Epidemiological and Clinical Characteristics of Ulcerative Colitis in Upper Egypt: A single center study

Abdelmajeed Moussa[1], Noha Eltaweel[2], Mohamed Elbadry[3]

[1]*Department of Tropical Medicine and Gastroenterology, Faculty of Medicine, Aswan University, Aswan, Egypt .*

[2]*Department of Medical Molecular genetics, National Research Centre, Cairo, Egypt.*

[3]*Department of Endemic Medicine , Faculty of Medicine, Helwan University, Cairo, Egypt .*

Corresponding Author
Mohamed Elbadry

Mobile:
00201001815738

E mail:
melbadry2002@yahoo.com,

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Background and study aim: Ulcerative colitis (UC) is a chronic remitting relapsing disease affecting the colon. We aimed to study the epidemiology and clinical characteristics of UC patients in Aswan governorate - south of Upper Egypt .

Methods: Our study was a retrospective observational cross-sectional study including all patients who attend the inflammatory bowel disease (IBD) clinic of tropical medicine and gastroenterology department- Aswan university hospital over the five years period from 2015 to 2020 in whom the diagnosis of UC was confirmed by clinical, laboratory, endoscopic and histological examinations.

Results: A total of 26 patients with established diagnosis of UC were included in this study. Their mean± (SD) age at diagnosis was 30± (8.7) years. In our study the male: female ratio was 1.6:1. Only 4 (15.4%) patients had positive family history of UC. Bleeding per rectum was the main presenting symptom in 76.9%, most of the studied patients had no associated extra intestinal manifestations at presentations; while arthralgia, oral ulcers, sacroiliitis or arthralgia and sacroiliitis were associated symptoms in 7.6%, 3.8%, 11.5% or 3.8% of patients respectively. There was no statistically significant difference upon comparing laboratory data between the two age groups (more or less than 40 years) or between positive and negative extra intestinal manifestations. However, the level of fecal calprotectin and serum level of C-reactive protein (CRP), Erythrocyte sedimentation rate (ESR), platelets (PLT) and white blood cells (WBCs) count were raised with the increase in the clinical or endoscopic severity indices, while serum albumin and hemoglobin were dropped.

Conclusion: Epidemiology and clinical characteristics of UC patients in Upper Egyptian population closely resembled those of the Lower Egypt and Middle East. UC was more common in males and had mild and distal pattern.

INTRODUCTION

Ulcerative colitis (UC) is a chronic remitting relapsing disease affecting the colon, with an increasing incidence all over the world. It is a chronic immune-mediated inflammatory condition of the colon that is frequently associated with rectal inflammation and often extends proximally to involve other areas of the colon. Sparing the rectum has been noted in less than 5% of adult patients with UC at diagnosis but may be seen in up to 33% of pediatric-onset colitis **[1]**. The initial presentation of new UC is characterized by symptoms of proctitis as bleeding per rectum, urgency, and tenesmus. Onset of the disease could be in all age groups but there is a predominant age distribution that peaks between ages 15 and 30 years. The course of disease activity is most often described as relapsing and remitting course. Some patients with UC have persistent disease activity despite a full medical therapy, and a small number of patients present with the acute severe form of colitis known as fulminant disease **[2,3]**. UC can cause a significant morbidity and less mortality **[4,5]**. Patients with active UC are more liable to have anxiety and depression and are more likely to have a bad impact on their social and work activities **[6]**. Long-standing UC

is also associated with an increased risk of dysplasia and colorectal cancer, which is believed to be related to long-standing mucosal inflammation **[7–10]**. Management of UC must start with a prompt and accurate diagnosis, good assessment of the patient's risk factors of poor outcomes, and after that initiation of effective, safe, and tolerable medications. The optimal aim of management is to reach a sustained steroid-free remission, accompanied by appropriate normal health-related quality of life (QoL), prevention of morbidity including frequent hospitalization and colectomy, and prevention of colon cancer **[11]**. UC occurs with different frequencies around the world and its incidence noted in Egypt is going up in the last decades **[12]**. In this study, we studied the epidemiological and clinical characteristics of patients diagnosed with UC in Tropical medicine and Gastroenterology Department of Aswan University Hospital, which is a tertiary care referral center in south of Upper Egypt.

MATERIALS AND METHODS

Study area:

Aswan University Hospital has been recently established with construction of faculty of medicine in Aswan city, in Upper Egypt in 2014. It serves patients from all over the Aswan governorate also referred patients from Luxor and Red Sea primary and secondary care units. The hospital comprises 33 clinical departments and 23 units in all the specializations with more than 400 beds and 3000 employees. Instead of transferring patients to University hospitals in Cairo or Assiut governorates, the patients can receive specialized and well qualified services in Aswan.

Study design and assessments:

It was a retrospective observational, including all patients who attend the IBD clinic of Tropical Medicine and Gastroenterology Department-Aswan University Hospital over the years period from March 2015 to March 2020 in whom the diagnosis of UC was confirmed by clinical, laboratory, endoscopic and histological examinations.

During this period of time Aswan University Hospital-IBD clinic (multidisciplinary clinic with a team from different departments: gastroenterology, general surgery and histopathology) received 1982 patients from three big Egyptian governorates (Aswan, Luxor and Red Sea) who were referred for higher level of gastrointestinal evaluation and endoscopic examinations.

The following data were collected at time of diagnosis of UC for assessment and analysis: epidemiological data, clinical presentation, smoking, family history of IBD, disease characteristics, extraintestinal manifestations and the used medical treatment. All this clinical information was obtained from medical records. The diagnosis of UC was established by clinical, endoscopic, and histopathological criteria.

UC was diagnosed when there was evidence of a diffuse mucosal disease of colon with different proximal extensions from the rectum, superficial inflammation, and rectal involvement without any evidence of small bowel involvement other than backwash ileitis, with histopathological findings included the following: vascular congestion, crypt abscesses, mucin depletion, cellular infiltrate, cryptitis, and crypt branching [**12]**.

Endoscopic extent of the disease was characterized according to the Montreal classification as proctitis (E1), left-sided colitis (E2), or extensive colitis (E3) (extension proximal to the splenic flexure) **[13, 14].**

Clinical severity of UC has been classified according to the Truelove and Witts' criteria: Mild colitis is defined as fewer than 4 bowel movements daily, normal temperature, heart rate, hemoglobin (above 11 g/dl), and ESR (less than 20 mm/hr). Severe disease is defined by bowel frequency more than 6 times a day in association with fever, tachycardia, drop in hemoglobin level, or an elevation in ESR. Moderate disease lies in between mild and severe criteria **[15].**

Endoscopic severity was assessed by Mayo score 0: normal or inactive disease, 1: mild disease (erythema, decreased vascular pattern, and mild friability), 2: moderate disease (marked erythema, lack of vascular pattern, friability, and erosions), 3: severe disease (spontaneous bleeding and ulcerations) **[16].**

Statistical analysis:

Data were collected, coded, revised and entered to the Statistical Package for Social Science (IBM SPSS) version 20. The data were presented as number and percentages for the qualitative data, mean, standard deviations and ranges for

the quantitative data with parametric distribution and median with inter quartile range (IQR) for the quantitative data with non-parametric distribution. ***Chi-square test*** was used in the comparison between two groups with qualitative data and ***Fisher exact test*** was used instead of the Chi-square test when the expected count in any cell found less than 5. ***Independent t-test*** was used in the comparison between two groups with quantitative data and parametric distribution and ***Mann-Whitney test*** was used in the comparison between two groups with quantitative data and non-parametric distribution. The comparison between more than two groups with quantitative data and parametric distribution were done by using ***One Way Analysis of Variance (ANOVA) test*** and ***Kruskall-Wallis test*** was used in the comparison between more than two groups with quantitative data and non-parametric distribution. The confidence interval was set to 95% and the margin of error accepted was set to 5%. So, the p-value was considered significant as the following: P > 0.05: Non significant (NS) - P < 0.05: Significant (S) - P < 0.01: Highly significant (HS).

RESULTS:

In the current study, the participants were A total of 26 patients with established diagnosis of UC were included in this study. Their mean± (SD) age at diagnosis was 30± (8.7) years, with a range from 17-55 years old. For gender distribution, the male: female ratio in our study was 1.6:1, also there were only 4 (15.4%) patients who had positive family history of UC.

Regarding the clinical presentation; bleeding per rectum was the main presenting symptom in 76.9% of patients while the rest of them was presented with chronic diarrhea moreover 73.1% of the studied patients had no associated extra intestinal manifestations at presentations; while arthralgia, oral ulcers, sacroiliitis or arthralgia associated with sacroiliitis were associated symptoms in 7.6%, 3.8%, 11.5% or 3.8% of patients respectively.

Regarding the clinical and endoscopic severity of the cases at presentation, 7.7% of the patients showed severe clinical and endoscopic severity, while the moderate cases either clinically or endoscopically were 50% and 34.6% respectively. According to Montreal classification, we found that 50% of the studied patients were E1 while 30.8% of them were E2. Moreover, 57.7% of the patients received 5-amino-salycilic acid (ASA) treatment, 34.6% of them received ASA in combination with steroid and azathioprine (AZA) , while 7.7% of them were taking biologics.

Studying the laboratory data of the studied patients revealed; the mean (SD) of HGB, WBCs, PLT, CRP and ESR was 11.8 (1.8), 8.5 (2.6), 351.4 (104.7), 38.1 (36.6) and 37.81 (23.8), respectively. Furthermore, the mean (SD) of alanine transaminase (ALT) was 43.5 (6), aspartate transaminase (AST) was 40.7 (4.6), serum Albumin was 3.8 (0.4), alkaline phosphatase (ALP) was 142.5 (14.7) and fecal calprotectin was 317.1 (302.2). No statistically significant difference was found upon comparing lab data between the 2 age groups (more or less than 40 years) or between positive/negative extra intestinal manifestations. However, the level of fecal calprotectin and serum level of CRP, ESR, PLT and WBC were increased with the increase in the clinical or endoscopic severity while serum albumin and HB, were dropped (table 2&3).

There was no significant difference between positive/negative extra intestinal manifestations groups regarding clinical and endoscopic severity or Montreal classification (table 4).

Table (1): Comparison between age and Extraintestinal Manifestation, Clinical Severity, Endoscopic Severity, Montreal Classification and Treatment.

		Age					
		Up to 40		> 40		Chi square test	
		No	%	No	No	%	No
Extra intestinal Manifestation	Arthralgia	1	8.4%	0	0.0%	3.3	0.7
	Arthralgia and sacroiliitis	1	4.2%	0	0.0%		
	Normal	18	75.0%	1	50.0%		
	Oral ulcers	1	4.2%	0	0.0%		
	Sacroiliitis	2	8.3%	1	50.0%		
Clinical Severity	Mild	13	54.2%	2	100.0%	1.6	0.5
	Moderate	9	37.5%	0	0.0%		
	Severe	2	8.3%	0	0.0%		
Endoscopic Severity	Mild	10	41.7%	1	50.0%	0.2	0.9
	Moderate	12	50.0%	1	50.0%		
	Severe	2	8.3%	0	0.0%		
Montreal Classification	E1	11	45.8%	2	100.0%	2.2	0.3
	E2	8	33.3%	0	0.0%		
	E3	5	20.8%	0	0.0%		
Treatment	ASA	13	54.2%	2	100.0%	1.6	0.5
	ASA+Steriod and AZA	9	37.5%	0	0.0%		
	Biologics	2	8.3%	0	0.0%		

Table (2): Comparison between Clinical Severity and Laboratory findings.

	Clinical Severity							
	Mild		Moderate		Severe		One way ANOVA	
	Mean	SD	Mean	SD	Mean	SD	F	p value
HGB	13.03	1.03	10.58	0.96	8.00	0.71	33	>0.001
WBCs	7.14	1.36	9.72	2.62	13.25	2.47	11.4	>0.001
PLT	291.00	73.53	415.67	80.36	516.00	28.28	13.1	>0.001
CRP	20.38	15.44	44.33	14.51	143.00	38.18	48	>0.001
ESR	23.40	14.06	50.22	13.46	90.00	0.00	27.1	>0.001
Fecal calprotectin	179.93	220.66	395.67	209.49	992.50	10.61	13.9	>0.001
ALT	42.33	7.14	44.78	3.99	46.50	0.71	0.7	0.495
AST	39.93	5.12	41.78	4.24	41.50	0.71	0.5	0.635
ALP	143.13	13.39	141.00	18.40	144.50	13.44	0.1	0.930
Serum Albumin	4.05	0.31	3.54	0.35	3.00	0.14	13.8	>0.001

Table (3): Comparison between Endoscopic Severity and Laboratory findings.

	Endoscopic Severity							
	Mild		Moderate		Severe		One way ANOVA	
	Mean	SD	Mean	SD	Mean	SD	F	p value
HGB	13.19	1.24	11.20	1.20	8.00	0.71	19.1	>0.001
WBCs	7.94	1.58	8.25	2.78	13.25	2.47	4.6	0.021
PLT	299.18	84.72	370.38	96.95	516.00	28.28	5.5	0.011
CRP	22.43	20.34	35.23	16.17	143.00	38.18	32.7	>0.001
ESR	25.09	16.22	40.54	18.73	90.00	0.00	12.3	>0.001
Fecal calprotectin	183.45	254.4	326.3	209.4	992.50	10.61	10.9	>0.001
ALT	41.91	6.17	44.38	6.17	46.50	0.71	0.8	0.475
AST	39.64	4.90	41.46	4.74	41.50	0.71	0.5	0.625
ALP	144.82	15.18	140.23	15.32	144.50	13.44	0.3	0.750
Serum Albumin	4.02	0.37	3.73	0.40	3.00	0.14	6.454	0.006

Table (4): Comparison between Extra intestinal Manifestations and Clinical and Endoscopic Severity.

Extra intestinal Manifestations		Negative		Positive		Chi square test	
		No	%	No	%	X^2	P value
Clinical Severity	Mild	10	52.6%	5	71.4%	1.2	0.562
	Moderate	7	36.8%	2	28.6%		
	Severe	2	10.5%	0	0.0%		
Endoscopic Severity	Mild	8	42.1%	3	42.9%	0.8	0.659
	Moderate	9	47.4%	4	57.1%		
	Severe	2	10.5%	0	0.0%		
Montreal Classification	E1	7	36.8%	6	85.7%	5.1	0.077
	E2	7	36.8%	1	14.3%		
	E3	5	26.3%	0	0.0%		

DISCUSSION

The exact etiology of UC remains unclear; however, many epidemiological studies in different populations revealed a combination of environmental and genetic roles in its pathogenesis. UC is considered a rare disease in developing countries **[20].** However, it is being reported with increasing frequency from different developing countries **[20].** The incidence and prevalence of UC are well defined in the industrialized countries, amounting to 40 to 100 cases / 100 000 members of the total population. Figures from developing countries are around 7.57 /100 000 populations **[20].**

Data on the epidemiology and clinical characteristic of UC in south of Upper Egypt are lacking, with the beginning of work at our department in Aswan University Hospital by 2014, we tried to make data registry for all IBD patients, in this study we included all UC patients who diagnosed in the period between March 2015 and March 2020.

According to our results the mean ± (SD) age of the studied patients at diagnosis of UC was 30 ± (8.7) which is near to the mean age in a similar study done in Cairo university hospitals **[12].**

The male: female ratio was 1.6:1 with predominance of the disease in males, which is consistent with previous studies in the Middle East from Saudi Arabia **[17]** Kuwait and Lebanon **[18, 19],** sub-Saharan Africa **[20]** and in contrast to Cairo study which showed slight female predominance, male to female ratio was 1:1.15 **[12].**

In our study, we did not find any correlation between smoking habits, positive UC family history or presence of extra intestinal manifestations and the severity of the disease at time of diagnosis, which also was the same finding in Cairo study **[12]**.

The clinical characteristics of the disease in our patient showed that most of our patients with UC had mild distal (E1) or left-sided colitis (E2) (approximately 84%) which is a similar to what have been found in Cairo study **[12]** other studies from Korea **[21]**, Japan **[22]** and Europe **[23].** Although Saudi Arabia study showed a different pattern with more patients having pancolitis 42.7% **[17].**

CONCLUSIONS:

In our study, we found that the epidemiological characteristics of UC patients in Upper Egyptian population closely resembled those of the Lower Egypt and Middle East. UC was more common in males with mild and distal pattern. No correlation had been found between disease severity and smoking history, family history of UC or presence of extraintestinal manifestations. Our study was observational study at time of diagnosis of the disease only with small number of patients; no follow up data was collected to see the progress of the disease regarding relapse and remission pattern, the need for surgical interventions or the response to different treatment options. Further studies needed covering big data registry from all Upper Egypt governorates..

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Conflict of interest: none to declare.

Ethical considerations: The study was designed and performed according to the ethical guidelines of the 1975 Declaration of Helsinki after approval from Institutional Review Board (IRB) at Aswan University Hospital.

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