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Venue: Digestive Disease Week 2017

Date: May 9, 2017

Presentation: Poster

Obesity is associated with worse disease activity in patients with inflammatory bowel diseases: an internet based cohort study

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BACKGROUND: Over 1/3 of adults in the United States are obese. Little is known about the prevalence and impact of obesity on clinical disease activity and longitudinal disease course in patients with inflammatory bowel disease (IBD). In the present study, we sought to investigate the prevalence and impact of obesity on disease outcomes amongst a large internet based cohort of individuals with IBD.

METHODS: We performed a cross-sectional and longitudinal study within CCFA Partners, an internet-based cohort of >15,000 patients living with Crohn's disease (CD) and ulcerative colitis (UC). Adult patients with IBD, with recorded data on body mass index (BMI), and at least 6 months of follow up were included in the analysis. Obesity was defined as BMI ≥ 30.0 kg/m², overweight as 25.0 – 29.9, normal weight as 18.5 – 24.9, and underweight as < 18.5. Bivariate analyses were performed comparing disease characteristics by BMI status at baseline. Among those in clinical remission at baseline, binomial regression models were used to determine the independent effects of BMI on relapse of disease at next available follow up, as defined by validated indices including the short Crohn's disease activity index (sCDAI) for CD and the simple clinical colitis activity index (SCCAI) for UC.

RESULTS: A total of 7565 individuals with IBD were included in the study; 4744 with CD and 2815 with UC. The overall prevalence of obesity was 19.2%. Rates of obesity were not significantly different for CD and UC populations (19.2% vs. 19.3%, p=0.93). Those who were overweight/obese tended to be older, had longer disease duration, and had similar medication use when compared to normal weight individuals. Overweight/obese individuals were less likely to be in clinical remission at baseline when compared to normal weight individuals for both CD and UC populations (59.6% vs 66.3% p < 0.001 for CD and 43.0% vs 55.4%, p < 0.001 for UC). Among those in remission at baseline, individuals who were obese had increased risk of relapse at follow up when compared to normal weight individuals in both CD and UC populations, controlling for medication use at baseline (RR 1.29 [1.05-1.58] and RR 1.41 [1.09-1.82] for CD and UC respectively).

CONCLUSIONS: Approximately 1/5 of individuals with CD and UC in this cohort were obese. Being overweight/obese is associated with lower likelihood of being in remission. Among individuals in remission, obesity is an independent risk factor for subsequent disease relapse. Hence, obesity may represent a modifiable risk factor with the potential to improve disease outcomes for individuals with IBD.

Table 1: Baseline Characteristics by IBD Disease Type

Characteristic	Crohn's disease		Ulcerative Colitis	
	n	%, mean (SD) or median (IQR)	n	%, mean (SD) or median (IQR)
Age (years)	4744	43.3 (15.0)	2815	44.1 (14.9)
Disease duration (years)	4744	14.7 (12.8)	2815	11.2 (10.8)
Gender (% female)	3469	73.1	1987	70.5
Race (Caucasian)	4269	94.9	2470	92.4
BMI (continuous)	4748	24.7 (21.6-28.6)	2817	24.8 (21.8-28.6)
BMI (categories)				
Underweight (<18.5)	207	4.4	122	4.3
Normal (18.5-24.9)	2239	47.2	1309	46.5
Overweight (25-30)	1389	29.3	843	29.9
Obese (30-35)	913	19.2	543	19.3
Prior surgery (% yes)	2343	49.4		N/A
Prior hospitalization	3508	73.9	1218	43.2
Smoking (current, % yes)	377	8	111	3.9
Remission (defined by SCCAI and sCDAI)	2962	62.4	1371	48.7

Table 2: Adjusted Risk Ratio of IBD Relapse among Individuals in Remission at Baseline

	Ulcerative Colitis	Crohn's disease	IBD overall
	Risk Ratio (RR) and 95% confidence interval (CI)	Risk Ratio (RR) and 95% confidence interval (CI)	Risk Ratio (RR) and 95% confidence interval (CI)
Adjusted model*			
Normal weight (referent)	1.0 referent	1.0 referent	1.0 referent
Underweight	1.41 (0.93-2.17)	1.12 (0.75-1.69)	1.24 (0.92-1.7)
Overweight	0.80 (0.62-1.03)	1.14 (0.96-1.35)	1.01 (0.88-1.16)
Obese	1.41 (1.09-1.82)	1.29 (1.05-1.58)	1.31 (1.12-1.55)

Relapse defined as sCDAI > 150 or SCCAI > 2.

* Adjusted for IBD Medication use.