R-5

Opioid Prescribing Patterns and their Effect on Rehospitalisations

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1 Background & Objectives

Opioid sales in Switzerland increased 91.3% between 2000 and 2009. This increase was primarily driven by strong opioids, led by oxycodone.[1]

Opioid use was identified as one of the predictors associated with rehospitalisation at 30 days in an external validation of the Potentially Avoidable Readmission-Risk Score (PAR-Risk Score).[2]

We aimed to investigate the association between opioid prescribing at hospital discharge and the likelihood of rehospitalisation within 18 and 30 days.

2 Methods

Data	Hospital electronic health records
Patients	≥ 65 years of age who were hospitalised for > 48 hours
Design	Nested case-control (Fig. 1)
Cases	Rehospitalisation after 18 (index 1) or 30 days (index 2)
Exposure	Opioid prescription on the day of discharge in morphine equivalent doses (MED): low (MED < 50 mg), medium (MED 50 - 89 mg), and high (MED ≥ 90 mg). Co-prescription of opioids with benzodiazepines and gabapentinoids
Analysis	1:5 matching of cases and controls on age, sex, year of index day and Charlson Comorbidity Index (CCI); conditional logistic regression adjusted for confounders

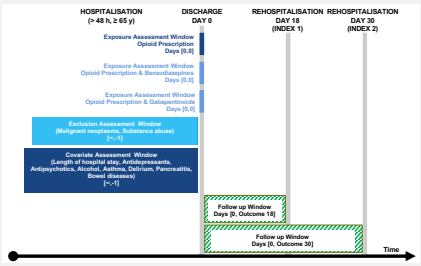

Fig. 1: Nested Case-Control Design. The cohort inclusion was all patients aged ≥ 65 years hospitalised > 48 hours who were discharged alive. Cases were those rehospitalised within 18 days (index 1) or 30 days (index 2). Cases were matched 1:5 to controls who were not rehospitalised at index. Exposure on opioids and co-prescribed benzodiazepines and gabapentinoids was assessed at day of discharge.
Visualisation:[3]

3 Results

At both the 18-day and 30-day rehospitalisation, cases and controls were well matched (Table 1). Remaining differences were adjusted for in the logistic regression.

Table 1: Characteristics of matched cases and controls among those rehospitalised at 18 and 30 days.

	Rehospitalisation 18 days			Rehospitalisation 30 days		
Variable	**Cases** (n = 1698)	**Controls** (n = 8490)	**SMD**	**Cases** (n = 1458)	**Controls** (n = 7290)	**SMD**
Age, years (mean ± SD)	78.06 ± 7.36	78.45 ± 7.78	< 0.01	79.18 ± 7.46	78.37 ± 7.77	< 0.01
Male	880 (53.5%)	4400 (46.5%)	< 0.01	702 (48.1%)	3510 (46.8%)	< 0.01
Year of index day:			< 0.01			< 0.01
2015	382 (22.5%)	1900 (23.2%)		338 (23.2%)	1685 (23.1%)	
2016	409 (24.1%)	2047 (24.5%)		362 (24.8%)	1820 (24.4%)	
2017	442 (26.0%)	2226 (25.7%)		391 (26.8%)	1950 (25.7%)	
2018	465 (27.4%)	2317 (26.6%)		367 (25.2%)	1835 (26.8%)	
Charlson Comorbidity Index:			< 0.01			< 0.01
0	403 (23.7%)	2015 (37.3%)		312 (37.3%)	1560 (21.4%)	
1 - 2	838 (49.4%)	4196 (48.0%)		776 (47.7%)	3880 (53.2%)	
3 - 4	389 (22.9%)	1971 (13.2%)		320 (13.4%)	1608 (21.9%)	
≥ 5	68 (4.0%)	308 (1.6%)		50 (1.6%)	242 (3.4%)	
Length of stay (d) [IQR]	17.11 [12]	8.77 [7]	0.84	10.62 [8]	9.2 [7]	0.16
Prescriptions:						
Opioid	253 (14.9%)	982 (11.6%)	0.10	248 (11.6%)	844 (17.0%)	0.16
Opioid dose:						
MED < 50 mg	238 (10.5%)	892 (14.0%)	0.11	227 (10.6%)	773 (15.6%)	0.15
MED 50-89 mg†	8 (0.5%)	47 (0.6%)	0.01	10 (0.5%)	37 (0.7%)	0.02
MED > 90 mg†	7 (0.5%)	43 (0.4%)	0.01	11 (0.5%)	34 (0.8%)	0.04
Benzodiazepine*,†	13 (0.6%)	48 (0.8%)	0.03	12 (0.7%)	48 (0.8%)	0.02
Gabapentinoid*,†	43 (1.7%)	143 (2.5%)	0.06	39 (1.6%)	119 (2.7%)	0.07

Notes: n = number; SMD = standardised mean difference; SD = standard deviation; d = days; IQR = interquartile range; MED = morphine equivalent doses; *Number of patients with co-prescribed opioids. †Based on previously identified proportions of opioid use in rehospitalised and non-rehospitalised patients, a one-sided Fisher`s exact test calculated the minimum sample size of 169 opioid exposed cases for statistically correct conclusions.

Odds of rehospitalisation at 30 days increased by 49% when opioids were used at discharge, with no effect on 18-day rehospitalisation (Fig. 2). Evaluation by dose was limited by small sample size.

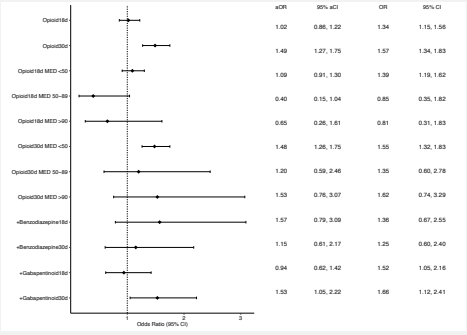

Fig. 2: Summary of calculated odds ratios (OR) with 95% confidence intervals (CI) for all exposures and rehospitalisation after 18 or 30 days.

4 Conclusion

This study identified a significant association between opioid prescription and 30-day rehospitalisation. Hospitals should strive to stop newly established opioid treatments before discharge.

To improve prescribing safety, we call for the introduction of opioid stewardship programmes.

[1]The Lancet Regional Health - Europe, 2022, 20: 100437.
[2]PLOS ONE, 2022, 16(11): e0259864.
[3]Ann Intern Med. 2019;170(6):398-406.

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