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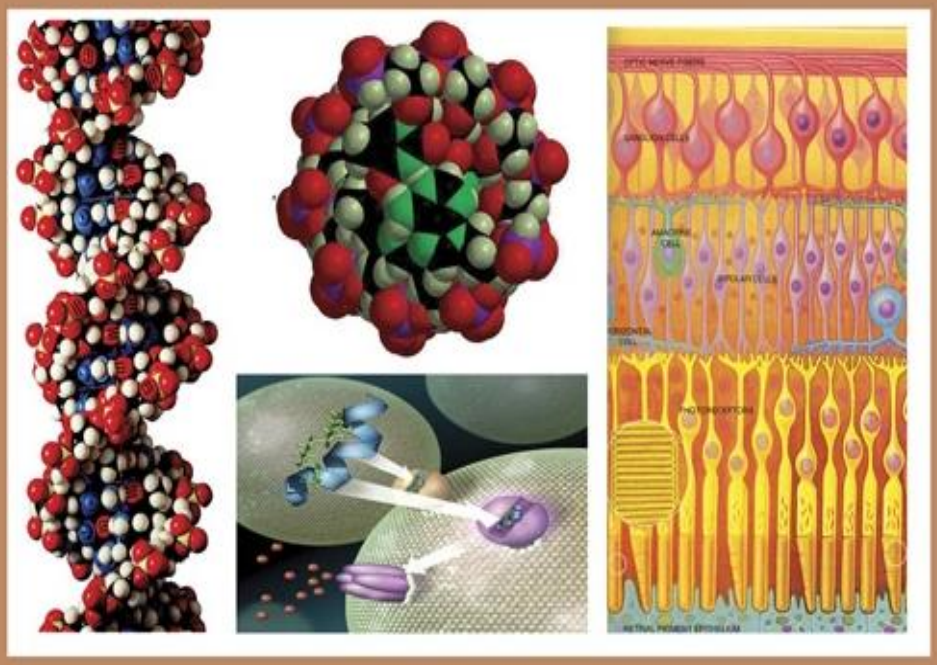

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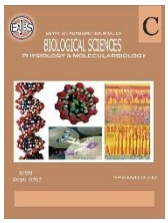

Epidemiological Study and Clinical Characteristics of Crohn's Disease in The West Algerian Population

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ABSTRACT

Background: Crohn's disease (CD) is a chronic multifactorial inflammatory disorder, characterized by discontinuous lesions that affect the entire gastrointestinal tract from the mouth to the anus. The aim of our work was focused more particularly on the study and determination of epidemiological data, clinical, para-clinical and therapeutic aspects of Crohn's disease in the Western Algerian population. **Methods**: A retrospective analytical study was carried out at the level of the general surgery department (western Algeria), during the period 2008-2019. **Results:** During the period of our study, which ran from 2008-2019, we collected 300 cases of Crohn's disease. 184 males and 116 females with a sex ratio of 1.6. Anemia, ESR and CRP were the most impaired biological noted signs. The ileo-caecal location was the most dominant (56%) and the most common phenotype was the inflammatory type (47%). Statistical analysis showed an evidence association between Colic location, ilea-caecal location and gender (p=0.005; p=0.017). Similarly, we noted a significant relation between Colic location, ilea-caecal location and < 40-year group (P=0.007, p=0.005 respectively). The treatment of Crohn's disease was essentially medical. Nevertheless, surgery remains necessary in most patients as 79% underwent it. Postoperative morbidity was dominated by the occurrence of recurrence (83%). As major risk factors, we noted appendectomy at 17%, smoking at 22.7% and oral contraception at 32%. **Conclusions** According to our results Crohn's disease is a frequent pathology, its care remains multidisciplinary despite a well-conducted medical treatment and complicated cases are frequently observed. The therapeutic sanction remains surgical which does not protect the patient from the occurrence of recurrence.

INTRODUCTION

Crohn's disease (CD) is a chronic multifactorial inflammatory disorder, it is a subgroup of a broad classification of disorders known as inflammatory bowel disease (IBD)(Barrett and Chandra, 2011).

CD involves, in varying proportions, genetic and environmental factors as well as intestinal microbiota which has a role in the occurrence of this pathology. The current etiological hypothesis describes this pathology as an abnormal inflammatory and immune response to the intestinal microflora triggered or aggravated by environmental factors in genetically predisposed individuals (Kökten *et al.*, 2016)**.**

Crohn's disease is characterized by discontinuous lesions that affect the entire gastrointestinal tract from the mouth to the anus (Mak *et al.,* 2019). Symptoms are variable and may include diarrhea, abdominal pain, weight loss, nausea, vomiting and sometimes fever or chills (Sinčić *et al*., 2006)**.** Patients may present one or more phenotypes during the course of their disease; they often progress from an inflammatory state to a state of stenosis or penetration. Unfortunately, there is no cure for CD and most patients require at least one surgical resection (Cheifetz, 2013)**.** Clinical manifestations depend on the location of the different segments of the digestive tract, they may be accompanied by general signs and more rarely by extra-intestinal signs, it differs from a patient to another.

A comprehensive study on the disease prevalence in Algeria, reporting that partial studies conducted between 1981 and 2016 showed a 300% increase in Crohn's disease in the last decade, affecting both men and women (Arab, s. d.). The objective of this paper was to study the epidemiological profile, clinical, para-clinical and therapeutic aspects of Crohn's disease in the Western Algerian population.

MATERIALS AND METHODS

Epidemiological Study:

This was an analytical comparative retrospective study of 300 cases suffering from Crohn's disease and diagnosed between 2008 and 2019 at the surgical department of Sidi-Bel-Abbés University Hospital (Western Algeria). These cases were collected from surgical department records. The selected cases were completed from referral department records. The studied parameters were age, phenotype, location, symptomatology data, medical and paramedical examination.

Statistical Analysis:

In the statistical analytical study, the raw data were processed using cross-tabulations. Associations between categorical parameters were tested using the Pearson Chi-square test ($\chi 2$) and sample t-test for continuous variables. The results were presented using the p-value; the level of significance was limited by the 5% significance level. All data were processed and analysed by SPSS 20.0 (Statistical Package for the Social Sciences, IBM Corporation, Chicago, IL August 2011).

RESULTS

184 men and 116 women of comparable age (39,42±14,47 vs 38,34±14,74 respectively; p=0.53) were enrolled. A male predominance was noted (61.3%) with a male/female sex ratio of 1.6.The most recorded age group at presentation was 20-40 (75.3%) with a minimum age of 12 years and a maximum age of 80 years. Based on the age of diagnosis, there were two peaks in the incidence of Crohn's disease, the first one was between 20-40 years, the second one between 40-60 years with a minimum age of 16 years and a mean age of 39.94 (Table .1 and 2). There was possibly an average duration of 62 days between the time of the first consultation and the day of diagnosis. The different types of phenotypes are presented in (Table .1). The most common was the inflammatory type (47%), followed by stenosing (42.3%), fistula (8%) and ano-perineal lesions (2.7%). The ileo-caecal location was the most dominant at 56% followed by the colonic location (37%) and the jejunal location with a percentage of (7%) (Table .1).

Table 1: Details of demographic and clinical characteristics of patients with Crohn disease

Characteristics :	Number of cases	Percentage %
Gender		
Female	116	38.7
Male	184	61.3
Age		
>20 years	15	5
20-40 years	216	72
40-60 years	55	18.3
60-80 years	14	4.7
Minimum age	16 years old	
Maximum age	80 years old	
Age at presentation		
>20 years	25	8.3
20-40 years	226	75.3
40-60 years	42	14.0
60-80 years	7	2.3
Diagnostic delay (mean)	4 years	
Duration of symptoms before diagnosis (Mean)	62 days	
Behavior		
Inflammatory. T	141	47
Stenosing. T	127	42.3
Fistula T	24	8.0
ano-perineal.T	8	2.7
Location		
Ileo-caecal location	168	56
Colonic location	111	37
Jejunal location	21	7
Family history		
Yes	32	10.7
No	268	89.3
Clinical features		
Pain syndrome	20	6.7
Occlusive syndrome	111	37.0
Sub occlusive syndrome	69	23.0
Crohn disease	28	9.3
Fistula	39	13.0
Abscess	19	6.3
Perineal syndrome	14	4.7
Morbid-mortality		
Relapse requiring surgical treatment	249	83
Relapse requiring medical treatment	45	15
Deceased patient	6	2.0
Treatment		
5-asa	72	24
Immunosuppressants	40	13.3
Corticosteroids	19	6.3
Biotherapy	63	21
Biological examination		
CRP (>11)	110	36.7
ERS 1h (>7mm); 2h (>11mm)	71	23.7
Anemia		
Male<130	104	37.7
Female<120	74	24.6
CRP (Mean)	56.78	
Other clinical features		
Inflammatory lesions	35	11.7
Skin lesions	28	9.3
Absence	237	79
Para-clinical examination		
RX		
PSA	17	5.7
Tele -thorax	110	36.7
Radiography	115	38.3
Barium enema	101	33.7
Hail transit	180	60.0
Ultra-sound	184	61.3
Scan	134	44.7
Endoscopy		
Coloscopy	235	78.3
Recto-sigmoidoscopy	77	25.7
Fibroscopy	30	10.0
Histological assessment		
Yes	111	37.0
No	189	63.0
Diagnostic delay		
>1 year	164	54.7
1-5 years	91	30.3
5-10 years	29	9.7
10-15 years	14	4.7
15-20 years	1	0.3
20-25 years	1	0.3
Evolutive data		
Good evolution	245	81.7
Sensitive evolution	38	12.7
Difficult evolution	17	5.7
Transferthias		
Gastro-enteritis	274	91.3
Emergency	20	6.7
Other	6	1.9
Operative indications		
- Total coloproctectomy:	4	1.3
- Right hemi-colectomy:	44	14.7
- Fistula resection:	15	5
-Ileal resection with ileo-ileal anastomosis:	40 88	13.3 29.3
-Ileocaecal resection with ileocolic anastomosis:	31	10.3
-Sigmoid resection :	15	5.0
-Jejunal resection :		
Surgery		
Yes	237	79
No	63	21
ASA		
I	84	28.0
II	22	7.3
III	1	0.3
Not mentioned	193	64.3
Risk factors		
Appendicitomy	51	17
Smoking	68	22.7
Oral Contraception	96	32
Food factor	9	2.9
Alcoholism	19	6.3

Values presented as Number (%)

The Pearson chi-square test showed a significant association between Colic location, ilea-caecal location and gender (p=0.005; p=0.017respectively) (Table .2). Moreover, there were more than half of our patients (84%) among the <40 years group. In fact, a significant relation was found between colic location, ilea-caecal location and <40 years group (P=0.007 and p=0.005). On the other hand, we did not observe any significant association between age groups and phenotype (Table.3).

Table 2: Association gender by age and location

Gender Characteristics	Male	Female	P-value
Mean Age (years)	39,42±14,47	38,34±14,74	0.53*
Location			
Colic location	56 (18.7%)	54 (18%)	**P= 0.005****
Ileo-caecal location	113 (37.7%)	55 (18.3%)	**P= 0.017****
Jejunal location	14 (4.7%)	7 (2.3%)	P= 0.60**

*Sample t-test; **chi-square test. Values presented as Number (%) or mean ± standard deviation

Table 3: Association of age at presentation and other characteristics

	<40 years	>40 years	P value*
Location			
Colic location	85(28.3%)	26(8.7%)	**0.007**
Ileo-caecal location	150(50%)	18(6%)	**0.005**
Jejunal location	17(5.7%)	4(1.3%)	0.963
Phenotype			
Inflammatory. T	123(41%)	18(6%)	0.150
Stenosing. T	102(34%)	25(8.3%)	0.136
Fistula. T	20(6.7%)	04(1.3%)	0.92
Ano-perineal. T	7(2.3%)	1(0.3%)	0.78

*Data analyzed by Chi-square test**.** Values presented as Number (%)

The diagnosis of Crohn's disease is based on the para-clinical diagnosis. Anemia, Erythrocyte sedimentation rate (ERS) and C-reactive protein (CRP) were the most impaired biological signs in our patients. The radiological assessment based on ultrasound was performed on 61.3%, hail transit on 60%, CT scan on 44.7% and radiography on 38.3%. Concerning endoscopic examinations, 78.3% were performed on colonoscopy examinations, 25.7% on recto-sigmoidoscopy examinations, and 37% on histological examinations (Table.1).

At the time of data collection, the mean C-reactive protein (CRP) was 56.78 mg/L. Therefore, there was no significant correlation between mean CRP and phenotype. The rate of inflammatory and skin lesions in our patients were respectively at 11.7% and 9.3% (Table .1). The treatment of Crohn's disease is essentially medical, as observed in 24% of patients treated with 5-aminosalicylic acid, 21% with biotherapy, 13.3% with immunosuppressant and 6.3% with corticosteroid therapy. Nevertheless, surgery remains necessary in most patients as 79% underwent it, of which 29.3% underwent surgical treatment by ileo-caecal resection with ileocolic anastomosis and 14.7% a right hemi-colectomy (Table 1). According to the findings, we note that in the majority of cases (81.7%) the post-operative course was favorable. On the other hand, it was sensitive for (12.7%)

and difficult for (5.7%) (Table. 1). Several risk factors for Crohn's disease were observed in our studied population, namely appendectomy 17%, 22.7% smoking, 32% oral contraception, 2.9% dietary factors and 6.3% of patients with alcoholism (Table.1).

DISCUSSION

The present scientific study is one of the rarest investigations made at the North African level in general and the Algerian level in particular. According to the obtained sex-ratio rate of 1.6, we confirmed that most patients diagnosed with Crohn's disease were males, which concords with many authors' findings **(**Aida *et al.,* 2018; Al Fadda *et al.,* 2012; Aljebreen *et al.,* 2014**)** and discords with other results of Caini *et al.*(2016), where the dominance was female. Our retrospective study also showed that the most affected age group was 20-40 years old with an average age of 39.94 as noted in the literature (Bouzid *et al.,*2011). In our series, the inflammatory type was dominant followed by the fistulous stenosing type and ano-perineal lesions with a lower frequency. These results are consistent with the results of (Aljebreen *et al.,* 2014; Can *et al.,* 2015; Feuerstein and Cheifetz, 2017)**.** There was also a predominance of ileo-caecal location, followed by colonic location, as noted in the surveys of Can *et al.*(2015) and (Krati and Cherquaoui, 2015**).** Our results revealed as well a jejunal location in 21 patients. Moreover, we found a significant association of ileo-caecal localization and colonic localization with gender and age as noted in different studies (Herzog *et al.,* 2018; Severs *et al.,* 2018)**.** Family history results analysis showed that only 10.7% had a family history, while nothing was reported among 89.3% of the patients. According to Gower-Rousseau (2012), the genetic factor is involved in Crohn's disease.

In the study of Medarhi *et al.*(2001**),** patient admission was due to bowel occlusion, followed by fistula masses and abdominal pain which was also confirmed in our study, since most of our patients were diagnosed with occlusive Sd followed by sub-occlusive Sd and fistulas. Regarding the biological findings, we reported that most of our patients (36.7%) had a mean CRP level (>11 mg/L). There was no significance between the mean CRP and the phenotype (Aljebreen *et al.,* 2014)**,** ESR 1h (>7mm); 2h (>11mm) in 23.7%, anemia (<130) in 37.7% men and (<120) in 24.6% women, this result is consistent with those of Al Fadda *et al.*(2012)**.**

Crohn's disease treatment is essentially medical. It aims to control and put the patient into remission and prevent relapses. 24% of our CD patients have been treated with 5-ASA preparations as noted by Al Fadda *et al.*(2012); 21% by biotherapy (TNFalpha) which have been shown to be effective in inducing remission and preventing postoperative recurrence of the disease as cited in the survey of Al Fadda *et al.* (2012) and (Burger and Travis, 2011)**.** Postoperative morbidity was dominated by the occurrence of recurrence and requires surgical resumption, which agrees with (Can *et al.,* 2015) results.

Patients with Crohn's disease require surgery at some point to relieve symptoms if drug treatment has failed or also to treat complications. In fact, the majority of patients went through surgery through the gastroenterology department with a rate ranging from 79% to 91.3% as confirmed by Aghazadeh *et al.*(2005); Al Fadda *et al.*(2012) and Ballester Ferré *et al.* (2018**)** findings. Crohn's disease remains an unknown and still ill-defined disease. We confirmed once again that the postoperative course was favourable in the majority of cases. The objective of the surgery is to allow good control of the lesions while performing the most

economical bowel resection. In the majority of cases the surgical treatment applied to our patients was that of ileo-caecal resection with ileocolic anastomosis, which is similar to the results of Al Fadda *et al.* (2012); Burr *et al.*(2019); Medarhi *et al.*(2001)**.**

Based on risk factors, we found that17% of our patients had undergone an appendectomy;(Feuerstein and Cheifetz, 2017; Kaplan *et al.*,2008; Loureiro and Barbosa, 2019)**.** It has been found that after an appendectomy, there is a risk of developing Crohn's disease. This risk is the highest in the following 4 years(Kaplan *et al.*,2008; Oslash *et al.*, 2012). Smoking is also a risk factor for developing CD since the rate of smokers found in our series was 22.7%, however, the effect of smoking on Crohn's disease is still mysterious. The studies of Cosnes *et al*.(2011) have shown that the incidence of Crohn's disease was low in Asian and African populations with high smoking rates and high in some populations with low smoking rates (Sweden, Canada). However, the study of Cosnes *et al.*(2011) had shown that smoking results in the early onset of CD, leading to more surgeries, higher rates of postoperative recurrent disease and a more frequent need for immunosuppression.

CONCLUSION

At the end of our study, we were able to observe that Crohn's disease is a frequent pathology that causes public health problems, the pathology's diagnosis is easy, its care remains multidisciplinary despite a well-conducted medical treatment, complicated cases are frequently observed. The therapeutic sanction remains surgical, which does not protect the patient from the occurrence of recurrence.

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