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Alimentary Tract

Obesity in adult patients with inflammatory bowel disease: Clinical features and impact on disability. A cross-sectional survey from the GETAID ☆

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☆ The data underlying this article will be shared on reasonable request to the corresponding author.

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ABSTRACT

Background: In recent years, an increasing prevalence of obesity in inflammatory bowel disease (IBD) has been observed. However, only a few studies have focused on the impact of overweight and obesity on IBD-related disability.

Aims: To identify the factors associated with obese and overweight patients with IBD, including IBD-related disability.

Patients and methods: In this cross-sectional study, we included 1704 consecutive patients with IBD in 42 centres affiliated with the Groupe d'Etude Therapeutique des Affections Inflammatoires du tube Digestif (GETAID) using a 4-page questionnaire. Factors associated with obesity and overweight were assessed using univariate and multivariate analyses (odds ratios (ORs) are provided with 95% confidence intervals).

Results: The prevalence rates of overweight and obesity were 24.1% and 12.2%, respectively. Multivariable analyses were stratified by age, sex, type of IBD, clinical remission and age at diagnosis of IBD. Overweight was significantly associated with male sex (OR = 0.52, 95% CI [0.39–0.68], $p < 0.001$), age (OR = 1.02, 95% CI [1.01–1.03], $p < 0.001$) and body image subscore (OR = 1.15, 95% CI [1.10–1.20], $p < 0.001$) (Table 2). Obesity was significantly associated with age (OR = 1.03, 95% CI [1.02–1.04], $p < 0.001$), joint pain subscore (OR = 1.08, 95% CI [1.02–1.14], $p < 0.001$) and body image subscore (OR = 1.25, 95% CI [1.19–1.32], $p < 0.001$) (Table 3).

Conclusion: The increasing prevalence of overweight and obesity in patients with IBD is associated with age and poorer body image. A holistic approach to IBD patient care should be encouraged to improve IBD-related disability and to prevent rheumatological and cardiovascular complications.

1. Introduction

Obesity is a chronic disease that negatively affects quality of life and contributes to a number of chronic conditions, such as diabetes, major adverse cardiovascular events and cancer [1]. The prevalence of obesity tends to increase worldwide and has often been described as a global pandemic. In Europe, the rates of obesity have increased from 8.4% in 1980 to 20% in 2019, while France is considered to have the lowest rate (10%) [2].

The prevalence of obesity in inflammatory bowel disease (IBD) has risen in parallel with the global pandemic, ranging from 15% to 40% according to cross-sectional studies [3]. Obesity is proposed to be a proinflammatory state through increased adipose tissue production of proinflammatory mediators that may impact IBD course, response to anti-inflammatory drugs and surgical outcomes. Indeed, obesity was shown to worsen the clinical course of IBD and increase hospitalization duration and risk of readmission [3]. Obesity is also associated with poorer response to anti-TNF and higher drug clearance [4–6].

Most cohort studies have focused on clinical outcomes and disease severity, whereas few have focused on disability linked to both IBD and obesity. Disability is an umbrella term covering impairments, activity limitations and participation restrictions, summing up the functional dimension of the handicap [7,8]. In a recent cross-sectional study including 2011 patients with IBD, moderate-to-severe IBD-related disability was associated with a BMI >25 kg/m² [9]. Based on the IBD-partners internet-based IBD cohort including 926 obese patients with IBD, obesity was independently associated with higher anxiety, depression, fatigue, pain and inferior social function using the Patient Reported Outcomes Measurement Information System (PROMIS®) scores, which have not been validated in IBD [10].

The aim of this study was to describe the clinical features associated with obese patients with IBD and to study the impact of obesity on IBD-related disability in a large population of patients with IBD.

2. Patients and methods

2.1. Study population

We performed a cross-sectional multicentre survey between 26 and 30 November 2018 in 42 French and Belgian centres of the Groupe d'Etude Therapeutique des Affections Inflammatoires du tube Digestif (GETAID). All consecutive outpatients with IBD who were seen at the outpatient clinic or infusion unit were eligible and were asked to participate in the survey [9,11]. This study was conducted in accordance with French ethics and legal principles through reference methodology MR-004 (Institut National des Donnees de Sante registration number 2210131).

2.2. Survey instrument

All participants completed the whole questionnaire to ensure anonymity and patient-reported assessment. The autoquestionnaire was then retrieved by a nurse after full completion. The assistance of a trained nurse or gastroenterologist was possible if needed.

The autoquestionnaire included the following items:

- Patient characteristics, including patient demographics, weight and height, classification of IBD according to Montreal classification, date of diagnosis of IBD, history of surgery for IBD, current medical treatments, occupational status, distance between home and clinic, and IBD-related sick leave rates.
- Patients' global assessment of disease activity defined as clinical remission or absence of clinical remission
- IBD-related disability was assessed using the IBD-disk questionnaire, which includes 10 items, one for each dimension of IBD-related disability: joint pain, abdominal pain, body image, education and work, emotions, energy, interpersonal interaction, regulation defecation, sexual function and sleep. Each item is presented in a polygon with a specific statement and a 0 to 10 visual analogue scale (VAS; 0 means no burden and 10 means maximal burden) to score the patient's level of agreement with each statement. A subscore >5 represents a significant disability for each IBD-disk component.
- History and perceived need for other health care workers among dieticians, psychotherapists, sexologists, sports coaches, IBD nurses and social workers.

2.3. Study objectives

In the present large cohort of patients with IBD, the objectives were i) to assess the prevalence of overweight and obesity; ii) to determine factors associated with overweight and obesity; and iii)

to assess the impact of overweight and obesity on IBD-related disability. Overweight was defined as a body mass index (BMI) between 25 and 30 kg/m² and obesity as a BMI ≥30 kg/m², according to the World Health Organization [12]. Obesity was categorized as class 1 (BMI from 30 to less than 35 kg/m²), class 2 (BMI from 35 to less than 40 kg/m²) and class 3 (BMI higher than 40 kg/m²).

2.4. Statistical analysis

Qualitative data are expressed as numbers (%), and quantitative data are expressed as the mean ± standard deviation (SD) or median [interquartile range] according to specific distribution. We excluded from the analysis patients with zero to five completed items and generated missing data using multiple imputations method for those with ≥ 6 out 10 completed items [9]. Univariate analysis was conducted using the chi² test to identify factors associated with overweight and obesity compared with patients within the healthy weight range (from 18.5 to less than 25 kg/m²), excluding patients with malnutrition from the control group. Subsequent multivariate analysis using binary logistic regression models was performed and adjusted for using the selected variables. Variables with a p value <0.10 in the univariate analysis were considered to be potential adjustment variables for the multivariable analysis. All the analyses were two-tailed, and P values less than 0.05 were considered significant. All statistics were calculated using SPSS statistical software (SPSS Inc., v23, Chicago, IL, USA).

3. Results

3.1. Study population

Among the 2011 participants, the whole IBD-disk questionnaire was completed in 1484 (73.8%) patients, whereas 307 (15.3%) completed zero to five items and 220 (10.9%) six to nine. Overall, 1704 patients with IBD (Crohn's disease (CD) in 1109 (67.7%) cases and ulcerative colitis (UC) in 595 (32.3%) cases) were included in 42 tertiary care centres. Table 1 summarizes the main characteristics of the study population. Patients were treated with 5-aminosalicylates in 8.6% of the cases, immunosuppressants (thiopurines or methotrexate) alone in 10.4%, anti-TNF agents in 54.8%, vedolizumab in 13.8% and ustekinumab in 6.5%. Patients did not receive any treatment in 6.3% of the cases. The median duration of IBD was 10.5 [IQR 5.5–18.5] years. A total of 802 patients were males (47.1%), and the median age was 39.0 [IQR 29.0–51.0] years.

3.2. Prevalence of overweight and obesity in the study population

The mean overall BMI was 24.3 ± 5.1 kg/m². Among the 1704 patients, 90 (5.3%) were underweight, 995 (58.4%) had a BMI within the healthy weight range (from 18.5 to less than 25), 411 (24.1%) were overweight and 208 (12.2%) were obese. The severity of obesity was class 1 in 142 (68.3%) cases, class 2 in 48 (23.1%) and class 3 in 18 (8.6%).

3.3. Factors associated with overweight

Four hundred and eleven overweight patients (BMI 25–30 kg/m²) were compared with 995 patients with a healthy weight range (BMI 18–25 kg/m²) (Table 1). Overweight patients were more frequently male (56.7 vs. 46.5%, $p = 0.001$) and less frequently students (2.9% vs. 11.2%, $p < 0.001$). They had higher age at diagnosis (29.8 ± 13.3 vs. 26.5 ± 12.4, $p < 0.001$), higher IBD duration (14.3 ± 10.6 vs. 13.0 ± 10.6, p=0.04), higher history of intestinal resection (49.6% vs. 43.9%, p=0.05) and lower history of sexologist use (1.5% vs. 3.4%, p=0.05). Considering IBD-related disability, overweight patients had a higher mean regulating defecation subscore (4.1 ± 3.5 vs. 3.6 ± 3.4, p=0.006) and body image subscore (4.3 ± 3.4 vs. 3.3 ± 3.2, $p < 0.001$).

In the multivariable analysis stratified by age, sex, type of IBD, clinical remission and age at diagnosis of IBD, overweight was significantly associated with male sex (OR = 0.52, 95% CI [0.39–0.68], $p < 0.001$), age (OR = 1.02, 95% CI [1.01–1.03], $p < 0.001$) and body image subscore (OR = 1.15, 95% CI [1.10–1.20], $p < 0.001$) (Table 2).

3.4. Factors associated with obesity

Two hundred eight obese patients were compared with patients in the healthy weight range (Table 1). Obese patients were less frequently male (34.6 vs. 46.5%, $p = 0.002$) and students (0% vs. 11.2%, $p < 0.001$) and more frequently unemployed (11.1% vs. 8.2%, p=0.003). They had a higher age at diagnosis (32.1 ± 13.5 vs. 26.5 ± 12.4, $p < 0.001$) and reported more frequent use of dieticians (56.7% vs. 45.7%, $p = 0.005$). Considering IBD-related disability, obese patients had significantly higher mean subscores in all ten dimensions of disability than patients in the healthy weight range.

In the multivariable analysis stratified by age, sex, type of IBD, clinical remission and age at diagnosis of IBD, obesity was significantly associated with age (OR=1.03, 95% CI [1.02–1.04], $p < 0.001$), joint pain subscore (OR = 1.08, 95% CI [1.02–1.14], $p < 0.001$) and body image subscore (OR = 1.25, 95% CI [1.19–1.32], $p < 0.001$) (Table 3).

4. Discussion

The prevalence of obesity worldwide tripled between 1975 and 2016 according to the WHO (2016), with data showing that there were 650 million obese people globally in 2016. A recent study published in the World Obesity Atlas 2022 estimates that 1 billion people will be obese in 2030, including 1 in 5 women and 1 in 7 men. It is considered a major issue for health care services given the increased risk of morbidity and mortality due to major adverse cardiovascular events, neoplasia and socioeconomic impairment (1). Recent reports on the increased prevalence of overweight and obesity in patients with IBD are also problematic given the excess risk of major adverse cardiovascular events due to the chronic inflammatory state and of neoplasia due to chronic inflammation and immunosuppressive therapy. In the present study, the prevalence of overweight and obesity among patients with IBD was 24.1% and 12.2%, respectively.

Obesity is responsible for a perpetual state of chronic low-grade inflammation of complex and multifactorial origin [3]. There are also similarities in the epidemiological patterns of IBD and obesity, mostly affecting Western countries [13]. Therefore, it is questionable whether obesity can contribute to IBD and vice versa. In the present study, the prevalence of obesity in patients with IBD was close to that in the French general population, as were other cohort studies with respect to the specific epidemiology of obesity [2]. In addition, we did not find any specific difference between obese patients and patients with a healthy weight range, suggesting a more severe disease. In a recent pooled analysis of five prospective cohort studies, Chan et al. found a small increased risk (adjusted hazard ratio of 1.34, 95% CI [1.05–1.71]) for Crohn's disease and no risk for UC in patients with obesity over a 10,110,018 person-years follow-up period [14]. However, other systematic reviews found conflicting results [15,16]. A similar debate exists regarding the impact of obesity on the clinical course of IBD. In a recent, multicentre cohort of 3,038 biologically treated patients with IBD, obesity ($n = 416$) was not associated with hospitalization, surgery or serious infections [17]. In contrast, obesity was independently associ-

Table 1
Demographic, disease and medication characteristics of the study population according to body mass index.

	BMI of 18 and <25 (n = 995)	BMI of 25 and <30 (n = 411)	p	BMI ≥30 (n = 208)	p
Male gender, no (%)	463 (46.5%)	233 (56.7%)	0.001	72 (34.6%)	0.002
Age, years	39.5 ± 14.7	44.0 ± 14.2	<0.001	44.9 ± 12.5	<0.001
Weight, kg	63.0 ± 9.4	79.3 ± 9.1	<0.001	95.7 ± 14.8	<0.001
Length, m	1.69 ± 0.10	1.71 ± 0.10	0.02	1.67 ± 0.11	0.001
BMI, kg/m²	21.8 ± 1.9	27.0 ± 1.3	<0.001	34.3 ± 4.8	<0.001
Distance between home and the clinic	46.4 ± 147.8	48.5 ± 100.1	0.76	35.4 ± 44.0	0.05
Ocupational status, %					
Employed	613 (61.6%)	264 (64.2%)	0.37	134 (64.4%)	0.48
Homemaker	74 (7.4%)	38 (9.2%)	0.41	30 (14.4%)	0.22
Unemployed	82 (8.2%)	40 (9.7%)	0.28	23 (11.1%)	0.003
Student	111 (11.2%)	12 (2.9%)	<0.001	0 (0%)	<0.001
Retired	115 (11.6%)	57 (13.9%)	0.25	21 (10.1%)	0.63
Age of diagnosis of IBD, years	26.5 ± 12.4	29.8 ± 13.3	<0.001	32.1 ± 13.5	<0.001
Type of IBD					
Crohn's disease	645 (67.3%)	265 (67.6%)	0.95	136 (68.0%)	0.93
Ulcerative colitis	350 (32.7%)	146 (32.4%)		72 (32.0%)	
Duration of IBD, years	13.0 ± 10.6	14.3 ± 10.6	0.04	12.8 ± 9.5	0.72
> 10 years	511 (51.4%)	243 (59.1%)	0.008	114 (54.8%)	0.40
History of intestinal resection, %	437 (43.9%)	204 (49.6%)	0.05	88 (42.3%)	0.70
IBD-related sick leave, %	718 (72.2%)	312 (75.9%)	0.16	151 (72.6%)	0.93
Clinical remission, %	454 (51.6%)	178 (49.6%)	0.53	77 (43.5%)	0.06
Current treatment					
None	61 (6.1%)	23 (5.6%)	0.81	12 (5.8%)	1.00
5-ASA	95 (9.5%)	32 (7.8%)	0.31	13 (6.3%)	0.14
Immunomodulator alone	101 (10.2%)	42 (10.2%)	1.00	26 (12.5%)	0.32
Anti-TNF	545 (54.8%)	230 (56.0%)	0.72	114 (54.8%)	1.00
Vedolizumab	132 (13.3%)	56 (13.6%)	0.86	36 (17.3%)	0.13
Ustekinumab	65 (6.5%)	29 (7.1%)	0.73	10 (4.8%)	0.43
Histoy of use of other healthcare worker					
Dietician	455 (45.7%)	202 (49.1%)	0.26	118 (56.7%)	0.005
Psychologist	262 (26.3%)	94 (22.9%)	0.18	54 (26.0%)	1.00
Sexologist	34 (3.4%)	6 (1.5%)	0.05	4 (1.9%)	0.38
Sports coach	45 (4.5%)	16 (3.9%)	0.67	15 (7.2%)	0.12
IBD nurse	202 (20.3%)	91 (22.1%)	0.47	53 (25.5%)	0.11
Social worker	145 (14.6%)	66 (16.1%)	0.51	35 (16.8%)	0.39
Perceived need for healthcare workers					
Dietician	248 (24.9%)	104 (25.3%)	0.89	55 (26.4%)	0.66
Psychologist	145 (14.6%)	51 (12.4%)	0.31	28 (13.5%)	0.75
Sexologist	89 (8.9%)	39 (9.5%)	0.76	15 (7.2%)	0.50
Sports coach	208 (20.9%)	96 (23.4%)	0.32	41 (19.7%)	0.78
IBD nurse	66 (6.6%)	27 (6.6%)	1.00	9 (4.3%)	0.27
Social worker	88 (8.8%)	26 (6.3%)	0.13	17 (8.2%)	0.89
IBD-disk scores					
Joint pain subscore >5	3.6 ± 3.2	4.1 ± 3.2	0.006	5.0 ± 3.3	<0.001
Abdominal pain subscore >5	4.0 ± 3.1	4.2 ± 3.0	0.45	4.5 ± 3.0	0.04
Regulating defecation subscore >5	3.6 ± 3.4	4.1 ± 3.5	0.006	4.5 ± 3.5	<0.001
Interpersonal relation subscore >5	2.4 ± 2.9	2.5 ± 3.0	0.60	3.0 ± 3.1	0.004
Education and work subscore >5	3.7 ± 3.3	3.9 ± 3.4	0.43	4.9 ± 3.4	<0.001
Energy subscore >5	5.5 ± 3.2	.6 ± 3.2	0.36	6.3 ± 3.1	<0.001
Sleep subscore >5	4.7 ± 3.4	4.9 ± 3.4	0.84	5.7 ± 3.3	0.002
Emotions subscore >5	4.4 ± 3.3	4.4 ± 3.4	0.95	5.3 ± 3.2	<0.001
Body image subscore >5	3.3 ± 3.2	4.3 ± 3.4	<0.001	5.7 ± 3.4	<0.001
Sexual function subscore >5	2.7 ± 3.2	2.9 ± 3.1	0.39	3.6 ± 3.5	<0.001
Overall IBD disk score >40	35.8 ± 22.6	38.4 ± 21.4	0.05	46.2 ± 22.5	<0.001

Variables are presented as numbers and percentages and mean ± standard deviation. Quantitative variables between groups was compared using chi² and Mann-Whitney test whenever appropriate.
BMI: body mass index; IBD: inflammatory bowel disease.

Table 2
Associated factors of overweight in our study population of 1704 patients with inflammatory bowel disease.

	Univariable analysis OR [95% CI]	p	Multivariable analysis OR [95%CI]	p
Male gender	0.67 [0.53–0.84]	0.001	0.52 [0.39–0.68]	<0.001
Age	1.02 [1.01–1.03]	<0.001	1.02 [1.01–1.03]	<0.001
History of intestinal resection	0.80 [0.63–1.01]	0.05	–	NS
Duration of IBD >10 years	0.73 [0.58–0.92]	0.008	–	NS
Age at diagnosis >25 years	0.69 [0.55–0.87]	0.002	–	NS
Regulating defecation subscore	1.05 [1.01–1.08]	0.005	–	NS
Body image subscore	1.09 [1.06–1.13]	<0.001	1.15 [1.10–1.20]	<0.001

Stratified on age, gender, type of IBD, clinical remission and age at diagnosis of IBD.
OR, odds ratio; CI, confidence interval; NS, not significant. Odds ratios (ORs) with 95% confidence intervals (CIs) were estimated using binary logistic regression.

Table 3
Associated factors of obesity in our study population of 1704 patients with inflammatory bowel disease.

	Univariableanalysis OR [95% CI]	*p*	Multivariableanalysis OR [95% CI]	*p*
Male gender	1.64 [1.20–2.25]	0.002	–	NS
Unemployed	2.10 [1.33–3.30]	0.001	–	NS
Age	1.03 [1.02–1.04]	<0.001	1.03 [1.02–1.04]	<0.001
History of dietician use	1.56 [1.15–2.10]	0.004	–	NS
Joint pain subscore	1.14 [1.09–1.20]	<0.001	1.08 [1.02–1.14]	<0.001
Abdominal pain subscore	1.05 [1.01–1.10]	0.04	–	NS
Regulating defecation subscore	1.09 [1.04–1.13]	<0.001	–	NS
Interpersonal relation subscore	1.07 [1.02–1.13]	0.004	–	NS
Education and work subscore	1.10 [1.06–1.15]	<0.001	–	NS
Energy subscore	1.08 [1.03–1.14]	0.002	–	NS
Sleep subscore	1.08 [1.04–1.13]	<0.001	–	NS
Emotions subscore	1.09 [1.04–1.14]	<0.001	–	NS
Body image subscore	1.24 [1.18–1.29]	<0.001	1.25 [1.19–1.32]	<0.001
Sexual function subscore	1.09 [1.04–1.13]	<0.001	–	NS

Stratified on age, gender, type of IBD, clinical remission and age at diagnosis of IBD.
OR, odds ratio; CI, confidence interval; NS, not significant. Odds ratios (ORs) with 95% confidence intervals (CIs) were estimated using binary logistic regression.

ated in a dose-dependent fashion with worsening disease activity, which may favour undertreatment of obese patients with IBD [10].

Our study demonstrated that overweight and obesity were independently associated with age. Losurdo et al. found similar results, with obese patients being older than nonobese IBD patients [18]. In fact, ageing has been closely associated with an increase in abdominal obesity and subsequent insulin resistance and metabolic syndrome [19]. Starr et al. demonstrated that ageing is associated with an increased inflammatory state with overexpression of interleukin-6 secreted by adipose tissue, describing it as an age-associated phenomenon [20]. To date, there are no epidemiological data supporting such a paradigm in IBD, suggesting the absence of a link between IBD and obesity pathogenesis.

It is also known that obesity is a major contributor to osteoarthritis, causing joint pain, impaired joint function and reduced quality of life [21]. A study showed that patients aged > 30 were at higher risk of knee and hand osteoarthritis [22]. In parallel, weight loss induced by either dietary intervention or physical exercise in obese and overweight patients with knee osteoarthritis resulted in a significant reduction in joint pain, improvement in joint function and reduction in systemic IL-6 levels [23]. Last, a systematic review underlined the link between osteoarthritis in obese patients and health-related quality of life and the benefits of weight loss on this peculiar outcome [24].

Arthropathy and arthritis are the most common extraintestinal manifestations in patients with IBD [25]. However, it is mostly related to peripheral and axial inflammatory arthropathies belonging to the spondyloarthritis group of conditions. In the present study, we did not record the presence of extraintestinal manifestations of IBD. It is therefore difficult to assess whether the reported joint pain is related to spondyloarthritis or obesity-linked osteoarthritis. However, joint pain subscores of the IBD-disk questionnaire were significantly correlated with BMI with a Pearson correlation coefficient of (data not shown). There was a dose-dependent increase in joint pain subscore between normal weight, overweight and obese patients but with a poor correlation between joint pain subscore and BMI, suggesting that both inflammatory and mechanical joint pain coexist.

In our study, we found that IBD patients with BMI≥ 30 had a negative body image compared to nonobese IBD patients. In fact, it is known that body dissatisfaction is more important in obese individuals than in individuals with normal BMI. Furthermore, studies have shown that body dissatisfaction may persist even after weight loss [26]. In a cross-sectional cohort study of 330 patients with IBD, body dissatisfaction was common in up to 87% of patients and was associated with disease activity and steroid treatment but not BMI [27]. However, contributors to body dissatisfaction have been reported in patients with IBD, including sex and high BMI [28]. Subsequently, a negative body image was associated with poorer quality of life.

Our study has strengths considering the cohort size and the use of validated patient-reported outcome tools to describe IBD-related disability, which has been poorly studied. However, we have to acknowledge some limitations. First, self-reports of weight and height may be biased. However, we thought that anonymity was an important issue for patient-reported disability. In addition, the cohort size may have lowered the risk of systematic errors. Second, this auto-questionnaire was not designed specifically to report obesity and its associated factors. It is conceivable that we did not take into account important factors such as dietary habits and restrictions as well as the impact of steroid use. Third, the study population was recruited in a tertiary care centre with a high proportion of biologically treated patients, which may not be a good reflection of the French IBD population. Last, looking at outpatients, we did not ask specifically for current use of prednisone and/or prednisolone in the treatment list. However, very few patients reported taking steroids as “other treatment”. The absence of a specific box for steroids in our questionnaire may have underestimate the proportion of patients with ongoing steroids.

In conclusion, we reported that patients with IBD followed up in French tertiary care centres are overweight in 24.1% of cases and obese in 12.2%. Similar to non-IBD patients, age was a major contributor to overweight and obesity, and obesity was significantly associated with joint pain. The presence of overweight and obesity was associated with an impaired body image that is not associated with a perceived need for dieticians or psychotherapists, which may be helpful to overcome this burden. Further studies should be focused on the benefit of screening and proactive multidisciplinary management of obesity in patients with IBD.

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Author contributions

Conceptualization: AAm, REB, MN, DL, LPB.

Data curation, Investigation and Writing - review and editing: REB, JT, MN, YB, MS, JF, XR, AB, GB, DF, GS, AB, EL, SN, VA, JMR, OdW, LV, NM, LPB, CG, MA, SV, CLB, ND, HB, MB, LP, RA, MF, LC, DL, AAm.

Writing- original draft: AAm, REB, DL.

Declaration of Competing Interest

Yoram Bouhnik received lecture and consulting fees from Abbvie, Biogaran, Boehringer-Ingelheim, CTMA, Ferring, Gilead, Hospira, ICON, Inception IBD, Janssen, Lilly, Mayoli Spindler, Merck, MSD, Norgine, Pfizer, Robarts Clinical Trials, Roche, Sanofi, Shire, Takeda, UCB and Vifor Pharma. This author has also stock ownership of Inception IBD, San Diego, CA, USA.

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Jerome Filippi has received lecture and consulting fees from Abbvie, Amgen, Biogen, Ferring, HAC Pharma, Janssen, MSD, Pfizer, Sandoz and Takeda.

Xavier Roblin reported a relationship with MSD, Abbvie, Amgen, Sandoz, Pfizer, Takeda and Janssen.

Guillaume Bouguen received lecture fees from Abbvie, Ferring, MSD, Takeda and Pfizer and consultant fees from Takeda, Janssen.

Denis Franchimont is research director of FNRS; he has received educational grants from Abbvie, Takeda, MSD, and has received honoraria fees for lectures or consultancy from Ferring, Falk, Chiesi, Abbvie, MSD, Centocor, Pfizer, Amgen, Janssen, Mundipharma, Takeda and Hospira.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.dld.2023.05.008.

Appendix. The GETAID-patients experience study group

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