I.V. Paracetamol Infusion Is Better Than I.V. Meperidine Infusion For Postoperative Analgesia After Caesarean Section

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Citation

M Inal, N Cel?k, F Tuncay. *I.V. Paracetamol Infusion Is Better Than I.V. Meperidine Infusion For Postoperative Analgesia After Caesarean Section*. The Internet Journal of Anesthesiology. 2006 Volume 15 Number 1.

Abstract

Background: Effective analgesia is important after caesarean section but ın the literature there are no studies on the clinical efficiency of paracetamol (perfalgan) compared to meperidine in the postoperative analgesia after caesarean section. In this study, we compare the quality of analgesia and side effects of paracetamol versus meperidine for postoperative analgesia after elective caesarean section.

Methods: Fifty ASA Ⅰ- Ⅱ parturients undergoing elective caesarean section were included in a randomised double-blind study. The patients were randomly allocated to receive i.v. meperidine 100 mg (n=25) and i.v. paracetamol 1 g (n=25). After the operation VAS scores were all recorded.

Results: In the meperidine group the VAS scores after the operation were higher than paracetamol group. In meperidine group most of the patients had a VAS score higher than seven in the second hour after the operation and had extra analgesics. But in the paracetamol group most of the patients had lower VAS scores in the second hour after the operation and had the first extra analgesic six hours after the operation. Side effects were all similar. In the meperidine group total analgesic consumption were higher than paracetamol group.

Conclusion: Our resuts indicate that i.v. paracetamol has better analgesic potency than i.v. meperidine for postoperative analgesia after caesarean section.

INTRODUCTION

Effective pain management is an important component of postsurgical care. Many patients, however, continue to experience inadequate pain relief ([1]). Despite improvements in analgesic delivery, several recent surveys have found that up to 80% of patients report moderate to severe pain after surgery ([2,3,4]).

Effective analgesia is important after caesarean section to provide the mother, early ambulation and discharge, hence leading to greater overall patient satisfaction.

After caesarean section, parenteral acetaminophen, opioids and NSAIDS are commonly used for postoperative analgesia ([5,6]).

Opioids remain the agents of choice for severe pain; however, this class of analgesics is associated with dose-dependent adverse effects such as nausea, vomiting, ileus, sedation and respiratory depression and prolong the time to readiness for discharge ([7,8]).

Nonopioid analgesics (acetaminophen and NSAIDS) are commonly used alone or as adjuncts to opioid-base analgesia to treat moderate to severe pain ([8]).

In our instutition it is general practice to administer meperidine for post-caesarean section analgesia. Meperidine is a synthetic opioid agonist belonging to the phenylpiperidine class. The onset of action is lightly more rapid than with morphine, and the duration of action is slightly shorter ([9]).

Acetaminophen has a well-established safety and analgesic profile.It has few contrindications and lacks significant drug interactions ([10,11]).

Perfalgan (1g/100ml) is an injectable paracetamol solution in a unit-dose form, ready for infusion. It was introduced into clinical practice in 2002. Various clinical studies show that paracetamol is an effective analgesic drug in the postoperative pain ([11]).

In the literature no data are available on the clinical efficiency of paracetamol (perfalgan) compared to meperidine in the postoperative analgesia after caesarean section.

The purpose of this randomised, double blinded study was to compare the quality of analgesia and side effects of intravenous paracetamol 1 g versus intravenous meperidine 100 mg for postoperative analgesia after elective caesarean section.

METHODS

We studied 50 ASA I women undergoing elective caesarean section. The study was approved by the hospital Ethics Committee and all participants gave informed consent to this double-blind study. Patients with known contraindications for meperidine or paracetamol, a history of alcoholism or drug abuse, phychiatric disease, severe allergic, hepatic, renal, cardiovasculer or pulmonary disease, preeclampsia or eclampsia, hypertension, diabetes and emergency caesarean were excluded from study. Also patients with central or peripheral nervous system disease, chronic abdominal pain or treated with analgesics were not included in the study.

The patients were transported to the operating theatre in the lateral position and 15º left lateral tilt was maintained on the operating table. Pre-medication was omitted. An 18-gauge i.v. cannula was inserted into forearm and standart monitoring (ECG, $Sp0_2$, and non-invasive arteriel pressure) was used.

After 2 min of pre-oxygenation, general anaesthesia was induced with propofol 2 mg kg^{-1} followed rapidly by succinylcholine 1 mg kg^{-1} . Cricoid pressure was applied after loss of consciousness and maintened until airway was secured using a teracheal tube. Anesthesia was maintened with a mixture of nitrous oxide 50% and oxygen 50%. No gases was used until umblical cord was clemped. After recovery from succinylcholine, muscle relaxation was maintened with vecuronium 0.1 mg kg^{-1} . Lungs were mechanically ventilated and normocapnia was maintaned.. Systolic, mean, diastolic arteriel pressures, heart rate and pulsoximetre were recorded every 5 minutes during operation. The time of beginning of anesthesia, times of skin incision, delivery and time of surgery were all recorded.

After the umblical cord was clamped, nitrous oxide was increased to 60% and sevoflurane 1% in oxygen started.

After the umblical cord was clamped, thirty minutes before the end of the surgical procedure, the study medication was administered. The patients were randomly allocated to three groups: 25 patients received 1g/100ml iv paracetamol (Perfalgan, Bristol Myers Squibb, München, Germany)(P group) in 15 minutes and 25 patients received 100 mg meperidine i.v. (Aldolan, Gerot Pharmazeutika, Vienna) (M group) in 15 minutes.

Patients and investigators were blinded to the identity of study treatment.

After extubating the trachea, patients were transferred to the recovery room.

An anaesthesist, who was not part of the anesthesia team, visited the patients at 0, 1,5, 30. minutes and 1, 2, 4, 6, 8 and 24 h after surgery and recorded the pain score at rest on a visuel analogue scale (VAS; 0-10 cm; 0= no pain and 10= worst possible pain).

Side effects including nausea, retching, vomiting, respiratory depression (respiratory rate < 8 breaths·min^{-1} or oxygen saturation < 90% without oxygen supplementation), vertigo, ataxia, somnolence and headache were recorded.

If indicated, side effects were treated as required (oxygen saturation < 90%, two or greater than two episodes of vomiting.

If the patients pain is greater than 7 according to VAS or moderate pain according to VRS rescue analgesic is used.The total rescue analgesic requirement during 24 h was recorded.

Statistical calculations were performed using SPSS 12.0 (SPSS, Chicago, IL, USA). We used independent t-test to analyse non-continous data and the Mann-Whitney U-test for continous data. A value of $P<0.05$ was considered statistically significant.

RESULTS

Demographic data concerning the patients age, height, weight, duration of anesthesia and duration of surgery were similar in all the study groups (Table 1). The evolution of

pain intensity displayed different in the two treatment groups; in meperidine group the pain intensity increases with hours and made a peak level in the second hour after the operation. So the patients had a VAS score more than seven and a rescue analgesic was given to the patient. But in paracetamol group also pain intensity increases in hours but the peak level is 6 hours after the operation. Most of the patients in paracetamol group had a VAS Score more than seven at sixt hour after the operation.The time to the first request for supplemental analgesia after injection of the study drugs was approximately three times as long with the paracetamol compared with meperidine. Mean VAS scores and time were shown in table 2. The rescue analgesic treatment was different in paracetamol and meperidine groups.Total analgesic consumption was higher in meperidine group.15 patients in meperidine group were taken three doses of rescue analgesic but 3 patients in paracetamol group take three doses of rescue analgesics. This was shown in table 3. The side effects were all similar in the two treatment groups. 2 patients in meperidine group and 3 patients in paracetamol group had itching and 7 patients in meperidine and paracetamol group had nausea. No respiratory depression, vertigo, ataxia, somnolance and headache was observed in this study.

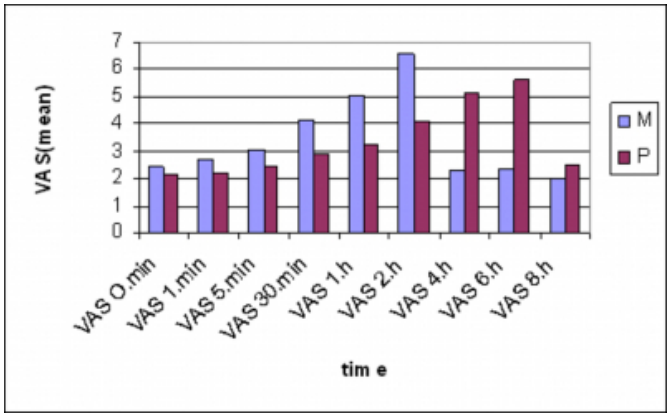
Figure 1

Table 1: Demographic Data

Variable	Meperidine Group	Paracetamol Group
Age (yr)	29.6±3.51	30.6±4.23
Height (cm)	155.08±2.84	154.32±3.07
Weight (kg)	79.32±7.44	78.44±6.89
Duration of surgery (min)	37.2±3.4	36.4±2.70
Duration of Anesthesia (min)	49.4±14.8	50.0±12.6

Figure 2

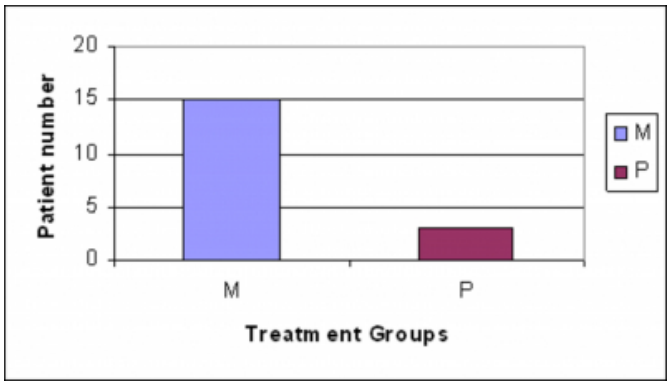
Table 2: Mean VAS Scores after operation



M: Meperidine GroupP: Paracetamol Group

Figure 3

Table 3: Total analgesic consumption



M: Meperidine GroupP: Paracetamol Group

DISCUSSION

The object of our study was the comparison of meperidine and paracetamol as an iv application form for postoperative analgesia after caesarean section.

Meperidine has been a drug in question during recent decades becouse of its possible complications respiratory depression and low-risk of abuse.

Opioids are associated with respiratory depression and prolong the time to readiness for discharge ([7,8]). Non-opioids are not associated with this side effects.

The development of perfalgan, a ready-to-use infusion of paracetamol, motivated us to compare the clinical efficiency of iv paracetamol and iv meperidine on a 24 h period.

To our knowledge, to this date there is no study that compared iv paracetamol and iv meperidine for postoperative pain after caesarean section.

Paracetamol (acetaminophen), a non-opioid centrally acting analgesic, is widely prescribed.

Perfalgan* (1g/100ml) is an injectable paracetamol solution in a unit dose form, ready for infusion. It was introduced into clinical practice in 2002. iv administration of paracetamol has already demonstared its analgesic efficiency in patients with postoperative pain following gynecologic surgery ([13,20]), retinal surgery ([14]), dental surgery ([15,16]), hand surgery ([17]), spinal fusion surgery ([18]) and orthopedic surgery ([8,19]).

Previous studies have shown meperidine to be an effective postoperative analgesia following caserean surgery ([21]) and orthopedic surgery ([22]).

In this randomized and double-blinded postoperative study, parenteral paracetamol showed significantly superior analgesic effects compared with meperidine.

In the literature there was no data about the comparison of i.v meperidine and paracetamol.

Varrassi et al ([13]) compared the analgesic efficiency and tolerability of proparacetamol and ketorolac after gynecologic surgery. In this study they demostrate that the relative morphine requirement of the proparacetamol group was similar to that of the ketorolac group. This suggests that proparacetamol is effective in the management of postoperative pain when combined with an opioid analgesic. Side effects were all similar.

Landwehr et al ([14]) compared iv paracetamol and metamizol for postoperative analgesia after

retinal surgery. They found that i.v paracetamol and i.v metamizol had similar analgesic effects and effective analgesic effects on control group.

Another study that compared morphine and proparacetamol after dental surgery made by Aken et al ([16]). found that there was no difference between morphine and paracetamol. Adverse effects were significantly larger in the morphine group.

Rawal et al ([17]). compared oral metamizol, oral tramadol and iv paracetamol for the postoperative analgesia at home after ambulatory hand surgery. This study showed that tramadol provided the most effective analgesia as compared with the other groups. But in this study, side effects were higher in tramadol group.

Gin et al ([21]). compared intramuscular ketorolac and meperidine for analgesia after caesarean section. They showed that there were no difference between the two agents.

The analgesic drugs in this study have different mechanisms of effect. Acetaminophen has analgesic and antipyetic effects similar to aspirin, but neither the site nor the mechanism of the analgesic effect of acetaminophen has been clearly defined([23]). It is generally throught to be mediated peripherally ([24]), through evidence suggests a direct action within the central nervous system([25]). Meperidine is a centrally-acting analgesic with a weak affinity for μ-opioid receptors. It also modifies pain transmission by inhibiting neuronal noradrenaline and serotonin uptake, as well as stimulating the release of serotonin([26]).

After caesarean section, parenteral acetaminophen, opioids and NSAIDS are commonly used for postoperative analgesia. For this patients the analgesic agent must be effective. Also breast feeding was another problem. The agents must not transfer to the baby with milk.

Meperidine and paracetamol were videly used for postoperative analgesia and previous studies shown that they can use in breast-feeding women([27]).

In conclusion, our resuts indicate that iv paracetamol 1g has better analgesic potency and less side effects than 100 mg meperidine for postoperative analgesia after caesarean section.

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