Clonidine versus Morphine as additives to Bupivacaine in patient-controlled epidural analgesia for postoperative pain after abdominal hysterectomy

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Background and goal of study:

We planned this study to compare in terms of analgesic effect and safety, the value of clonidine and morphine, used as adjuvants to local anaesthetic, in patient-controlled epidural analgesia (PCEA) after abdominal hysterectomy with midline laparotomy.

Materials and methods:

Randomized, double-blind, prospective study

Fig. 3: Time to first bolus request in our groups
Time to first bolus request was found significantly longer in group C versus group M.

Fig. 6: Hemodynamic status

Primary outcomes: the quality of pain control (VAS) at rest and after coughing, assessed 6 hourly; time to first bolus request; total analgesic consumption via PCEA; consumption of rescue analgesic.

Secondary outcomes: hemodynamic status; incidence of sedation and nausea/vomiting; patient satisfaction (assessed by a four point scale: 0=poor, 1=fair, 2=good, 3=excellent).

Results and Discussions:

Demographic variables did not differ significantly among the two groups. None of the patients were excluded from the study.

According to the recorded VAS scores, acute postoperative pain was significantly better controlled, both at rest and after coughing, in group C compared to group M. Clonidine, an α_2 -adrenergic agonist, has analgesic properties and, when added to bupivacaine solution via PCEA, has synergistic effect on local anaesthetic.

Group	VAS at 6h	VAS at 12h	VAS at 18h	VAS at 24h
Group C	0.88+/-0.09	1.08+/-0.56	1.15+/-0.94	1.33+/-0.74
Group M	1.38+/-0.49	2.04+/-0.79	2.42+/-0.56	2.67+/-0.82
p	<0.05	<0.05	<0.05	<0.05

Fig. 1: VAS at rest during study period

Group	VAS at 6h	VAS at 12h	VAS at 18h	VAS at 24h
Group C	1.38+/-0.76	1.94+/-0.58	2.11+/-0.57	2.27+/-0.67
Group M	2.04+/-0.62	2.72+/-0.60	3.00+/-0.69	3.46+/-0.49
p	<0.05	<0.05	<0.05	<0.05

Fig. 2: VAS after coughing during study period

The interpretation of our results in conjunction with these observations could explain the advantages of clonidine compared to morphine regarding the quality of postoperative analgesia in abdominal hysterectomy women.

Fig. 4: Total analgesic consumption via PCEA

Fig. 5: Rescue analgesic requirements

The analysis of cumulative volume of analgesic solution used by the two groups during study period revealed that group C requested lower PCEA analgesic consumption.

Dose of rescue analgesic required by group C was significantly less compared to that of group M. Thus, our results demonstrated that clonidine was more potent than morphine when added to bupivacaine via PCEA, in increasing duration of postoperative analgesia and reducing cumulative volume of analgesic solution as well as the need for systemic rescue analgesic.

Systolic blood pressure, as well as heart rate were lower in group M, the difference being statistically significant. However, the fall in both hemodynamic parameters was not clinically deleterious since, according to our recordings, heart rate was more than 50 beats/min and the decrease in systolic blood pressure was less than 15% of baseline during study period.

Concerning sedation, this adverse effect appeared more prominent in group M compared to group C. However, sedation was mild in all cases and did not adversely affect the early postoperative evolution.

Although nausea/vomiting remains a common side effect of postoperative analgesia, patients in group C experienced lower incidence of this event versus those of group M. The low dose of clonidine added to bupivacaine and delivered by PCEA could explain such a distribution of side undesirable events, favorable to group C.

Overall satisfaction concerning pain management regimen was good to excellent in both groups, but 37 patients in group C, respectively 19 patients in group M were fully satisfied by the degree of their pain relief.

Fig. 7: Incidence of sedation

Fig. 8: Incidence of nausea/vomiting

Fig. 9: Patient satisfaction with analgesic regimen

Conclusions:

Our study concluded that, when administered through PCEA, a solution of 0.125% bupivacaine plus clonidine 1 mcg/ml provided optimal pain control without associated clinically significant morbidity, thus being a better option than combination 0.125% bupivacaine - morphine 0.1mg/ml for acute postoperative analgesia in abdominal hysterectomy patients.

Selective bibliography:

- Comparison of effect of epidural bupivacaine, epidural bupivacaine plus fentanyl and epidural bupivacaine plus clonidine on postoperative analgesia after hip surgery. **Kamawat R et al.**, J. Anesth. Clin. Res. 2013, 4:12.
- Role of clonidine as adjuvant to intrathecal bupivacaine in patients undergoing lower abdominal surgery: a randomized control study. **RB Singh et al.** Anesth. Essays Res. 2014 sep-dec; 8(3): 307-312.