



Original contribution

Postanesthesia emergence in patients with post-traumatic stress disorder[☆]



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Abstract

Study objective: Recovery from anesthesia may be complicated with development of severe panic symptoms and anxiety. Preexisting anxiety disorder has been reported as a risk factor for development of these symptoms. We aimed to examine the frequency of emergence delirium (EDL) among veterans diagnosed with posttraumatic stress disorders (PTSDs).

Design: Retrospective cohort.

Setting: Postoperative recovery area.

Patients: Perioperative information of 1763 consecutive patients who underwent a surgical procedure requiring general anesthesia were collected. The patients were grouped on the basis of previous diagnosis of PTSD. A total of 317 patients were identified with a positive history of PTSD and were compared to 1446 patients without such a history for the occurrence of EDL in the postanesthesia care unit (PACU) as the primary endpoint.

Measurements: Duration of stay in PACU in minutes and the frequency of hospital admission were the secondary endpoints. Multivariate binary logistic regression analysis was performed to identify the predictors of EDL among the veteran population.

Main results: Emergence delirium was reported in 37 cases (2.1%) after general anesthesia. Fifteen (4.7%) of 317 patients with PTSD and 22 (1.5%) of 1446 patients without history of PTSD demonstrated symptoms related to EDL in the PACU ($P = .002$). After propensity matching, there were 8 patients with EDL in the PTSD group whereas there were only 2 patients with EDL among controls. Posttraumatic stress disorder was also an independent predictor of EDL in multivariate analysis with an odds ratio of 6.66 and a 95% confidence interval of 2.04 to 21.72 ($P = .002$).

Conclusions: Posttraumatic stress disorder independently predicted the frequency of EDL even after correcting for preexisting depression and anxiety disorders. A relatively longer duration of PACU stay in PTSD patients may reflect raised awareness of the health care workers about this debilitating mental disorder. Published by Elsevier Inc.

[☆] Conflict of interests: none

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1. Introduction

Over the past century, the US military participated in several major conflicts in the world, notably the Vietnam War, Operation Enduring Freedom (Afghanistan), Operation New Dawn (Iraq), and Operation Iraqi Freedom (Iraq). According to the data from the US Department of Defense, the total US service members wounded in action in Operation Enduring Freedom, Operation New Dawn, and Operation Iraqi Freedom, as of July 2015, was 52 317 [1]. Posttraumatic stress disorder (PTSD) is a stress-related disorder that is described as a triad of symptom clusters, including reexperiencing, avoidance/numbing, and hyperarousal after an exposure to 1 or more traumatic events [2]. The National Vietnam Veterans Readjustment Study, conducted between 1986 and 1988, estimated the lifetime prevalence of PTSD among the Vietnam veterans to be 30.9% for men and 26.9% for women, significantly higher than that of the general population [3]. Between 2001 and 2003, the US National Comorbidity Survey Replication estimated the lifetime prevalence of PTSD among American adults to be 6.8% [4]. From 2000 to 2014, the US Army Office of Surgeon General reported 138 197 new diagnoses of PTSD per year [1]. Hence, PTSD as a disabling psychiatric condition is common among veterans and constitutes a major health challenge [5].

Recently, military nurse anesthetists have reported an increased incidence of emergence delirium (EDL) in US combat veterans [6,7]. Emergence delirium is a condition in which emergence from general anesthesia is accompanied by psychomotor agitation. Upon waking up from general anesthesia, a patient with EDL may be combative to operating room staff, attempting to remove endotracheal tubes or intravenous lines, thus increasing the difficulty of postanesthesia care [7]. Emergence delirium is uncommon outside the pediatric population, although its incidence has been reported at 3.0% to 21.3% for adults after general anesthesia [8–10].

No study has specifically examined the effect of PTSD on anesthesia outcomes, especially in relation to EDL. In this study, we aim to examine whether the prevalence of EDL is more common in surgical patients with a history of PTSD. We hypothesize that the incidence of EDL is increased in patients with a history of PTSD compared with patients without such a history. Furthermore, we hypothesize that the duration of stay in the postanesthesia care unit (PACU) is prolonged in patients with a known history of PTSD.

2. Patients and methods

The study design and protocol were reviewed and approved by the VA Western New York Institutional Review Board. Because of its noninterventive nature, the study was exempted from obtaining a written informed consent. Care was taken to maintain patient privacy according to the Health Information for Portability and Accountability Act.

In this cohort study, we reviewed pertinent perioperative information from 1877 patients undergoing a major surgery under general anesthesia at the VA Western New York Healthcare System in 2012. Patients with a history of PTSD according to their discharge *International Classification of Diseases, Ninth Revision (ICD-9)* code (309.81) have been identified. We collected patient data from the VA Computerized Patient Record System and the Veterans Health Information Systems and Technology Architecture. Demographic information including sex, age, race, height, and weight of the patients were collected. Perioperative records including preoperative anesthesia evaluation (comorbid disease, preoperative functional status, physical status, and preoperative medications), intraoperative anesthesia flow charts (nature and dosage of hypnotic agents, opioids, benzodiazepines, anticholinergic drugs, duration of anesthesia, and any remarkable events during anesthesia), and PACU nursing notes and flow charts (occurrence of EDL, pharmacological treatment of EDL, and length of PACU stay) were examined, and pertinent data were entered into a Microsoft Excel datasheet.

Patients with known cerebrovascular accidents with neurologic deficit, those with organic brain syndrome, arterial hypotension as defined by mean blood pressures less than 55 mmHg, or hypoxia defined as arterial oxygen saturation less than 90% were excluded. We additionally excluded patients with verbal or visual analog pain scores above 3.

Definitions for primary and secondary endpoints: EDL during the PACU stay was the primary endpoint for this study. Emergence delirium was defined as agitation on emergence, emergence excitement, or postanesthetic excitement in which emergence from general anesthesia is accompanied by psychomotor agitation [11]. The nurses and anesthesiologists use the following definitions to assess agitation routinely in our practice. The following verbiages were thoroughly searched from the review of the PACU nursing notes: “attempting to sit up,” “agitated,” “pulling intravenous lines,” “trying to remove surgical dressing,” “climbing over bed rail,” “physically pushing or pulling staff,” “moving side-to-side,” “does not calm or follow verbal reminding,” and “requires physical restraints”; as opposed to calm and responding to verbal command. Secondary endpoints included the length of PACU stay and admission to the hospital due to the state of agitation or confusion. Ambulatory surgery patients were scheduled to be discharged within the same day, and if they had to be admitted to the hospital after a day surgery, they were considered unplanned admissions.

Power analysis and sample size determination: Screening VA Computerized Patient Record System database for postoperative incidence of EDL (primary endpoint) revealed a rate of 2.1% among the veterans undergoing general anesthesia. An increase in the frequency to 4.7% in PTSD patients (reported by Lepouse et al in 2006) [10] at a power of 80% and an α error of .05 required 312 patients in each group. Inclusion of 317 patients provided a power 95% for comparison of PACU length of stay.

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