

Letter to the Editor

Neurotoxicity of general anesthetics: anesthesia and Alzheimer's disease in Serbia

Dear Editor,

A large body of preclinical as well as some retrospective clinical evidence suggest that exposure to general anesthesia could be detrimental to cognitive development in young subjects, and might also contribute to accelerated cognitive decline in the elderly. Though general anesthetics have now been used clinically for well over a century, both their mechanisms of action as well as the nature of any potentially neurotoxic side effects remain elusive. With roughly 234 million people undergoing surgery each year worldwide, it remains imperative that any potentially deleterious effects of anesthetics be investigated and addressed. The issue of anesthetic-induced neurotoxicity in certain subsets of patients has continued to garner attention over the past decade, as more pre-clinical and clinical studies released are suggesting that inhalational and intravenous anesthetics may both cause and mitigate existing significant neuropathology. Literatures, however, acknowledge the potential neurotoxic effects of several anesthetic agents and suggest that further epidemiological prospective studies are required to examine the link between general anesthesia and Alzheimer's disease (AD)¹⁻³. Our study included 176 patients of both sexes, ASA status I-IV. During the examination period, a range of variables were monitored preoperatively, intraoperatively and postoperatively along with the mini-mental state exam and the mini-cog test. Laboratory data were obtained using standard laboratory methods. Application of anesthetics and anesthetic agents was statistically analyzed as well as duration of the surgical procedure itself and anesthesia. The criteria for inclusion into the study: the first group of patients: patients undergoing major vascular surgery performed in general within the time interval of up to six hours after establishing the diagnosis. Significant predisposing factors for the occurrence of AD were recorded preoperatively, intraoperatively, and postoperatively. The first group: patients who underwent major vascular surgery within the six hours. The second group: patients who underwent major vascular surgery within the seventy-two hours after admission. Out of the total number of participants, 88 (50%) respondents were males. Forty-two (2%) patients were younger than 40 years. There were 44 (27.5%) treated patients aged 40-60 years, and 88 (50%) older than 60. The average age of the respondents was 55.71 years (± 18.273). Thanks to the mini-mental state exam and the mini-cog test we observed in 76 (43.2%) patients, signs of deterioration of AD in group two. Jevtovic-Todorovic rightly suggest that since general anaesthesia often cannot be avoided regardless of patient age, it is important to understand the complex mechanisms and effects involved in anaesthesia-induced neurotoxicity, and to develop strategies for avoiding or limiting potential brain injury through evidence-based approaches. Inhaled anaesthetic agents remain the mainstay for patients undergoing major surgical operations, especially in elderly patients. In addition, isoflurane interacts with A β 40 peptides and promotes A β oligomerization and cytotoxicity⁵.

Several perioperative factors such as hypoxia, hypocapnia and anesthetics may be associated with AD via triggering AD neuropathogenesis. More studies to assess the potential relationship between anesthesia/surgery and AD dementia are, therefore, urgently needed.

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Conflict of Interest

The Authors declare that they have no conflict of interests.

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