Rates and risk factors for prolonged opioid use after major surgery: population based cohort study

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STUDY QUESTION

What are the rates and risk factors for prolonged postoperative opioid use in patients undergoing major elective surgery who have not used opioids previously?

SUMMARY ANSWER

Approximately 3% of patients who had not used opioids previously continued to use them for more than 90 days after major surgery. Predictors of prolonged use include younger age, lower household income, major thoracic surgery, specific comorbidities (diabetes, heart failure, pulmonary disease), and specific drugs used preoperatively (benzodiazepines, selective serotonin reuptake inhibitors, angiotensin converting enzyme inhibitors).

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

The risk of patients who have not previously used opioids developing prolonged opioid use after major surgery is unclear. This study showed the risk to be relatively low at an individual level; none the less, it still represents an important public health concern given the millions of patients who undergo major surgery annually.

Participants and setting

This population based study included residents of Ontario, aged 66 years or older, who had not used opioids previously and underwent major elective surgery, including cardiac, intrathoracic, intra-abdominal, and pelvic procedures.

Patient factors significantly predictive of prolonged opioid use

Factors	Adjusted odds ratio (95% CI)
Age groups (years):	
66-75	1.63 (1.08 to 2.46)
76-85	1.47 (0.97 to 2.22)
≥86	Reference
Heart failure	1.32 (1.02 to 1.74)
Diabetes	1.15 (1.00 to 1.31)
Chronic pulmonary disease	1.53 (1.17 to 1.99)
Preoperative treatment:	
Selective serotonin reuptake inhibitors	1.41 (1.10 to 1.80)
Benzodiazepines	1.26 (1.07 to 1.48)
Angiotensin converting enzyme inhibitors	1.26 (1.09 to 1.44)

Design, size, and duration

This was a retrospective cohort study, performed between 1 April 2003 and 31 March 2010, of 39 140 patients who underwent major elective surgery. We used multivariable logistic regression modelling to determine the adjusted association of patient and surgery characteristics with prolonged postoperative opioid use, which was defined as ongoing outpatient prescriptions for opioids for more than 90 days after surgery.

Main results and the role of chance

Of the cohort, 49% (n=19 256) were discharged from hospital with an opioid prescription, whereas 3.1% (n=1229) continued to receive opioids for more than 90 days after surgery. Factors associated with significantly higher risks of prolonged opioid use included younger age, lower household income, specific comorbidities, and use of specific drugs preoperatively. Surgical procedure was also highly predictive of prolonged opioid use. Compared with open radical prostatectomies, both open and minimally invasive thoracic procedures were associated with significantly higher risks (odds ratio 2.58, 95% confidence interval 2.03 to 3.28 and 1.95 1.36 to 2.78, respectively). Conversely, open and minimally invasive major gynaecological procedures were associated with significantly lower risks (0.73, 0.55 to 0.98 and 0.45, 0.33 to 0.62, respectively).

Bias, confounding, and other reasons for caution

Since this study used administrative healthcare data, the indications for opioid prescriptions are unknown and the influence of unmeasured residual confounding cannot be excluded.

Generalisability to other populations

These results can be reasonably extrapolated to individuals undergoing major elective non-cardiac surgery in healthcare systems that are similar to that in Ontario, Canada.

Study funding/potential competing interests

The study was supported in part by the Institute for Clinical Evaluative Sciences, which is itself supported in part by the Ontario Ministry of Health and Long-Term Care. HC has externally peer reviewed grant support from Pfizer Canada to evaluate perioperative pregabalin for pain management after hip replacement surgery.

Opioid prescribing by multiple providers in Medicare: retrospective observational study of insurance claims

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- Analysis: Facing up to the prescription opioid crisis (*BMJ* 2011;343:d5142)
- Practice: Opioids for chronic non-cancer pain (*BMJ* 2013;346:f2937)

STUDY QUESTION

How often do US Medicare beneficiaries obtain prescriptions for opioid drugs from multiple healthcare providers (rather than a single physician provider) and is multiple provider prescribing associated with adverse patient outcomes?

SUMMARY ANSWER

Nearly a quarter of Medicare beneficiaries who receive prescriptions for an opioid receive prescriptions from three or more providers in a year, with prescriptions often being concurrently provided. Beneficiaries who receive opioids from multiple providers are at higher risk for hospital admission related to opioid use.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Rising rates of opioid misuse and adverse effects of legitimate use might reflect fragmented patient care as well as deliberate "doctor shopping." National estimates of the frequency and characteristics of multiple provider opioid prescribing in the US Medicare population are unknown as are associated outcomes. This study of Medicare beneficiaries shows that they often receive prescriptions for opioids from multiple providers and that this is associated with higher rates of hospital admissions related to opioid use.

Participants and setting

Individuals enrolled in the US Medicare program, the primary source of insurance for Americans aged over 65.

Design, size, and duration

Retrospective cohort study of prescription drug and medical claims of a random sample of 1 808 355 individuals continuously enrolled in Medicare in 2010 who had at least one prescription for an opioid. We estimated the proportion of beneficiaries who filled opioid prescriptions from one, two, three, or four or more healthcare professionals (providers). We used logistic regression models to estimate the association of multiple provider prescribing (exposure) with admission to hospital related to opioid use.

Main results and the role of chance

Among 1 208 100 beneficiaries with more than one opioid prescription in 2010, 34.6% filled prescriptions from two providers, 14.2% from three providers, and 11.9% from four or more providers. Prescriptions were often concurrently provided. For example, among beneficiaries with four or more opioid providers, 77.2% received concurrent opioid prescriptions from multiple providers. Multiple provider prescribing was highest among beneficiaries also prescribed stimulants, non-narcotic analgesics, and central nervous system, neuromuscular, and antineoplastic drugs. Opioid related admissions increased with multiple provider prescribing. The adjusted percent of beneficiaries admitted with an opioid related condition was 1.6% among beneficiaries with one provider, 1.9% for two providers, 2.3% for three providers, and 3.2% for four or more providers.

Bias, confounding, and other reasons for caution

Not all instances in which patients obtain opioid prescriptions from multiple providers are cause for alarm (for example, people are often prescribed opioids after a routine dental procedure). Selection bias also precludes a definitive conclusion of whether multiple provider prescribing causes higher rates of admission to hospital related to opioid use.

Generalisability to other populations

The generalisability to the population outside Medicare is yet to be determined.

Study funding/potential competing interests

The study was funded by the National Institutes of Health (ABJ, PK-M, DG) and the University of Minnesota (PK-M).

Percentage of Medicare beneficiaries with admission to hospital related to opioid use in 2010, according to number of unique opioid providers

No of unique opioid providers	No of beneficiaries	No of opioid related admissions	Percentage admitted to hospital (95% CI)	
			Unadjusted	Adjusted
1	314 132	5111	1.63 (1.58 to 1.67)	1.64 (1.59 to 1.69)
2	268 753	5598	2.08 (2.03 to 2.14)	1.97 (1.92 to 2.02)
3	111 830	3209	2.87 (2.77 to 2.97)	2.33 (2.25 to 2.41)
≥4	98 048	4735	4.83 (4.70 to 4.96)	3.24 (3.14 to 3.33)

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Comparative effectiveness of radical prostatectomy and radiotherapy in prostate cancer: observational study of mortality outcomes

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STUDY QUESTION

Is surgery or radiotherapy better for managing prostate cancer?

SUMMARY ANSWER

Survival from prostate cancer is greater in men with localised disease treated with surgery rather than radiotherapy.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

High quality evidence comparing cancer outcomes after surgery and radiotherapy in men with prostate cancer is lacking. This observational study suggests that surgery might offer benefit over radiotherapy for most men with clinically localised prostate cancer.

Participants and setting

34 515 Swedish men first treated for prostate cancer from 1996-2010 with surgery (n=21 533) or radiotherapy (n=12 982). We captured data through the PCBaSe dataset: age, prostate specific antigen, year of treatment, clinical stage, tumour grade, county of residence, marital status, Charlson comorbidity index, and educational and socioeconomic status. Patients were categorised by risk group (low, intermediate, high, and metastatic), age, and Charlson comorbidity score.

Design, size, and duration

The cohort was followed-up for a median 5.37 years (5.26 for radical prostatectomy arm, 5.60 for radiotherapy arm). The primary outcome was death from prostate cancer. To investigate differences in distributions of patient characteristics by treatment we used x^2 and Wilcoxon-Mann-Whitney tests. We derived cumulative incidence curves for mortality from prostate cancer and other causes. Competing risks regression hazard ratios for radiotherapy versus surgery were calculated without adjustment and after propensity score and multivariable adjustments, as well as after propensity score matching. We carried out several sensitivity analyses for residual confounding.

Main results and the role of chance

Patients in the radiotherapy arm had on average worse tumour-patient characteristics than those in the surgery arm. In the surgery arm, there were 339 deaths from prostate cancer and 1064 from other causes, with 697 and 1127, respectively in the radiotherapy arm. Among men with non-metastatic disease (risk groups 1-3), radiotherapy was associated with higher mortality from prostate cancer with and without adjustments, although we found no discernible differences between treatments for patients with metastatic disease (risk group 4); younger and fitter men (fewer comorbidities) with intermediate and high risk disease had the greatest differential benefit from surgery.

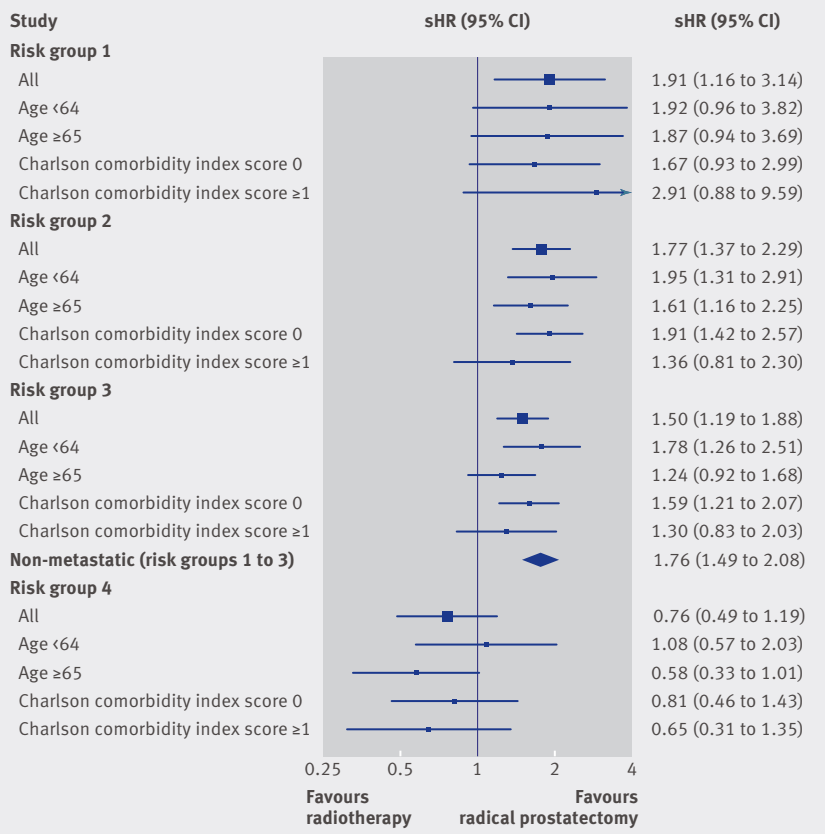
Bias, confounding, and other reasons for caution

Sensitivity analyses showed that residual confounding was highly unlikely to account for the main findings. However, the study was not randomised, our dataset had missing data on potentially important covariates such as radiotherapy dosing, tumour volume, and secondary treatments, and treatment choices for men with prostate cancer and their doctors must take account of toxicity profiles as well as cancer outcomes; such data were not available in this study.

Generalisability to other populations

Given the important burden prostate cancer poses to the National Health Service and healthcare systems worldwide, the findings that surgery may be of benefit over radiotherapy for most men with localised prostate cancer could have important policy implications for resource allocation in the management of this disease. This study was, however, limited to an overwhelmingly non-screen diagnosed, white population. How the findings relate to screen diagnosed men of various ethnicities in countries outside Sweden is therefore uncertain.

Propensity score adjusted subdistribution hazard ratios (sHR) for radiotherapy versus radical prostatectomy for cancer specific mortality stratified by risk group, age, and Charlson comorbidity index score



Role of quality measurement in inappropriate use of screening for colorectal cancer: retrospective cohort study

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- Watch this paper's video abstract at bmj.com/multimedia
- Research: Time lag to benefit after screening for breast and colorectal cancer (*BMJ* 2013;346:e8441)
- Practice: Colorectal cancer (*BMJ* 2013;346:f3172)

STUDY QUESTION

Is the upper age cut off (75 years) of an age based quality measure for screening for colorectal cancer associated with overuse of screening among 70 to 75 year olds in poor health, and underuse in those over age 75 in good health?

SUMMARY ANSWER

Screening use decreased markedly after age 75 (the age cut off used by the quality measure), independent of sex, Charlson comorbidity index, and number of primary care visits, such that an older person in good health with longer life expectancy was less likely to be screened than a younger person in poor health with reduced life expectancy.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Age based quality measures for screening might encourage use of screening that is not clinically sensitive. This study shows that specification of a quality measure can have important implications for clinical care. Future quality measures should focus on individual risk/benefit to ensure that patients who are likely to benefit from a service receive it (regardless of age), and that those who are likely to incur harm are spared unnecessary and costly care.

Participants and setting

United States veterans aged ≥50 at average risk for colorectal cancer, due for repeat screening for colorectal cancer at a primary care visit in fiscal year 2010.

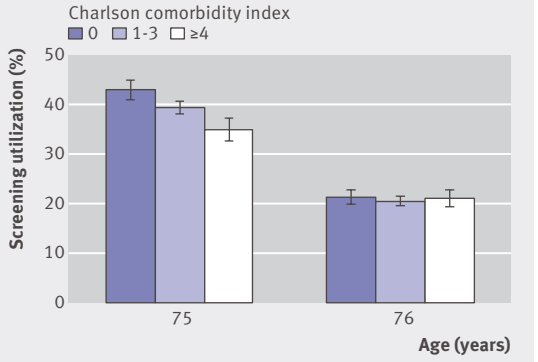
Design, size, and duration

Retrospective cohort study (n=399 067) using electronic data from the Veterans Affairs (VA) Health Care System, the largest integrated healthcare system in the US. The primary outcome was completion of a screening test (fecal occult blood test, sigmoidoscopy, or colonoscopy) within 24 months of the primary care visit in fiscal year 2010.

Main results and the role of chance

Some 38% (151 850/399 067) of veterans underwent a screening test for colorectal cancer in the 24 months after their qualifying primary care clinic visit in fiscal year 2010. Screening use was relatively stable from age 50 to age 75, but use declined abruptly after 75, matching the age cut off promoted by the existing quality measure (relative risk 0.35, 95% confidence interval 0.30 to 0.40). This finding was independent of comorbidity status, number of primary care visits, and sex. A 75 year old in poor health (in whom life expectancy might be limited and screening likely to result in net burden or harm) was significantly more likely to undergo screening than a 76 year old in good health (1.64, 1.36 to 1.97).

Screening utilization at age 75 *v* age 76 (n=21 499)



Bias, confounding, and other reasons for caution

We were unable to adjust for socioeconomic status, race, and education, which could have an impact on screening use. Electronic data are subject to imprecision in coding, leading to overestimation or underestimation of screening use. Screening tests performed outside the VA system were not captured.

Generalizability to other populations

Data were obtained from a large integrated healthcare system in the US with a strong framework for improving quality of preventive care. Results in other settings might differ from those seen in this work. Most existing screening programs, however, use age but not health status to identify a target population for screening, meaning that the key issue highlighted by this study is likely to be generalizable.

Study funding/potential competing interests

This study was funded by the Department of Veterans Affairs. The funder had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; and preparation, review, or final approval of the manuscript.