Attitudes of healthcare professionals regarding different modalities used to manage acute postoperative pain

Carmen R. Green, MD, Alan R. Tait, PhD

Department of Anesthesiology, Multidisciplinary Pain Center, University of Michigan Medical Center, 1500 East Medical Center Drive, 1G23 UH, Box 0048, Ann Arbor, MI 48109, USA

Abstract

The education and perceptions of healthcare professionals regarding pain are important in acute postoperative pain management. A survey was designed to assess healthcare providers’ knowledge and beliefs regarding the use of epidural analgesia (EA) or patient controlled analgesia (PCA) for acute postoperative pain management.

Completed questionnaires were obtained from 46 (72%) third and fourth year medical students (MS) prior to their lecture on pain management. Forty-seven percent of the MS felt that EA provided superior analgesia to PCA. Seventy percent of the MS believed that naloxone had a longer duration of action than morphine. Completed questionnaires were received from 38 (63%) anesthesiology house officers (HO) from all levels of clinical anesthesia (CA) training. Sixty-eight percent of the HO felt that EA provided superior analgesia to PCA. The HO correctly responded that the duration of naloxone was shorter than morphine. Completed questionnaires were received from 20 (59%) post anesthesia care unit (PACU) nurses (RN). Fifty percent of the RN reported that EA provided superior analgesia to PCA. Eighty percent of the RN responded correctly that naloxone had a shorter duration than morphine. Our data suggests that lack of knowledge and fear of side effects may negatively affect pain management [Acute Pain 4 (1) (2001) 17].

© 2002 Elsevier Science B.V. All rights reserved.

Keywords: Healthcare professionals; Attitudes; Acute pain management; Postoperative pain; Variability

1. Introduction

Patients continue to report that their primary fear following surgery is inadequate pain management [1–3]. Furthermore, there is evidence suggesting that acute postoperative pain remains under-treated [4–6]. Aggressive management of acute postoperative pain has been shown to improve outcome and patient satisfaction [7–13]. Recommendations of multidisciplinary approaches have led to interdisciplinary acute pain management teams [14–21]. Epidural analgesia (EA), intravenous patient controlled analgesia (PCA), and the traditional ‘on demand’ nurse administered analgesia (e.g. intramuscular, subcutaneous, etc.) for postoperative pain control remain common methods for the provision of acute postoperative analgesia. Despite these modalities, patients continue to experience significant postoperative pain while in the hospital [22].

At the University of Michigan Medical Center (UMMC), an Acute Pain Service (APS) exists to manage acute postoperative pain for surgical inpatients. All primary services are expected to participate in the management and assessment of postoperative pain for these patients. The APS team at the UMMC includes an attending anesthesiologist, anesthesiology house officer or pain management fellow, and a clinical nurse [14]. However, all house officers (HO) and senior medical students (MS) involved in the care of postoperative patients are involved in treating the patient’s analgesic needs. The anesthesiology HO represent an integral part of the APS at the UMMC. MS during their clinical training are also exposed to surgical patients and the management of pain during the postoperative period. The observations of MS are particularly important since they may contribute to the way they learn to treat and respect pain once they become physicians. Nurses (RN) are also involved in the implementation of pain therapy as well as providing comfort measures for the perioperative patient. Since healthcare professionals’ perceptions and education are important in evaluating their overall management of the surgical patient with acute postoperative pain [23–27], we surveyed MS, anesthesiology HO and post anesthesia care unit (PACU) RN to assess their general knowledge of analgesics and beliefs regarding the use of EA or PCA for treatment of postoperative pain.
2. Methods

The Institutional Review Board at the UMMC approved this study. A two-page questionnaire was developed to assess the attitudes and perceptions of anesthesiology HO, senior MS, and PACU RN regarding the current methods available for the treatment of acute postoperative pain (Appendix A). The questionnaire focused on:

1. demographic data,
2. general knowledge of opioids and pain management adjuvants,
3. goals of postoperative analgesia,
4. risk and benefit profile of EA and intravenous PCA,
5. causes of inadequate analgesia, and
6. placebo response.

The healthcare providers were also asked to report on their perceived knowledge of different opioid agonists and antagonists using a 100-point scale (0 = know nothing; 100 = know everything). A specific question was added to evaluate their knowledge of the opioid adjuvant amitriptyline (a commonly used tricyclic antidepressant). A cover letter accompanied the questionnaire describing the purpose of the study. Sixty-four MS undergoing a required medical school surgical clerkship were asked to complete the survey prior to listening to a lecture presented on acute postoperative pain management. A questionnaire was also placed in the mailboxes of the 60 current anesthesiology HO and the 34 PACU RN in a large academic medical center. Informed consent was implied when the MS, HO, or RN completed the questionnaire and returned it anonymously to the investigators. Replies were tabulated and analyzed in a descriptive fashion, mean ± S.D., and percentages.

3. Results

The surveys of 104 healthcare professionals were returned for analysis. Completed questionnaires were obtained from 46 (72%) third and fourth year MS, 38 (63%) HO from all levels of anesthesia (CA) training, and 20 (59%) RN. The average age of the study participants by respondent type in years was as follows: MS 25.9 ± 3.3, HO 31.7 ± 4.2, and PACU RN 38.1 ± 4.9. Thirty-five (78%) of the MS respondents and 13 (33%) of the HO reported that they had received lectures regarding pain management during medical school (MS 3.4 ± 2.2 h versus HO 5.9 ± 4.2 h). All HO completed a 1-year internship: 59.5% transitional, 28.1% general, and 11.9% general medicine. The mean number of years in the nursing profession was 15 ± 6.0 years. Only two MS and three HO reported clinical exposure to acute pain management during medical school. Six MS (13%) reported exposure to chronic pain management during medical school.

The respondents were queried on their perceptions of the ideal goal of pain management using either EA or PCA for acute pain therapy (Figs. 1 and 2). In a related question 47% of the MS, 68% of the HO, and 50% of the RN felt that EA provided superior analgesia to PCA. Respondents felt that the most likely causes of inadequate analgesia with a PCA or an EA were due to inadequate initial dosing MS (33% PCA, 60% EA), HO (52% PCA, 57% EA), and RN (50% PCA, 45% EA). Table 1 describes the respondents’ perceived risks of addiction and respiratory depression in healthy patients after intraabdominal surgery who received a PCA or EA for pain control. Fig. 3 shows the healthcare professional’s goals for postoperative pain management. Seventy percent of the MS, 20% of RN, and 2% of HO believed that naloxone had a longer duration of action than morphine. Fig. 4 describes the respondents’ perceived
Table 1
Perception of the risk of adverse side effects associated with the mode of analgesia in healthy patients after intraabdominal surgery

<table>
<thead>
<tr>
<th>Addiction</th>
<th>Respiratory depression</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA</td>
<td>PCA</td>
</tr>
<tr>
<td>Risk</td>
<td>MS (n = 46)</td>
</tr>
<tr>
<td>&lt;1</td>
<td>30 (65)</td>
</tr>
<tr>
<td>1-5</td>
<td>8 (17)</td>
</tr>
<tr>
<td>6-15</td>
<td>4 (9)</td>
</tr>
<tr>
<td>&gt;15</td>
<td>3 (7)</td>
</tr>
</tbody>
</table>

The percentage values are given in parenthesis. RN: PACU nurses, HO: anesthesiology house officers, MS: medical students, EA: epidural analgesia, PCA: intravenous patient controlled analgesia.

knowledge of different opioid analgesics, opioid antagonists, and adjuvants. Overall all of the respondents consistently reported more knowledge of the commonly used opioid analgesics, morphine and meperidine/pethidine, than of hydromorphone. The respondents had minimal knowledge of the role of adjuvants in pain management. Most of the healthcare providers believed that non-pharmacologic methods had an important role in postoperative pain management (79% MS, 81% HO and 70% RN).

4. Discussion

One of the most important challenges of clinical medicine today is the effective management of pain [28]. On behalf of the Agency for Healthcare Policy and Research (AHCPR), an interdisciplinary panel of experts developed guidelines for the management of acute postoperative and cancer pain [14,22]. The AHCPR guidelines were developed to address the inadequacies in acute postoperative pain management. Despite the existence of sophisticated techniques for the management of acute postoperative pain, it remains under-treated [1,8,14–16]. Acute pain remains a major issue for healthcare providers, patients, and families during the perioperative period. This study was designed to evaluate healthcare professionals’ beliefs and knowledge regarding pain management by specifically looking at MS, anesthesia house officers, PACU RN.

Knowledge deficits and misconceptions persist amongst healthcare providers regarding the care of patients who are experiencing pain [25–27]. Mortimer and Bartlett [29] demonstrated significant deficits in the knowledge of HO regarding the pharmacology, side effects and bioequivalence of opioid analgesics. Attitudinal differences were also noted by Weinstein et al. [36]. In their study, physicians had negative views about patients with chronic pain and were prejudiced against the use of opioid analgesics. It follows that healthcare professionals’ perceptions, observations, and attitudes regarding pain may affect analgesic care leading to inadequate analgesia during the acute postoperative period [30]. Weis et al. [31] supported these findings by reporting
that RN and house staff lacked confidence in their knowledge of opioid analogics. They also reported that house staff and RN believed that patients received adequate pain relief. Although done in 1983, the Weiss study provides a platform for discussion and supports discordance between the healthcare provider’s beliefs regarding the adequacy of postoperative analgesic care and the patient’s belief of the adequacy of the pain care that they received [31]. Absolute postoperative pain relief is obtainable with epidural and intravenous PCA [8,32]. More importantly, it is commonly accepted that optimizing postoperative pain management improves outcome [8]. Ideally, we believed that a healthcare provider’s goal for pain management would be absolute and complete pain relief. Charap [25] reported that the aim of medical personnel treating pain in the terminally ill was to provide complete or near complete analgesia. Therefore, we were surprised when the healthcare providers in this study did not express an ideal goal for postoperative analgesia of absolute pain relief. Instead, the majority reported a goal of adequate pain relief with both intravenous PCA and EA [22,25–27]. These results suggest that the perceived fear of opioid side effects may affect prescribing patterns which may result in inadequate postoperative analgesia with epidural and PCA. Furthermore, our study suggested that fears might affect prescribing habits resulting in inadequate postoperative analgesia with both PCA and EA. Charap [25] reported that surgical residents and RN had a lack of knowledge regarding different modalities for pain management as well as an overestimation of the risks associated with analgesics. Beyond this, the healthcare providers’ lack of knowledge about opioid agonists and adjuvants (e.g. amitriptyline) could lead to inadequate pain management as well as detrimental side effects [24].

Our results are consistent with Von Roenn et al. [24] who reported that 65% of physicians hesitate to prescribe more potent opioid analogics for cancer pain due to concerns about side effects. Although our study did not specifically look at the effects of pain education on behavior, they support the need for more pain education for all healthcare providers. Clearly, education regarding the risks and benefits of different modalities used to treat acute pain is necessary. The role of non-pharmacologic approaches in pain management should also be addressed. The literature supports that healthcare professionals would be interested in pain education if such educational programs existed [27].

Considerable confusion exists amongst healthcare providers regarding the terms addiction, physical dependence, psychological dependence and tolerance [33]. Although patients who are prescribed daily opioids can develop some degree of tolerance or physical dependence, this phenomenon is not equivalent to addiction. The risk of iatrogenic addiction even during treatment of chronic non-malignant pain is exceedingly rare (less than 1% of patients) [34]. Since multiple biological, chemical, social, and psychological factors contribute to addiction, the healthcare provider’s fear of opioid addiction should not limit the legitimate use of opioids as one component of the management of acute postoperative pain [35]. The lack of medical training may reinforce negative attitudes regarding opioids, thereby contributing to fear of addiction and reluctance to prescribe opioids [36]. Since perceptions often correlate with beliefs, our findings regarding the perceived risk of addiction and respiratory depression suggest that the healthcare professionals may very well contribute to the undertreatment of acute postoperative pain. Overall exposure to pain management during medical or nursing school varied greatly amongst the respondents (MS 78% versus HO 33% versus RN 32%). The amount of time spent on pain education amongst the healthcare professionals was lacking. Although recall could be a confounding variable for all respondents, those respondents reporting a lecture or exposure to acute pain management was comparable (MS 3.4 h versus HO 4.2 h versus RN 5.0 h). Our study did not specifically look at the effects of pain education on behavior, but our results support the need for more pain education for all healthcare professions. These results are also consistent with Von Roenn et al. [24], where most physicians described their cancer pain management training as poor. This work emphasizes the importance of changes in medical and nursing school curriculums to address the importance of treatment of acute postoperative pain.

The response rate of 66% for this survey, constitutes both an adequate sample size and a reasonable response rate. Other surveys of healthcare professionals have reported similar response rates [37,38]. Since the response rate was considered good, the potential bias of non-response and self-report should be minimal. The promise of anonymity was important for those healthcare providers currently involved in educational training programs. Thus, follow-up of non-responders did not occur.

A limitation of this study is that a questionnaire does not reflect actual practice. Cleeland et al. [26] suggested that younger healthcare professionals might be more liberal in their prescribing habits and were more knowledgeable about new and different pain modalities. This study does support that healthcare providers are receptive to the potential role of non-pharmacologic modalities for the management of postoperative pain. We were not able to investigate the influence of age and knowledge due to the size of our sample. Future studies should be directed at how knowledge and education influence behavior.

Since perceptions often correlate with behavior, additional educational efforts should be directed early in the healthcare professional’s education and be ongoing throughout their career [36]. These results suggest that lack of knowledge and fear of side effects affect pain management. Attention should be directed at instituting and improving the educational efforts for all healthcare providers in regards to pain management. Future studies should also be directed at investigating any additional barriers of healthcare providers to pain management as well as the influence of attitudes and knowledge on prescribing behavior.
Appendix A

<table>
<thead>
<tr>
<th>MEDICAL STUDENT PAIN PERCEPTIONS QUESTIONNAIRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What is your gender? Describe your racial/ethnic status?</td>
</tr>
<tr>
<td>2. What is your age?</td>
</tr>
<tr>
<td>3. What is your current level of training? □ M-1 □ M-2 □ M-3 □ M-4</td>
</tr>
<tr>
<td>4. Have you completed additional training in another medical field? □ Yes □ No</td>
</tr>
<tr>
<td>5. In medical school, did you receive any lectures or workshops on pain management?</td>
</tr>
<tr>
<td>□ Yes □ No If yes, how many hours?</td>
</tr>
<tr>
<td>6. Have you completed or are you currently enrolled in an anesthesia rotation? □ Yes □ No</td>
</tr>
<tr>
<td>7. Have you completed or are you currently enrolled in a chronic pain rotation? □ Yes □ No</td>
</tr>
<tr>
<td>8. Have you spent any time during medical school in an acute pain service? □ Yes □ No</td>
</tr>
<tr>
<td>9. The effect of tricyclic antidepressants (eg, elavil or amitriptyline) when added to an opioid analgesic:</td>
</tr>
<tr>
<td>a. Marked increase in the analgesic effect</td>
</tr>
<tr>
<td>b. Slight increase in the analgesic effect</td>
</tr>
<tr>
<td>c. Decrease in the analgesic effect</td>
</tr>
<tr>
<td>d. Makes no change in the analgesia</td>
</tr>
<tr>
<td>e. Don’t know</td>
</tr>
<tr>
<td>10. The chance of addiction when a healthy 27 yo, 70 kg, 5’7” adult male patient after intra-abdominal surgery, receives 1 mg of morphine every hour continuously with the ability to self-administer 2 mg of morphine every 8 minutes via Patient Controlled Analgesia (PCA) for 7 days for postoperative pain management:</td>
</tr>
<tr>
<td>a. less than 1%</td>
</tr>
<tr>
<td>b. 1-5%</td>
</tr>
<tr>
<td>c. 6-15%</td>
</tr>
<tr>
<td>d. 16-50%</td>
</tr>
<tr>
<td>e. &gt;50%</td>
</tr>
<tr>
<td>11. The chance of addiction when a healthy 27 yo, 70 kg, 5’7” adult male patient after intra-abdominal surgery, receives an epidural infusion of bupivacaine 0.125% and 5 µg of fentany at 10 ml/hr with the ability to self-administer a 4 ml bolus every 20 minutes for 7 days for postoperative pain management:</td>
</tr>
<tr>
<td>a. less than 1%</td>
</tr>
<tr>
<td>b. 1-5%</td>
</tr>
<tr>
<td>c. 6-15%</td>
</tr>
<tr>
<td>d. 16-50%</td>
</tr>
<tr>
<td>e. &gt;50%</td>
</tr>
<tr>
<td>12. The most common cause for inadequate analgesia on the first postoperative day in a healthy 70 kg, 5’7” patient who is receiving a morphine Patient Controlled Analgesia (PCA) is:</td>
</tr>
<tr>
<td>a. Inadequate dose (loading and intermittent)</td>
</tr>
<tr>
<td>b. Patient failure to self-administer medication</td>
</tr>
<tr>
<td>c. Patient fear of addiction</td>
</tr>
<tr>
<td>d. PCA failure</td>
</tr>
<tr>
<td>e. Don’t know</td>
</tr>
</tbody>
</table>
13. The most common cause for inadequate analgesia on the first postoperative day in a healthy 70 kg. 5’7” patient who is receiving an epidural for postoperative pain management is:
   a. Inadequate dose (loading and intermittent)    c. Patient fear of addiction
   b. Patient failure to self-administer medication d. Catheter related problems

14. Naloxone has a longer duration of action than morphine. True or False?

15. Have you experienced acute postoperative pain?  
   □ Yes □ No
   If yes, how well was it treated?
   a. Absolute and complete pain relief
   b. Adequate pain relief without distress
   c. Moderate pain relief with minimal distress
   d. Pain relief only during painful periods or procedures
   e. No pain relief at all

16. Epidurals provide better postoperative analgesia than patient controlled analgesia:
   a. Strongly agree
   b. Agree
   c. Neither agree or disagree
   d. Disagree
   e. Strongly disagree

17. PCA’s provide superior postoperative analgesia than epidural infusions:
   a. Strongly agree
   b. Agree
   c. Neither agree or disagree
   d. Disagree
   e. Strongly disagree

18. Non-pharmacologic methods for postoperative analgesia have an important role in the management of postoperative pain:
   a. Strongly agree
   b. Agree
   c. Neither agree or disagree
   d. Disagree
   e. Strongly disagree

19. The impact of a patient’s racial/ethnic and cultural background on their perception of pain:
   (0 = not important, 10 = extremely important)

20. The impact of a patient’s gender on their perception of pain:
   (0 = not important, 10 = extremely important)

21. Please assess your knowledge regarding the following drugs when they are used for acute pain management on a scale of 0 to 100 (0 = know nothing, 100 = know everything):
   Morphine _______ Hydrocodone (Dresitol) _______ Hydromorphone (Dilaudid) _______ Fentanyl _______

Thank you! Comments, if any:

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

References


