Neuroanaesthesiology editorial

Stellema, Nadia; Absalom, Anthony R.

Published in:
Current opinion in anesthesiology

DOI:
10.1097/ACO.0000000000001052

Publication date:
2021

Neuroanaesthesiology editorial

Nadia Stellema and Anthony R. Absalom

During the past 18 months, the news, medical literature and our personal and professional lives have been dominated by the COVID-19 pandemic. Many (neuro) anaesthesiologists will have been in the 'frontline' providing airway management, transport and critical care to those most severely affected, and occasionally confronted with the challenges of providing anaesthetic care to patients with recent or current COVID-19 who require diagnostic or therapeutic procedures. The Society for Neuroscience in Anesthesiology and Critical Care has produced helpful guidance for the latter situation [1].

Although the name chosen by the WHO for the virus (severe acute respiratory syndrome coronavirus 2 or SARS-CoV2) suggests that it only results in respiratory dysfunction, it has gradually become clear that the disease caused by the virus (COVID-19) is often a multisystem disease. Involvement of the central nervous system, whether directly, or indirectly via the vigorous immune response to the virus or as a result of thromboembolic problems. This topic was recently summarized succinctly by Pasternak [2], and the body of literature continues to grow with the publication of ever-larger epidemiological studies [3]. Given the growing number of reviews of the literature on COVID-19, such as that published by Aghagoli *et al.* [4], we chose for this edition of *Current Opinions in Anesthesiology*, to focus on some of the clinical topics that occupied us before the pandemic, and that will continue to occupy us in the future.

Deep brain stimulation (DBS) has been a standard surgical treatment for patients with movement disorders (Parkinson's disease, essential tremor and dystonia) for some years. More recently, the indications have been expanded to include a wide variety of other neurological and psychiatric conditions. Different nuclei will be targeted in different patients, and as time progresses, we will likely also see improvements in the technology used for navigation and stimulation. Not only will we be faced with growing numbers of patients requiring our care during DBS electrode implantation, we are also likely to be involved in the anaesthetic care of patients with electrodes in-situ, who require other surgical procedures. These issues are the subject of a review by Dinsmore and Venkatraghavan [5].

Patients with Parkinson's disease are among the large group of patients requiring sedation or anaesthesia who have a history of chronic psychoactive medication use. Other members of this group include those with mood disorders, psychiatric disorders and patients with back pain taking benzodiazepines for 'muscle relaxation'. Ho and Wong [6] provide a timely update on the interactions among the anaesthetic drugs and prescribed psychoactive medications. Of course, it is likely that even larger numbers of surgical patients use psychoactive substances without a prescription, but that is a topic that justifies a separate review.

Ketamine has been an important drug in the anaesthetist's armamentarium since the 1970s. Despite frequent clinical use, and sadly also frequent illicit use, it somehow took several decades before it was realized that ketamine also has rapid and potent antidepressant properties. Rozet [7] summarizes the path by which this action became known, the interesting theories and data on the underlying antidepressant mechanism, and the current evidence of benefit of the use of ketamine for anaesthesia for electroconvulsive therapy.

As the population ages, and the prevalence of cancers of all types increases, funding for healthcare is under increasing pressure. Efforts to improve efficiency, reduce the incidence of complications and contain healthcare costs are essential. One potential way to achieve these goals for a subset of patients requiring craniotomies for removal of cerebral tumours is to perform their craniotomy as a day surgery procedure. A group in Toronto Western Hospital has been doing this for more than 25 years, and have demonstrated that they have achieved these and other goals without jeopardizing patient safety or satisfaction. A review of the recent

Department of Anesthesiology, University Medical Center Groningen, University of Groningen, Groningen, The Netherlands

Correspondence to Anthony R. Absalom, Department of Anesthesiology, University Medical Center Groningen, Huispostcode EB 32, Hanzeplein 1, Postbus 30001, 9700 RB Groningen, The Netherlands.
E-mail: a.r.absalom@umcg.nl

Curr Opin Anesthesiol 2021, 33:000–000
DOI:10.1097/ACO.0000000000001052

KEY POINTS

- COVID-19 is a multisystem disease that commonly involves the neurological system and has longer-term neuropsychiatric consequences such as depression.
- As the population ages, the prevalence of degenerative diseases such as Parkinson's Disease, and brain tumours, will likely increase, with consequences for the anaesthesiologist.
- Technological developments, and the discovery of new indications for old drugs such as ketamine, offer the anaesthesiologist ample chances for engaging with a wide range of patients, and participation in the complete perioperative care pathway of surgical patients.

literature on this topic is thus timely, and is provided by Goldmacher *et al*. from this group [8].

Esfahani and Dunn provide a timely update on anaesthesia for pituitary tumour surgery [9]. Over the years, there have been numerous surgical advances. Not only is it no longer necessary to operate via a craniotomy, fibreoptic techniques and navigation systems have made the operations safer and more accurate, although the jury is still out concerning the influence of these techniques on outcomes such as cerebrospinal fluid (CSF) leak and meningitis. Patients with pituitary tumours commonly suffer from endocrinological problems requiring careful preoperative preparation. The degree of involvement of anaesthesiologists in the perioperative care of these patients differs among hospitals around the world. As we try to shift the focus of our work towards perioperative medicine, it only seems logical that (neuro) anaesthesiologists should become more involved in the perioperative management of this patient population.

Fibreoptic technology has been usefully applied in the development of videolaryngoscopy systems. D' Arville *et al*. [10] discuss the role of these systems in the airway management of patients with unstable cervical spine fractures. It is likely that videolaryngoscopy may soon replace more traditional approaches to airway management such as direct laryngoscopy with manual in-line stabilization or awake fibreoptic intubation. As in many areas of medicine, airway management in these patients has mostly been based on expert opinion rather than on scientific evidence. Some time-honoured practices, such as use of hard collars and manual inline stabilization, are being revisited, and may be applied more selectively in future.

The commonly used hypnotic drugs have been long considered to offer neuroprotection. Although they do reduce cerebral metabolism and thereby oxygen requirements, and can theoretically increase the ischemic tolerance time, on the whole, there is very little strong evidence of benefit when they are administered after a traumatic or ischemic brain injury. The noble gases xenon and argon are perhaps more promising than the currently used hypnotic drugs in this regard. They possess some anaesthetic properties, have few adverse effects and might well possess neuroprotective properties when used after brain trauma, as discussed by Höllig and Coburn [11].

Many neurosurgical procedures are associated with a risk of neurological injury resulting in disabling postoperative neurological deficits. This particularly applies to surgery in the vicinity of the speech and motor cortex areas, base of skull procedures and complex spinal procedures. One of the main goals of intraoperative neuromonitoring (IONM) is to detect impending surgery-associated neuronal dysfunction at a stage when corrective measures can still be taken to prevent that dysfunction from becoming permanent. Sahinovic *et al*. [12] focus on IONM for spinal procedures. The warning signs used to detect impending injury can be difficult to interpret, as they can also be caused or exacerbated by a variety of factors under the control of the anaesthesiologist such as choice of drugs, drug doses and physiological homeostasis. Well tolerated and effective use of IONM requires good preparation, specific skills and knowledge, and good communication between surgeon, anaesthesiologist and surgeon. The authors suggest a useful schema of actions to take when warning signs are detected.

We trust that you, the readers of this neuroanaesthesiology collection, will agree with our assessment that all the articles are of an excellent standard, and hope that you too will find them informative and thought-provoking.

Acknowledgements

None.

Financial support and sponsorship

This work was supported by internal funding from the Department of Anesthesiology, University Medical Center Groningen, Groningen University, The Netherlands.

Conflicts of interest

A.R.A. has received payments (made to institution) for sponsor-initiated research or consultancy advice from The Medicines Company (Parsippany, New Jersey, USA), Janssen (Beerse, Belgium), Becton Dickinson (Eysins, Switzerland), Paion (Aachen, Germany), Terumo (Tokyo, Japan), Ever Pharma (Unterach am

Attersee, Austria), Rigel Pharmaceuticals (San Francisco, USA) and Philips BV (Eindhoven, The Netherlands).

REFERENCES

1. Flexman AM, Abcejo AS, Avitsian R, *et al.* Neuroanesthesia practice during the COVID-19 pandemic: recommendations from Society for Neuroscience in Anesthesiology and Critical Care (SNACC). J Neurosurg Anesthesiol 2020; 32:202–209.
2. Pasternak JJ. Neuroanesthesiology update. J Neurosurg Anesthesiol 2021; 33:107–136.
3. Taquet M, Geddes JR, Husain M, *et al.* 6-month neurological and psychiatric outcomes in 236 379 survivors of COVID-19: a retrospective cohort study using electronic health records. Lancet Psychiatry 2021; 8:416–427.
4. Aghagoli G, Gallo Marin B, Katchur NJ, *et al.* Neurological involvement in COVID-19 and potential mechanisms: a review. Neurocrit Care 2021; 34:1062–1071.
5. Dinsmore M, Venkatraghavan L. Anesthesia for deep brain stimulation: an update. Curr Opin Anesthesiol 2021. in press.
6. Ho S, Wong A. Perioperative management considerations in patients taking prescribed psychoactive medications (including those for depression and Parkinson's Disease). Curr Opin Anesthesiol 2021. in press.
7. Rozet I. Ketamine in depression and electroconvulsive therapy. Curr Opin Anesthesiol 2021. in press.
8. Goldmacher J, Bernstein M, Venkatraghavan L. Same day discharge for craniotomy. Curr Opin Anesthesiol 2021. in press.
9. Esfahani K, Dunn LK. Anesthetic management during transsphenoidal pituitary surgery. Curr Opin Anesthesiol 2021. in press.
10. d'Arville A, Walker M, Lacey J, *et al.* Airway management in the adult patient with an unstable cervical spine. Curr Opin Anesthesiol 2021. in press.
11. Höllig A, Coburn M. Noble gases and neuroprotection – summary of current evidence. Curr Opin Anesthesiol 2021. in press.
12. Sahinovic MM, Gadella MC, Shils J, *et al.* Anesthesia and intraoperative neurophysiological spinal cord monitoring. Curr Opin Anesthesiol 2021. in press.