

Effect of intraoperative depth of anesthesia on postoperative pain and analgesic requirement: A randomized prospective observer blinded study

Sir,

We appreciate the interest of Lequeux *et al.* in our article entitled “Effect of intraoperative depth of anesthesia on postoperative pain and analgesic requirement: A randomized prospective observer blinded study.”^[1]

The study was planned on the basis of pilot study and earlier work by Henneberg *et al.* to investigate the effect of intraoperative depth of anesthesia measured by BIS on the postoperative pain response and analgesic requirements in patients undergoing laparoscopic cholecystectomy. A deeper plane of anesthesia provides preemptive analgesia by partially aborting the obnoxious stimuli. In both the groups standard anesthesia technique was used.^[2] Anesthesia was induced with morphine 0.1 mg/kg and propofol 2 mg/kg, while vecuronium 0.1 mg/kg was used to facilitate endotracheal intubation. Anesthesia was maintained with 66% nitrous oxide in oxygen

supplemented by 0.5–1.5% isoflurane in both the groups. Additional dose of propofol was used in group B only when required to maintain the BIS 45–40.

Cheng *et al.*^[3] showed that general anesthesia with propofol is associated with less postoperative pain and morphine use than general anesthesia with isoflurane and this difference is attributed to hyperalgesic state induced by isoflurane-induced inhibition on nicotinic receptors. However, in our study both isoflurane and propofol were used in the two groups. Isoflurane-induced inhibition of nicotinic receptors was possible in both the groups. No definite mechanism for reduction of pain after propofol use has been cited by Cheng *et al.* Thus, it cannot be concluded that lesser amount of propofol used in group S led to increased postoperative pain scores.

Cheng *et al.* used BIS to monitor depth of anesthesia and the value of BIS was maintained as 50. Numerical analogue scores for pain intensity were lower as compared to a previous study by same authors in which a similar protocol was followed but depth was not monitored.^[4] As shown in our study, the deeper plane of anesthesia was possibly responsible for decreased pain intensity in their study too.

The authors have also suggested that the lesser rescue analgesic requirement in our study in the low BIS group could be a result of larger propofol dose use. Hand *et al.*^[5] have shown that intravenous administration of subhypnotic doses of propofol could relieve pain in postoperative period. Their results suggest that propofol given at subhypnotic doses could serve as adjunct for acute postoperative pain management, although no concrete mechanism has been proposed. The larger total dose of propofol used in our study probably has no bearing on lesser intensity of postoperative pain in patients of low BIS group.

Whether propofol has analgesic effects is unclear, given conflicted reports in clinical and experimental pain. The literature also supports negative modulation of pain with the use of isoflurane. We did not consider the total amount of propofol administered because the analgesic effect of propofol has been reported in subhypnotic doses. In view of the difference in pain intensity in two groups lasting up to 24 h, we conclude that maintaining BIS to a value of 45–40, i.e., deeper plane of anesthesia throughout the surgery, results in better postoperative pain relief and decreases requirement of rescue analgesic.

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| Quick Response Code: | Website: www.joacp.org |
|  | DOI: 10.4103/0970-9185.94920 |