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CORRESPONDENCE

Continuous wound infusion combined with intrathecal morphine for analgesia after Cesarean delivery compared with intrathecal morphine or continuous wound infusion alone

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To the Editor,

Cesarean delivery (CD) is associated with intense postoperative pain that may hamper the rehabilitation process. Although numerous previous studies have evaluated the efficacy of continuous wound infusion (CWI) and intrathecal morphine (ITM), their combination for pain management has been seldom described.[1,2] We therefore sought to investigate the benefits of adding CWI to ITM for post-CD analgesia.

We conducted a double-blinded single-centre randomized controlled trial approved by the Ethics Committee (CPP Est III) at the University Maternity of Nancy, France. The study was registered at ClinicalTrials.gov (NCT02279628) and EudraCT (EUDRACT 2012-004498-14). Parturients undergoing elective CD were randomized to the following postoperative analgesia groups: CWI with ropivacaine 0.2% and intrathecal saline (CWI group), ITM (100 μg) plus saline CWI (ITM group), or CWI with ropivacaine 0.2% plus ITM (CWI+ITM group). All patients received spinal anaesthesia with hyperbaric bupivacaine 0.5% (10 mg), 2.5 μg sufentanil, and 100 μg (1 mL) morphine or 1 mL normal saline depending on the group, and a multiorificed wound catheter. At wound closure, a bolus of 20 mL of either normal saline or ropivacaine 0.2% was administered through the wound catheter, followed by an infusion at 7 $mL \cdot hr^{-1}$ for 24 hr. All patients received multimodal analgesia (acetaminophen, ketoprofen, and intravenous patient-controlled analgesia with morphine). The primary outcome was cumulative postoperative morphine consumption at 48 hr. Secondary outcomes were the incidence of adverse effects, postoperative pain scores (visual analogue scale [VAS]), and chronic pain scores at three months (Douleur Neuropathique 4 [DN4] scores). We calculated the sample size partly based on data from research comparing wound infiltration *vs* placebo.[3] Assuming a mean 48 hr morphine consumption in the CWI, ITM, and ITM+CWI groups of 25 mg, 14 mg, and 10 mg,

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Table 1 Maternal characteristics and postoperative data at H48 (morphine consumptions, visual analogue scale [VAS] [0–100] at rest and movement, side effects)

	ITM *N* = 27	CWI *N* = 26	ITM + CWI *N* = 26	*P* value
Body mass index ($kg \cdot m^{-2}$), median [IQR]	29 [26–33]	27 [24–31]	25 [25–32]	
Gestational age (weeks), median [IQR]	39 [38–39]	38.5 [38–39]	39 [38–39]	
History of Cesarean delivery, *n*/total *N* (%)	18/27 (67%)	14/26 (53%)	17/26 (65%)	
Morphine consumption (mg), median [IQR]	5 [2–9]	22 [11–27]	4 [1–13]	< 0.0001
VAS at rest at 48 hr, median [IQR]	0 [0–15]	40 [0–25]	10 [0–20]	0.54
VAS at movement at 48 hr, median [IQR]	27 [20–35]	20 [10–35]	22 [10–40]	0.48
Pruritus, *n*/total *N* (%)	8/27 (31%)	3/26 (12%)	7/26 (30%)	0.25
Urinary retention, *n*/total *N* (%)	0/27 (0%)	0/26 (0%)	0/26 (0%)	1.00
Vomiting, *n*/total *N* (%)	4/27 (15%)	0/26 (0%)	0/26 (0%)	0.03
Sedation, *n*/total *N* (%)	2/27 (8%)	1/26 (4%)	1/26 (4%)	1.00

CWI = continuous wound infusion; IQR = interquartile range; ITM = intrathecal morphine

with a standard deviation of 7 mg, respectively, we determined that at least 49 patients per group were needed to detect a difference of 4 mg of morphine with 80% power and a two-sided alpha of 0.05.

Because of a low recruitment rate (due to changes in French recommendations regarding scheduled CD indications), we enrolled 79 patients instead of the 147 initially planned. Baseline patient characteristics are shown in the Table. Median morphine consumption during the first 48 postoperative hours was significantly lower in the ITM group and ITM+CWI group than in the CWI group (Table). There was no difference in morphine consumption between the ITM and CWI+ITM groups. There were no differences in postoperative pain scores at rest or during activity, first ambulation, and side effects, with the exception of a higher incidence of vomiting in the ITM group (Table). Three months after CD, 40%, 57%, and 41% of women in the ITM, CWI, and ITM+CWI groups reported persistent pain, respectively.

Our results are consistent with those reported in two previous studies that reported on opioid consumption with CWI plus ITM after CD.[1,2] Morphine requirements in the CWI group were significantly higher than in groups receiving ITM as reported in the literature.[4,5]

Limitations of our study include the single-centre design and the low sample size, which rendered the study underpowered. Nevertheless, we would consider it unlikely based on the overall similar morphine consumption and VAS scores in the ITM *vs* ITM+CWI groups that CWI in addition to ITM offers a clinically important advantage for analgesia after Cesarean delivery.

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