Bispectral index monitors, non-invasive cardiac output monitors, and haemodynamics of induction agents

Editor—We read with great interest the recent article by Petrun and Kamenik1 regarding the use of a bispectral index (BIS) monitor as a guide to induce anaesthesia using an infusion technique with propofol compared with etomidate. This infusion technique is a plausible concept because of the BIS monitoring. Infusion techniques using propofol were performed many years ago, dating back to 1983–7 when BIS monitors were not in clinical use. Minimally invasive monitors to measure cardiovascular haemodynamic variables, such as the Lidco rapid monitor (Lidco cardiac sensor system, Cambridge, UK) were also not in clinical use. According to the authors, the monitor provides beat-to-beat measurements of cardiac index (CI) by analysing the arterial pressure (AP) tracing. The displayed values are nominal and are derived from a population-based nomogram which may not be absolutely accurate. Therefore, the numbers recorded may be even more negative than expressed in the article. In the article, the authors state that CI was never measured in earlier studies using propofol or etomidate. In fact, the first haemodynamic study was performed in 1985 by Lippmann and colleagues2 in the USA, using a Swan–Ganz catheter, and studying the effects of a propofol i.v. bolus given over 30–45 s. CI was decreased by 18 (13)%; cardiac work index and stroke work index also decreased by some 35 (16)% over 2–3 min. Petrun and Kamenik feel that intubation would reverse the decreases in AP and heart rate, which occur especially with propofol. Because propofol is so depressant on the heart and vasodilates the peripheral vascular system so strongly, intubation can only modify it minimally. Therefore, patients are always in a compromised position, especially the elderly and the sick.

Declaration of interest

None declared.

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Bispectral index-guided induction of general anaesthesia

Reply from the authors

Editor—Thank you for the opportunity to reply to the letter of Professors Kakazu and Lippman. We would like to express our gratitude to the authors for their interest in our work.1 Certainly, we are aware of the fact that cardiac output has been measured before/after a propofol infusion. In this respect, the study of Lippmann and colleagues,2 where the effects of propofol and thiopental on cardiac output (measured invasively with the pulmonary artery catheter, PAC) were compared, is extremely valuable.

However, the objective of our study was to compare the effects of bispectral index-guided infusion of propofol and etomidate on cardiac output during the induction of anaesthesia. As stated in the article, we came across four studies where the haemodynamic effects of these two drugs were compared during the induction phase. We are certainly aware of the fact that, at the time of the study by Lippmann and colleagues,2 the authors had no possibility to measure the depth of anaesthesia. As also mentioned in the article, we agree that haemodynamic measurements with the LiDCOrapid monitor are not absolutely accurate. But, in our opinion, such monitoring is sufficient to trace the trends in cardiac output and other haemodynamic parameters, especially when trends of two drugs are compared. Moreover, it is significantly less invasive than PAC and other new calibrated methods like transpulmonary dilution methods. Therefore, it can be used in a much broader population, since it requires only insertion of an arterial line—a routine procedure performed in our institution in this type of surgery.

Declaration of interest

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