**Effectiveness of Rapid Response System in Patients with Hip Fractures**

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**Purpose:** Even with preoperative screening and medical preparation, elderly hip fracture surgery (HFS) patients may have serious events including cardiopulmonary arrest (CPA) and death during the perioperative period. The rapid response system (RRS) that responds early to changes in the condition of patients is helping to improve the survival rate. To date, there have been no studies on the effectiveness of RRS in HFS patients.

**Methods:** In October 2012, our institution, a tertiary referral hospital, implemented an RRS. The system activated in heart rate <40 beats/min or >140/min, systolic blood pressure <80 mm Hg, respiratory rate <10 breaths/min or >30/min, oxygen saturation <90%, sudden change in the level of consciousness, and seizure. We conducted before-and-after study using electronic medical records of patients older than 60 years, who underwent surgery during before implemented period (May 2003 to September 2012) and after implemented period (October 2013 to December 2018). 1483 pre-RRS patients and 1315 post-RRS patients were enrolled in this study. We aimed to evaluate the effect of implementing the RRS on the management of patients undergoing HFS. We analyzed (1) interval between the detection of abnormal vital sign and notification to attending physician, (2) interval between the detection of abnormal vital sign and adequate intervention, (3) incidence of CPA, (4) admission to ICU, (5) unexpected death, (6) duration of hospital stay, and (7) survival rate.

**Results:** The interval between the detection of abnormal vital sign and notification to attending physician decreased from 23.9 (±28.1) minutes to 11.4 (±11.02) minutes (P<0.001). The interval between the detection of abnormal vital sign and intervention by the attending physician decreased from 67.3 (±40.3) minutes to 15.8 (±10.9) minutes (P<0.001). There were no significant differences in unexpected admission to ICU (32/50 vs 20/88, P = 0.213) and in-hospital death (15 vs 16, P = 0.605) between the 2 groups. The duration of hospitalization decreased from 24.9 days to 15.4 days (P<0.001). The 5-year survival rate was 57% in the pre-RRS group and 72% in the post-RRS group (hazard ratio = 0.73; 95% confidence interval = 0.61-0.87, P<0.001).

**Conclusion:** Implementation of RRS rendered early notification and prompt intervention of deteriorating patients undergoing HFS and reduced the duration of hospital stay.