Variability in Opioid Prescription Practices for Common General Surgery Procedures in Nova Scotia, Canada

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Introduction

Opioids are commonly prescribed post-operatively; variability in opioid prescription practices (OPP) that do not account for patient factors can significantly contribute to the opioid epidemic in North America[1]. Studies frequently find significant variability and excessive prescribing for common surgical procedures in North America[2,3].

Objectives

The objective of this study was to determine variability in OPP for common general surgery procedures in Nova Scotia (NS) Canada from 2016-2022.

Methods & Procedures

- Study population identified through Canadian Classification of Health Interventions procedure codes in the Canadian Institute for Health Information Discharge Abstract Database and National Ambulatory Care Reporting System.
- Surgical procedures included cholecystectomy, appendectomy, inguinal hernia repair, and hemorrhoidectomy.
- The Drug Information System was used to identify filled opioid prescriptions. OPP were standardized to an equianalgesic pill count of 2 mg hydromorphone tablets.
- The mean, standard deviation (SD) and coefficient of variation (CV) were calculated.
- Variation in OPP was measured using a hierarchical linear regression model (HLM), with surgeons and hospitals included as random effects, and patient factors (procedure, age, sex, Charlson comorbidity index, prior opioid within 180 days of procedure, distance from hospital, and length of stay for inpatients) as fixed effects.
- Intraclass correlation was calculated to determine the amount of variance attributable to variability between hospitals and surgeons.
- A p-value of <0.05 was considered statistically significant.

Results

Table 1: OPP for Inpatients and Outpatients

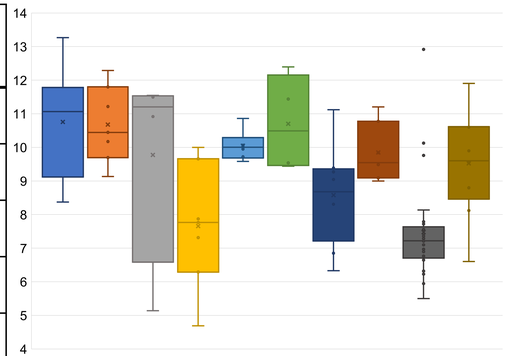
OPP	Inpatient	Outpatient	p-value
n	12199	13333	N/A
% Received Opioid	22.8%	26.8%	<0.0001
Pill Count (SD)	8.1 (SD=3.0)	9.4 (SD=2.7)	<0.0001
Range in Pill Count	0.6-40	1.5-14.1	N/A
CV	36.9	28.7	<0.0001

OPP for inpatients and outpatients are described in Table 1, with the rates of type of opioid prescribed described in Table 2. In the HLM, including patient factors reduced the unexplained variance in pill count by 10.5% for inpatients, and by 2.4% for outpatients, with statistically significant variation amongst both hospitals (p=0.026 for inpatients, p=0.029 for outpatients) and surgeons (p=0.0002 for inpatients, p<0.0001 for outpatients). The intraclass correlation of hospitals and surgeons for the inpatient group was 16.0% and 12.8%, respectively, and was 17.9% and 29.4% respectively for the outpatient group. Figure 1 illustrates variability in OPP between different surgeons, with each box representing a different hospital.

Table 2: Rates of Opioid Type Prescribed for Inpatients and Outpatients

Opioid Type	Inpatient (%)	Outpatient (%)	p-value
Codeine	12.83%	52.53%	<0.0001
Hydromorphone	71.24%	33.92%	<0.0001
Morphine	6.76%	2.47%	<0.0001
Oxycodone	0.98%	1.94%	0.0018
Tramadol	8.2%	9.11%	0.2037

Figure 1: Mean Pill Count Per Surgeon Within Each Hospital



Discussion

- Significant variability in OPP was found – between hospitals, and between surgeons within any given hospital – for patients who underwent common general surgery procedures in NS, Canada.
- There were significant differences in variability between inpatients and outpatients. While inpatients received fewer pills, the range in pill count and CV were higher (Table 1).
- In the inpatient group, more variability in pill count could be explained by the inclusion of patient factors, while variability in the outpatient group was better explained by hospitals.
- Outpatients were more likely to be prescribed opioids with higher rates of misuse[4] (Table 2), with rates of the type of opioid prescribed differing from what has previously been reported in Canada[3].

Conclusion

Unwarranted variability in OPP is of significant concern as it may increase the risks of drug diversion, opioid use disorder and long-term opioid use[1]. Shared decision-making models and prescription guidelines by regulatory bodies have been shown to reduce variability in OPP[5] and may be considered in NS, Canada.

References

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