▼ Original Articles

Correlation of Postoperative Pain to Quality of Recovery in the Immediate Postoperative Period

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Background and Objectives: It is unclear whether the severity of postoperative pain may affect patients' quality of recovery in the immediate postoperative period (within 2 weeks of surgery).

Methods: This was a prospective, observational study in patients undergoing elective radical retropubic prostatectomy. All patients received a standardized intraoperative general or spinal anesthetic followed by intravenous patient-controlled analgesia. Visual analog scores for pain at rest, pain with activity, and nausea along with the QoR, an instrument validated to assess quality of recovery in the postoperative period, and Brief Fatigue Inventory were assessed on postoperative days 1 to 3, 7, and 30. The Epworth Sleepiness Scale was assessed on postoperative days 7 and 30.

Results: We found that the severity of pain both at rest and with activity correlated with a decrease in quality of recovery as assessed by the QoR.

Conclusions: Our findings suggest that an increase in postoperative pain is correlated with a decrease in a patient's quality of recovery in the immediate postoperative period. *Reg Anesth Pain Med 2005;30:516-522.*

Key Words: Postoperative pain, Nausea, Fatigue, Quality of recovery, Radical retropubic prostatectomy.

Uncontrolled postoperative pain may result in a wide range of detrimental consequences including increased morbidity (e.g., pulmonary complications, cognitive dysfunction), delayed convalescence, and a higher incidence of chronic pain.[1-3] In examining the relationship between postoperative pain and patient outcomes, the majority of available trials have focused on the effect of various analgesic regimens on "traditional" patient outcomes such as morbidity and mortality.[1] Fewer studies have examined the correlation of postoperative pain on "nontraditional" patient-oriented outcomes such as patient satisfaction, quality of recovery, or quality of life.[1] The incidence of anesthesia-related mortality and major morbidity has diminished over the past decades, and there has been a parallel increase in interest in examining patient-oriented outcomes, which have been accepted as a valid endpoint.[4]

Despite the introduction of pain management guidelines, postoperative pain continues to be undertreated.[5,6] High levels of postoperative pain may adversely impact many patient-oriented outcomes by limiting or decreasing physical functioning, quality of sleep, energy/fatigue, and overall mental health. Our previous study[7] examined the effect of postoperative pain on patient-oriented outcomes but used a quality of life instrument that was not validated for use in postoperative surgical patients. In our current study, we used a validated instrument (Quality of Recovery Score [QoR]),[8] a clinically meaningful assessment, to examine the correlation of postoperative pain on patient-oriented outcomes.

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Methods

This protocol was approved by our institutional review board, and written informed consent was obtained in all patients before surgery. Patients undergoing elective radical retropubic prostatectomy (RRP) were eligible. Inclusion criteria included age >18 years, American Society of Anesthesiology physical status of I or II, patients undergoing elective RRP, and weight between 50 and 120 kg. Exclusion criteria included altered mental status or inability to comprehend questions, chronic opioid use, allergy to any study medication, or patients scheduled for a postoperative intensive care unit stay.

Preoperatively, all patients received midazolam intravenously for anxiolysis and sedation. Blood lost during the perioperative period was replaced with a balanced salt solution; administration of blood products was at the discretion of the anesthesia team caring for the patient. On completion of surgery, patients were transferred to the recovery room (post-anesthesia care unit [PACU]) where they received intravenous patient-controlled analgesia (IV PCA) with hydromorphone 0.2 mg every 10 minutes as needed. Patients were discharged from the PACU to the surgical ward according to institutional guidelines. Transition from IV PCA to oral analgesia (acetaminophen 500 mg with codeine 5 mg for each combination tablet; 2 tablets given every 4 to 6 hours as needed for pain) occurred when the patient had adequate pain control (visual analog scale [VAS] <3/10), return of gastrointestinal function, and ability to tolerate a liquid diet. Patients were discharged to home when they met standard institutional discharge criteria.

Patient assessments included VAS scores for pain at rest, pain with activity, and nausea. VAS scores for pain at rest, pain with activity, and nausea were obtained every morning (midmorning) while the patient was in the hospital (up to postoperative day [POD] 3). VAS pain and nausea were not assessed after patient discharge (i.e., after POD 3) because patients would not be able to physically provide a VAS score and use of a verbal numeric score as a substitute may not have accurately reflected VAS scores.

The primary outcome variable was the QoR, a validated 9-item instrument designed to assess postoperative patient recovery.[8] A QoR summary score (0-18) is obtained after asking patients questions regarding their degree of general well-being; support from others; general mental function; ability to perform personal hygiene; bowel/bladder function; ease of respiration; and presence of headache-backache-myalgias, nausea-vomiting, and pain. Typically, the QoR summary score drops from a baseline of 18 to 13 (major procedure) to 15 (minor procedure) immediately after surgery with recovery to baseline within 5 to 7 days postoperatively.

Table 1. Demographic and Perioperative Data

Parameter	Data (n = 100)
Age (y)	56.2 ± 7.2
Weight (kg)	86.8 ± 11.8
Height (cm)	178.7 ± 6.7
Surgical Time (min)	106.5 ± 22.0
Anesthesia Time (min)	149.5 ± 28.0
Intravenous Fluids (mL)	4,579.1 ± 1,060.6
EBL (mL)	1,176.3 ± 516.0
Length of Stay (h)	75.0 ± 5.1

NOTE. All presented as mean ± SD unless noted otherwise.
Abbreviations: EBL, estimated blood loss; Anesthesia time, time from induction to extubation; Surgical time, time from incision to placement of dressing; length of stay, time from admission to discharge from hospital.

Secondary outcomes variables included the Brief Fatigue Inventory (BFI) and Epworth Sleepiness Scale (ESS).[9,10] The BFI, a 9-item instrument, has been validated for the assessment of fatigue in cancer patients but has not been validated for the postoperative period. The ESS, an 8-item instrument, was developed to provide a measurement of a subject's general level of daytime sleepiness but also has not been validated in the postoperative period. The BFI was administered in each morning of POD 1 to 3, 7, and 30. The ESS was administered on POD 7 and 30. The ESS was not assessed from POD 1 to 3 because 2 of the 8 questions were inappropriate to be asked while patients were in the hospital (i.e., assessment of sleepiness while in a car). After discharge from the hospital, patients were called at home at the appropriate interval to complete the remaining surveys. During the telephone calls, interviewers asked questions exactly as worded in the survey.

The relationship between the patient-oriented outcomes (QoR and BFI) and the severity of pain at rest, pain with activity, and nausea were analyzed with analysis of variance (best linear fit) (SPSS 10.7; SPSS Inc, Chicago, IL). Pearson correlations between pain and nausea versus QoR and BFI were calculated for each postoperative day and in aggregate. A P value $< .05$ was considered statistically significant.

Results

A total of 100 patients (84 spinal and 12 general anesthetics) were enrolled. Demographic and perioperative data are shown in Table 1. Table 2 shows overall pain, nausea, and patient-oriented assessments by postoperative day. As would be expected,