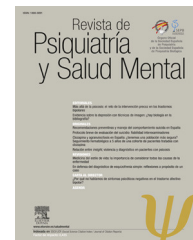




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LETTERS TO THE EDITOR

New advances in electroconvulsive therapy. What is the influence of anaesthetic agents?☆



Nuevos avances en terapia electroconvulsiva. ¿Cuál es la influencia de los agentes anestésicos?

Dear Editor,

We have recently read with interest an original article published by Martínez-Amorós et al.,¹ where two hypnotics usually used in electroconvulsive therapy (ECT) are compared. Said authors seek to determine variables such as epileptic fit duration, cardiovascular profile and the development of cognitive effects after ECT.

When we use a hypnotic drug we enable the application of electric stimulus to produce a generalised seizure with specific characteristics.

From our point of view, we want to add that many drugs may be used during the ECT process and that an adjustment of the preoperative medical treatment, in accordance with the psychiatry team, may have an influence on its success.

It is recommended to consider a reduction of benzodiazepine dose, which should be assessed according to the individual needs of each patient. The Spanish consensus on ECT of 1999² recommends not to discontinue already established treatments with tricyclics or selective serotonin reuptake inhibitors and to individualise the decision in the case of monoamine oxidase inhibitors where treatment must preferably be discontinued. In a revision of Sanz-Fuentenebro et al.,³ it is recommended to stop or to reduce the lithium dose due to higher risk of relapse.

There are many drugs used in ECT: a hypnotic, a neuromuscular blocking (NMB) drug, an intravenous analgesic that could be added to minimise post-ECT myalgia, and those used according to the haemodynamic changes triggered by the electric shock. This embraces a broad drug spectrum including beta-blockers, anticholinergic drugs, calcium

antagonists, urapidil, clonidine, lidocaine, etc. Cases of malignant arrhythmia, myocardial ischaemia and even asystole have been reported.

Regarding hypnotics, as mentioned by Martínez-Amorós et al.,¹ methohexital is considered the drug of choice⁴ as it barely interferes with the seizure threshold but its unavailability in Spain forces the use of propofol and thiopental, although they reduce seizure duration, or etomidate.

The quality of seizures, the therapeutic efficacy and the cognitive dysfunction were determined in a study conducted by Geretsegger et al.,⁵ in which the use of propofol with methohexital is compared.

The epileptic fits were shorter in the group receiving propofol, and the seizure threshold was higher, but there were no differences regarding their quality and the therapeutic response. The group receiving propofol showed a lesser degree of cognitive dysfunction and less haemodynamic changes.

In another study of Bailine et al.,⁶ a lower rate of post-ECT nausea and vomiting was reported when propofol was the hypnotic used.

The use of etomidate,⁴ ketamine and theophylline may be useful in excessively short epileptic fits, but they may lead to a worse haemodynamic profile. The use of dexmedetomidine before the application of an electric shock provides a better haemodynamic control. Hyperventilation may improve seizure characteristics.

In a study of Nishikawa et al.,⁷ it was reported that remifentanyl, an ultra-short-acting opioid associated with a lower propofol dose, showed a better haemodynamic profile and longer seizures.

Regarding NMB drugs, they are little-known drugs outside the anaesthesia practise, although they are essential in ECT to maintain certain level of muscle block in order to avoid tooth fractures and injuries. Generally, succinylcholine has been considered the NMB drug of choice, due to its short duration. However, it may produce many undesirable effects such as arrhythmia, hyperkalaemia and malignant hyperthermia⁸ in susceptible patients. Catatonic schizophrenic patients have a proliferation of extra-binding nicotinic receptors, which leads to an increase in serum potassium levels by more than 1 mEq/mL after the administration of succinylcholine with a high risk of triggering malignant arrhythmia. In a revision of Mirzakhani et al.,⁸ and in another study of Hoshi et al.,⁹ the use of nondepolarising NMB drugs at low doses (rocuronium or vecuronium) reversed by a new antagonist with immediate onset of action,

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sugammadex, is considered an attractive alternative in those cases where succinylcholine is not recommended.⁸

Lastly, with reference to the study of Martínez-Amorós et al.¹ regarding cognitive alterations associated with anaesthetic drugs, we want to state that much research^{10,11} is being done applying a bispectral index monitoring, a consciousness or depth of anaesthesia monitor. Although it is still not possible to establish a parallelism between post-ECT values and the awakening time, it is certain that a good correlation between the bispectral index values before ECT and the duration of the motor seizure activity and the electroencephalography has been observed.¹⁰ On the other hand, the baseline values of the bispectral index before ECT are predictors of seizure duration and intraoperative¹¹ awakening time. This would enable an adequate dose adjustment, thus avoiding drug-induced cognitive impairment and obtaining seizures of therapeutic efficacy.¹¹

A multidisciplinary approach between psychiatrists and anaesthesiologists, including these new contributions, could offer better clinical outcomes and a better safety profile in ECT.

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On the use of Winters' formula in chronic metabolic acidosis[☆]



Sobre el uso de la fórmula de Winters en la acidosis metabólica crónica

Dear Sir,

We have read with great interest the letter published in this Journal by Rubio et al.,¹ and we would like to expound briefly our ideas on his comments.

Upon observing the value of HCO₃, Rubio et al., calculated the expected value of pCO₂ by using the famous Winters' formula,² which consists of a linear regression

with a slope of 1.5 and an interception of 8.3. Although still widely used, the Winters' formula was proposed in the sixties. There is a more recent formula, which is a contribution made by Bushinsky et al.,³ who argued that the decrease in pCO₂ should be predicted by multiplying the decrease in HCO₃ by the factor 1.2. The relationship between pCO₂ and HCO₃ proposed by Bushinsky et al., may be found in many current textbooks; see, for example, Du Bose.^{4,5}

Nevertheless, these two formulas are not necessarily in conflict. In order to prove this, let us consider the normal values of HCO₃, pCO₂, namely 24 mEq/L, 40 mmHg, respectively. By introducing these numbers into the formula of Bushinsky et al., the formula reduces to the equation pCO₂ = 1.2 × HCO₃ + 11.2, that is to say, a linear regression with a slope of 1.2, an intersection of 11.2, which is not that different from Winters' regression.

Moreover, the Winters' formula was derived from a population where the value of HCO₃ was close to 9.9 mEq/L, while Bushinsky et al., analysed a wider range of HCO₃

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