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ORIGINAL ARTICLE

Use of epidural clonidine for the management of analgesia in the opioid addicted parturient on buprenorphine maintenance therapy: an observational study

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ABSTRACT
Objectives: Management of labor analgesia and post-cesarean delivery pain is challenging in the patient taking buprenorphine as opioid addiction maintenance therapy. We observed whether substituting clonidine for fentanyl in an epidural solution would provide adequate analgesia for labor and after cesarean delivery.
Methods: We substituted our standard 2 μg/mL fentanyl in 0.0625% bupivacaine epidural solution with 2 μg/mL clonidine in 0.0625% bupivacaine, or 1.2 μg/mL clonidine in 0.1% bupivacaine, for labor and post-cesarean analgesia in parturients on buprenorphine therapy. All cesarean deliveries were performed with a combined spinal-epidural technique and the catheters maintained for immediate postoperative analgesia using an epidural infusion. Catheters were discontinued the next day and patients were then managed with other analgesics based on obstetric preference. We recorded pain scores during labor and in the immediate post-surgical period; and supplemental medications given after epidural catheter removal.
Results: Fourteen patients were included in the study, of whom seven presented in spontaneous labor and seven had elective cesarean delivery. All laboring patients achieved good analgesia, and five of seven avoided supplemental opioid use in the postpartum phase. Of the postsurgical patients, six of seven had pain scores less than 5/10 at epidural catheter removal and three of seven avoided supplemental opioids postoperatively.
Conclusions: The combination of clonidine and bupivacaine appears effective in parturients on buprenorphine therapy for opioid addiction maintenance. As study numbers were small and several factors were not examined, further confirmatory research is needed, including to determine the ideal dose of epidural clonidine in this setting.

Keywords: Buprenorphine; Clonidine; Analgesia; Labor; Epidural; Post-cesarean; Opioid addiction

Introduction

Illicit drug use is at its highest point this decade, with about 4.5% of pregnant women aged 15–44 years using illicit or prescription opioid medications.[1,2] Opioid dependence during pregnancy is associated with both obstetric and neonatal complications. Pharmacological treatment of opioid dependence with a mu-opioid receptor agonist improves both maternal and fetal outcomes in opioid-addicted mothers.[3] Both methadone and buprenorphine are approved medications for opioid addiction maintenance therapy but have different mechanisms of action. Buprenorphine is a partial μ-receptor agonist with a very high receptor affinity, making it difficult to displace from the binding site. As such, pain management with traditional opioids for labor and after cesarean delivery is challenging for women on this therapy. Pain scores are consistently higher and opioid requirements can increase as much as 70% following a

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cesarean delivery.[4] Consequently, to achieve pain control patients require either greatly elevated doses of other opioids, such as fentanyl, or a multimodal approach using analgesics with other sites of action.

Clonidine is an α_2-adrenergic agonist that provides analgesia when given as a neuraxial injection. Used as an adjuvant in lieu of opioids in a labor epidural solution, it can provide a local anesthetic dose-sparing effect and does not appear to have significant side effects.[5] This suggests clonidine may be a reasonable substitute analgesic for neuraxial opioids in opioid addicted parturients.

Increasing numbers of women on buprenorphine therapy are presenting to our labor unit. From past experience, we noted that our traditional labor and post-cesarean pain management regimens were inadequate for these women. We hypothesized that the substitution of clonidine for fentanyl in our epidural solution would improve pain scores. We report our observational experience using this substitution for pain management in this population.

Case series

Our observational series consisted of 14 patients maintained on buprenorphine therapy for opioid addiction. Institutional Review Board approved this study as exempt research. As our standard bupivacaine/fentanyl/epinephrine infusion solution did not provide adequate analgesia in these patients, we exchanged clonidine for fentanyl and the epinephrine was removed. During initial consultation, the benefits of analgesia with clonidine (without additional opioid) were discussed as well as the potential side effects (hypotension, bradycardia, sedation). Seven patients presented in active labor and seven presented for elective cesarean delivery. Demographic and antenatal buprenorphine dosing data are summarized in Table 1. All patients were maintained on their daily buprenorphine dose throughout their peripartum stay.

Patient data were separated by delivery mode. No patient converted from labor to a cesarean delivery in this series. The Pain Numeric Rating Scale was used to assess pain, as is standard in our institution.

Spontaneously laboring patients requesting labor analgesia had their epidural initiated with 10 mL of our standard epidural bolus solution (0.125% bupivacaine, 5 μg/mL fentanyl and 1.2 μg/mL epinephrine) which is stored on our labor unit and available for immediate use. Meanwhile the Pharmacy Department prepared and transported the bupivacaine/clonidine epidural solution for use as a continuous solution. The infusion solution of 1.2 μg/mL clonidine and 0.1% bupivacaine was started at 10 mL/h with a patient-controlled bolus option of 5 mL every 15 minutes.

Table 2 shows the infusions used and pain scores attained in the pre- and immediate post-epidural placement periods in the labor group. All patients received the prepared clonidine solution except patient 4. She was given a combined spinal-epidural (CSE) with 10 μg intrathecal fentanyl and 1.2 mg bupivacaine before being placed on a 0.0625% bupivacaine with 2 μg/mL clonidine mixture that her anesthesiologist had customized. Initial analgesia was inadequate and she was rescued with 100 μg of epidural clonidine before achieving her score of 0/10 after 10 minutes.

Data were not collected on the number of times a patient used her bolus option and labor nurses inconsistently recorded pain scores during labor. However, no patient requested a provider-supplied bolus to

Table 1 Patient data and buprenorphine dose antenatally

Delivery mode	Age (y)	Gravida (n)	Para (n)	Gestational age (wk/days)	Buprenorphine dose (mg/day)	Buprenorphine dosing frequency
				Vaginal delivery		
1	24	2	1	37/4	24	BID
2	30	2	1	37/6	24	TID
3	25	3	2	37/5	16	BID
4	24	2	1	36/4	16	BID
5	27	3	2	41/1	16	TID
6	25	1	0	36/4	8	BID
7	27	2	1	39/3	2	QD
				Cesarean delivery		
8	20	1	0	34/3	16	BID
9	30	2	1	39	8	BID
10	26	5	4	37	8	QD
11	25	4	3	39/6	24	BID
12	26	6	2	38/6	8	BID
13	24	3	2	35/1	8	BID
14	25	1	0	39/3	2	BID

BID: twice daily; TID: three times daily; QD: daily.

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