Nystagmus Following Intrathecal Morphine Administration

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(Key words: nystagmus, intrathecal morphine, naloxone)

Complications associated with epidural or intrathecal opioid administration include nausea and vomiting, pruritus, and respiratory depression[1]. Neurological complications are rare[2], although vertical nystagmus after epidural opioids was reported by Fish et al[2]. We treated two patients in whom nystagmus was detected after intrathecal morphine administration. They were successfully treated with naloxone or diazepam. To our knowledge, this is the first report of nystagmus following intrathecal administration of opioids.

Case Reports

Case 1

A 34-year-old, 62.2 kg woman was scheduled for cesarean section under spinal anesthesia. Except for previous cesarean section, her medical history was unremarkable. Preoperative physical examinations and laboratory values were within normal limits for a pregnant woman. Spinal puncture was performed with a 25-gauge spinal needle at the L3–4 intervertebral space. Tetracaine hydrochloride (HCL) (10 mg) and preservative-free morphine HCL (200 μg) in 2.5 ml of 10% glucose were injected intrathecally. The sensory block extended to the T4 level on both sides. After delivery of a healthy baby, droperidol (1.0 mg) and methyl ergometrine (0.1 mg) were given intravenously. The operation was uneventful. The estimated blood loss including amniotic fluid was 1,000 ml, while 1,600 ml of lactated Ringer's solution was administered. On arrival at the recovery room, the patient was awake. Four hours after the intrathecal injection of morphine and tetracaine, she complained of rotary vertigo and oscillopsia. Neurological examination showed no abnormalities except vertical nystagmus. Extrapyramidal sign was suspected to be a side effect of droperidol so that biperiden (2.5 mg) was administered intravenously, but no improvement was observed. Diazepam (10 mg) was then administered intravenously, and the patient fell asleep. Three hours after the injection of diazepam, she regained consciousness without nystagmus or rotary vertigo. Subsequent neurological examination revealed no abnormalities.

Case 2

A 43-year-old, 70 kg woman was scheduled for cesarean section under spinal anesthesia. Except for previous cesarean section for severe toxemia, her medical history was unre-

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J Anesth 7:102–104, 1993

markable. Preoperative physical examinations and laboratory values were withinn normal limits. Spinal puncture was performed with a 25-gauge spinal needle at the L3–4 intervertebral space. Tetracaine HCL (10 mg) and preservative-free morphine HCL (100 μg) in 2.5 ml of 10% glucose were injected intrathecally. The sensory block extended to T4 level on both sides. After delivery of the baby, droperidol (1.0 mg) and methyl ergometrine (0.1 mg) were administered. The operation was uneventful, and the estimated blood loss including amniotic fluid was 760 ml, while 1,300 ml lactated Ringer's solution was administered. Three and a half hours after intrathecal injection, the patient complained of rotary vertigo. Neurological examination showed only horizontal nystagmus. Intravenous administration of naloxone (0.1 mg) resulted in no improvement, however, after the second dose of 0.1 mg, her nystagmus disappeared. Her rotary vertigo improved completely, although she complained of abdominal pain. Subsequent neurological examination revealed no abnormality.

Discussion

Nystagmus is a involuntary movement of the eyes. It is subdivided into two types; pendular and jerk. In pendular nystagmus, the rate of eye movement is roughly equal in both directions. In jerk nystagmus, there are quick and slow phases. Ocular movements are horizontal, vertical, rotary or mixed. In healthy subjects, not only vestibular and optokinetic stimuli but also some drugs, such as alcohol, tranquilizers, barbiturates[4], ketamine and opioids[5,6], induce jerk nystagmus.

In our cases, the nystagmus was of the jerk type, and the patients did not show any history of neurological disorders. Although, as mentioned above, many drugs can induce nystagmus, morphine was most likely the cause in our cases. In general, drug induced nystagmus is observed with higher dosage levels, however, there have been two reports[2,7] of small doses of epidural opioids causing vestibular dysfunction. The nystagmus of our patients, therefore, could have been induced by small doses of 100 or 200 μg of morphine administered intrathecally. Furthermore, in case 2, the symptom was completely reversed by naloxone. Another suspected drug is droperidol. It has an extrapyramidal effect and induces tremor, but hardly ever nystagmus. Although it potentiates the analgesic effects opioids[8], our patients did not show any signs of side effects caused by intrathecal morphine. It was, therefore, unlikely that droperidol had potentiated the side effect of morphine. In case 1, biperiden failed to reverse nystagmus, and no other extrapyramidal signs were observed. These facts suggest that droperidol was not the cause of the nystagmus of our patients.

Naloxone is one of the drugs of choice for treatment of nystagmus after intrathecal or epidural opioids. In case 2, however, naloxone also reversed the analgesic action of the morphine, and the patient complained of abdominal pain instead of vertigo. In case 1, diazepam was administered, also with good effect. Although, it is not clear whether it has a direct effect, diazepam may reverse nystagmus and vertigo without reducing the analgesic effect of intrathecal opioids.

In summary, intrathecal morphine induced nystagmus that was effectively antagonized by intravenous naloxone. Diazepam was also effective without reversal of the analgesic effect of the opioids.

(Received Dec. 27, 1991, accepted for publication May. 13, 1992)

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