The author and operating staff of this case thank Thomas Lajos, M.D. and his cardiac surgical team. Without their efficient response to our call for help, the outcome would have been much different.

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Anesthesiology
74:1153-1155, 1991

Early Respiratory Depression Following Intrathecal Fentanyl-Morphine Combination

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The use of spinal opioids is becoming increasingly popular in anesthesiology for the control of postoperative and obstetric pain. Morphine has enjoyed widespread acceptance when used epidurally, and the use of intrathecal morphine, particularly in obstetrics, is also increasing. Recent reports regarding the use of intrathecal fentanyl and of opioid combinations including fentanyl in obstetric patients have indicated they may have advantages over morphine while having a lower risk of respiratory depression.† The following case report illustrates that this perceived safety may be unwarranted.

CASE REPORT

A 23-yr-old gravida II, para 0 woman at 39 weeks gestation presented late in the evening complaining of labor pains. A diagnosis of breech presentation had been made by her obstetrician 2 weeks earlier, and after extended discussion, the patient and her obstetrician opted for an elective cesarean delivery. Examination at the time of presentation to the labor suite confirmed the breech presentation, cervical dilation to 2 cm, and an active labor pattern. In preparation for an urgent cesarean delivery, preoperative anesthetic evaluation revealed an unremarkable medical history. Physical examination revealed a 67.5-kg, 160-cm woman in mild distress due to labor pain and was otherwise unremarkable. A subarachnoid blockade was planned to facilitate delivery.

Following hydration with 2 l lactated Ringer’s solution, the patient was positioned sitting on the operating room table. Preservative-free morphine 0.2 mg and fentanyl 15 μg (total volume 0.7 ml) was drawn into a 1-ml tuberculin syringe; this was added to 100 mg hyobaric lidocaine in 5% dextrose. Dural puncture was performed with a 26-G spinal needle at the L3–L4 interspace with return of clear cerebrospinal fluid (CSF). The anesthetic-opioid combination was injected, and the patient was placed in the supine position with left uterine displacement. A sensory level of T3 bilaterally was confirmed using the response to fluoromethane spray. Surgery proceeded uneventfully with delivery of a healthy girl, with Apgar scores of 8 (1 min) and 9 (5 min).

Approximately 25 min after initiation of the subarachnoid blockade, following delivery of the infant, the patient became rather abruptly somnolent. The only further medications that had been administered were oxytocin 20 μl/added to the intravenous infusion and cefoxitin 2 g intravenously. Blood pressure and heart rate were stable at 110/55 mmHg and 88 beats per min, respectively. The patient was arousable verbally with moderate tactile stimulation and was otherwise appropriate, saying she felt very sleepy. Initially it was believed that the relief she felt after a stressful evening may have been the cause of her fatigue until the patient’s hemoglobin oxygen saturation (SPO2) began to decrease and her observed respiratory rate became 2–4 breaths per min. Oxygen 10 l/min via face mask, which had been removed after delivery, was reapplied, and with occasional prompting to take a deep breath, SPO2 > 90% was maintained throughout the remainder of the case.

On admission to the postanesthesia care unit (PACU), 45 min after initiation of the block, the patient was arousable to vigorous verbal stimulation; her blood pressure was 95/48 mmHg, her pulse 70 beats per min, and her respirations irregular with apneic periods of greater than 30 s. Level of sensory anesthesia to fluoromethane spray was again noted to be T5 and her grip strength good, with no apparent weakness of the upper extremities. When the patient did not arouse spontaneously after several minutes of observation, naloxone 0.08 mg was administered intravenously, with little apparent effect. This dose was repeated twice more. After the last dose (total naloxone administered, 0.24 mg) the patient became more alert and talkative, and

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Received from the Department of Anesthesiology, University of Arizona Health Sciences Center, Tucson, Arizona. Accepted for publication February 25, 1991.
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Key words: Analgesics, intrathecal: fentanyl; morphine. Complications: respiratory depression.
CASE REPORTS

Intrathecal fentanyl and bupivacaine to provide anesthesia for cesarean delivery. They found that the addition of 6.25 µg or more fentanyl to the bupivacaine anesthetic resulted in prolongation of the duration of both complete pain relief and effective analgesia. Further, they reported no adverse respiratory effects from the administration of the fentanyl. Their assessment of respiratory function was limited to observation of respiratory rate. Leighton et al. reported the use of a combination of intrathecal fentanyl and morphine for labor analgesia and also reported no adverse respiratory effects. No reports of the effect of intrathecal fentanyl on either arterial carbon dioxide tension or carbon dioxide response curves are available. Other groups have reported the use of intrathecal fentanyl, sufentanil, and meperidine for labor analgesia.

In the case reported above, the onset of respiratory depression was heralded by a decrease in SpO2. Given the decrease in functional residual capacity in the parturient woman and the alteration of respiratory mechanics associated with subarachnoid anesthesia at cesarean delivery, a marked degree of desaturation could have occurred in a very short time had pulse oximetry not been used in this case. For a variety of reasons (patient discomfort, shivering, and electrocautery interference), pulse oximetry is occasionally discontinued in the immediate postdelivery period; observation of respiratory rates frequently is hampered by surgical drapes, and a precordial stethoscope is not always auscultated continuously. It is apparent how a combination of these factors might easily have led to an adverse outcome in the above case had pulse oximetry not been used, even with an anesthesiologist in constant attendance.

Respiratory depression following epidural or intrathecal morphine has been well defined to be a low-frequency event influenced by a large number of variables and has required large series of patients to characterize. Respiratory depression following intrathecal fentanyl, sufentanil, or meperidine may likewise occur at a low frequency, and large series may also be necessary to characterize its incidence accurately. Until wider experience is gained with larger series, prudence dictates that all patients receiving such intrathecal opioids or combinations, including parturient women, be closely and appropriately monitored to detect the abrupt onset of respiratory depression.

In summary, a case of early respiratory depression following the intrathecal injection of a mixture of fentanyl, lidocaine, and morphine for cesarean delivery is described. Though it is impossible to implicate any single agent as the cause, the case clearly illustrates that significant respiratory depression can occur at very low doses with these opioids. While the respiratory depression was readily reversible with intravenous naloxone, a review of the case...
indicates that careful and continuous monitoring of respiration, which may include pulse oximetry, is warranted in patients receiving intrathecal opioids.

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