Use Of Remifentanil For Reverse Opioid Blockade In A Patient

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Citation

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Abstract

Naltrexone is a pure competitive antagonist at opioid receptors used in the maintenance of abstinence from opioids, alcohol and in rapid opioid detoxification under anaesthesia. Patients on naltrexone therapy may present a challenge in emergency anesthesia and pain management because of very high opioid requirements with several side effects. We report a case where remifentanil was used successfully and uneventfully to overcome this competitive blockade during the anaesthetic management using high doses without accumulation and prolonged recuperation.

CASE REPORT

A 36-yr-old male with an open fracture of the left femur was admitted to our hospital for emergency external fixation. On arrival he complained of severe pain (visual analog scale score (VAS) of 10 on a scale from 0=no pain to 10=worst pain imaginable). Metamizol 2 gr was given but it was not enough (VAS score of 8). He refused a regional anesthesia technique. His medical history included heroin and alcohol ex-addiction and his medication consisted of naltrexone 50 mg orally daily. He was monitored pulse oximetry, capnography, non-invasive blood pressure (NIBP) measurement and a 5 lead continuous electrocardiogram. Prior to induction his NIBP was 160/80 and pulse rate 95 beats per minute. After premedication with 2 mg midazolam a rapid sequence induction was carried out with propofol 200 mg and remifentanil 1 ugr kg-1 min-1 and tracheal intubation facilitated by succinylcholine 75 mg. Anaesthesia was maintained with Isofluorane (1%) in nitrous oxide (70%) and oxygen (30%). The patient was paralysed with cisatracurium 8 mg and ventilated mechanically maintaining end-tidal CO2 between 35-40 mm Hg. Intubation was associated with a large sympathetic response (pulse rate of 140, BPNI 220/130). Remifentanil was increased initially to 2 ugr kg -1min-1 and later to 4 ugr kg-1min-1. Pulse rate and blood pressure was gradually reduced to normal levels. Propacetamol 2 gr and ketorolac 60 mg was given intraoperatively for postoperative analgesia. The remifentanil infusion was ceased five minutes before extubation. On recovery room no further analgesia was required and postoperative course was uneventful. On the seventh postoperative day, he was discharged from hospital.

DISCUSSION

Naltrexone hydrochloride, a long acting pure opioid antagonist is a synthetic congener of oxymorphone with no opioid agonist properties. It differs in structure from oxymorphone in that the methyl group on the nitrogen atom is replaced by a cyclopropylmethyl group.

Naltrexone HCl is also related to the potent opioid antagonist naloxone or nallylnoroxymorphone. It is suitable for oral administration in scored tablets containing 50 mg of naltrexone HCl. Clinical studies indicate that this dose will block the pharmacological effects of 25 mg of intravenously administered heroin for periods as long as 24 hours. It binds to opioid receptors in the central nervous system and competitively inhibits the actions of opioid drugs (both pure agonists and agonist/antagonists) and endogenous opioids. It is indicated as opioid antagonist, maintenance of abstinence from opioid addiction, alcoholism [1,2] and in rapid opioid detoxification under anaesthesia [3]. In small doses may reduce the risks of respiratory depression, pruritus and vomiting associated with epidural and intrathecal opioids [4,5]. Its use as an antipruritic in cholestatic liver disease and uraemia [6,7] indicate that endogenous opioids are responsible for this itching.

Naltrexone HCl blocks the effects of opioids with a prolonged pharmacologic effect (24-72 hours), by

competitive binding (i.e., analogous to competitive inhibition of enzymes) at opioid receptors. This makes the blockade produced potentially surmountable which is useful in patients who may require analgesia, but overcoming full naltrexone blockade by administration of very high doses of opioids is resulted in excessive symptoms [$_2$]. In an emergency situation, when reversal of naltrexone blockade is required, in patients receiving fully blocking doses of naltrexone HCl, suggested options are regional analgesia, conscious sedation, use of non-opioid analgesics or general anesthesia. Local anaesthesic blockade is unaffected by opioid antagonists. Non-opioid analgesics include non-steroidal anti-inflammatory drugs (NSAIDs), ketamine and inhaled agents. The MAC of volatile anaesthetics is also unaffected.

In a situation requiring opioid analgesia the amount of opioid required may be greater than usual and the resulting respiratory depression may be deeper and more prolonged so a rapidly acting opioid analgesic which minimizes the duration of respiratory depression is preferred. Irrespective of the drug chosen to reverse naltrexone blockade, appropriately trained personnel should monitor the patient closely. Remifentanil is a new opioid that is now in regular clinical use in many countries. The clinical advantage of this new opioid lies in its extremely rapid clearance which means that the anaesthetist can deliver very high doses of opioid without an obligatory accumulation compared with other opioids or prolonged recuperation and mechanical ventilation, which is very useful in this case. Thus, the choice of Remifentanil based on its pharmacokinetic profile, an ultra-short duration of action easy to be titrated to the needs of the patient, appeared ideal. We conclude that remifentanil may be suitable for reverse opioid blockade in patients on naltrexone therapy.

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