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Short Commentary

Lidocaine Perioperative Intravenous Infusion: Effectiveness and Safety

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BACKGROUND

Since the 1960s, since synthetic opioids have been introduced in clinical practice, anesthesia has been based on opioids and has been developed variations of balanced anesthesia combining opioids, inhalation and intravenous anesthetics. As a result we have received a safe and stress free anesthesia but there are also side effects of opioids such as respiratory depression, immunosuppression, muscle central rigidity, respiratory tract obstruction, negative inotropism, nausea, vomiting, hyperalgesia, urinary retention, postoperative ileus, tolerance and drowsiness. Therefore, the actual problem is to avoid these adverse events by reducing of opioid doses. For this purposes lidocaine perioperative intravenous infusion can be helpful but there is luck of evidence about its effectiveness, safety and optimal use for better outcome.

CASE PRESENTATION

This is a prospective non-randomized clinical trial including 185 adult patients of both sex with different types of elective surgery in whom lidocaine perioperative infusion performed. For all patients before induction of anesthesia lidocaine 1.5 mg/kg/h and ketorolac 50 mg had been injected. Patients were divided into two groups: group I-induction with fentanyl 2 μkg/kg, propofol 1.4-2.0 mg/kg, atracurium 0.5 mg/kg., group II-induction without fentanyl, propofol and atracurium- same doses. Anesthesia maintenance-inhalation anesthetic (sevoflurane) 0.8 -1.2 mac, lidocaine 1.5-2 mg /kg/h, MgSO4 30-50 mg/kg, paracetamol 1000 mg, atracurium 0.5 mg/kg/h, fentanyl as needed. Postoperative analgesia-lidocaine 1-2 mg/kg/h during 2-8 h, opioids and nonsteroidal anti-inflammatory medications as needed. In group I (105 patients) fentanyl adjustment was needed in 9 cases (8.6%). In group II for 70% of cases (56 patients) anesthesia was opioid-free. Groups were equal according to types of surgery: major open upper abdominal and colorectal surgery (15 cases), laparoscopic colorectal surgery (29) appendectomy (12), laparoscopic cholecystectomy (77), breast surgery (7), hernia surgery (23), head and neck surgery (12), laparoscopic oesophageal surgery (10). Contraindications were patients with lidocaine allergy, complete atrioventricular block, bradycardia and hepatic insufficiency. In group I propofol dose for induction of anesthesia was significantly lower than in group II (1.42 mg/kg vs 1.83 mg/kg, $p<0.05$). In group II there was a significant hemodynamic reaction on skin incision (rise of heart rate and arterial blood pressure about 30% above baseline) andneed in high MAC (1.2) of sevoflurane during first 30 minutes of surgery. No perioperative complications,no clinical signs of lidocaine toxicity. In all cases immediately after awaking and extubation was a need in opioid analgesia. After 8 h of lidocaine continuous infusion there was a stable analgesia and minimal or no needing in additional opioid or non-opioid analgesia during 24 hour. After laparoscopic colorectal and cholecystectomy surgery postoperative bowel sound recovery time in both groups of patients was practically equal 150 ± 25 min and 152 ± 25 min respectively.

DISCUSSION

Surgical operations requires stress free anesthesia and is ideal for this purpose the using of opiates which are associated with many side effects of drugs. One of the ways to reduce the use of opiates is direct and indirect sympathetic blocking, which is achieved by using lidocaine, $MgSO_4$, inhalation agents, ketamine, clonidine and dexmetodomidine. Their combination with paracetamol and nonsteroidal anti-inflammatory drugs is the cornerstone of non-opioidanesthesia. We did not use dexmetodomidine, clonidine (direct sympathetic blockade) and ketamine and in 70% of cases in group II anesthesia was opiod-free. According to our observations, minimal intraoperative opiod consumption reduces the propofol dose for induction of anesthesia, reduces sevoflurane MAC at the beginning of surgery and gives a better hemodynamic stability then opioid-free anesthesia, with no influence on postoperative bowel recovery. Effectiveness of lidocaine infusion for postoperative analgesia is directly related with duration of infusion. 8 hour continuous lidocaine infusion results in stable analgesia and significant reduction in additional pain killer needing up to 24 hour postoperatively. This observation agrees with the data of other authors according to which if the lidocaine infusion duration is more than 5 hours, it was followed by long term analgesia after the cessation of infusion. There were no perioperative anesthesia related complications, no clinical signs of lidocaine toxicity.

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CONCLUSION

We have demonstrated the safety and effectiveness of lidocaine perioperative infusion for different types of surgery. According to our findings optimal combination of opioids and non-opioid analgesia techniques is essential. Limitation of this study is its retrospective and non-randomized character. Perioperative analgesia is still one of the actual problems of anesthesiology and in this field is great area for prospective randomized trials.