Using High-Quality Open Data to Find Long-Term Results in a Continuously Enrolled Population, an Example in Benign Prostatic Hyperplasia

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Introduction

Traditionally, the utilization of open-claims data has not been widely accepted for use in research studies since it has been perceived as less reliable and comprehensive compared to closed-claims data.[1] However, recent advancements in data-linking technologies have enabled the integration of open claims from multiple sources, leading to improved completeness and accuracy for research studies.[2, 3]

In the context of events that have a long latency time, such as surgical treatment for benign prostatic hyperplasia (BPH), leveraging a dataset that has longer follow-up in both open- and closed-claims data can provide valuable insights into treatment rates over time. This approach helps researchers to better understand the nuances of the disease and potentially identify disparities in care. Combining open and closed datasets with other datasets such as race and ethnicity data allows for analysis that is otherwise not possible.

While medical treatment for BPH remains the first-line therapy, surgical treatment is the definitive care. The average time to surgical care is multiple years. Previous research[4] in one hospital network showed that Black men were less likely to undergo surgical treatment, even when adjusting for age, insurance status, major comorbidities, and type of LUTS medication.

Objective

The objective of this study was to determine rates of surgical treatment in Black and White men and compare these rates in open- and closed-claims data.

Methods

Study Design

- This retrospective, observational study was conducted using de-identified administrative claims from Komodo's Healthcare Map™
- Study Population
  - Age 40+ male
  - Study period: January 1, 2017–June 30, 2021
  - Index event: First treatment of medication therapy
  - History of BPH, no previous history of malignancy
  - One year continuous enrollment (CE) prior to index event
  - Variable (1, 2, and 3 years) of CE after index event
- Cohorts: White, Black, Asian, and Hispanic populations
- Rates and time to surgery were calculated during the CE window and for all time.
- Demographics including age, region, year, Charlson Comorbidity Index (CCI) and previous medications were calculated.
- Rates and time to surgery were compared across the different cohorts.

Results

Table 1. Demographics data of patients with three years of continuous enrollment after index event

	White Asian (N = 179,496)	Asian (N = 11,812)	Black (N = 24,959)	Hispanic (N = 30,692)	Overall (N = 246,959)	SMD
Age						
40-64	88,524 (49.3%)	5,467 (46.3%)	15,235 (61.0%)	15,490 (50.5%)	124,716 (50.5%)	-0.003
65-74	52,375 (29.2%)	3,593 (30.4%)	6,354 (25.5%)	8,973 (29.2%)	71,295 (28.9%)	0.011
75-84	31,304 (17.4%)	2,196 (18.6%)	2,823 (11.3%)	4,990 (16.3%)	41,313 (16.7%)	0.019
>85	7,293 (4.1%)	556 (4.7%)	547 (2.2%)	1,239 (4.0%)	9,635 (3.9%)	0.030
Region						
Northeast	46,449 (25.9%)	4,047 (34.3%)	6,372 (25.5%)	5,568 (18.1%)	62,436 (25.3%)	0.076
Midwest	36,942 (20.6%)	1,039 (8.8%)	4,198 (16.8%)	1,860 (6.1%)	44,039 (17.8%)	-0.209
South	66,047 (36.8%)	2,450 (20.7%)	11,992 (48.0%)	11,881 (38.7%)	92,370 (37.4%)	-0.143
West	28,688 (16.0%)	4,240 (35.9%)	2,256 (9.0%)	10,065 (32.8%)	45,249 (18.3%)	0.256
U.S. Territories	104 (0.1%)	0 (0%)	2 (0.0%)	1,200 (3.9%)	1,306 (0.5%)	-0.025
Year						
2017	85,504 (47.6%)	5,731 (48.5%)	11,620 (46.6%)	14,304 (46.6%)	117,159 (47.4%)	0.001
2018	63,167 (35.2%)	4,051 (34.3%)	8,797 (35.2%)	11,069 (36.1%)	87,084 (35.3%)	-0.006
2019	30,825 (17.2%)	2,030 (17.2%)	4,542 (18.2%)	5,319 (17.3%)	42,716 (17.3%)	0.000
Charlson Comorbidity Index						
0	7,100 (4.0%)	471 (4.0%)	1,042 (4.2%)	1,315 (4.3%)	9,928 (4.0%)	0.002
1-2	54,961 (30.6%)	3,078 (26.1%)	7,239 (29.0%)	8,336 (27.2%)	73,614 (29.8%)	-0.043
3-5	73,678 (41.0%)	5,032 (42.6%)	8,990 (36.0%)	11,338 (36.9%)	99,038 (40.1%)	0.005
6+	43,757 (24.4%)	3,231 (27.4%)	7,688 (30.8%)	9,703 (31.6%)	64,379 (26.1%)	0.033
History of selective alpha blockade in previous 3 years						
Yes	168,604	11,242 (95.2%)	23,987 (96.1%)	29,319 (95.5%)	233,152 (94.4%)	-0.047
No	(93.9%)	570 (4.8%)	972 (3.9%)	1,373 (4.5%)	13,807 (5.6%)	-0.047
History of 5-alpha-reductase inhibitor						
Yes	46,259 (25.8%)	3,598 (30.5%)	5,391 (21.6%)	8,278 (27.0%)	63,526 (25.7%)	0.047
No	133,237 (74.2%)	8,214 (69.5%)	19,568 (78.4%)	22,414 (73.0%)	183,433 (74.3%)	0.047
Surgery within 1 year of medication use						
Yes	6,060 (3.4%)	247 (2.1%)	665 (2.7%)	955 (3.1%)	7,927 (3.2%)	-0.008
No	9,248 (5.2%)	408 (3.5%)	1,002 (4.0%)	1,405 (4.6%)	12,063 (4.9%)	-0.008
Surgery within 2 years of medication use						
Yes	8,992 (5.0%)	387 (3.3%)	1,002 (4.0%)	1,446 (4.7%)	11,827 (4.8%)	-0.001
No	6,316 (3.5%)	268 (2.3%)	665 (2.7%)	914 (3.0%)	8,163 (3.3%)	-0.001
Surgery within 3 years of medication use						
Yes	11,673 (6.5%)	496 (4.2%)	1,281 (5.1%)	1,844 (6.0%)	15,294 (6.2%)	-0.084
No	167,823 (93.5%)	11,316 (95.8%)	23,678 (94.9%)	28,848 (94.0%)	231,665 (93.8%)	-0.084
Days to Surgery						
Mean (SD)	654 (523)	656 (517)	639 (517)	631 (513)	650 (521)	-0.019
Median [Min, Max]	552 (0,1990)	555 (0,1950)	553 (0,1940)	525 (0, 2000)	549 (0, 2000)	0.046

- Overall, Black patients were younger and had slightly higher rates of selective alpha blockade and similar comorbidities to other populations. In every time period, they had a lower rate of surgical treatment and a longer time to treatment than their White counterparts.
- Asian patients were older and also had higher rates of selective alpha blockade and 5-alpha-reductase inhibitor and similar comorbidities to other populations. In every time period, they had a lower rate of surgical treatment and a longer time to treatment than their White counterparts.

Table 2. Rate of events for each year and all time

	Number of patients in cohort	Number of patients with event in the first year of continuous enrollment	Number of patients with event in the second year of continuous enrollment	Number of patients with event in the third year of continuous enrollment	Number of patients with event within open and closed time frames	Mean days (SD) to event all time
1 year continuous enrollment after index	586,443	21,103 (3.6%)	—	—	43,694 (7.5%)	531 (479)
2 year continuous enrollment after index	382,859	12,746 (3.3%)	19,026 (5.0%)	—	29,836 (7.8%)	592 (494)
3 year continuous enrollment after index	246,959	7,927 (3.2%)	11,827 (4.8%)	15,294 (6.2%)	19,990 (8.1%)	650 (521)

The study population was more than two times larger when only 1 year of continuous enrollment after the index date was required compared to 3 years of continuous enrollment being required.

- Similar rates of events were seen within 1 and 2 years regardless of the time of continuous enrollment required.
- The number of events was highest when the population was followed in an open time period (8.1% all time versus 6.2% in 3 years continuous enrollment)
- The number of days to event was longest when the population was followed in open and closed time frames after 3 years of continuous enrollment, 650 days.

Conclusion

Within this dataset, similar surgical rates were seen in each continuous enrollment cohort; however, the largest volume of events was seen in the open time frame. The shortest continuous enrollment period had the largest volume of surgical treatments and a similar percentage of surgeries compared to longer periods.

While BPH is a relatively common disease and surgical treatment is well captured in the open and closed data, rare diseases or uncommon events may be difficult to find in a closed-claims population. This study suggests that in a high-quality population, open data can be used to capture long-term events. More research is needed in these populations to confirm these findings.

References

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