days. In those patients who fail to undergo surgery within 12 hours of admission, there may be a mortality benefit to delaying surgery beyond 48 hours for further medical optimization as evidenced by the increased mortality at 30, 60, and 90 days in those patients.