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PAIN ON INJECTION OF PROPOFOL: COMPARISON OF LIGNOCAINE WITH METOCLOPRAMIDE

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SUMMARY

We have conducted a randomized, double-blind study in 255 ASA I and II patients to compare the efficacy of lignocaine and metoclopramide in minimizing the pain of injection of i.v. propofol. When administered immediately before propofol into a dorsal hand vein, compared with placebo both drugs significantly reduced the incidence of pain on subsequent injection of propofol ($P < 0.001$). Twenty patients who had received metoclopramide ($n = 85$) experienced pain, compared with 18 who had received lignocaine ($n = 85$) and 42 who had been pretreated with saline ($n = 85$).

KEY WORDS

Anaesthetics, intravenous: propofol. Complications: pain on injection.

In its original Cremophor formulation, propofol produced pain when given into small hand veins in 39% of subjects [1]; this incidence was reduced to 30% with the emulsion preparation [2]. Attempts have been made to reduce the pain by injection into a large vein, adding local anaesthetic [3], dilution with 5% glucose or the administration of opioids.

We observed that the i.v. injection of metoclopramide before induction of anaesthesia with propofol seemed to reduce the incidence of pain on injection. We report a double-blind comparison of metoclopramide, lignocaine and placebo in reducing the injection pain of propofol. A preliminary report was presented to the American Society of Anesthesiology.

METHODS AND RESULTS

After approval by the local Ethics Committee, we studied 255 patients (ASA grades I and II), aged 16–70 yr, undergoing various elective surgical procedures. Patients with a history of Parkinsonism or those who had poor veins were excluded from the study. Subjects were allocated randomly to receive, on a double-blind basis, normal saline 1 ml, 1% lignocaine 1 ml or metoclopramide 1 ml (5 mg) immediately before injection of propofol. Ampoules were prepared and coded by the hospital pharmacy.

Patients were given diazepam 10 mg by mouth 90–100 min before operation. In the anaesthetic room, a 23-gauge cannula was placed in a dorsal hand vein and, immediately after pretreatment, anaesthesia was induced with propofol 2–2.5 mg kg^{-1} at room temperature administered in 30–40 s. After satisfactory induction of anaesthesia, a cannula was placed in a vein on the dorsum of the contralateral hand, through which all subsequent drugs were administered.

Immediately after the commencement of propofol injection, patients were asked to grade any pain as none, mild, moderate or severe; this was repeated in the recovery ward, at 24 h, 7 days and 14 days after operation. The injection site was examined every day by one of the authors (R.G.) until the patient was discharged from hospital, but patients who were discharged before the second week were asked to return a stamped addressed questionnaire giving a daily record of any redness, pain or swelling which occurred at the site of injection. Chi-square and Fisher's exact tests were used for statistical analyses and the results were considered significant at $P < 0.05$.

The three groups were comparable in age, sex and body weight. Pain on injection and thrombophlebitis are shown in table I. Both lignocaine and metoclopramide significantly reduced pain on injection compared with saline. Five patients in the lignocaine group and six in the metoclopramide group complained of severe pain, compared with 20 in the saline group ($P < 0.001$). There were no significant differences in venous sequelae between the groups.

TABLE I. *Physical characteristics (mean (SD)) and incidence of pain on injection and thrombophlebitis after injection of propofol.* *P < *0.001 compared with saline group*

	Metoclopramide	Lignocaine	Saline
Age (yr) (range 16–70 yr)	47	51	48
Sex (M/F)	44/41	43/42	46/39
Pain	20*	18*	42
Thrombophlebitis	5	4	8

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COMMENT

Metoclopramide (2 methoxy-chloroprocainamide) was first developed as a structural analogue of procainamide and is relatively devoid of local anaesthetic and antiarrhythmic activity. It is a synthetic benzamide and a dopamine (D2) receptor antagonist. Although metoclopramide, in common with morphine, may alter the influx of calcium ions across the membrane to produce a generalized analgesic effect, the mechanism whereby it prevents local pain is unknown. However, a recent investigation in patients undergoing second trimester abortion, showed that morphine requirements were reduced significantly by i.v. metoclopramide. The authors speculated that the drug reduced "spasm" in the Fallopian tubes and it may be on this basis that venous pain is attenuated [4]. Metoclopramide has also been shown to provide analgesia for ureteric colic [5] and improves opioid analgesia when used as an antiemetic in labour [6].

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