

# The effect of commonly prescribed renin-angiotensin-aldosterone system blocking agents on the 5- and 10-year disease course of Crohn's disease patients with hypertension

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## BACKGROUND AND PURPOSE

Renin-angiotensin-aldosterone system (RAAS) activation is associated with gastrointestinal inflammation and fibrosis, suggesting that RAAS-blockade may benefit patients with inflammatory bowel disease (IBD).

Using surrogate markers of IBD severity, we aimed to compare the 3-, 5-, and 10-year disease course of patients with Crohn's disease (CD) who were initiated on RAAS-blocking therapy.

## METHODS

### Patient groups

- Angiotensin-converting enzyme inhibitor (CD-ACEI, n= 40, age 60 ±11, 55% male)
- Angiotensin receptor blocker (CD-ARB, n= 40, age 60 ± 8.8, 50% male )
- Control (CD-Control, n= 40, age 58 ±4.7, 43% male)

### Matching

- Gender, BMI, age at CD diagnosis, CD duration, Montreal classification, and common comorbid conditions (hypertension, obesity, diabetes, hyperlipidemia).

### Surrogate markers of IBD severity

- Clinical (emergency department (ED) visits, hospitalizations, corticosteroid use)
- Radiological (CT abdomen, CT enterography, MRI abdomen, MR enterography)
- Procedural (endoscopic procedures, IBD-related operations)

### Statistical analysis

- One-way multivariate analysis of variance with Tukey post-hoc testing

## RESULTS

Surrogate markers	Average number of events per patient											
	3 years				5 years				10 years			
	CD-ACEI (n= 40)	CD-ARB (n= 40)	CD-Control (n= 40)	p-value	CD-ACEI (n= 40)	CD-ARB (n= 40)	CD-Control (n= 40)	p-value	CD-ACEI (n= 32)	CD-ARB (n= 33)	CD-Control (n= 40)	p-value
ED visits (all)	1.25	1.50	1.90	0.33	2.52	2.30	2.60	0.87	5.34	3.91	6.1	0.10
ED visits (abdominal pain)	0.58	0.48	0.48	0.87	1.05	0.60	0.75	0.29	2.34	0.91	1.70	<0.02*
Hospitalizations (abdominal pain)	0.18	0.15	0.25	0.72	0.38	0.23	0.28	0.56	0.88	0.30	0.65	0.07
Systemic corticosteroid use (single instances)	0.63	0.35	1.00	0.09	1.53	0.45	1.28	<0.05*	3.72	1.06	2.88	<0.01*
Abdominal imaging (all)	2.05	1.55	1.25	0.12	3.00	1.83	1.75	<0.02*	6.19	2.73	3.50	<0.01*
Abdominal imaging (enterographic)	1.23	0.90	0.55	0.06	1.70	1.15	0.70	<0.02*	3.38	1.55	1.70	<0.01*
Endoscopic procedures	1.45	0.90	1.05	0.12	2.70	1.60	1.78	<0.01*	5.91	2.61	3.78	<0.01*
IBD operations	0.13	0.08	0.08	0.72	0.15	0.10	0.08	0.18	0.59	0.15	0.18	<0.01*

## CONCLUSION

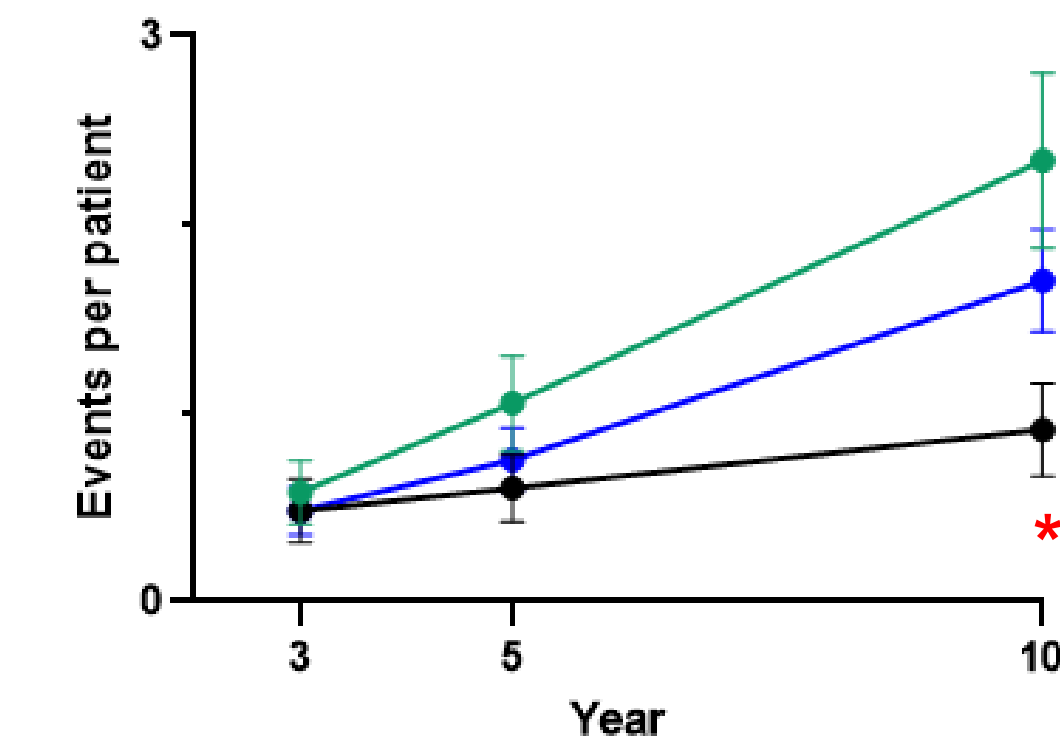
RAAS-blocking agents may significantly affect the long-term disease course of patients with CD, even when initiated at a relatively older age. Differences in disease course were noted at medium-term (5 year) and long-term (10 year) follow up:

ARB-treated patients had fewer emergency department visits (-47%) and less corticosteroid use (-63%) at 10 years.

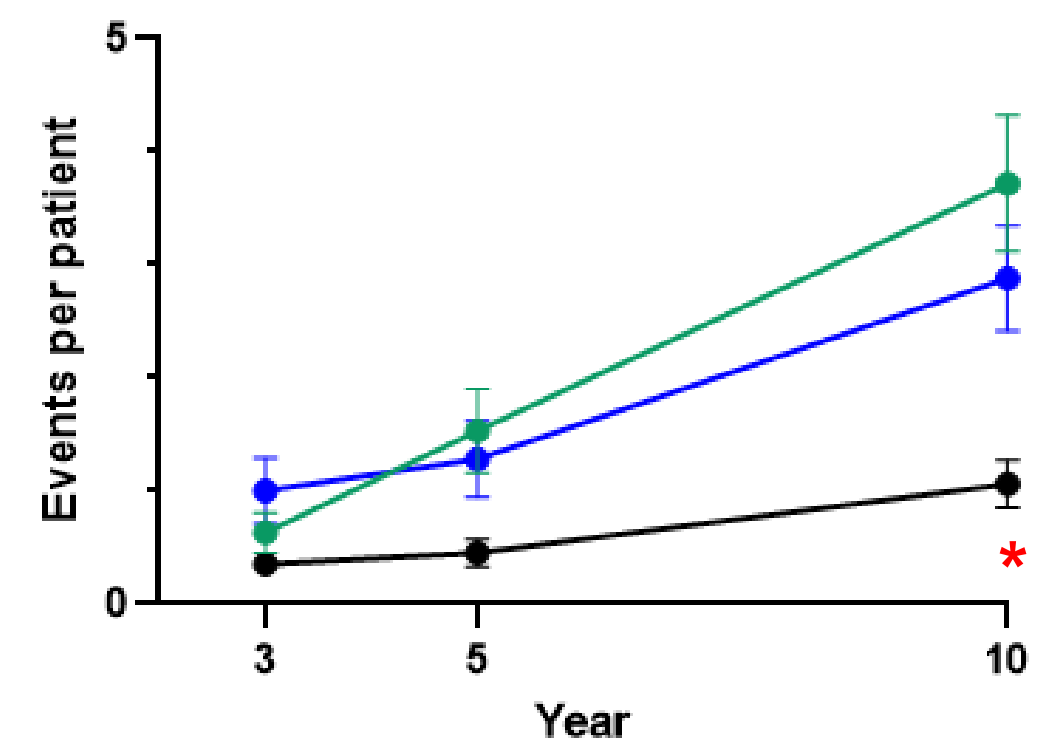
ACEI-treated patients had more imaging (+71%) and endoscopic procedures (+52%) at 5 years and more imaging (+77%), endoscopic procedures (+56%), and IBD operations (+228%) at 10 years. They were also more likely to initiate biologic therapy (56% vs. 32%).

Overall whilst ARB therapy had an ameliorating effect on CD course at 10-years, ACEI use was associated with a worse 5- and 10-years disease course. Further studies are needed to confirm findings on a larger scale.

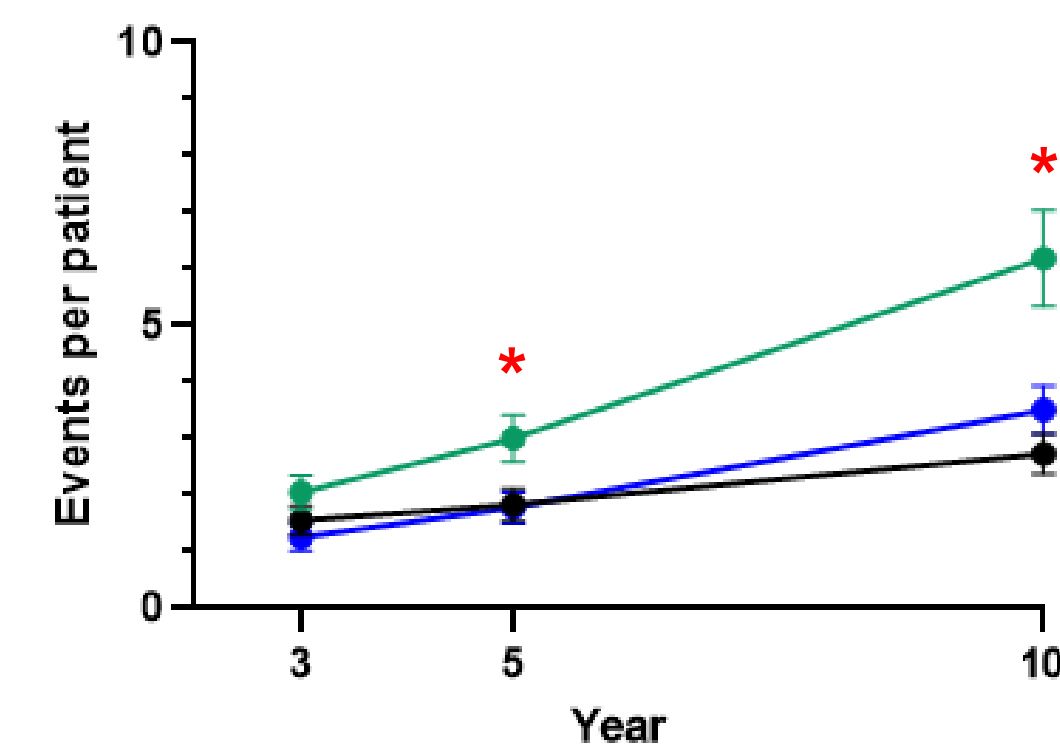
ED visit (abdominal pain)



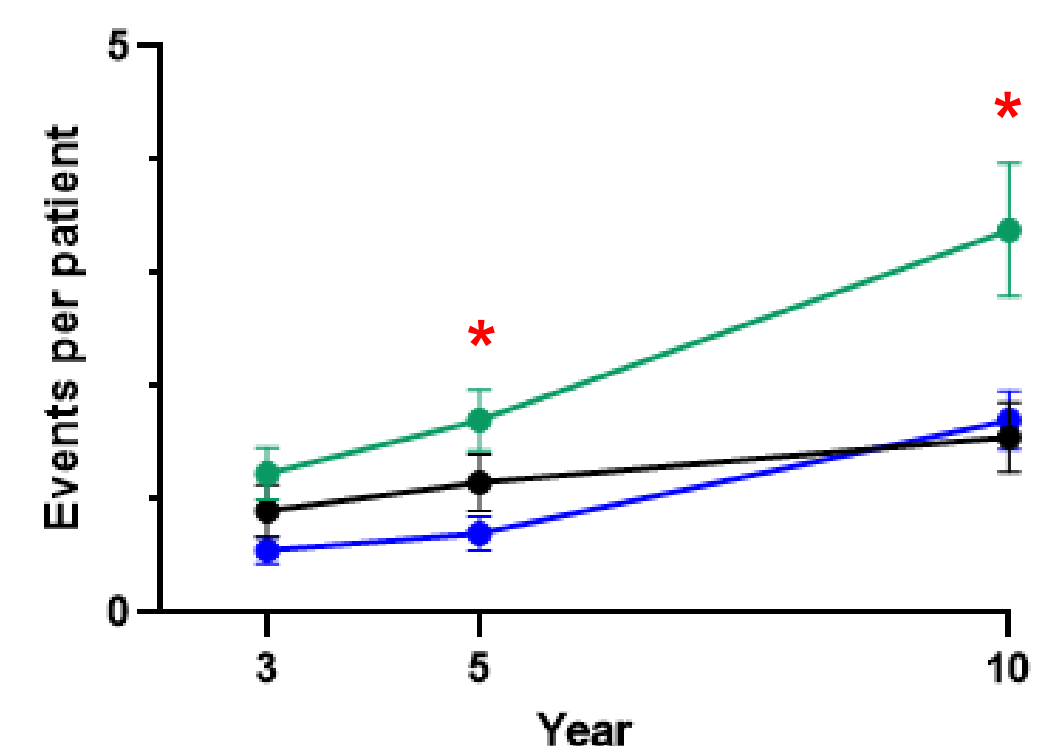
Corticosteroid use



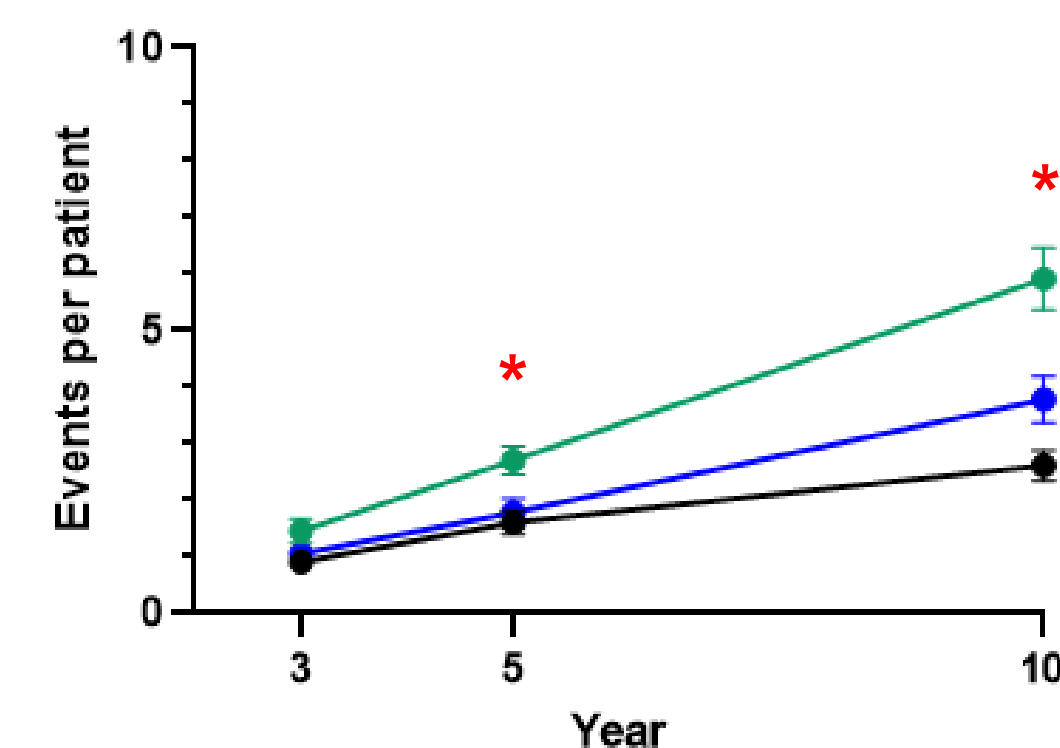
Abdominal imaging (all)



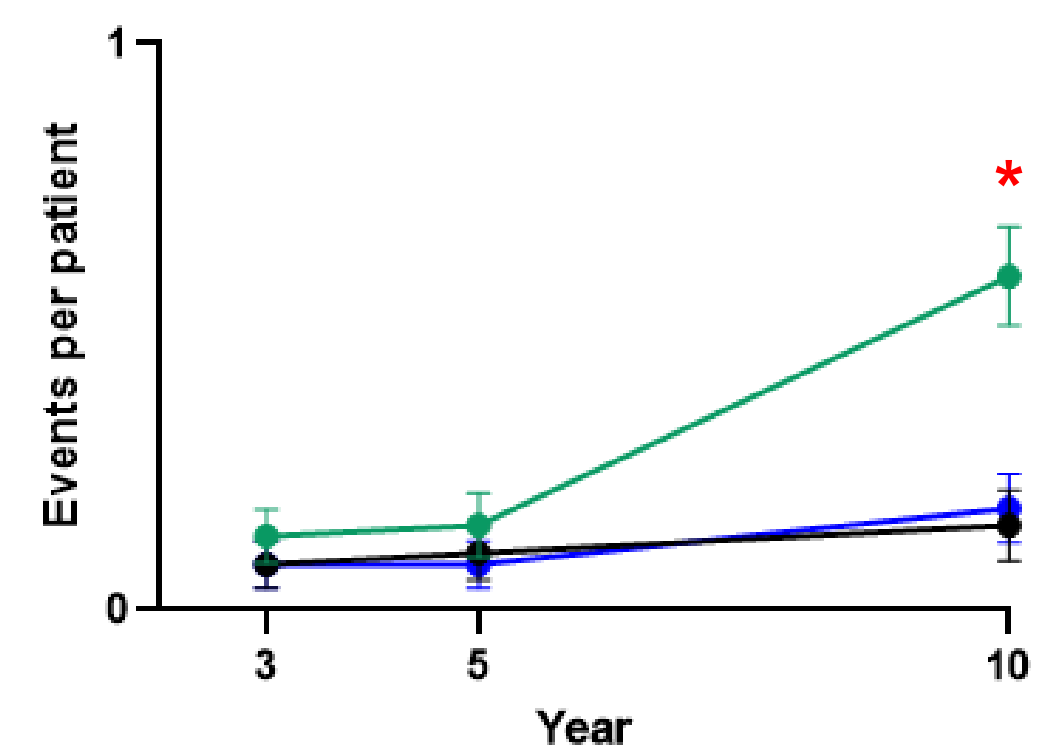
Abdominal imaging (enterographic)



Endoscopic procedures



IBD - operations



● ACEI  
● ARB  
● Control  
\* p<0.05