A suitable induction agent favorable for ERAS in terms of psychomotor recovery after surgery: Etomidate or propofol

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DESCRIPTION

In the present times of ERAS (Enhanced Recovery After Surgery) there is a need for anaesthetic agents that provide not only optimal operating conditions but also allow rapid recovery after surgery. Psychomotor tests are good tools to assess the recovery from anaesthesia. Propofol has unique pharmacodynamics and pharmacokinetics which favors rapid recovery from anaesthesia (ERAS) and has been widely used in day care surgeries since ages [1-3]. Though widely used, the effect of propofol causing respiratory depression and negative ionotropic effect leads to the need to look for an agent which would allow rapid recovery and also avoid these adverse effects. Etomidate has some of these promising characteristics.

The commonly used psychomotor tests are aiming test, trieger dot test, shape deletion test, address recall test were obtained in the pre-operative room. Waking time, talking time, standing time and walking time are also reliable predictors of recovery after surgery.

As per earlier literature there is enough evidence in support of propofol being a favorable induction agent for ERAS. However there is lack of evidence favoring the use of etomidate in this field of anesthesia. We conducted a prospective randomized trial including 60 patients and concluded that patients induced with etomidate were hemodynamically more stable intraoperatively and recovered earlier from anesthesia favoring an overall early recovery and early discharge of the patient [4].

The concept of ERAS protocol was first pioneered by Prof. Kehlet and Wilmore somewhere in the last decade of the twentieth century [5]. This includes multimodal evidence-based strategies at every step of perioperative care including the rehabilitation phase and the recovery from anesthesia is a very crucial step in achieving this goal.

Several modalities have been studied but no fixed protocol could be derived to aid ERAS. Total intravenous anaesthesia with short acting agents is preferred. Early mobilization aims to reduce skeletal muscle loss and improve respiratory function and oxygen delivery to tissues which in turn optimizes recovery [6].

Propofol (2, 6diisopropyl phenol), undergoes rapid redistribution, metabolism to inactive metabolites, and has a short elimination half-life. These pharmacokinetic characteristics make this a suitable agent for outpatient anaesthesia by allowing rapid recovery of psychomotor and cognitive function.

Etomidate is R-1-(1-ethylphenyl) imidazole-5-ethyl ester intravenous hypnotic agent that acts directly on GABA receptor complex blocking neuroexcitation producing sedation, hypnosis and anaesthesia without analgesia. Etomidate is a preferred drug in hemodynamically unstable patients. It has rapid onset, short duration of action, rapid distribution and very short elimination half-life.

The cardiorespiratory effects of propofol have been compared with other intravenous agents in several studies. The hypotension related to propofol is due to sympathetic inhibition and disturbances in baroreflex mechanisms; however, etomidate preserves hemodynamic stability by maintaining sympathetic responses and preserving autonomic reflexes [7]. Wu et al. also concluded that etomidate preserves hemodynamic stability during anaesthesia [8].

Salimetoklua and team compared etomidate–remifentanil and propofol–remifentanil sedation in patients scheduled for colonoscopy and concluded that the remifentanil combination with etomidate provided better hemodynamic stability with fewer or no respiratory complications than the combination with propofol [9]. Pawar and Malde studied the time course of psychomotor, cognitive and ambulatory recovery after propofol day care anaesthesia and stated that the patients with propofol showed faster recovery than thiopentone and were better oriented [10].

CONCLUSION

From the previous studies discussed above, propofol provides early recovery from anesthesia but at the cost of pain on injection and hemodynamic instability. While etomidate provides a good alternative as an induction agent facilitating early recovery, it can be safely used in all types of short day care surgical procedures such as colonoscopy, electroconvulsive therapy; short gynecological procedures etc. to conclude etomidate would be preferred over propofol for early recovery from anesthesia. We intend to conduct further studies with ASA III and IV patients to look for its efficacy in morbid patients

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