Expert Review of Neurotherapeutics

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/iern20

Anesthesia for electroconvulsive therapy during the COVID-19 pandemic

Elaine Loureiro Pereira-Soares , Antonio Leandro Nascimento , Jorge Adelino da Silva & Antonio Egidio Nardi

To cite this article: Elaine Loureiro Pereira-Soares , Antonio Leandro Nascimento , Jorge Adelino da Silva & Antonio Egidio Nardi (2020): Anesthesia for electroconvulsive therapy during the COVID-19 pandemic, Expert Review of Neurotherapeutics, DOI: 10.1080/14737175.2020.1835471

To link to this article: https://doi.org/10.1080/14737175.2020.1835471

Published online: 18 Oct 2020.

EXPERT REVIEW OF NEUROTHERAPEUTICS
https://doi.org/10.1080/14737175.2020.1835471

Taylor & Francis
Taylor & Francis Group

EDITORIAL

Anesthesia for electroconvulsive therapy during the COVID-19 pandemic

Elaine Loureiro Pereira-Soares, Antonio Leandro Nascimento, Jorge Adelino da Silva and Antonio Egidio Nardi

Institute of Psychiatry, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

ARTICLE HISTORY Received 14 July 2020; Accepted 8 October 2020

1. Introduction

Coronavirus disease (COVID-19) is a disease caused by a new coronavirus, the SARS-CoV-2, which was first reported in Wuhan, China, in December 2019. The outbreak of the disease was declared as a public health emergency of international interest on 30 January 2020. Less than two months later, on 11 March 2020, the World Health Organization (WHO) declared that the outbreak was already a pandemic [1]. The primary route of transmission of SARS-CoV-2 is the inhalation of infected respiratory droplets, and the major symptoms [2] of COVID-19 are fever, myalgia, dry cough, diarrhea, and vomiting. The most severe infections are more likely to occur in elder individuals and patients with several comorbidities [2]. The mean incubation period of the disease is about five days [2], and the mortality rate of COVID-19 is ten times higher than that of seasonal respiratory infections [3]. There is neither a treatment nor an effective vaccine for the virus [2]. The airway management procedures can produce aerosols that increase the risk of disease transmission [4]. Therefore, the COVID-19 pandemic poses a challenge while administering anesthesia.

The electroconvulsive therapy (ECT) was developed in 1938 and has since been used to treat severe mental disorders or those refractory to treatment. Most patients referred for ECT have tried other treatment options unsuccessfully or need a fast recovery that cannot be achieved by pharmacological treatment; hence, these patients require ECT to avoid the risk of serious complications, disability, or death.

ECT is performed under general anesthesia, using a traditional technique of intravenous injection of a hypnotic agent, succinylcholine, for muscle relaxation, and manual ventilation (MV) using a mask. Several hypnotics can be used in this procedure, and methohexital is considered the best option [5], followed by etomidate, propofol, and thiopental. In the case of contraindication to succinylcholine, muscle paralysis can be achieved using rocuronium with subsequent reversal with sugammadex [5]. Positive-pressure hyperventilation is generally used prior to ECT for improving seizure quality [6] although the evidence for this is weak [7]. However, MV is a potentially risky procedure for aerosol production and virus dispersion. The smaller particles produced by aerosols can be suspended in the air, pass through filter barriers, and inhaled [8]. Therefore, the anesthesia procedure prior to ECT had to be modified to continue using this treatment option along with ensuring the safety of patients and healthcare professionals.

2. Recent recommendations

The adjustments to be implemented in ECT following the emergence of the pandemic are multifactorial and involve screening of patients, reducing the number of patients as well as medical professionals in the ECT field to further decrease the movement of people, introducing appropriate PPE, and modifying anesthesia protocols.

The patient screening has led to the review of cases with the psychiatric team and patient testing. The initial guidelines recommended that elective procedures should be postponed to direct the healthcare professionals and supplies in treating the patients with COVID-19. Patients undergoing ECT have severe mental disorders and the lack of treatment can lead to severe decompensation; therefore, ECT services continued to provide care although there was a reduction in the number of provided treatments. In a national online survey, Amad et al. [9] demonstrated that there were fewer consultations in >90% of the ECT centers that responded. The Institute of Psychiatry of the UFRJ (IPUB) maintained inpatient care and outpatient care of cases selected for having the highest risk of decompensation. This represented an 80% reduction in the number of provided treatments.

Regarding patient testing, the centers have started to implement it according to their protocols and possibilities. The suspected or positive patients for SARS-CoV-2 are not referred for ECT [10–12], a recommendation also followed by the IPUB. The ECT procedure is postponed until patients have a negative test result [8]. Sienaert et al. [13] reported that patients with a positive PCR test were scheduled for the last treatment of the day and the room was thoroughly cleaned at the end. In services where there was no test available for outpatients or the number of tests was limited, as in the IPUB, patients started to be screened before treatment for the presence of symptoms or a suspected epidemiological history. Those with no symptoms or suspected history were referred for treatment with a surgical mask. The suspected patients were referred for testing. Limoncelli et al. [12] described that in addition to screening, the patients received an iodine–povidone nasal swab and a mouth rinse with hydrogen peroxide or povidone solution for reducing the nasopharyngeal viral load.

CONTACT Elaine Loureiro Pereira-Soares elainelpsoares@gmail.com Institute of Psychiatry, Federal University of Rio de Janeiro, Rio de Janeiro CEP 22290-140, Brazil

Despite the screening strategies, such as tracking and/or testing, there is always the possibility of having asymptomatic positive patients and even tests with false negative results. Therefore, it is recommended to limit the number of individuals in the ECT service [4,8,10,14]. Only essential team members should be present for reducing unnecessary exposure of health professionals to aerosol-generating procedures, such as airway management during general anesthesia. At the IPUB, in addition to having reduced the staff to the essential, both undergraduate and graduate students were dismissed.

The ECT room is an environment potentially contaminated by aerosols produced by airway management; therefore, the use of appropriate PPE is necessary, which includes the following [8]: an N95 mask, a face shield, an apron, and gloves. Hand hygiene is essential before putting on and after removing the PPE [8]. For reducing the risk of self-contamination, healthcare professionals should remove and discard the PPE very carefully [8]. Training on protocols to correctly put on and remove PPE is recommended [4,8,14]. An observer with a checklist [14] to confirm each step of the procedure and the use of visual educational guides [12] are also recommended.

The anesthesia procedure should be adjusted for avoiding the contamination of patients and healthcare professionals, following the recently published consensus guidelines. Aerosol-generating procedures, such as high-flow nasal oxygen, MV, and tracheal suction, should be avoided [14]. It can often be difficult to identify and isolate infected patients; therefore, it is recommended to take precautions during airway management of all patients [4]. Ideally, patients should be treated in rooms with negative pressure, if available [4,8,10,14]. It is recommended to use glycopyrrolate for minimizing salivation [15] and remifentanil and lidocaine for reducing cough upon awakening [16]. The induction agents that provide the best seizure quality, such as ketamine, etomidate, or methohexital, should be selected [5]. The airway management is undoubtedly the most important issue in the current recommendations. The use of the traditional bag-valve-mask hyperventilation prior to ECT generates aerosols and should be avoided during the COVID-19 pandemic [4,8,10,11,14] for not exposing health professionals and patients to unnecessary risks of infection. Pre-oxygenation by face mask for 3–5 min should be prioritized for reducing the need for MV [4,8,10,11,14], and apneic oxygenation via nasal prongs should be considered [17]. If hyperventilation is necessary, the use of a laryngeal mask allowing capnography [17] is preferred to MV. A high efficiency particle filter (HEPA) must be placed between the Y-piece of the breathing circuit and the patient's mask [8,11,12]. Luccarelli et al. [11] developed an anesthesia protocol for modified ECT, prioritizing pre-oxygenation for reducing the need for MV. The usual hyperventilation was not used prior to ECT, and rescue MV was provided only to patients who desaturated at the discretion of the anesthesiologist. Using this protocol, only 48.1% of the patients required rescue MV. Similar procedures were adopted at the IPUB and it was observed that with a rigorous pre-oxygenation, a good part of the patients went through the procedure without the need for MV. In terms of breathing circuits, the closed circuit, such as anesthetic circle circuit, is ideal [14] for ventilation and preferred to a bag-valve-mask that expels the expired gas into the environment, but the use of Mapleson C [14] and Jackson-Rees [12] circuits has also been mentioned. For awakening from anesthesia, a disposable transparent plastic curtain [18] can be used on the patient's face between the filter and the mask for retaining aerosols, in cases MV is required. If ventilation is required, the technique of two people and two hands should be used for improving the sealing, low flow, and low O_2 pressure [12,14]. If airway suction is required, a closed suction system [8] should be used, if available. After recovery, the patient must immediately wear a surgical mask [10,12]. Although orotracheal intubation is rarely required in the context of ECT, the requirement cannot be prevented. The guidelines recommend that the most experienced professional at the site should perform the intubation using video laparoscopy and minimize the MV [10]. At the end of each treatment, the room should be thoroughly disinfected and there should be a minimum interval of 30 min between each patient [10], depending on the air exchange rate of the institution's room.

3. Final considerations

Many medical services have been interrupted for directing efforts to the care of patients with COVID-19. However, patients referred for ECT have severe mental disorders and should not have their treatment interrupted for avoiding the risk of serious complications. These changes in the anesthesia procedure prior to ECT during the COVID-19 pandemic increase the safety of health professionals and patients and reduce the risk of contamination by the new coronavirus.

Funding

This paper was not funded.

Declaration of interest

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

Reviewer disclosures

Peer reviewers on this manuscript have no relevant financial or other relationships to disclose.

ORCID

Antonio Egidio Nardi http://orcid.org/0000-0002-2152-4669

References

Papers of special note have been highlighted as either of interest (•) or of considerable interest (••) to readers.

1. WHO. WHO Director-General's opening remarks at the media briefing on COVID-19-11 March 2020 [Internet]. Geneve (CH): World Health Organization; 2020 March 11 [cited 2020 May 19]; [about 6 screens]. Available from: https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—11-march-2020

•• **This important website provides updated information on the evolution of the Covid-19 pandemic in the world.**

2. Sohrabi C, Alsafi Z, O'Neill N, et al. World Health Organization declares global emergency: a review of the 2019 novel coronavirus (COVID-19). Int J Surg. 2020;76:71–76.
3. Colbert SA, Mc Carron S, Ryan G, et al. Images in clinical ECT: immediate impact of COVID-19 on ECT Practice. J Ect. 2020;36:86–87.
4. APSF. Perioperative considerations for the 2019 novel coronavirus (COVID-19) [Internet]. Rochester (MN): Anesthesia Patient Safety Foundation; 2020 February 12 [cited 2020 Apr 16]; [about 9 screens]. Available from: https://www.apsf.org/news-updates/perioperative-considerations-for-the-2019-novel-coronavirus-covid-19/
5. Rozet I, Rozet M, Borisovskaya A. Anesthesia for electroconvulsive therapy: an update. Curr Anesthesiol Rep. 2018;8:290–297.
6. Aksay SS, Bumb JM, Janke C, et al. New evidence for seizure quality improvement by hyperoxia and mild hypocapnia. J Ect. 2014;4:287–291.
7. Gomez-Arnau J, de Arriba-arnau A, Correas-Lauffer J, et al. Hyperventilation and electroconvulsive therapy: a literature review. Gen Hosp Psychiatry. 2018;50:54–62.
8. ASA. COVID-19 information for health care professionals recommendations [Internet]. Washington (DC): American Society of Anesthesiologists; 2020 [cited 2020 Apr 18]; [about 7 screens] Available from: https://www.asahq.org/about-asa/governance-and-committees/asa-committees/committee-on-occupational-health/coronavirus
9. Amad A, Magnat M, Quilès C, et al. Evolution of electro-convulsive therapy activity in France since the beginning of the COVID-19 pandemic. Encephale. 2020 Jun;46(3):S40–S42.
10. Flexman AM, Abcejo A, Avitisian R, et al. Neuroanesthesia practice during the COVID-19 pandemic: recommendations from society for neuroscience in anesthesiology & critical care (SNACC). J Neurosurg Anesthesiol. 2020 Jul;32(3):202–209.

•• **This consensus statement provides information relevant to the practice of neuroanesthesia during the COVID-19 pandemic.**

11. Lucarelli J, Fernandez-Robles C, Fernadez-Robles C, et al. Modified anesthesia protocol for electroconvulsive therapy permits reduction in aerosol-generating bag-mask ventilation during the COVID-19 pandemic. Psychother Psychosom. 2020;18:1–6.
12. Limoncelli J, Marino T, Smetana R, et al. General anesthesia recommendations for electroconvulsive therapy during the coronavirus disease 2019 pandemic. J Ect. 2020 Jun 12. DOI:10.1097/YCT.0000000000000705
13. Sienaert P, Lambrichts S, Popleu L, et al. Electroconvulsive therapy during COVID-19-times: our patients cannot wait. Am J Geriatr Psychiatry. 2020;28(7):772–775.
14. ICMANAESTHESIACOVID-19. COVID-19 airway management principles [Internet] London (UK): ICM Anaesthesia COVID-19 Web Site; 2020 March 19 [cited 2020 Apr 18]; [about 45 screens] Available from: https://icmanaesthesiacovid-19.org/covid-19-airway-management-principles
15. Christensen STJ, Staalsø JM, Jørgensen A, et al. Electro convulsive therapy: modification of its effect on the autonomic nervous system using anti-cholinergic drugs. Psychiatry Res. 2019;271:239–246.
16. Greenland JR, Michelow MD, Wang L, et al. COVID-19 infection: implications for perioperative and critical care physicians anesthesiology. Anesthesiology. 2020;132(6):1346–1361.

• **This review provides a comprehensive summary of the evidence currently available to guide management of patients whit COVID-19.**

17. Wax RS, Christian MD. Practical recommendations for critical care and anesthesiology teams caring for novel coronavirus (2019-nCoV) patients. Can J Anaesth. 2020;67(5):568–576.
18. Matava CT, Yu J, Denning S. Clear plastic drapes may be effective at limiting aerosolization and droplet spray during extubation: implications for COVID-19. Can J Anesth. 2020;67:902–904.