

Effects of race on treatment and outcomes of inflammatory bowel disease.

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Abstract

Objectives: Prior studies suggested that African American (AA) patients with inflammatory bowel disease (IBD) have worse outcomes compared to non-Hispanic white (NHW) patients. We aimed to compare racial differences in IBD treatment, medication compliance, and clinical remission at our institution.

Methods: Chart review was performed on all gastroenterologist visits with the diagnosis of IBD between 01/2011 and 10/2012. Patient characteristics, IBD medical treatment, medication compliance, and clinical remission status were obtained at the last visit. The chi-square (or Fisher's exact) test and multivariate logistic regression were used in statistical analysis.

Results: There was no significant difference in IBD medical treatment between the 87 AA (49 Crohn's, 38 UC) and 404 NHW patients (182 Crohn's, 222 UC). Compared to NHW patients, AAs were more likely to use narcotics (16.1% vs 8.4%, $p < 0.05$) and less likely to be compliant with medical treatment (83.9% vs 92.8%) and in clinical remission (12.6% vs 29.2%) (both $p < 0.05$). In multivariate logistic regressions, AA race (odds ratio [OR] 0.40, 95% confidence interval [CI] 0.20-0.80) were negative associated with medication compliance; AA race (OR 0.33, 95% CI 0.17-0.65) and family history of IBD (OR 0.30, 95% CI 0.13-0.73) were negatively associated with clinical remission.

Conclusion: Compared with NHW patients, AAs had similar IBD medical treatment, were more likely to use narcotics, and were less likely to be compliant with medical treatment and achieve clinical remission.

Keywords: IBD treatment, Clinical remission, Inflammatory bowel disease.

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Introduction

Inflammatory Bowel Disease (IBD), i.e., Crohn's disease and ulcerative colitis (UC), is characterized by chronic inflammation of the gastrointestinal tract. Previous studies showed an increase in the incidence of IBD including those in African American (AA) and Hispanic patients [1,2].

Previous literature on racial differences in IBD phenotype, treatment pattern, and outcomes yielded mixed results [3-14]. While some studies showed similar disease presentation, including age of onset and severity, and medical treatment, others showed more aggressive disease course, less use of immunomodulator and biological treatment, lower compliance with medical treatment, and more need for surgical resection in AA patients.

In this retrospective study, we compared AA and NHW IBD patients in disease characteristics, medical treatment, medication compliance and clinical remission at our tertiary IBD center. We hypothesized that AAs are similar to NHW patients in disease characteristics and medical treatment but due to socioeconomic factors, are less compliant with medical treatment and less likely in clinical remission.

Data and Methods

After IRB approval, a complete list of gastroenterologist

visits of patients 18 years or older with the ICD-9 diagnosis codes 555.x for Crohn's disease and 556.x for UC at Cooper University Health Care was obtained for the 22-month study period between January 1, 2011 and October 31, 2012. In-depth chart review was performed using the EPIC electronic medical record system to verify IBD diagnosis and obtain patient demographics, race/ethnicity, presence of primary sclerosing cholangitis (PSC), family history of IBD, current smoking status, use of various medications (NSAIDs except for aspirin, narcotics, steroids including budesonide, 5-ASA products, immunomodulators (azathioprine, 6-mercaptopurine, or methotrexate), and biological products (anti-TNF agents and natalizumab)), compliance with IBD treatment, and clinical remission status at the last visit with a gastroenterologist during the study period. Both medication compliance and clinical remission status were ascertained based on clinical documentation of the gastroenterologist at the last visit. Patients of other race/ethnicity (not AA or NHW) were excluded from the study sample. We also conducted subgroup analysis of patients with either Crohn's disease or UC.

The Student's t-test for a continuous variable (age), the chi-square test for a binary variable (or the Fisher's exact test if one cell had an expected count < 5), and the multivariate logistic regression with stepwise selection to identify significant variables with $p < 0.05$ were used in statistical analysis.

Results

There were 491 IBD patients in our study sample, including 87 AA and 404 NHW patients (Table 1). Compared to NHW patients, AA patients were about 3 years younger ($p<0.001$) and similar in percentages of female, Crohn's disease, PSC, family history of IBD, and current smoker.

Narcotic use almost doubled in AA patients compared to NHW patients (16.1% vs 8.4%, $p<0.05$), due to more narcotic use in AA patients with Crohn's disease (24.5% vs. 13.2%, $p=0.05$) but not in AA patients with UC (5.3% vs. 4.5%, $p=0.69$) (Table 2). AA patients were similar to NHW patients in the use of various IBD medications including 5-ASA, steroids, immunomodulators, and biologicals.

Medication compliance was lower in AA patients (83.9% vs 92.8% for NHW patients, $p<0.01$), similar for AA patients with Crohn's disease (81.6% vs. 92.9%, $p<0.05$) and AA patients with UC (86.8% vs. 92.8%, $p=0.21$). AA patients was much less likely in clinical remission compared to their NHW counterparts (12.6% vs. 29.2%, $p<0.01$), similar for AA patients with Crohn's disease (12.2% vs. 24.2%, $p=0.07$) and AA patients with UC (13.2% vs. 33.3%, $p<0.05$) (Table 2).

In multivariate logistic regression, AA race (vs NHW) was negatively associated with compliance with IBD medication(s) (odds ratio [OR]: 0.40, 95% confidence interval [CI]: 0.20-0.80) (Table 3); none of the other patient characteristics from Table 1 were significant. Both AA race (vs NHW) (OR 0.33, 95% CI 0.17-0.65) and family history of IBD (OR 0.30, 95% CI 0.13-0.73) were negatively associated with achieving clinical remission in multivariate logistic regression; the other patient characteristics were not significant. Subgroup analyses of

Table 1. Racial differences in patients with inflammatory bowel disease (IBD).

Variables	Non-Hispanic White	African American
N	404	87
Age, mean (SD), years	47.3 (17.0)	44.7 (16.3) ***
Female, %	57.2	60.9
Crohn's disease, %	45.0	56.3
PSC, %	1.5	2.3
Family history of IBD, %	11.6	6.9
Current smoker, %	13.5	16.5% Z

SD=Standard Deviation; PSC=Primary Sclerosing Cholangitis.
*** $p<0.001$.

Table 2. Racial differences in inflammatory bowel disease treatment, medication compliance and clinical remission.

Variables	Non-Hispanic White	African American
N	404	87
Medication use, %		
NSAIDs	4.0	6.9
Narcotics	8.4	16.1*
5-ASA	70.8	67.8
Steroids	17.1	21.8
Immunomodulators	19.1	24.1
Biologicals	22.3	26.4
Medication compliance, %	92.8	83.9**
Clinical remission, %	29.2	12.6**

NSAID=Non-Steroidal Anti-Inflammatory Drugs; 5-ASA=5-Aminosalicylic Acid.
* $p<0.05$; ** $p<0.01$.

Table 3 Logistic regression results on predictors of inflammatory bowel disease (IBD) medication compliance and clinical remission.

Variables	Odds Ratio (95% Confidence Interval)
Medication compliance	
African American (vs Non-Hispanic White)	0.40 (0.20,0.80)
Clinical remission	
African American (vs Non-Hispanic White)	0.33 (0.17,0.65)
Family history of IBD	0.30 (0.13,0.73)

Crohn's disease and UC confirmed the robustness of the above findings on differences between AA and NHW patients.

Discussion

In this retrospective study, we found that AA patients were similar to NHW patients in IBD characteristics and medical treatment but were more likely to use narcotics and less likely to comply with medical treatment and achieve clinical remission.

Considering that both AA and NHW patients were treated by the sample group of gastroenterologists at our tertiary IBD center, including three IBD subspecialists, it is not surprising that there was no racial difference in medical treatment. The finding of more narcotic use by AA patients is concerning, as narcotic use is associated with worse long-term outcomes [15]. In this retrospective study, we could not ascertain the clinical rationale for narcotics, its prescriber (gastroenterologist, primary care physician, emergency room physician, or others), and the length of usage, which are important questions for future research.

Our finding of less compliance with IBD medical treatment by AA patients is consistent with several previous studies [6,9,11,13] and likely contributed to their lower rate of clinical remission. AA patients are more likely of low socioeconomic status (education, income, etc) and consequently less likely to understand the risk/benefit tradeoffs of IBD therapy, afford often expensive medications, and have timely access to subspecialists. In addition, AA race-specific cultural and genetic factors may also contribute to racial differences in IBD outcomes [4,10,16]. To separate out the effects of socioeconomic factors from those of AA race-specific factors has important health policy and treatment implications but is not possible in our retrospective study. Use of AA care navigators in an IBD medical home setting may help, considering the lack of AA gastroenterologists (let along IBD subspecialists) in the United States.

One limitation of our study is the reliance on physician clinical documentation to measure medication compliance and clinical remission. Real compliance rate may be much lower than that reported by patients. This likely led to overestimation of medication compliance (as compliant patients are more likely to visit their gastroenterologists) and underestimation of clinical remission (due to the higher chance of sick visits for IBD flares) as shown by the high compliance and low remission rates in our study. Secondly, for AA patients, there may be socioeconomic, insurance, culture and communication barriers that bias physician assessment of medication compliance and clinical remission. Use of pill counts and endoscopic remission measures in a prospective study can mitigate such biases and provide accurate measures of medication compliance

and clinical remission respectively. Thirdly, we did not have detailed information on Crohn's disease surgical history and complications (bowel obstruction, fistula, etc) that affects narcotics use, medication compliance, and clinical remission.

Conclusion

In summary, despite similar medical treatment at our tertiary IBD center, AA patients were more likely to be on narcotics, less compliant with medical therapy, and less likely to achieve clinical remission. Whether socioeconomic, cultural, or other race related factors lead to these differences is an important question for future research.

Compared with NHW patients, AAs had similar IBD medical treatment, were more likely to use narcotics, and were less likely to be compliant with medical treatment and achieve clinical remission.

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