

Patient Controlled Intravenous Analgesia (PCIA) in Postoperative Surgical patients: an Audit

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Introduction

Effective treatment of postoperative pain is a fundamental component of quality patient care.¹ Adverse physiological and psychological effects may result from unrelieved severe acute pain. Adequate control of postoperative pain may reduce the incidence of postoperative morbidity. ¹

Patient controlled intravenous analgesia (PCIA) is a relatively recent innovation driven by the poor history of pain control with conventional methods. PCIA is an analgesia delivery system in which patients administer their own analgesics intravenously within pre defined safety limits set by the physician.² Equipment for PCA consists of a programmed syringe pump (PCIA pump) and a handset connected to the pump, which is operated by the patient.

The main advantage of PCIA is "patient autonomy" which allows him to titrate the delivery of analgesics to achieve a plasma concentration consistent with good analgesia and minimal side effects without the help of a nurse who may be busy with other tasks. ³

Aga Khan University Hospital is among the pioneers of using patient controlled analgesia (PCIA) in Pakistan for relief of pain in postoperative surgical patients. We have conducted this study to evaluate the efficacy and side effects of patient controlled intravenous analgesia and to evaluate patient's degree of satisfaction in order to identify areas for improvement.

Material and Method

This was a prospective clinical audit done by acute pain management team of department of Anaesthesia, Aga Khan University hospital from September 1, 2002 to February 28, 2003. We included all those patients, who were scheduled for elective surgeries and decided by the primary anesthetist to receive PCIA for postoperative analgesia. Convenience sampling was done and

data was collected from all patients who received PCIA during the study period.

The patients , excluded from the study, included those who (1) were unable to understand how to use PCIA because of lack of understanding or education, language problem or a psychiatric disorder; (2) were less than 16 years of age and (3) were scheduled for emergency surgery, neurosurgery or coronary artery bypass grafting

All the patients were given information about PCIA and Visual Analogue Scale (VAS)⁴ a day before surgery and taught about how to use PCIA when they felt pain. Intraoperative analgesia was left on the discretion of primary anaesthetist. Soon after the surgery patient's pain was evaluated in recovery room and patient was given 10 mg boluses of pethidine intravenously, if required, and once the VAS was <3, a base line (background) infusion of pethidine started intravenously at the rate of 10mg/hr via the PCIA pump Graseby 3300.⁵ The patients were explained again about the functioning of PCIA pump and how to press the button when he/she felt pain. Patients were assessed regularly for pain at rest and on movement (dynamic pain score) by the doctor and the nurse according to the protocol set by acute pain management service. The anaesthetis visited each patient 24 hours after the start of PCIA. A questionnaire form in Urdu and English (Figure 1) was given to the patient, which the patient was requested to fill himself/herself. Patients were asked to rate average pain score during last 24 hours on the basis of Visual Analogue Scale (VAS). Zero to ten scale was used to express the degree of pain with zero being no pain and ten being the maximum.

Results

During the study period of six months total 76 Table 1. Degree of pain relief at rest as measured on VAS.

VAS pain scale	No. of patients	Pain score (VAS)at rest % of patients	Cumulative %
0	33	43.4	--
1	22	29.0	72.4
2	7	9.2	81.6
3	7	9.2	90.8
4	2	2.6	93.4
5	3	4.0	97.4
6	1	1.3	98.7
7	1	1.3	100
8	0	0	100
9	0	0	100
Total	76	100	100

Table 2. Degree of pain relief on movement as measured on VAS.

VAS pain scale	No. of patients	Pain score (VAS)on movement % of patients	Cumulative %
0	22	28.9	--
1	23	30.3	59.2
2	11	14.5	73.7
3	7	9.2	82.9
4	5	6.6	89.5
5	2	2.5	92.0
6	3	4	96.0
7	3	4	100
8	0	0	100
9	0	0	100
10	0	0	100
Total	76	100	100

Table 3. Convenience of pain control

Levels of convenience	No. of patients	%	Cumulative %
Excellent	61	80.3	--
Good	12	15.8	96.1
Satisfactory	2	2.6	98.7
Poor	1	1.3	100
Total	76	100	100

Degree of dependence	No. of patients	%	Cumulative %
Nil	70	92.1	--
Little	5	6.6	98.7
More	1	1.3	100
Total	76	100	100

patients participated in the audit. Most of the patients had gynaecological, abdominal and orthopaedic surgeries. All the patients were given a background intravenous infusion of pethidine 10 mg per hour with a bolus dose of 5 mg and a lockout period of 10 minutes through Graseby 3300 PCA pump. The questionnaire was filled by all patients.

Ninety one percent (n=69) of the patients had a visual analogue score of <3 at rest (Table 1) and 83% (n=63) had a score of <3 at movement (Table 2). Ninety six percent (n=73) patients rated the convenience of pain control as being good to excellent (Table 3). Ninety two percent (n=70) stated the dependence on nursing staff for pain management as nil (Table 4). The side effects are shown in Figure 2

Discussion

Patient Controlled Intravenous Analgesia (PCIA) is a relatively new technique of controlling postoperative pain and has been found to be very effective.⁶⁻⁸ It has been used with morphine, pethidine, fentanyl, etc. PCIA provides a mechanism to titrate drug administration according to the analgesic requirement of the patient and allows the patient to have control of his or her own pain. This patient autonomy has resulted in improved patient satisfaction and reduction in undesirable side effects like sedation and

respiratory depression which results from the traditional infusion of intravenous narcotic analgesics.

We are using PCIA in our hospital for the last two years which has gained popularity and acceptance among patients and health care providers. Patients seem to be more comfortable with PCA pumps and its usage.

According to the results of the audit, patients found it extremely helpful. Not only the degree of pain control was adequate with VAS score <3 in 83% of the patients but the comfort and satisfaction of the patient was also remarkable as 96.1% of the patients rated the convenience of pain control as good to excellent which is comparable with previous findings.⁹ This technique provides highly satisfying pain management to the patients and decreases the burden on the nursing staff as they did not require to visit the patient as frequently as in case of conventional methods of pain relief, which allows them to fulfil other tasks of patient care." On enquiring about the dependence on nursing staff, 92.1% of the patients marked "nil."

The main side effects which were highlighted included drowsiness (27.6%), nausea (27.6%), vomiting (15.8%) and restricted mobility (21.1%). These side effects are similar to those found in the earlier studies.¹⁰

One of the objectives of the audit was to assess the level of patient satisfaction. As satisfaction is complex and probably can be contributed from many aspects of postoperative care⁹ including level of dependence, convenience of pain control, degree of pain control and incidence of side effects. Among these measurable elements of satisfaction, results of our audit show that majority of patients were highly satisfied with the use of PCIA.

In summary, we have found the PCIA to be an excellent choice in postoperative pain management which is easy to manage and provides not only high degree of satisfaction to the patients but also allow the nurse to concentrate on other aspects of patient care in a busy surgical unit.

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Abstract

Objective: We conducted an audit for the evaluation of the effectiveness, adverse effects and degree of patient satisfaction with Patient Controlled Intravenous Analgesia (PCIA) for postoperative pain control in surgical patients.

Methods: This was an observational study. Patient, scheduled for different surgical procedures, were informed about PCIA a day before surgery and were offered PCIA for pain control after surgery. All the patients were asked to fill a questionnaire 24 hours after the start of PCIA, that contained the relevant questions reflecting the objectives of the study.

Results: Seventy-six patients participated in the study of whom 91% had a visual analogue pain score of <3 at rest and 83% had a score of <3 at movement on visual analogue scale of 0-10. Eighty percent of patients rated the convenience of pain control as being excellent, whereas 92% stated that the dependence on nursing staff for pain management was nil. The incidence of drowsiness and nausea was 28% each, while 21% of the patients complained of restricted mobility.

Conclusion: Patient controlled intravenous analgesia is an excellent method of postoperative pain relief, which provides a high degree of satisfaction to the patients (*JPMA* 54:353;2004)..