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LETTER TO THE EDITOR

Authors' response to: Anesthetic gases in the sedation of critically ill patients

Respuesta de los autores a: Gases anestésicos en la sedación de pacientes críticos

Dear Editor:

We appreciate the interest in our publication[1] and the opportunity to respond to the comments by Chamorro and Romera.

Our concern regarding the individualization of volatile anesthetics (VAs)[2] has recently been addressed and additional emphasis does not seem necessary.

It was not the purpose of our article to address the environmental impact of VAs, but we agree that it is a relevant issue. VAs are greenhouse gases that are almost entirely eliminated into the atmosphere after clinical use. According to the European regulation of 2024,[3] those gases with a global warming potential (GWP100) greater than 150 are considered to have a high environmental impact. In this context, isoflurane (GWP100 = 539) and desflurane (GWP100 = 2590) clearly exceed this threshold, while sevoflurane's value is lower (GWP100 = 144).[4] However, this regulation does not establish clinical restrictions; rather, it focuses on industrial emissions. According to the experts, negative environmental impacts can be mitigated through thorough training, selecting the least toxic agent, and implementing effective waste gas capture systems. At the same time, they underscore the responsibility of professionals to drive changes aimed at mitigating future environmental challenges.[5]

We reiterate that the evidence on the use of VAs in status asthmaticus is limited,[1] as it is based on case series, retrospective studies, and narrative reviews. There are no clinical trials or formal recommendations from scientific societies for their systematic use. Therefore, the utilization of VAs should be regarded as a rescue therapy that needs to be individualized. As in status epilepticus high doses are usually required and are associated with more adverse events, mainly hemodynamic deterioration - a well-documented issue.[6]

With respect to the questioned EEG[1] tracing, we aimed to demonstrate how quickly isoflurane can induce a stable burst-suppression pattern. Since it is not possible to show the complete recording, an interval of less than six seconds was selected for analysis of the background tracing. Diagnosing non-convulsive status epilepticus requires analyzing a much larger portion of the recording and also of possible patterns belonging to the *ictal-interictal continuum*. This represents a more contemporary approach that complements and sometimes overcomes the limitations of the Salzburg criteria.[7] We now present an additional recording of the same data (Fig. 1). In this recording, we observe rhythmic and continuous electronegative waves at 2–2.5 Hz in electrodes T7, P7, and P3. These electrodes cover the posterior region of the left temporal lobe and, to a lesser extent, the ipsilateral parietal region. This pattern shifts the balance of the *ictal-interictal continuum* towards the *ictal* side and reflects the patient's refractoriness to the drugs administered prior to isoflurane.

The results of ongoing clinical trials, such as INASED (NCT04341350) and the Spanish SI-CRITIC (NCT07000526), will determine the impact of isoflurane versus intravenous sedatives. We recognize the need for a personalized approach to sedation. We do not follow trends; we look for evidence. Personalized medicine can only be built on research that resolves uncertainties and generates solid evidence capable of guiding clinical decisions. This is the driving force behind truly individualized practice, and it is the focus of our efforts.

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Figure 1 Capture of the patient's recording in super-refractory status, shown in ''point of view'' before isoflurane administration. At the time this recording was obtained, the patient was being treated with lacosamide, levetiracetam, valproic acid, and propofol. Waves interpretarion is provided in the text.

CRediT authorship contribution statement

JMA, MPE, JON, APL, and FSS contributed to the initial concept and design. JMA and FSS participated in the final drafting of the manuscript. All the authors read and approved the final version of the manuscript.

Declaration of Generative AI and AI-assisted technologies in the writing process

No artificial intelligence was used.

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Declaration of competing interest

JMA, MPE, JON, and APL declare that they have no conflicts of interest. FSS is a member of the scientific advisory board of Maquet Critical Care and has received research grants from Air Liquide and Hamilton Medical.

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