

Incidences and Factors Associated with Perioperative Cardiac Arrest in Trauma Patient Receiving Anesthesia

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Abstract : Objective: To determine incidences and factors associated with perioperative cardiac arrest in trauma patients who received anesthesia for emergency surgery. Design and setting: Retrospective cohort study in trauma patients during anesthesia for emergency surgery at a university hospital in northern Thailand country. Patients and methods: This study was permitted by the medical ethical committee, Faculty of Medicine at Maharaj Nakorn Chiang Mai Hospital, Thailand. We clarified data of 19,683 trauma patients receiving anesthesia within a decade between January 2007 to March 2016. The data analyzed patient characteristics, traumas surgery procedures, anesthesia information such as ASA physical status classification, anesthesia techniques, anesthetic drugs, location of anesthesia performed, and cardiac arrest outcomes. This study excluded the data of trauma patients who had received local anesthesia by surgeons or monitoring anesthesia care (MAC) and the patient which missing more information. The factor associated with perioperative cardiac arrest was identified with univariate analyses. Multiple regressions model for risk ratio (RR) and 95% confidence intervals (CI) were used to conduct factors correlated with perioperative cardiac arrest. The multicollinearity of all variables was examined by bivariate correlation matrix. A stepwise algorithm was chosen at a p-value less than 0.02 was selected to further multivariate analysis. A P-value of less than 0.05 was concluded as statistically significant. Measurements and results: The occurrence of perioperative cardiac arrest in trauma patients receiving anesthesia for emergency surgery was 170.04 per 10,000 cases. Factors associated with perioperative cardiac arrest in trauma patients were age being more than 65 years (RR=1.41, CI=1.02-1.96, p=0.039), ASA physical status 3 or higher (RR=4.19-21.58, p < 0.001), sites of surgery (intracranial, intrathoracic, upper intra-abdominal, and major vascular, each p < 0.001), cardiopulmonary comorbidities (RR=1.55, CI=1.10-2.17, p < 0.012), hemodynamic instability with shock prior to receiving anesthesia (RR=1.60, CI=1.21-2.11, p < 0.001), special techniques for surgery such as cardiopulmonary bypass (CPB) and hypotensive techniques (RR=5.55, CI=2.01-15.36, p=0.001; RR=6.24, CI=2.21-17.58, p=0.001, respectively), and patients who had a history of being alcoholic (RR=5.27, CI=4.09-6.79, p < 0.001). Conclusion: Incidence of perioperative cardiac arrest in trauma patients receiving anesthesia for emergency surgery was very high and correlated with many factors, especially age of patient and cardiopulmonary comorbidities, patient having a history of alcoholic addiction, increasing ASA physical status, preoperative shock, special techniques for surgery, and sites of surgery including brain, thorax, abdomen, and major vascular region. Anesthesiologists and multidisciplinary teams in pre- and perioperative periods should remain alert for warning signs of pre-cardiac arrest and be quick to manage the high-risk group of surgical trauma patients. Furthermore, a healthcare policy should be promoted for protecting against accidents in high-risk groups of the population as well.

Keywords : perioperative cardiac arrest, trauma patients, emergency surgery, anesthesia, factors risk, incidence

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