Opioid Prescribing and Use after Corneal Surgeries

#3149799

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BACKGROUND

- Opioids, frequently used as analgesics following surgery, have high addition potential.[1] Corneal surgeries often require postoperative opioid medications, but data on usage in ophthalmology overall is limited.
- Recent research has demonstrated that evidence-based prescribing can reduce the number of pills used and does not increase the number of refills requested by patients.[2]

PURPOSE

- Determine if a change in ophthalmic opioid prescribing and monitoring would reduce opioid use by ophthalmic post-surgical patients while maintaining patients' pain control and satisfaction.

METHODS

Selection criteria

- All patients over 18 years who underwent a corneal surgery at the University of Michigan by any provider were recruited to take part in a telephone survey about post-surgical opioid use. Surgeries included penetrating keratoplasty (PKP), collagen cross-linking (CXL), photorefractive keratectomy (PRK), and superficial keratectomy (SK).

Pre-Policy Change Cohort

- The first participant cohort was recruited between December 1, 2017 and January 19, 2018. During this time, the standard post-surgical opioid prescribing policy was 20 tablets of acetaminophen/codeine, 300/30 mg (4.5 morphine equivalents per tablet). Participants were asked if they received an opioid prescription. The participants who confirmed receipt of opioid prescriptions were asked: (1) if they filled the prescription, (2) if they used the opioid tablets, and (3) if they used the tablets, how many tablets they used.

Policy Changes

- On February 26, 2018, the cornea service decreased the standard number of opioid tablets prescribed at the time of surgery from 20 to five tablets after reviewing opioid usage data from the first cohort.
- On June 1, 2018, the State of Michigan adopted Michigan Automated Prescription System (MAPS), a prescription monitoring program used to track controlled substances.[3]

Post-Policy Change Cohort

- After the two policy changes, a second participant cohort was recruited from June 1, 2018 to September 15, 2018. These patients received a detailed survey about their opioid use and effect of pain management.

Statistical Analysis

- Differences between pre- and post-policy change cohorts were tested with 2-sample t, Fisher's exact, and Chi-square tests.

RESULTS

Patient Socio-Demographic and Clinical Information

		Pre-Policy (n=38)	Post-Policy (n=44)
Continuous Variable		Mean (SD)	Mean (SD)
Age at Surgery (years)		37.7 (14.1)	46.7 (19.8
Categorical Variable		%	%
Gender	Male	55.3	47.7
	Female	44.7	52.3
Race	White	81.6	81.4
	Black	2.63	7
	Asian	10.5	9.3
	Other	5.3	2.3
Ethnicity	Non-Hispanic	92.1	100
	Hispanic	7.9	0
Type of Surgery	CXL	18	11.4
	PKP	12.8	7
	PRK	61.5	21
	Super K	7.7	11

Post-policy Change Survey Questions and Results

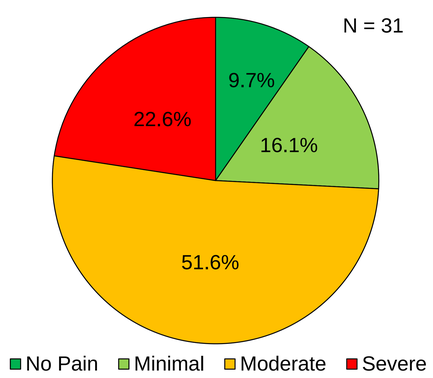
Question	Answer	#	%
Did you take any opioid pain medications daily or most days before you corneal surgery?	Yes	1	3.2
	No	30	96.8
In reviewing data from your medical record, I see that you were discharged with {opioid name} after corneal surgery. Did you fill this prescription?	Yes	27	87.1
	No	4	12.9
Did you need to refill the prescription for {opioid medication} you were given after your surgery or a different opioid pain medication prescription after you left the hospital?	Yes	1	14.3
	No	6	85.7
Did you take medications like ibuprofen, Motrin, Celebrex or naproxen after you left the hospital to treat your pain?	Yes	17	54.8
	No	14	45.2
Did you take Tylenol or acetaminophen after you left the hospital to treat your pain?	Yes	8	25.8
	No	23	74.2
Did you have to seek additional care for your pain after you left the hospital?	Yes	1	3.2
	No	30	96.8
How would you describe the amount of opioid pain pills that you received after you left the hospital?	About right	19	70.4
	Less than I needed	2	7.4
	More than I needed	6	22.2
Do you remember receiving specific instructions about pain management?	Yes	29	93.6
	No	6.5	6.5

Opioid Prescribed after Corneal Surgery in patients receiving a prescription

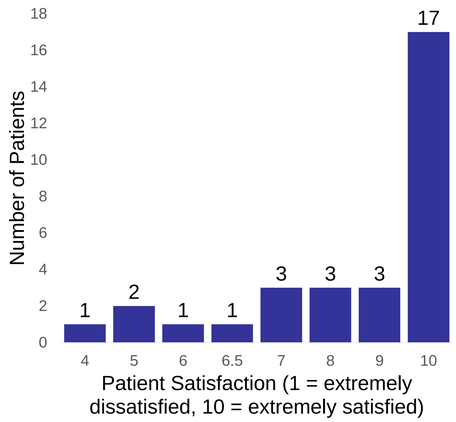
	Pre-Opioid Policy Change Cohort (n = 38)				Post-Opioid Policy Change Cohort (n = 31)				
Variable	N	Mean (SD)	Min, Max	Median	N	Mean (SD)	Min, Max	Median	P-value*
# Pills Rx	34	18.8 (4.2)	3, 30	20	31	6.6 (3.1)	1, 15	5	<0.0001
# Pills Used	29	8.3 (7.0)	0, 30	6	28	4.0 (3.2)	0, 14	4	0.0047
# Pills Left	29	10.3 (6.9)	0, 20	12	28	2.9 (2.7)	0, 10	2.5	<0.0001

*2-sample t-test
SD, Standard Deviation; Min, Minimum; Max, Maximum; Rx, prescribed

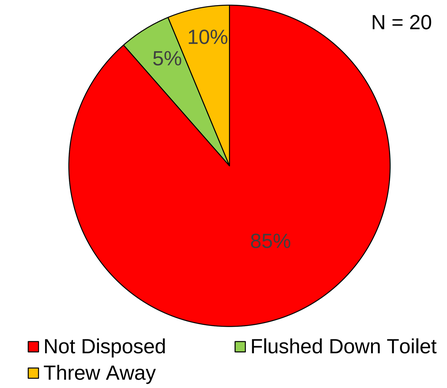
Pain Level Post Corneal Surgery (Post-Policy)



Patient Satisfaction with Pain Management (Post-Policy)



Disposal of Leftover Opioid Medication (Post Policy)



DISCUSSION

Key Findings

- Patients' postoperative use of opioids significantly decreased after surgeons decreased the number of pills prescribed.
- Despite significant decreases in the number of tablets prescribed and used, 92% of patients reported the quantity of opioid pills they received was adequate or more than enough despite 74% of patients reporting moderate to severe postoperative pain.
- Satisfaction with pain management was high with 84% of patients reporting satisfaction ≥ 7 out of 10. Patients did not dispose of opioid tablets properly with 81% retaining leftover medications and 4.8% disposing tablets improperly.
- Not all patients reported receiving opioid information upon discharge despite a state mandate.

Study Limitations

- Data limited to providers at one tertiary-care, academic institution. Data collection required self-report of opioid use subject to potential recall bias.
- Inability to distinguish whether our internal corneal service audit or the state-wide mandate was the key determinant to change opioid use by patients.

Conclusions and Implications

- Prescribing fewer opioid tablets after corneal surgery was associated with less excess opioid tablets and less use of opioids by patients. Despite this reduction, pain was adequately controlled for most patients.
- However, even with the lower usage, pills remained unused in patient's' homes.

REFERENCES AND DISCLOSURES

1. Seth P, Scholl L, Rudd RA, Bacon S. Overdose Deaths Involving Opioids, Cocaine, and Psychostimulants -- United States, 2015-2016. MMWR Morbidity Mortality Weekly Report.
2. Haffajee RL, Mello MM, Zhang F, Zaslavsky AM, Larochelle MR, Wharam JF. Four states with robust prescription drug monitoring programs reduced opioid dosages. *Health Aff*. 2018;37(6):964-974.
3. Michigan Opioid Laws. Department of Licensing and Regulatory Affairs (LARA) and the Michigan Department of Health and Human Services (DHHS)

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