Case Report

Repellitive single subarachnoid injections for trial administration of the intrathecal morphine pump in patients with intractable non-cancer pain
-A case report-

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Since the early 1980s, the implantable intrathecal drug pump (ITDP) has been used increasingly to manage chronic pain. Prior to making a decision to implant an ITDP, trial administration of the intrathecal (IT) drug should be performed to estimate the effective dose for a starting set of implantable ITDPs. There is no standard method of trial IT drug administration, though. Therefore, this paper reports 20 cases of IT morphine trial with single and repetitive injections until the appropriate dose was attained with respect to analgesia and its side effects. The trial procedure was performed with daily sequential IT injections using morphine and 0.3% mepivacaine. Twelve out of the total of 20 patients had positive responses. Thus, it is inferred that daily sequential IT morphine injections combined with a placebo injection as a trial ITDP would be useful in evaluating the effectiveness and adverse effects of IT morphine infusion with clinically insignificant side effects. (Korean J Anesthesiol 2011; 60: 138-141)

Key Words: Intractable pain, Intrathecal, Morphine, Pump.

The prevalence of moderate to severe chronic non-cancer pain in the general population has been reported to be 9–19% [1]. The most common condition of intractable chronic pain is neuropathic in nature, including complex regional pain syndrome (CRPS), post-laminectomy pain syndrome (PLPS, which is persistent pain following back surgery), and pain caused by nervous system injury or dysfunction. Treatments for chronic pain should employ a multidisciplinary approach. Although all modalities for the management of chronic pain have been tried, some chronic pain patients are still suffering from intractable pain. Currently, neuromodulation therapies such as stimulation of the spinal cord, thalamus, or motor cortex, and intrathecal (IT) drug infusion could be final options to managing intractable chronic pain [2,3].

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For modern pain medicine, opioid receptors in the nervous tissues were first found in 1973 [4]. The first clinical use of IT morphine to treat intractable cancer pain was reported by Wang et al. in 1979 [5]. In addition to that, continuous IT drug infusion using an implantable pump was introduced in a chronic cancer pain patient in 1981 [6]. Since the early 1980s, the implantable IT pump has been used increasingly to manage chronic pain, as the technology for the device has also been developed.

IT analgesia could have benefits for patients with intractable pain after they have undergone all the treatment modalities of or taken a high dose of opioid therapy. Successful use of IT implantable devices should be preceded, however, by the determination of the appropriate analgesic dose for clinical practitioners have used different methods for this, such as intrathecal or epidural bolus injection, and intrathecal or epidural indwelling catheter placement. So far, however, there is still no standard method of trial IT drug administration. Therefore, this paper reports 20 cases of IT morphine trial with single and repetitive injections until the appropriate dose was attained with respect to analgesia and its side effects.

Case Report

A total of 20 patients with intractable chronic pain who had trial intrathecal morphine injections between March and August 2009 at the pain clinic of the authors’ university hospital were included in this study. All of them had severe chronic pain with non-malignant refractory to conservative management, such as oral or parenteral opioids and multiple therapies.

The participants’ informed consent was obtained after the nature of this study was explained to them. Then they were placed in a lateral decubitus position on a table, and their skin was prepared for needle insertion using an iodine-based antiseptic solution. A 25-gauge 10 cm spinal needle (Hakko®, Hakko, Japan) was inserted in the L3-4 or L4-5 interspinous space and advanced to obtain a spontaneous flow of cerebrospinal fluid (CSF).

After confirming the CSF free flow through a needle, a mixed solution of morphine sulfate (1 mg/ml/ampule: BCWorld Pharmacy Co., Ltd., Seoul, Korea) and 0.3% mepivacaine (Mevan®, 20 mg/ml/vial: HANLIM, Korea) was administered intrathecally. These two drugs do not contain preservatives. The morphine dose was measured with a 1 ml syringe and mixed with 2 ml of 0.3% mepivacaine in a 5 ml syringe. Only in the case of the use of 0.075 mg of morphine was morphine diluted first with 0.3% mepivacaine. For example, 1 ml (1 mg) of morphine and 1 ml of 0.3% mepivacaine were mixed in a 5 ml syringe, and then 0.15 ml (0.075 mg) of the mixed solution was withdrawn to formulate the injection solution with 2 ml of 0.3% mepivacaine. The total volumes of the injection solution were 2.15 ml (morphine, 0.075 mg and 0.15 mg), 2.3 ml (morphine, 0.3 mg), 2.5 ml (morphine, 0.5 mg), and 2.7 ml (morphine, 0.7 mg), depending on the morphine doses. The morphine dose was determined based on the amount of oral opioids and the patient’s age. If the patient was below 65 years old or consumed opioids with an equivalent dose of more than 90 mg of morphine, 0.3 mg of morphine was used for the initial dose. If the patient was more than 65 years old or consumed opioids with an equivalent dose of less than 90 mg of morphine, 0.15 mg of morphine was administered for the initial dose. If the patient had a poor clinical condition, the first trial injection was made with 0.075 mg of morphine. A positive response was