

Prevalence and Predictors of Cannabis Use Disorder among Inflammatory Bowel Disease Hospitalizations in the United States and its Effect on Length of Stay

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Received: 26 Jan 2022; Accepted: 24 Feb 2022; Published: 02 Mar 2022

Citation: Wang YR. Prevalence and Predictors of Cannabis Use Disorder among Inflammatory Bowel Disease Hospitalizations in the United States and its Effect on Length of Stay. *Gastroint Hepatol Dig Dis*. 2022; 5(1): 1-4.

ABSTRACT

Background: The prevalence of cannabis use has been increasing in the United States in recent years. We examined the prevalence and predictors of cannabis use disorder among IBD hospitalizations and its effect on length of stay.

Methods: Using the 2017 National Inpatient Sample, cannabis use disorder was identified using ICD-10-CM code F12.xxx in adult IBD patients. Other variables of interest included age, sex, race, Crohn's disease (vs. ulcerative colitis), region, metropolitan status, zip code household income, primary insurance, and length of stay. Multivariate logistic and Poisson regressions were used in statistical analysis.

Results: Of the 17,857 IBD hospitalizations, 565 (3.1%) had cannabis use disorder. Patients with cannabis use disorder were younger (mean \pm standard deviation [years]: 35.1 ± 11.8 vs. 45.6 ± 18.1), less likely female (32.7% vs. 54.1%), more likely African American (24.8% vs. 13.9%), and more likely Crohn's disease (72.0% vs. 62.2%) (all $p < 0.001$). There were also significant differences by region, income, and insurance. Multivariate logistic regression confirmed age (odds ratio [95% confidence interval]: 0.964 [0.957, 0.971]), female (0.444 [0.369, 0.531]), African American (1.405 [1.124, 1.750]), and Crohn's disease (1.363 [1.126, 1.657]) as predictors of cannabis use disorder. There was no association between cannabis use disorder and length of stay, confirmed in multivariate Poisson regression.

Conclusions: Young age, male sex, African American race, and Crohn's disease were positively associated with cannabis use disorder in IBD hospitalizations. There was no effect of cannabis use disorder on length of stay.

Keywords

Inflammatory Bowel Disease, Cannabis, Digestive tract.

Introduction

The prevalence of cannabis use has been increasing in the United States in recent years [1-3]. In small studies, cannabis use improved inflammatory bowel disease (IBD) symptoms, including pain, nausea, and decreased appetite [4,5]. There is no evidence that cannabis can reduce IBD inflammation or improve disease activity [6,7].

In this study, we examined the prevalence and predictors of cannabis use disorder among IBD hospitalizations in the United States in 2017 and studied the effect of cannabis use disorder on length of hospital stay.

Data and Methods

Using the 2017 National Inpatient Sample [8], the largest publicly available database of inpatient admissions in the United States, we first identified adult IBD hospitalizations as those aged 18 years or older and with the primary diagnosis of either Crohn's disease

(ICD-10-CM diagnosis code K50.xxx) or ulcerative colitis (K51.xxx). Patients with cannabis use disorder were identified using the ICD-10-CM diagnosis code F12.xxx present in any of the 39 secondary diagnoses.

Other variables of interest included patient age, sex, race (White, African American, Hispanic, and other), hospital region (Northeast, Midwest, South, and West), metropolitan status (large or not), zip code household median income (above or below the national median), primary insurance (Private, Medicare, Medicaid, and other), and length of stay.

The Student's t-test, chi-square test, multivariate logistic regression, and multivariate Poisson regression were used in statistical analysis.

Results

Of the 17,857 IBD hospitalizations, 565 (3.1%) had cannabis use disorder. Compared to patients without cannabis use disorder, those with cannabis use disorder were younger (mean \pm standard deviation [years]: 35.1 \pm 11.8 vs. 45.6 \pm 18.1), less likely female (32.7% vs. 54.1%), more likely African American (24.8% vs. 13.9%), and more likely Crohn's disease (72.0% vs. 62.2%) (all $p < 0.001$) (Table 1). There were also significant differences

between patients with cannabis use disorder and those without the disorder in region (West: 24.1% vs 15.5%), zip code household median income (Below median: 61.1% vs. 51.5%), and primary insurance (Medicaid: 40.5% vs. 18.2%) (all $p < 0.001$). There was no significant difference in length of stay (4.7 \pm 5.0 days vs. 4.9 \pm 5.3 days).

In the multivariate logistic regression, patient age (odds ratio [95% confidence interval]: 0.964 [0.957, 0.971]), female sex (0.444 [0.369, 0.531]), African American race (1.405 [1.124, 1.750]), and Crohn's disease (vs. ulcerative colitis: 1.363 [1.126, 1.657]) were significant predictors of cannabis use disorder (Table 2). The other significant predictors included West region (vs. Northeast: 1.631 [1.257, 2.119]), zip code household median income (below vs. above the national median: 1.270 [1.050, 1.540]), and primary insurance other than private insurance (Medicare 1.781 [1.310, 2.403]; Medicaid 2.829 [2.284, 3.509]; other 2.573 [1.952, 3.372]).

In the multivariate Poisson regression, cannabis use disorder is not a significant predictor of length of stay (incidence risk ratio [95% confidence interval]: 0.981 [0.943, 1.020]) (Table 3). The significant predictors of length of stay included patient age, sex, race, Crohn's disease, and primary insurance.

Table 1: Characteristics of IBD hospitalizations with and without cannabis use disorder in 2017.

Variable	Cannabis Related Disorder	No Cannabis Related Disorder
Number of Hospitalizations	565	17,292
Age, years (mean \pm STD)***	35.1 \pm 11.8	45.6 \pm 18.1
Female (%)***	32.7	54.1
Race (%)***		
White	62.0	73.3
African American	24.8	13.9
Hispanic	9.2	8.3
Other	4.1	4.6
Inflammatory Bowel Disease Type (%)***		
Crohn's Disease	72.0	62.2
Ulcerative Colitis	28.0	37.8
Region (%)***		
Northeast	20.4	21.7
Midwest	21.1	23.5
South	34.5	39.2
West	24.1	15.5
Large Metropolitan Area (%)	60.2	57.8
ZIP Code Household Income Below Median (%)***	61.1	51.5
Primary Insurance (%)***		
Private	29.7	47.0
Medicare	13.6	25.9
Medicaid	40.5	18.2
Other	16.1	8.9
Length of Stay, days (mean \pm STD)	4.7 \pm 5.0	4.9 \pm 5.3

Notes: *** $p < 0.001$.

Table 2: Multivariate logistic regression results on the predictors of cannabis use disorder in IBD hospitalizations in 2017.

Variable	Odds Ratio (95% Confidence Interval)
Age, years***	0.964 (0.957, 0.971)
Female***	0.444 (0.369, 0.531)
Race (vs. White)	
African American**	1.405 (1.124, 1.750)
Hispanic	0.834 (0.604, 1.132)
Other	0.829 (0.521, 1.258)
Crohn's Disease (vs. Ulcerative Colitis)**	1.363 (1.126, 1.657)
Region (vs. Northeast)	
Midwest	0.914 (0.699, 1.195)
South	0.864 (0.675, 1.109)
West***	1.631 (1.257, 2.119)
Large Metropolitan Area	1.087 (0.902, 1.314)
ZIP Code Household Income Below Median*	1.270 (1.050, 1.540)
Primary Insurance (vs. Private)	
Medicare***	1.781 (1.310, 2.403)
Medicaid***	2.829 (2.284, 3.509)
Other***	2.573 (1.952, 3.372)

Notes: ***p<0.001, ** p<0.01, *p<0.05.

Table 3: Multivariate Poisson regression results on the predictors of length of stay in IBD hospitalizations in 2017.

Variable	Incidence Risk Ratio (95% Confidence Interval)
Age, years***	1.002 (1.002, 1.003)
Female***	0.962 (0.949, 0.975)
Race (vs. White)	
African American	1.017 (0.996, 1.037)
Hispanic***	0.911 (0.887, 0.935)
Other**	0.953 (0.922, 0.985)
Crohn's Disease (vs. Ulcerative Colitis)***	0.931 (0.918, 0.944)
Region (vs. Northeast)	
Midwest***	0.941 (0.922, 0.960)
South	1.001 (0.983, 1.019)
West	0.980 (0.959, 1.002)
Large Metropolitan Area	0.998 (0.983, 1.013)
ZIP Code Household Income Below Median	1.000 (0.985, 1.015)
Primary Insurance (vs. Private)	
Medicare***	1.044 (1.024, 1.065)
Medicaid***	1.075 (1.055, 1.096)
Other**	0.966 (0.942, 0.991)
Cannabis Related Disorder	0.981 (0.943, 1.020)

Notes: ***p<0.001, ** p<0.01.

Conclusions

In this retrospective observational study, we found that young age, male sex, African American race, and Crohn's disease were positively associated with cannabis use disorder in admitted IBD patients in 2017. Cannabis use disorder was not associated with any change in length of stay. Our findings are in line with previous

studies noting an increase in cannabis use by IBD patients in the United States, similar to the general population trends [9-11]. Whether increasing cannabis use is associated with better or worse IBD outcomes is an important topic for future research.

Our study has a number of limitations. The National Inpatient

Sample is a 20% sample of all inpatient admissions in the United States, but it does not include a unique patient identifier. Some IBD patients might be admitted more than once in 2017 and overrepresented in our study sample. We do not have access to important clinical details on the location and severity of IBD, although IBS patients admitted for inpatient care tend to suffer from severe disease activity. Future studies using an outpatient IBD database or ideally an IBD registry over time may address these limitations.

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