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Editorial

Brain Stimulation and General Anesthesia

Editorial

The use of brain stimulation either without drugs at all or with ones that are currently obsolete for the promotion of general anesthesia [1]. Furthermore, different intensities and time durations of stimulation were reported, making it difficult to compare between studies.

In the past few decades, there has been an intensive development in the techniques of neurostimulation [2], including the use for chronic pain management [3]. Although it has not been assessed for general anesthesia anymore, current data on brain stimulation suggests that low intensity electric currents may have mechanisms that could be useful as an add-on therapy in anesthesia; this supports ethical and well-designed experimental and clinical studies focusing on their anesthetic and analgesic effects.

The development of chemical anesthetics quelled the interest for brain stimulation. Currently, most anesthetic drugs are active only a short time period, after being safely metabolized or eliminated. However, in addition to the cardiovascular effects of drugs, the incidence of neuropshychological adverse events related to general anesthesia is not negligible, especially in the elderly undergoing cardiac or orthopedic surgery. It is suggested that delirium and postoperative cognitive dysfunction are more frequent after depth anesthesia [4]. In addition, cognitive dysfunctional patients have a lower survival rate and quality of life [5]. On the other hand, the safety of the general anesthesia in children [6] and in cancer patients [7], is still not fully defined. The use of brain stimulation as an adjunctive therapy to traditional anesthetics could potentially decrease the risk of these adverse events in these vulnerable populations by lowering the required dosage of anesthetics.

Recent studies have showed that Transcranial Magnetic Stimulation, as well as the transcranial Direct Current Stimulation (tDCS), may be effective in the treatment of chronic pain [3], and preliminary data points to a possible effect in acute pain [8]. Other types of stimulation, such as transcranial Pulsed Current Stimulation (tPCS), are also under experimental and clinical evaluation. None of the current techniques use the high energy previously related [1]. The correct parameters of stimulation to promote anesthesia, as well as the safety and efficacy of the association of brain stimulation and drugs, are unknown. The opioid and propofol consumption during general anesthesia, for instance, could be measured during different intensities of brain stimulation for evaluation of the analgesic potential of this procedure.

The current knowledge related to brain stimulation in neurology, psychiatry, neuropsychology, neurophysiology, and chronic pain treatment could help in the re-evaluation of brain stimulation for a novel application. This could lead to the improvement of safety and long-term outcomes of patients undergoing general anesthesia.

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