

Trends in Prescribing Opioids, Benzodiazepines, and Both Among Patients Undergoing Interventional Pain Procedures in 2016-2019



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INTRODUCTION

- The prevalence of psychiatric comorbidities, such as anxiety and depression, in chronic pain patients may likely lead to concurrent use of benzo and opioids, which has been involved in at least 30% of opioid overdoses in the US. [3]
- Due to the risk of adverse effects, the CDC issued guidelines in 2016 with warnings against co-prescribing these drugs. Still, it is unclear how these guidelines precisely influenced prescription patterns.
- Interventional pain procedures can facilitate opioid use reduction and possibly decrease the psychological burden of pain. Yet, patterns of opioid or benzodiazepine use are not well characterized in patients undergoing interventional pain procedures.
- We performed a retrospective chart review of chronic pain patients undergoing interventional pain procedures at a tertiary medical center from 20016 through 2019.

METHOD

- A single-center retrospective, observational study that used a de-identified dataset was obtained from the University of Minnesota (UMN) pain clinic between 3/2/2016 and 10/11/2019.
 - Exception from being human subjects research by the UMN Institutional Review Board (#00000463).
- The patients were divided into four cohorts for analysis: (1) neither use of opioids and benzodiazepines, (2) opioid use (without benzodiazepine), (3) benzodiazepines use (without opioids), and (4) co-prescription of both opioids and benzodiazepine.
- Comparisons across groups were done using chi-squared tests for categorical measures. P < 0.05 was considered statistically significant. A smoothed Loess fit regression curve was used to show the proportion of opioid and benzodiazepine co-prescription over time.

Table 1. Summary table by Opioid/Benzo Groupings with Patient Gender and BMI as Covariate. Values presented are mean (SD) or N (%) where indicated.

Covariate	Overall (N=1424)	Neither (N=689)	Opioid Only (N=402)	Benzo Only (N=148)	Opioid+Benzo (N=185)	p-value
Male (v. Female)	640 (44.9%)	341 (49.5%)	183 (45.5%)	49 (33.1%)	67 (36.2%)	< 0.001
BMI (kg/m2)	29.3 (7.22)	29.1 (6.61)	30.2 (7.94)	27.9 (7.02)	29.0 (7.78)	0.013
BMI Group:						0.071
<25	328 (23.0%)	162 (23.5%)	81 (20.1%)	41 (27.7%)	44 (23.8%)	
25-30	398 (27.9%)	200 (29.0%)	99 (24.6%)	47 (31.8%)	52 (28.1%)	
30-35	247 (17.3%)	126 (18.3%)	78 (19.4%)	17 (11.5%)	26 (14.1%)	
35-40	108 (7.6%)	50 (7.3%)	42 (10.4%)	6 (4.1%)	10 (5.4%)	
>40	91 (6.4%)	42 (6.1%)	25 (6.2%)	9 (6.1%)	15 (8.1%)	
Missing	252 (17.7%)	109 (15.8%)	77 (19.2%)	28 (18.9%)	38 (20.5%)	

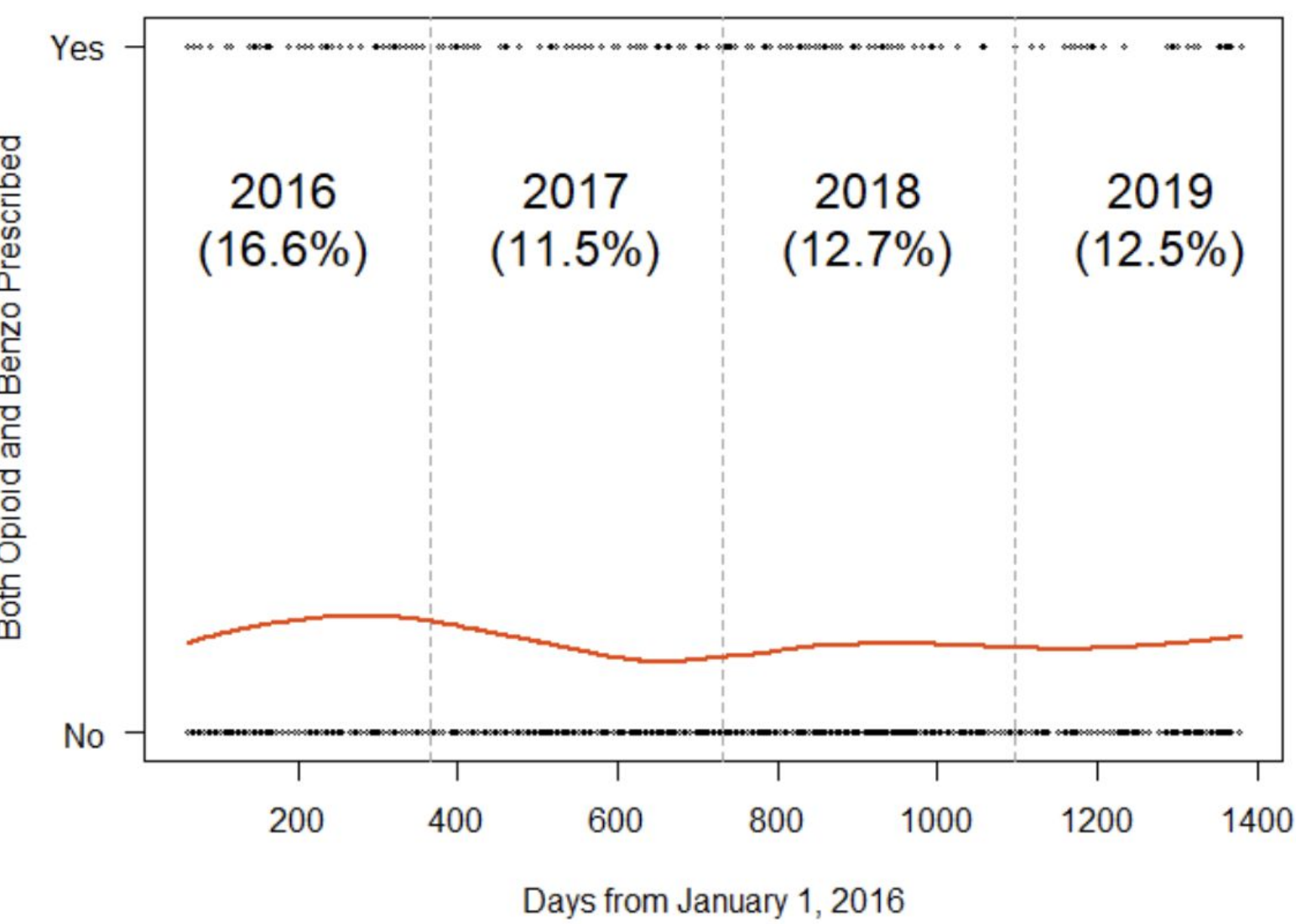


Figure 1. Proportion with Both an Opioid and Benzo Prescribed by Year with a Loess Smoothed Regression Curve (red line) Indicating a Smoothed Trajectory Over Time

Table 2. Summary table by Opioid/Benzo Groupings with Patient Age as Covariate. Values presented are mean (SD) or N (%) where indicated.

Covariate	Overall (N=1424)	Neither (N=689)	Opioid Only (N=402)	Benzo Only (N=148)	Opioid+Benzo (N=185)	p-value
Age (years)	59.0 (16.0)	58.4 (16.6)	60.7 (15.4)	55.7 (16.5)	60.0 (14.3)	0.006
Age Group:						0.096
18 to 44	277 (19.5%)	137 (19.9%)	73 (18.2%)	39 (26.4%)	28 (15.1%)	
45 to 64	544 (38.2%)	272 (39.5%)	143 (35.6%)	55 (37.2%)	74 (40.0%)	
65+	599 (42.1%)	276 (40.1%)	186 (46.3%)	54 (36.5%)	83 (44.9%)	
Underage (<18)	4 (0.3%)	4 (0.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	

RESULTS

- 1,424 patients identified from 4,413 procedures. Mean age was 56±16 years, female and male ratio was 55% and 45%, mean BMI was 24±13 - comprised of Neither use of opioids and benzodiazepines (48.4%), Opioid only (28.2%), Benzodiazepines only (10.4%), and Co-prescription of opioids & benzodiazepines (12.9 %). (Table 1)
- In the context of the CDC 2016 guideline release, the co-prescription rate showed a mild reduction from **16.6% in 2016 to 11.5-12.7% in 2017-2019**. (Figure 1).
- There was a **significant difference in the proportion of males vs. females** across the four cohorts (p< 0.001, chi-square). Females, compared to males, were prescribed with a higher rate of benzodiazepine (66.9% vs 33.1%; p<0.001, chi-square) and co-prescription of opioid and benzodiazepine (63.8% vs 36.2%; p=0.008, chi-square).
- A significantly increased number **of patients over 65 years were prescribed opioids (46.3% vs 18.2%)** or co-prescription of opioids and benzodiazepine (44.9% vs. 15.1%) when compared with 18-44 years old. (p=0.034, chi-square) (Table 2)
- Obesity was negatively associated with opioid and benzo prescription. The prescription of both drugs **declined at progressively higher BMI values after a BMI of 30**.

DISCUSSION

- A slight decline in the rate of co-prescribing of opioids and benzodiazepines in 2016 was observed, but the rate of yearly co-prescription **remained stable afterward**.
- Women had a higher rate of benzodiazepine use and co-prescription of opioids and benzodiazepines, possibly forming an increased prevalence of anxiety. [5]
- Patients of age 65+ had the highest proportion of opioid use.
- Surprisingly, 16.5% of patients with BMI > 40, who are more susceptible to opioid overdose and death [2], were still co-prescribed with opioids and benzodiazepines.

REFERENCES

- 1) Agarwal S, Landon BE. Patterns in Outpatient Benzodiazepine Prescribing in the United States. JAMA network open. 2019;2(1):e187399-e187399. doi:https://doi.org/10.1001/jamanetworkopen.2018.7399
- 2) Archibald P, Kavitha Subramoney, Beydoun HA, Ché Matthew Harris. The impact of obesity in patients hospitalized with opioid/opiate overdose. Substance Abuse. 2021;43(1):253-259. doi:https://doi.org/10.1080/08897077.2021.1941505
- 3) Cho J, Spence MM, Niu F, Hui RL, Gray P, Steinberg S. Risk of Overdose with Exposure to Prescription Opioids, Benzodiazepines, and Non-benzodiazepine Sedative-Hypnotics in Adults: a Retrospective Cohort Study. Journal of General Internal Medicine. 2020;35(3):696-703. doi:https://doi.org/10.1007/s11606-019-05545-y
- 4) Jeffery MM, W. Michael Hooten, Jena AB, Ross JS, Shah ND, Pinar Karaca-Mandic. Rates of Physician Coprescribing of Opioids and Benzodiazepines After the Release of the Centers for Disease Control and Prevention Guidelines in 2016. JAMA network open. 2019;2(8):e198325-e198325. doi:https://doi.org/10.1001/jamanetworkopen.2019.8325
- 5) S. R. Kathryn McHugh, Geyer R, Chase AR, Griffin ML, Olivera Bogunovic, Weiss RD. Sex differences in benzodiazepine misuse among adults with substance use disorders. Addictive Behaviors. 2021;112:106608-106608. doi:https://doi.org/10.1016/j.addbeh.2020.106608



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