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Original Research

Efficacy of continuous wound infiltration versus continuous epidural infusion technique in abdominal surgery

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ABSTRACT:

Background: In major abdominal surgery, different analgesic techniques such as systemic intravenous patient-controlled analgesia (PCA) or regional techniques, such as epidural analgesia (EDA), are established standard procedures for effective perioperative pain control. The present study was conducted to compare analgesic efficacy of continuous wound infiltration with continuous epidural infusion technique. **Materials & Methods:** 94 patients aged 30–60 years were divided into 2 groups of 47 each. Group I were given continuous epidural infusion (CEI) and group II were given (CWI). The catheter (epidural/wound infiltration) was inserted in group I before induction) and group II at the end of surgery. The primary outcome was the visual analogue score at rest (VASR) and at deep breathing (VASDB) post-operatively. Secondary outcomes were post-operative morphine consumption, side effects and patient satisfaction. **Results:** ASA I was seen in 27 in group I and 22 in group II and ASA II in 10 in group I and 15 in group II. VAS at rest was 3.2 in group I and 3.9 in group II and VAS at deep breathing was 2,4 in group I and 3.8 in group II. The mean time for PCA was 42.5 minutes in group I and 36.4 minutes in group II, hospital stays was 3.34 days in group I and 3.10 days in group II, total postoperative morphine consumption (mg) was 8.2 in group I and 8.9 in group II. PONV impact score 0 was seen in 26 in group I and 22 in group II, 1 in 7 and 10, 2 in 3 each and 3 in 1 in group I and 2 in group II. Wound complication was seen in 1 in group I and 2 in group II. The difference was significant (P< 0.05). **Conclusion:** CEI is a superior analgesic technique compared to CWI in total abdominal hysterectomy in terms of reduced pain scores.

Key words: Abdominal surgery, Continuous epidural infusion, Deep breathing

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INTRODUCTION

Pain after gynaecological surgeries is often undertreated as it is assumed to be associated with lower pain intensity. This under treatment of pain leads to patient dissatisfaction and other complications. The patient mobility, length of hospital stay and recovery can be hastened by using effective analgesic methods.[1]

In major abdominal surgery, different analgesic techniques such as systemic intravenous patient-controlled analgesia (PCA) or regional techniques, such as epidural analgesia (EDA), are established standard procedures for effective perioperative pain control.[2] However, the ideal analgesic technique in abdominal surgery remains unclear and further RCTs are needed. More recently new locoregional analgesic techniques like continuous wound infiltration (CWI), in which a local anaesthetic is continuously applied into the laparotomy wound via an elastomer pump, have been developed as potential alternatives to address drawbacks of EDA and PCA.[3]

While epidural infusion with local anaesthetics could provide adequate analgesia, it is also associated with complications such as hypotension, motor blockade, epidural haematoma and epidural abscess.[4] The continuous wound infiltration (CWI) catheter technique has been found to be effective in many surgeries including abdominal hysterectomy. Although the CWI catheter could be placed in several planes, we had planned to use it in the preperitoneal plane.[5]

EDA has been criticised for causing rare, but serious adverse events, its multiple contraindications, high failure rates, associated high personal and material costs and the associated immobilization patients due to equipment and urinary catheters. Despite these

disadvantages, EDA compares favourably to systematic opioid use in some surgical specialties and for high- risk patients.[6] The present study was conducted to compare analgesic efficacy of continuous wound infiltration with continuous epidural infusion technique.

MATERIALS & METHODS

The present study was conducted among 94 patients aged 30–60 years belonging to the American Society of Anaesthesiologists physical Status 1 and 2. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 47 each. Group I were given continuous epidural infusion (CEI) and group II were given (CWI). The catheter (epidural/wound infiltration) was inserted in group I before induction) and group II at the end of surgery. General anaesthesia was administered according to standard protocol. At the end of surgery, both groups received 10 mL bolus of 0.2% ropivacaine followed by infusion at 6 mL/h through the respective catheters. They also received intravenous patient-controlled analgesia with morphine. The primary outcome was the visual analogue score at rest (VASR) and at deep breathing (VASDB) post-operatively. Secondary outcomes were post-operative morphine consumption, side effects and patient satisfaction. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Demographic data

Parameters	Group I	Group II	P value
ASA (I/II)	27/10	22/15	0.18
VAS at rest	3.2	3.9	0.05
VAS at deep breathing	2.4	3.8	0.02

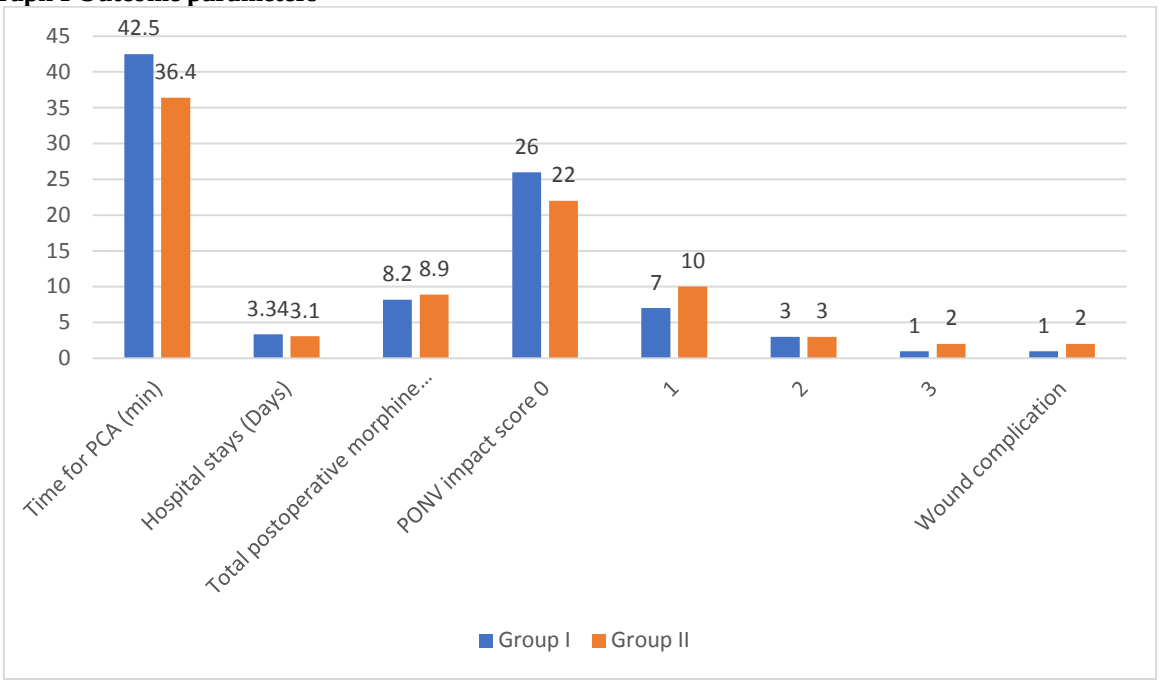
Table I shows that ASA I was seen in 27 in group I and 22 in group II and ASA II in 10 in group I and 15 in group II. VAS at rest was 3.2 in group I and 3.9 in group II and VAS at deep breathing was 2,4 in group I and 3.8 in group II. The difference was significant (P< 0.05).

Table II Outcome parameters

Parameters	Group I	Group II	P value
Time for PCA (min)	42.5	36.4	0.18
Hospital stays (Days)	3.34	3.10	0.05
Total postoperative morphine consumption (mg)	8.2	8.9	0.02
PONV impact score 0	26	22	0.04
1	7	10	
2	3	3	
3	1	2	
Wound complication	1	2	0.05

Table II, graph I shows that mean time for PCA was 42.5 minutes in group I and 36.4 minutes in group II, hospital stays was 3.34 days in group I and 3.10 days in group II, total postoperative morphine consumption (mg) was 8.2 in group I and 8.9 in group II. PONV impact score 0 was seen in 26 in group I and 22 in group II, 1 in 7 and 10, 2 in 3 each and 3 in 1 in group I and 2 in group II. Wound complication was seen in 1 in group I and 2 in group II. The difference was significant (P< 0.05).

Graph I Outcome parameters



DISCUSSION

A number of additional advantages like enhanced pain control, reduced consumption of anaesthetics, reduction of the surgical stress response and early bowel recovery have been postulated for EDA, however overall evidence is sparse.[7] Furthermore, depending on trial design, study population, and comparators the effect of EDA on clinically relevant outcomes such as morbidity and mortality are heterogeneous. CWI could potentially circumvent EDA-associated problems as placement into the laparotomy wound is fast and simple and the technique does not carry the risk of potentially detrimental epidural hematoma or infection.[8] Also, CWI has already been shown to successfully treat postoperative pain and a number of trials have established the equivalent analgesic potential of CWI vs. EDA following abdominal surgery.[9] The present study was conducted to compare analgesic efficacy of continuous wound infiltration with continuous epidural infusion technique.

In present study, ASA I was seen in 27 in group I and 22 in group II and ASA II in 10 in group I and 15 in group II. VAS at rest was 3.2 in group I and 3.9 in group II and VAS at deep breathing was 2,4 in group I and 3.8 in group II. Ammianickal et al[10] compared postoperative pain scores of CEI with CWI in patients undergoing total abdominal hysterectomy (TAH). This prospective randomised controlled trial included 102 patients planned for TAH who were randomised into either Group E (CEI) or Group L (CWI). The mean VASR between two groups were comparable up to 8 h. Group E showed significantly reduced VASR compared to Group L at 12 h (2.32 ± 0.59 vs 2.62 ± 0.67, P = 0.019) and 24 h (2.30 ± 0.58 vs 2.62 ± 0.57, P = 0.006). Group E showed significantly reduced VASDB compared to Group L at 5 min and from 4 to 24 h. Total morphine consumption, side effects and patient satisfaction were comparable.

We found that mean time for PCA was 42.5 minutes in group I and 36.4 minutes in group II, hospital stays was 3.34 days in group I and 3.10 days in group II, total postoperative morphine consumption (mg) was 8.2 in group I and 8.9 in group II. PONV impact score 0 was seen in 26 in group I and 22 in group II, 1 in 7 and 10, 2 in 3 each and 3 in 1 in group I and 2 in group II. Wound complication was seen in 1 in group I and 2 in group II. Klotz et al[11] compared epidural analgesia (EDA) with continuous wound infiltration (CWI) in respect to postoperative complications and mobility to design a future multicentre randomized controlled trial. Interventions CWI with local anaesthetics (experimental group) vs. thoracic EDA (control). Results Of 846 patients screened within 14 months, 71 were randomized and 62 (31 per group) included in the intention-to-treat analysis. Mobility was assessed in 44 of 62 patients and revealed no differences within the first 3 postoperative days. Overall morbidity did not differ between the two groups (measured via the comprehensive complication index). Median pain scores at rest were comparable between the two groups, while EDA was superior in pain treatment during movement on the first, but not on the second and third postoperative day. Duration of preoperative induction of anaesthesia was shorter with CWI than with EDA. Of 17 serious adverse events, 3 were potentially related to EDA, while none was related to CWI.

CONCLUSION

Authors found that CEI is a superior analgesic technique compared to CWI in total abdominal hysterectomy in terms of reduced pain scores.

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