

Factors to Weigh in While Administering Nitrous Oxide Anesthesia [Letter]

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Dear editor

We read with interest the article titled “Effects of Low-Concentration Nitrous Oxide Anaesthesia on Patient Anxiety during Cataract Surgery: A Retrospective Cohort Study” published by Sasajima et al in the reputable journal “CLINICAL OPHTHALMOLOGY”. We applaud this study and congratulate the authors on the successful publication.

This hospital-based retrospective study analyzed the medical and ocular histories of patients going through cataract surgery between October 12, 2021, and December 23, 2021. The study comprises 63 patients in two cohorts; one had 39 patients undergoing cataract surgery with local and N₂O anesthesia and the other had 24 patients undergoing the surgery with only local anesthesia. The study concluded that the application of low-concentration N₂O anesthesia significantly reduced patient anxiety and pain as well as intraoperative systolic blood pressure and diastolic blood pressure during cataract surgery.¹ Although this study is very thorough, we feel it has certain lacking as such we would like to address it.

Firstly, while Sasajima et al carefully monitored blood pressure and vital signs before administering anesthesia, they have not mentioned if there were any patients suffering from heart failure, renal dysfunction and hepatic dysfunction and if caution has been exercised while administering local anesthesia to these patients.¹ Patients suffering from stage A and stage B heart failure should be given anesthesia which does not interact with their long-term therapy, while patients suffering from stage C and D heart failure present challenges of perioperative fluid and medical management along with the aforementioned challenges.² Similarly, during anesthesia, hepatic blood flow decreases by 35% to 42% in the first half hour of anesthesia, but in patients suffering from hepatic dysfunction, there is no compensation for reduced blood flow which may result in hepatic dysfunction and postoperative loss of consciousness.³ On the other hand, in patients with renal failure, compromised renal function can prolong anesthetic drug effects by decreased elimination of these drugs, leading to a prolonged anesthetic effect.⁴

Secondly, the amount of anesthesia required to maintain a clinically acceptable level of sedation differs from patient to patient, and generally, patients who exhibit a high level of preoperative anxiety require a higher dosage. Sasajima et al gave the same dosage of anesthesia (4% xylocaine eye drop) and failed to take into account this important parameter, so we believe this study is prone to bias.¹ A study by Maranets et al concluded patients exhibiting higher anxiety preoperatively while undergoing bilateral laparoscopic tubal ligation require a higher dosage of anaesthesia.⁵

Thirdly, nitrous oxide anesthesia has its drawbacks such as respiratory depression, diffusion hypoxia and post-operative nausea, so we believe that the cohort receiving the N₂O anesthesia should have been made aware of these consequences before being administered the anaesthesia.⁶

While no patients in this study reported any side effects with the use of nitrous oxide, we believe that a large trial consisting of more patients should be conducted at multiple centers before approving the use of nitrous oxide in reducing pain and anxiety during cataract surgery.

Disclosure

The authors report no conflicts of interest in this communication.

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