Abstract

**Introduction:** Elapsed time from occurrence of injury to definitive care is considered as a determinant for mortality in trauma patients. The concept of the “golden hour” has had global consensus since 1970s. However, there is conflicting evidence to support it. We aimed to revise the association between time from injury to definitive care and mortality, especially for hemodynamically unstable patients.

**Method:** This was an analysis of the nationwide hospital-based registry, Japan Trauma Data Bank, of trauma patients admitted to emergency departments between 2004 and 2015. Inclusion criteria were adult patients who presented with hemodynamically unstable status (systolic blood pressure (SBP) < 90 mmHg and heart rate (HR) > 110 /min, or SBP < 70 mmHg) and underwent definitive care within five hours from injury onset. The outcome measure was in-hospital mortality. First, patients undergoing definitive care at 60 minutes or less were compared with those who had definitive care after 60 minutes using propensity score matching. Second, we evaluated the relationship between time to definitive care and outcome with generalized additive model for total patients. Further analysis was conducted after stratifying patients into severe (SBP < 70mmHg) and moderate shock (70 ≤ SBP < 90 mmHg and HR > 110 /min) status.

**Results:** There were 804 patients identified in this study. After propensity score matching, there was no significant difference in mortality between patients undergoing definitive care ≤ 60 and > 60 minutes (odds ratio 0.96; 95% confidence interval [0.34 – 2.4]; P = 0.92). Generalized additive models showed the odds of mortality remained stable for the first 150 minutes. In the subgroup analysis, the severe shock group presented a paradoxical decline
of mortality with increasing time, whereas the moderate shock group had a time-dependent increase in mortality. No threshold effect at 60 minutes was confirmed in all analyses.

**Conclusion:** There was no significant effect of initiating definitive care within 60 minutes on survival outcome for hemodynamically unstable patients. However, it was suggested that moderate shock patients were the specific population who could benefit the most from shortening time to definitive care.