



Ambulatory surgery acute pain management: A review of the evidence

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Summary The purpose of this review is to examine the evidence for postoperative analgesic techniques in ambulatory surgery. A search was performed using the title and text words ambulatory surgical procedures and postoperative pain to identify relevant publications on Medline, The Cochrane Library and Embase Anaesthesiology Database. The review assesses and compares benefits of local anaesthetic techniques, including local infiltration, intravenous regional anaesthesia, intra-articular anaesthesia, neuraxial block, peripheral nerve block, and continuous infusions. It examines types of peripheral nerve blockade pertinent to ambulatory surgery and indications for its use. It outlines current spinal anaesthesia controversies in ambulatory surgery including transient neurological symptoms and discharge criteria. It examines the role of opioids, non-steroidal-antiinflammatory drugs and non-pharmacological techniques in the management of postoperative pain in ambulatory surgery with a recommended pain management plan.

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1. Introduction

Ambulatory surgery has gained widespread acceptance with over 70% of all elective surgical procedures being performed on a day basis in some countries [1]. There are, of course, numerous surgical and administrative reasons for this trend, however, from the perspective of the anaesthetist it has been the advances made in pain management that has made this trend possible.

The objective of this review was to examine the evidence for postoperative analgesic techniques in ambulatory surgery. The review assesses and compares benefits of local anaesthetic techniques, including local infiltration, intravenous regional anaesthesia, intra-articular anaesthesia, neuraxial block, peripheral nerve block, and continuous infusions.

2. Methods

A search was performed using the title and text words *ambulatory surgical procedures* and

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postoperative pain to identify relevant publications on Medline, The Cochrane Library and Embase Anesthesiology Database from July 1966 to October 2004. Other relevant publications that did not fall within these parameters but were cited in the reference list of the aforementioned publications were also gathered for review. Publications were scrutinized by the authors, and evidence was collated for a range of anaesthetic techniques. Trends were described, and conclusions formulated upon best practice in this field.

3. Predicting postoperative pain

In a prospective study of 10,000 ambulatory patients, Chung noted the incidence of severe pain to be 5.3% in the post ambulatory care unit in the first 24 h [2]. After implementing multimodal analgesic techniques including local anaesthesia (LA) wherever possible, McGrath et al. noted in a follow up study of 5703 patients at 24 h, that 30% had moderate to severe pain [3]. Identified risk factors for severe postoperative pain are:

- Type of surgery: microdiscectomy, laparoscopic cholecystectomy, shoulder surgery, elbow/hand surgery, ankle surgery, inguinal hernia repair, knee surgery and plastic surgery [3,4];
- Increased body mass index [2];
- Increased duration of anaesthesia [2].

4. Results of inadequate analgesia

Inadequate analgesia may delay patient discharge so that extra nursing staff or extended nursing hours are needed resulting in a cost-inefficient system [4]. In a prospective study of 175 ambulatory patients Pavlin showed that pain was the most common cause of stage one recovery delays affecting 24% of patients overall [4]. Uncontrolled pain is a major cause of postoperative nausea and vomiting (PONV), further extending the patients stay in the recovery room; it is also a major cause of unplanned admissions and readmissions [5,6]. Inadequate pain management may cause sleep disturbances and limit early mobilisation, which may be crucial to early return to function and work [7,8].

The best predictor of severe pain at home was shown in a recent survey to be inadequate pain control in the first few hours following surgery [8]. For these reasons, the development of improved pain strategies in ambulatory surgery must be a priority.

5. Local anaesthesia techniques

5.1. Local infiltration

Infiltration techniques using LA have undoubtedly improved pain management, and for all day patients LA should be included in a multi-modal approach to pain management. LA may be infiltrated at the wound site or at a proximal nerve root, as used in regional anaesthesia. Use of LA reduces a patient's requirements for opioid analgesics in the perioperative period, and is therefore associated with a lower incidence of PONV [5,9]. Williams showed that the use of nerve blocks in patients undergoing anterior cruciate ligament reconstruction allowed postambulatory care unit (PACU) bypass and reliable same-day discharge. For a large volume of all types of invasive orthopaedic procedures this may have the potential to create significant financial benefits [10]. Indirect costs such as increased time consumption for block establishment, and prolonged first stage recovery or urinary retention post-spinal blockade should also be considered. Uneventful recovery with minimal pain and PONV can significantly improve overall costs [11–13].

5.2. Intravenous regional anaesthesia

This is a common technique used for hand surgery in the ambulatory setting. It is simple to perform, reliable and with a rapid onset of anaesthesia. Drawbacks to the technique include lack of postoperative analgesia; consequently researchers have investigated alternatives to the short acting drug lignocaine. In a study comparing 0.2% ropivacaine to 0.5% lignocaine, researchers found that ropivacaine provided a postoperative analgesic window of 20 min [14]. However, the clinical usefulness of this is questionable.

A systematic review of adjuncts for intravenous regional anaesthesia for surgical procedures has shown good evidence to recommend non-steroidal anti-inflammatory drugs (NSAIDs), particularly ketorolac for improving postoperative analgesia [15]. The α_2 -adrenergic agonist, clonidine, at a dose of 1 μ /kg also appears to improve postoperative analgesia and prolong tourniquet tolerance [15]. Muscle relaxants such as atracurium improve intraoperative motor block and aid fracture reduction [15]. Recently, Memis has shown that adding dexmedetomidine to lignocaine improves the quality of anaesthesia and perioperative analgesia without causing side effects [16].

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