REVIEW ARTICLE

Morphine Can Be Used Safely in a Resource Poor Tertiary Care Hospital for Postoperative Pain Management in Children - A Retrospective Review

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ABSTRACT

Rationale: Morphine is not used in our resource poor recovery room because of the stringent rules that hinder its easy availability, fear of respiratory depression and adverse events. This has lead to under treatment of severe pain in the perioperative setting. We used morphine as the opioid of choice in ASA I or II patients undergoing orthopedic surgery to assess the feasibility of using morphine in the perioperative period in our recovery room and identify complications arising from its use.

Methods: We retrospectively reviewed the charts of patients undergoing orthopedic surgery that had received morphine in the perioperative period from February 2011 to May 2011. Sixteen patients met the inclusion criteria. Balanced general anesthesia with endotracheal intubation was performed in 14 patients. Two underwent general anesthesia with LMA. The average morphine dose given was 0.09mg/kg (0.03mg/kg-0.19mg/kg). Morphine 0.025mg/kg to 0.1mg/kg was given prior to surgical incision in fourteen patients and as a supplement to caudal analgesia in the recovery room in two patients. Further morphine was titrated to keep pain at a Visual Analog Scale (VAS) <3 in the recovery room.

Results: All the patients who received morphine were discharged to the orthopedic ward with VAS score of three or less. None of the patients complained of nausea or vomiting or itching. Discharge time from recovery room varied from 45 minutes to 150 minutes. There were no adverse events in the recovery room or in the ward.

Conclusion: Safe re- organization of recovery room (RR) allowed us to use morphine without any adverse outcome in a resource poor setting.

Key words: Morphine, Postop pain, children

INTRODUCTION

The most commonly used opioid for perioperative pain management in children at Lahore Children's Hospital currently is Nalbuphine. Morphine is not used in our resource poor recovery room because of the stringent rules that hinder its easy availability, fear of respiratory depression and adverse events. This has lead to under treatment of severe pain in the perioperative setting. We used morphine as the opioid of choice in ASA I or II patients undergoing orthopedic surgery to assess the feasibility of using morphine in the perioperative period in our recovery room and identify complications arising from its use.

METHODS

We retrospectively reviewed the charts of patients undergoing orthopedic surgery that had received morphine in the perioperative period from February 2011 to May 2011. Sixteen patients met the inclusion criteria. One patient had some degree of vascular compromise in the postoperative period and had much larger than average morphine consumption and was excluded. There were eight females and eight males. The average age was 5.75 years (range 0.8 – 12 years). The average weight was 15.5 kg (7-30 kg). Four patients were ASA I status and 12 were ASA II status. Two patients underwent lower limb foot tendon lengthening, one underwent knee quadriceptoplasty, one underwent hand tendon repair, one underwent wound debridement, one underwent limb mass biopsy and the remaining ten underwent lower and upper limb ORIF of fracture or dislocation reduction procedures resulting from traumatic injury. Balanced general anesthesia with endotracheal intubation was performed in 14 patients. Two underwent general anesthesia with LMA. The average morphine dose given was 0.09mg/kg (0.03mg/kg-0.19mg/kg). Morphine 0.025mg/kg to 0.1mg/kg was given prior to surgical incision in fourteen patients and as a supplement to caudal analgesia in the recovery room in two patients. Further morphine was titrated to keep pain at a Visual Analog Scale (VAS) <3 in the recovery

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room. Twelve patients received Ketorolac as supplemental analgesic at the conclusion of the procedure. Thirteen patients above the age of two years received antiemetic prophylaxis with Dexamethasone 0.1mg/kg at the beginning of the procedure and Ondansetron 0.1mg/kg at the conclusion of the surgery. Orogastric suction was performed on all sixteen patients to decrease gastric contents prior to extubation. All patients were extubated awake and sent to the recovery with natural patent airways.

RESULTS

All the patients who received morphine were discharged to the orthopedic ward with VAS score of three or less. None of the patients complained of nausea or vomiting or itching. Patients who had received morphine were sedated but easily arousable on arrival in the recovery room. Patients were discharged to floor once they were awake and were able to maintain oxygen saturation at baseline or >96% on room air. Clear fluids were offered to all the patients in the recovery room. Discharge time from recovery room varied from 45-150 minutes. There were no adverse events in the recovery room or in the ward.

DISCUSSION

Nalbuphine, a mixed agonist antagonist opioid that exhibits a ceiling effect on respiratory depression is the only opioid that is used for postoperative pain control at our institution[1] . This makes it particularly desirable in a resource poor setting with minimal monitoring, limited number of pulse oximeters available and rarity of trained nursing staff equipped to manage adverse events in the recovery room. It has low abuse potential and is easily available in South Asia. However, increasing doses of nalbuphine have a ceiling effect and may not be appropriate to control severe pain[2]. Morphine, a potent mu-opioid is recommended as the analgesia of choice for moderate to severe cancer pain by the WHO pain ladder [2] and is commonly used for postoperative pain management in the developed world. In many developing countries, it is considered a drug of addiction and even a dangerous drug and is under stringent government regulatory control making access to morphine very difficult[3].

The major concern with morphine is that it causes dose-dependent depression of respiration, primarily through a direct action on brainstem respiratory centers (Miller. Seventh Ed). Hypoxemia requiring supplemental oxygen, airway obstruction and hypoventilation are the most commonly encountered issues in the recovery room[4]. . Close patient monitoring, early recognition of respiratory depression and institution of appropriate airway interventions prevent respiratory adverse events.

An organized recovery room ensures that postoperative patients are observed in a protected and safe environment[5]. Safe organization of recovery room (RR) must take into account the equipment necessary for the RR, define the role and qualification of the medical and nursing staff, and define the criteria for discharge and transfer. RR is administered by an anesthesiologist with clinical, therapeutic and decision-making responsibility for the discharge of patients, while the supervision and assistance patients is entrusted to specialized professional nurses[5,7].

We addressed several of these issues to minimize any potential sentinel event in our four bed (often shared between patients) recovery room with four oxygen outlets and two pulse oximeters. A cart with basic airway equipment was placed in the recovery room. All the patients who received morphine underwent surgery earlier in the day to allow at least forty minutes of observation time in the recovery room after receiving the last dose of morphine. A designated nurse was assigned to the recovery room and every new student nurse was taught basic airway management in the operating room. All patients were extubated awake and a senior anesthesiologist checked on the recovery room patients periodically.

Patients received oxygen in the recovery room to keep oxygen saturation above 94-96% and were weaned to room air as tolerated. A senior nurse with one or two student nurse received a brief handover summary of patient on arrival to recovery room, checked oxygen saturation, respiratory rate of all patients on arrival and periodically in sedated patients and prior to discharge from the recovery room. Pulse oximetry monitoring increases the diagnoses of hypoxemia 19-fold in both the OR and PACU [8]. The two pulse oximeters available in the recovery room were used for continous monitoring on the most sedated patients. The recovery room nurse and student were trained to recognize airway obstruction and taught jaw and chin lift, and bag mask ventilation prior to initiating the use of morphine as an analgesic in the perioperative period. Chest auscultation as an assessment tool was encouraged. Mothers were allowed to be present by the bedside and were also instructed to raise alarm if they noticed a change in respiration. Patients were discharged from the recovery room if they were awake or easily arousable, maintaining oxygen saturation >96% on room air and respiratory rate was appropriate for their age. Recovery room discharge times were long (45-

160 minutes) to ensure that sedated patients were not discharged to the ward where we do not have an evening physician.

The systematic use of checklists and structured preprocedural and postprocedural briefings like a time-out procedure reduces perioperative morbidity and mortality[9]. Care in the recovery room was standardized and a verbal checklist was carried out at handover and discharge to ward.

All sixteen of our patients had excellent analgesia with VAS scores of 3 or less at discharge from recovery. Although there were no complaints of nausea, vomiting and itching in our small number of patients, nausea and vomiting is a common complication in the recovery room and opioids, including morphine increase its incidence[10]. The 5-HT(3) antagonists can be effectively combined with dexamethasone with an increase in efficacy and should be considered in all moderate to high risk patients[11].

CONCLUSION

Morphine can be used for perioperative pain management in a resource poor tertiary care children's hospital provided that airway patency and adequate respiratory rate is continuously monitored and discharge from the recovery room is allowed when the patient is awake, maintaining oxygen saturation on room air and comfortable.

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