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Original contribution

A cross-sectional study of preoperative medication adherence and early postoperative recovery ☆

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Abstract

Study Objective: To quantify the impact of preoperative medication adherence on recovery length of stays and complication rates.

Design: Cross-sectional analytical study.

Setting: Postanesthetic care unit (PACU) of a single-center tertiary hospital.

Patients: Surgical patients admitted for surgery at our institution over a 4-month period.

Intervention: A data collection tool was used to collect demographic data, length of stay in recovery, prespecified conditions likely to impact on PACU recovery (chronic pain, insulin-dependent diabetes, epilepsy, hypertension, on a methadone program, and Parkinson disease), medication compliance, and complications in PACU.

Measurements: Differences among categorical variables were assessed for significance using the χ^2 test; continuous parametric data were compared using a time to survival analysis via Kaplan-Meier estimates and Cox proportional hazard regressions to account for possible confounders.

Main Results: Preoperative medication compliance for the prespecified conditions was 65.1%. Patients with a preoperative condition spent more time in the PACU compared to patients without a preoperative condition. Time in PACU was not significantly longer for patients who took their medications compared to those who failed to take their medications. Patients with multiple prespecified conditions were more likely to incur a postoperative complication compared to patients without a prespecified condition. Patients with preoperative hypertension and insulin-dependent diabetes incurred higher complication rates in PACU for medication nonadherence compared to medication adherence.

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Conclusion: This study taken together with accruing evidence suggests that preoperative medication omission remains an ongoing issue that can influence complication rates in the PACU. Patients with preoperative conditions stay longer in PACU, and medication omission was associated with higher rates of certain postoperative complications in PACU. This identifies patients likely to require more interventions and greater recovery resources. Further research into the impact of medication omission on recovery parameters after discharge from the PACU is warranted.

1. Introduction

Admission to the postanesthetic care unit (PACU) signals a period of physiological turbulence during recovery from surgery and a transition from the highly monitored intraoperative environment to postsurgical ward care. The PACU environment must balance the pressures of patient safety with the need for efficiency. Limited research efforts have been made to improve PACU cost-effectiveness [1,2], but these have mostly focused on scheduling and staffing strategies. Concurrently, evidence suggests that patients' perioperative adherence to chronic medications is poor, with 30% to 60% of surgical patients having medication incorrectly administered during this period [3]. The influence of preoperative medication adherence on parameters relevant to the PACU has not been studied.

The clinical concern of nonadherence to chronic medications, beyond the effects on the intraoperative period, is that the stress of surgery and anesthesia are superimposed onto the underlying pathology of preexisting comorbidities [4]. This underlying pathophysiology, now without pharmacological support, could lead to increased complication rates in the immediate recovery phase, extended recovery times, and the need for increased clinician input.

We therefore designed a cross-sectional study to explore the effects of preoperative medication adherence, with the hypothesis that nonadherence would (i) increase the length of stay in PACU and (ii) increase rates of postoperative complications. A secondary objective was to identify the reasons of incorrect medication administration in the preoperative period to further identify areas in which medication compliance can be improved.

2. Methods

Prospective approval was obtained from the Human Research Ethics and Governance Committees at St Vincent's Hospital, Sydney (LNR/14/SVH/197). The requirement for individual informed consent was waived.

2.1. Study design

A data collection sheet was designed after consultation with senior recovery nurses and senior departmental anesthetists. This tool was trialed before implementation and was amended to improve clarity. The study was conducted from July to October 2014, allowing 4 full calendar months of data collection. Before the study, in-services were conducted for recovery staff to enhance familiarity with the data collection tool. All patients who had undergone general or regional anesthesia and admitted to the PACU were included in the study. Patients admitted directly to the intensive care unit or the phase 2 recovery unit and those with cognitive impairment or who were non-English speaking were excluded from the study.

Data collected included basic demographic data (age/sex), American Society of Anesthesiologists (ASA) physical status score, type of procedure, and length of stay in recovery. Length of stay in recovery was measured from time of admission until ready for discharge time, rather than departure time from PACU to minimize the effects of "bed block" on the postsurgical wards. A panel of anesthetists and PACU nursing staff were interviewed for the purpose of identifying comorbidities likely to impact on PACU recovery. Although not an exhaustive list, the prespecified conditions (chronic pain, insulin-dependent diabetes, epilepsy, hypertension, on a methadone program, and Parkinson disease) were hypothesized as most likely to extend PACU recovery time.

2.2. Data collection

Patients were questioned immediately before discharge and had their medical records examined. If any of the prespecified medical conditions were present, the patient's preoperative adherence with medical treatment for these conditions and reasons for nonadherence were ascertained. Complications experienced in PACU, unrelated to surgery or anesthesia, and likely to contribute to prolonged stay and increased nursing requirements were also documented. The predetermined complications included ongoing pain management, hypertension (systolic blood pressure [SBP] $\geq$170 mm Hg ongoing after first set of observations), hypotension (SBP $\leq$90 mm Hg ongoing after first set of observations), outsourcing methadone (participant requests methadone while in the PACU), dystonia, hyperglycemia (blood sugar level [BSL] $\geq$1296 mg/dL), hypoglycemia (BSL $\leq$72 mg/dL), and seizures. All cardiac-, respiratory-, and hemodynamic-related complications in PACU including bradycardia, tachycardia, elevated troponin, desaturations, decreased respirations, urinary retention, and decreased urine output were grouped as "other."