This is simply not the case. Immobility and unconsciousness are two separate facets of anaesthesia, depending on different neurophysiological substrates. Immobility is a spinal cord phenomenon, almost independent of forebrain function, and even of the brain stem. The converse is true for depression of consciousness (‘hypnosis’).

There is solid evidence that at the same fraction (or multiple) of MAC, different agents may have different hypnotic potencies. The halogenated ethers isoflurane, sevoflurane, and desflurane happen to be clinically equivalent hypnotics at equal MAC fractions. In contrast, the halogenated hydrocarbon halothane is just over half as potent in depressing consciousness as the aforementioned ethers at equal MAC fractions! This is clearly reflected in the cortical EEG, as demonstrated in the study by Schwab and colleagues, where the BIS values were 34 (+6) with sevoflurane, and 54 (+7) with halothane at 1 MAC. Schwab and colleagues had been sharply aware of the lesser hypnotic potency of halothane, and had postulated this result, whereas Pandit and Cook, assuming that ‘equal MAC means equal hypnosis’, attributed it to a flaw of the BIS monitor. Yet it is clearly in support of a DOA monitor, if it correctly identifies the lesser hypnosis with halothane—it does, what it can be expected to do—it tracks cortical suppression, not immobility. But this is not unique to the BIS, and any EEG processor would do so, including the naked eye of the experienced observer.

The ‘gaba-ergic’ agents, such as the halogenated volatile agents and propofol, produce roughly similar EEG patterns at clinical concentrations, which is reflected in similar outputs of any one DOA monitor at similar hypnotic depth, and also vaguely similar probability curves, many of which were published 10–15 yr ago. Nitrous oxide and ketamine, however, have substantially different neurophysiological effects, and therefore generate profoundly different EEG patterns. As they often induce an increase in high frequency power, any EEG processor ‘trained’ on gaba-ergic agents would interpret this as lightening of anaesthesia. This is not paradoxical, just different physiology—the clinician must use the equipment with a degree of knowledge. It is, however, a limitation of the current class of EEG processors, and in fact, of the concept of using cortical EEG as a proxy of the consciousness level. But we should not give up on it, just as we have not thrown away pulse oximeters for giving false or no readings when there is poor blood flow in the finger.

Declarations of interest

None declared.

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The American experience with bispectral index and regulatory agencies

Editor—Pandit and Cook’s editorial reminded me of the 2004 US experience when the Joint Commission released their awareness guidelines that specifically recommended Aspect’s BIS. The response from ASA and AANA was strong and swift; the Sentinel Event Alert was removed from the JCAHO [now The Joint Commission (TJC)] website and replaced with a far less biased version. This was followed by an announcement that the three organizations together would write a patient information guide on intraoperative awareness. It is unfortunate that TJC first took a unilateral approach and antagonized those most knowledgeable and most affected by their meddling. I hope the UK might learn something from this bit of history.

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