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Research Article

Impacts of Perianal Crohn's Disease on Quality of Life and Work Productivity

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Abstract

Background: Few data exist on quality of life (QoL) and the socio-professional impact in patients with perianal Crohn's disease, especially in Tunisia, probably because the patient-doctor relationship is mainly focused on obtaining clinical, biological and endoscopic remission of the Crohn disease (CD). Our study aimed to evaluate the impacts of perianal Crohn's disease on QoL and work productivity.

Methods: A prospective cross-sectional study including patients with CD followed in the Gastroenterology department of Habib Thameur hospital between July and August 2020 was performed. QoL as well as professional impact were compared in patients with perianal Crohn's disease and controls without perianal symptoms.

Results: Thirty two patients were included. Mean age was 38.28 years [18 - 60] and the sex ratio was 1. Perianal lesions were observed in 15 patients (44% of cases). By calculating the HADS score, anxiety and depression were found in 22% and 19% of patients, respectively. Mean fatigue score was 3.75 [1 - 9]. Mean SF-36 score was 64.18 [37 - 98]. Mean SIBDQ score was 49.09 [29 - 64]. The significant impact of CD on QoL attested by an SIBDQ score < 40 was observed in 22% of cases. The average IBD-Disk score was 41.66 [3 - 88]. Severe functional impairment was predominantly associated with body image and sleep quality in 53% and 47%, respectively. Regarding the impact of CD on work productivity, only 41% of patients had paid work at the time of inclusion. CD was responsible for an overall average decline in productivity estimated at 56% and an average restriction of 45% of usual daily activities. By comparing the QoL scores according to the presence or not of perianal manifestations, we found a statistically significant link between perianal Crohn's disease and the field of mental health of the SF-36 score ($p = 0.03$). Regarding the impact of perianal Crohn's disease on professional activity, there was a statistically significant association between the mean rate of activity restriction and the presence of perianal manifestations ($p = 0.04$).

Conclusion: It appears that CD is a source of impaired QoL and psychological discomfort with reduced work productivity. Comprehensive care involving a gastroenterologists, occupational physicians and psychologists is sometimes necessary in these young patients. The presence of perianal manifestations seems to influence negatively mental health and professional activity.

Keywords: Crohn's Disease; Quality of Life; Perianal Manifestations; Scores, Questionnaires

Background

Crohn's disease (CD) is a chronic condition with an unpredictable clinical course. It frequently affects young active subjects, thus compromising their quality of life (QoL) in all physical, functional, psychosocial and professional areas [1].

The potentially disabling chronic course of CD can cause a major alteration in QoL with a significant discrepancy between the ex-

perience of this disease and the clinical-biological and endoscopic activity indices.

Thus, in the current conception of care, the aim is not only to treat the patient medically, but also to allow him to live as well as possible. This being the main goal of the patient, should be taken into account when setting priorities [1]. In this context, the systematic evaluation of QoL in patients with CD is based on reliable tools allowing an objective assessment of its impact on the daily life of patients.

A large number of QoL measuring instruments have been developed. These latter, also called scales, analyze responses to standardized and validated psychometric questionnaires [2].

Anoperineal lesions (APL) in CD have a high incidence and a poor prognosis because they are often complicated and responsible for functional damage [3]. QoL may be altered by these functional sequelae, but also by the phenomena of oozing and the presence of drains for several months after surgical operations [4].

Few data exist on the quality of life and the socio-professional effects in patients with perianal Crohn's disease, especially in Tunisia, probably because the patient-doctor relationship is mainly focused on obtaining clinical, biological and endoscopic remission of the patient.

Aim of the Study

The aim of our study was to assess the impact of perianal Crohn's disease on the quality of life and work productivity of patients.

Patients and Methods

Type of study

A cross-sectional prospective study was conducted at the Gastroenterology department of the Habib Thameur hospital in Tunis over a period of 02 months (July-August 2020).

Inclusion criteria

All hospitalized or outpatient patients with CD were included. The diagnosis of CD was based on patient's clinical symptoms, serologic tests, endoscopic, radiological and histological examinations. The APL were defined according to the Cardiff classification.

The data retrieved at the interview included age at diagnosis, gender, level of education, marital status, disease type according to the Montreal classification, and Harvey-Bradshaw Index (HBI). Data retrieved for patients with perianal Crohn's disease also included APL type and severity according to the Perianal Disease Activity Index (PDAI).

The patients were divided into two groups according to the presence or absence of active APL: Group 1: Absence of active APL and group 2: Presence of active APL.

Exclusion criteria

Patients unable to answer the questionnaire or who did not give their oral consent for the study as well as patients wishing to stop their participation were excluded as well as patients diagnosed for less than one year.

Main outcome measures: Quality of life was documented by six questionnaires:

- **The fatigue severity scale (FSS):** It comprises nine questions rated from one to seven. Significant fatigue was defined by a score greater than or equal to 5.5.
- **Hospital anxiety and depression scale (HADS):** Allows the evaluation of anxiety and depressive symptoms.
- **The 36-item short form survey** (**SF-36):** is one of the most commonly used instruments for evaluating health-related QoL. It is a generic tool not specific for inflammatory bowel disease (IBD). We used the Tunisian Arabic language validated version of the SF-36 [5]. The SF-36 comprises eight different health dimensions: Physical activity (10 items), role physical (4 items), bodily pain (2 items), general health (6 items), vitality (4 items), social functioning (2 items), role emotional state (3 items) and the mental health (5 items). The rating of the SF-36 varies from 0 points for poor QoL to 100 points for excellent QoL.
- **The short-form of inflammatory bowel disease questionnaire (SIBDQ):** QoL was assessed using the French version of the SIBDQ. The SIBDQ consists of ten questions about four dimensions of IBD: bowel (defecation frequency, abdominal pain), systemic discomfort (fatigue), social status (impact of disease on daily life) and emotional issues (concerns about surgery, anxiety). Each question was scored on a seven-point scale (1 to 7), with higher scores indicating better QoL.
- **The inflammatory bowel disease disk (IBD-Disk):** It is a validated visual tool for assessing functional disability during inflammatory bowel disease. The IBD-Disk includes ten items (abdominal pain, diarrhea, joint pain, sex life, body

image, relationships, education and work, sleep, energy and emotions) each assessed on a scale visual analog Likert from zero to ten (0 = normal; 10 = major handicap) for a total score of 0 to 100. The higher the score is, the more the QoL is impaired.

- **Work productivity and activity impairment questionnaire (WPAI):** is composed of six questions evaluated during the last seven days preceding the interview with the patient, the absenteeism, the presenteeism, the total decrease in productivity and the decrease in daily activities for health reasons. The results are multiplied by 100, expressed as a percentage of time lost. A higher percentage indicates greater depreciation and less productivity.

Statistical analysis

Quantitative variables were described through average and standard deviation, and qualitative variables through absolute and relative frequencies. The Student t-test was applied to assess the differences between the Crohn's disease with and without perianal manifestations for QoL scores. The level of significance adopted was 5% ($p \leq 0.05$) and the analyses were performed using SPSS (Statistical Package for the Social Sciences) version 21.

Results

During the study period (July - August 2020), 42 patients with Crohn's disease consulted in the Gastroenterology department. Ten patients were excluded (6 because disease evolution was lower than one year and four didn't want to participate to the study). Our work focused on 32 patients (Figure 1).

Figure 1: Distribution of the study population.

Mean age at inclusion was 38.28 ± 12 years [extremes 18 - 60 years] and the sex ratio was 1. The demographic characteristics of the population are shown in table 1.

Clinical Features	Crohn's diseasepatients (n = 32)
Mean age, years	38.28 ± 12
Sex ratio	1
Education level	**n (%)**
No education	2 (6%)
Primary education	11 (35%)
Secondary education	9 (28%)
University education	10 (31%)
Marital status	**n (%)**
Single	13 (41%)
Married	18 (56%)
Divorced	1 (3%)
Employment status	**n (%)**
Employed	13 (41%)
Unemployed	6 (19%)
Student	2 (6%)
Smoker	6 (19%)
Mean BMI	22,53 kg/m^2 ± 4,8
< 18 kg/m^2	7 (22%)
18 - 25 kg/m^2	15 (47%)
>25 kg/m^2	10 (31%)
Age at diagnosis, years	27,8 ±11.18
Disease duration, years	10,56 ±8.76
Disease location	**n (%)**
L1 (ileal)	12 (38%)
L2 (colonic)	3 (9%)
L3 (ileocolonic)	16 (50%)
L4 (upper gastrointestinal tract involvement)	2 (6%)
Disease behavior	**n (%)**
B1 (non-stricturing, non-penetrating)	13 (41%)
B2 (stricturing)	20 (63%)
B3 (penetrating)	24 (75%)
Patients with APL, n (%)	15 (44%)

Table 1: Baseline demographic and clinical characteristics of Crohn's disease patients.

The disease mean duration was 10.56 years [1 - 40]. CD was ileal (L1) in 12 cases (38%), colonic (L2) in three cases (9%) and ileocolonic (L3) in 16 cases (50%). An upper gastrointestinal tract involvement(L4) was present in two patients (6%). Perianal disease was noted in 15 patients (44%).

The most common behavior of the disease was the penetrating type (75%) and the stricturing type was observed in 63%. The inflammatory type was observed in 41% of the patients.

The average Harvey Bradshaw (HAB) score was 5.14 [1 - 14]. The mean HAB score for patients with APL was 4.6 ± 2 [1 - 14].

In the 15 patients with perianal disease, the average PDAI score was 3.73 ± 3.12 [0 - 9].

The mean fatigue score was 3.75 ± 1.9 [1 - 9]. A fatigue score greater than or equal to 5.5 was observed in three cases (9%). Obvious anxiety and depression were present in respectively seven (22%) and six (19%) patients. The mean SF-36 score was 64.18 ± 11.6 [range 37 - 98]. The data from the SF-36 questionnaire were analyzed by dimension (Table 2).

The mean SIBDQ score was 49.09 ± 10 [29 - 64]. The significant impact of CD on QoL attested by an SIBDQ score of less than 40 was observed in seven patients (22%).The data from the SIBDQ questionnaire were analyzed by dimension (Table 2).

The mean IBD-Disk score was 41.66 ± 10 [range 3-88]. IBD-Disk data was analyzed by domain (Table 2).

The significant impact of CD on QoL attested by an IBD-Disk score greater than 50 was observed in 13 patients (41%). For each IBD-Disk item, a score greater than five was considered a serious disorder. In our series, severe functional impairment was predominantly associated with body image and sleep quality in 53% and 47% of cases, respectively.

Thirteen patients (41%) were in paid employment at the time of inclusion. The CD was responsible for an average absenteeism of 30% ± 10.4% [0-80%] of the working time during the last seven days.

An average percentage of work impairment defining the presenteeism was noted to be 52% ± 28% [0 - 80%] of working time over the past seven days. The overall average decline in productivity was estimated at 56% ± 22% [0 - 97%]. CD was responsible for an average restriction of 45% ± 33% [0 - 100%] of usual daily activities.

Dimensions of the SF-36 score	
“Physical functioning” (PF) (10 items)	16,43 ± 4,8
“Role physical” (RP) (4 items)	2,06 ± 1,7
“Bodily pain” (BP) (2 items)	3,65 ± 2,9
“General health “ (GH) (6 items)	12,65 ± 3,2
“Vitality” (VT) (4 items)	10,62 ± 2,4
“Role emotional” (RE) (3 items)	1,53 ± 1,2
“Social functioning” (SF) (2 items)	4,03 ± 1,4
“Mental health” (MH) (5 items)	14,15 ± 3,6
Score dimensions of the S-IBDQ	
Intestinal symptoms (2 items)	11,78 ± 2,19
General signs “Fatigue-Energy” (2 items)	8,62 ± 2,9
Emotional domain (4 items)	19,21 ± 4,85
Social domain (2 items)	9,46 ± 2,94
Dimensions of IBD-Disk Score	
Abdominal pain	3,25 ± 3
Diarrhea	3,16 ± 2.5
Relationships	4,13 ± 3.18
Education and work	4,34 ± 3.31
Sleep	4,53 ± 3.4
Energy	5,09 ± 3.05
Emotions	5,03 ± 3.15
Body image	5,28 ± 3.45
Sexual activity	2,59 ± 2
Joint pain	4,38 ± 3.6

Table 2: Scores of health-related quality of life in patients with Crohn’s disease.

By comparing the QoL scores according to the presence or not of PAL, we found a statistically significant link between the presence of APL in CD and the field of mental health (HD) of the SF-36 score (p = 0.03) (Table 3).

We also found a statistically significant association between the mean rate of activity restriction and the presence of APL in CD (p = 0.04). However, no significant association was noted in the other dimensions of the WPAI questionnaire (Table 3).

	Anoperineal lesions				
	G1: Absence of active APL (n = 17)		G2: Presence of active APL (n = 15)		
	Mean	Standard deviation	Mean	Standard deviation	p
Fatigue Severity Scale FSS	3,89	2,39	3,6	1,35	0,69
Anxiety score (HADS)	7,06	4,34	8,07	3,7	0,49
Depression score (HADS)	7,19	3,3	6,67	4,7	0,72
SF-36 Score	64,12	14,5	64,27	7,7	0,97
“Physical functioning” (PF)	16,35	5,96	16,53	3,37	0,91
“Role physical” (RP)	2,24	1,82	1,87	1,64	0,55
“Bodily pain” (BP)	3,47	3,3	3,87	2,64	0,73
«General health” (GH)	13,59	3,4	11,6	2,72	0,08
“Vitality” (VT)	10,41	3,08	10,87	1,6	0,61
“Social functioning “ (SF)	4,41	1,54	3,6	1,29	0,12
“ Role emotional “ (RE)	1,65	1,41	1,4	1,12	0,59
“Mental health” (MH)	12,88	3,39	15,6	3,41	0,03
SIBDQ	48,71	9,7	49,53	11,24	0,82
Intestinal symptoms	11,82	2,03	11,73	2,43	0,91
General signs	8,47	2,03	11,73	2,43	0,91
Emotionaldomain	19,29	4,7	19,13	5,15	0,92
Social domain	9,05	2,94	9,93	2,96	0,41
IBD-Disk Score	43,06	23,2	40	24	0,72
Abdominal pain	3,06	3	3,47	2,9	0,71
Diarrhea	2,76	2,4	3,47	2,9	0,71
Relationships	4,18	3,2	4,07	3,2	0,92
Education and work	5,18	3,3	3,4	3,1	0,13
Body image	5,76	3,5	4,73	3,4	0,4
Energy	5,82	3,3	4,27	2,6	0,15
Emotions	5,59	3,39	4,4	2,8	0,29
Sexuality	2,76	2	2,4	1	0,71
Joint pain	3,47	2,7	5,4	3,2	0,13
Absenteeism (%)	25	5	30	9	0,3
Presenteeism rate (%)	45	12	48	20	0,19
Overall impairment rate at work (%)	47	25	51	17	0,15
Activity restriction rate (%)	21	5	43	11	0,04

Table 3: Quality of life and work productivity in patients with active anoperineal lesions compared to those without.

Discussion

Several studies have shown that IBD has a negative impact on QoL related to the health of patients, regardless of the duration of the disease [6,7]. This impact is more marked in CD than in ulcerative colitis (UC) [7]. A study in patients with CD and UC based on a Spanish version of the IBDQ showed a negative correlation

between the level of QoL and the severity of the disease [8]. It confirms the results of previous publications showing higher QoL scores in the states of remission or response to treatment [9,10].

Studies evaluating QoL in patients with CD are numerous [11,12] but those specifically looking at patients with APL are rarer. The QoL of patients with perianal Crohn's disease can be seriously affected in several ways such as the development of anal incontinence caused by the disease itself or by the occurrence of a complication of proctologic surgery [13], recurrent infections, psychological problems including anxiety, depression and degradation of body image [14], social interactions and restriction of sexual activity [15].

An Australian study published in 2011 suggested that CD patients with APL had significant emotional distress that affects their overall QoL [16]. Thus, Mahadev., *et al*. revealed a high prevalence of depressive symptoms and self-reported suicidal ideas in patients with perianal Crohn's disease [16]. In the latter, the duration of the disease, previous proctologic surgery and the presence of a digestive stoma or anal stenosis had a negative impact on QoL [16]. Another cross-sectional study published in 2011 including 69 patients with CD with APL found that physical symptoms of anoperineal CD such as anal pain and perianal discharge were judged to be more unfavorable than emotional aspects of QoL [4]. Likewise, patients with setons were more likely to have reduced QoL and to experience more severe psychological problems [4]. In addition, APL can lead to a disturbed body image and negatively influence the overall QoL of patients [4].

Furthermore, the association of psychiatric disorders with CD has been widely reported in the literature [11]. A recent study by Giovanni., *et al*. published in 2014 examined the link between CD and anxiety and showed that anoperineal localization (p = 0.003) and perineal surgery (p = 0.042) were significantly associated with anxiety [14]. Similarly, a case-control study published in 2013 including more than 2400 patients with CD showed that the presence of APL was a significant risk factor for anxiety and depression [17]. The same study also suggested that perineal surgery and the use of immunosuppressants were correlated with an increased risk of psychiatric illness [17]. Furthermore, our study did not show a statistically significant association between perianal Crohn's disease and anxiety or depression (p 0.49 and 0.72 respectively). The table 4 shows the main studies evaluating the impact of perianal Crohn's disease on quality of life.

Studies	Main results
Mahadev S., *et al*. [16]	**130 patients with perianal Crohn's disease** Depressive symptoms were self-reported 73% reporting feeling depressed and 13% reporting feeling suicidal. Associations were found between depressive symptoms and duration of disease, prior surgery, past or present stoma, and anal stenosis.
Mahadev S., *et al*. [4]	**130 patients with perianal Crohn's disease** The scores suggest that long-term drains are associated with increased aspect importance across multiple QoL domains. Patients indicated significant aversion to loss of independence (77%).
Maconi G., *et al*. [14]	**195 patients with Crohn's disease** Anxiety with or without depression was significantly correlated with history of perianal disease (p = 0.003) and perianal surgery (p = 0.042).

Table 4: Main studies evaluating the impact of perianal Crohn's disease on quality of life.

In addition to its psychological impact, CD can alter the productivity and professional activity of patients with considerable socio-economic cost [18]. Indeed, the burden of disease associated with CD leads to a decrease in work productivity with a higher rate of absenteeism than in healthy workers [18]. To our knowledge, no study has focused on the impact of perianal Crohn's disease on labour productivity. Our study showed that there is a statistically significant relationship between the average rate of activity restriction and perianal Crohn's disease (p = 0.04). On the other hand, no significant relationship was found for the other dimensions of the WPAI questionnaire.

Conclusion

Our study revealed that CD is a source of impaired QoL and psychological discomfort with reduced worker performance and increased rates of presenteeism and absenteeism. The presence of perianal manifestations seems to influence mental health and professional activity.

Thus, the impact of CD is really important. The gastroenterologists should identify some aspects of it during the consultation through open questions. To quantify it he/she can use generic and/or specific scores. Similarly, the occupational physician in collabo-

ration with the gastroenterologist should consider the productivity aspects in patients with CD.

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