Epidemiological and Clinical Aspects of Ulcerative Colitis in Mosul city, Iraq

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Abstract
Ulcerative Colitis (UC) is a chronic inflammatory disorder of the gastrointestinal tract with heterogeneous disease presentation. A cross-sectional descriptive study was undertaken in Mosul General Hospital. The study was conducted using two distinct methodologies. An observational checklist was used by the researcher to assess the patients' characteristics and factors related to UC from 200 hospitalized patients from December 2018 to April 2019. Data were entered into spreadsheets and analyzed in Statistical Package for Social Sciences (SPSS) version 22. The results showed that 49.0% of patients was males and 51.0% was female; the mean age was 46.36 years old. Elderly stage (> 45 years of age) makes the highest proportion of the patients 99 (49.5%). The majority of patients was from urban or inside Mosul city center 140 (70%). The study also showed that the more frequency of patients 103 (51.5%) were in severe condition. Patients were used or given more antibiotics, they will be liked to get UC 191 (95.5%) and the relation was found to be statistically significant at (p<0.001). The study showed that 95 (47.5%) of all cases had a previous family history of UC. Out of 102 female patients, 45 (44.1%) were more frequently under uses of contraceptive pills. 60 (58.8%) of patients was in severe cases of UC and followed by moderate 35 (34.3%). Out of 103 severe cases, 60 of them were female. These differences were statistically significant at (p<0.05). In addition, out of 45 female patients were used oral contraceptive pills, 30 (66.7%) of them were in severe cases of UC and followed by 14 (31.1%) were in moderate cases. Majority of patients previously were sensitive to spices 160 (80.0%) and followed by fish and eggs 21 (10.5) 16 (8.0%) respectively. In addition, out of 160 spices sensitive patients, 80 (50.5%) of them were in severe cases and 61 (38.1%) were in moderate cases. Statistically, these differences are significant at (p<0.05).
In the conclusion, UC among late adult in our community needs critical care and monitoring. The female patients were at risk of UC especially, who uses oral contraceptive pills. The random and more antibiotic uses are considered as major risk factors lead to cause UC.

Keywords: Ulcerative colitis, Mosul city, Oral contraceptive pills, Food sensitivity.

1. INTRODUCTION

Ulcerative colitis (UC) is an infection of the large intestine (colon). It has irritating and swelling of colon symptoms, which causes inflammation and then leading to cause ulcers in the lining of colon [1]. It is considered as a type of inflammatory bowel diseases, but it can be differentiated from Crohn's disease (CD) and irritable bowel syndrome (IBS) which have similar symptoms to UC [2].

The one of the main symptoms of UC is bloody diarrhea. Other problems include crampy belly pain, not feeling hungry, weight loss, weakness, anemia, and fever. For example, CD causes inflammation the digestive tract. UC only affects the lining site of colon. Furthermore, IBS has some similar symptoms with UC, however, it cannot able to cause ulcers, it has an issue with the intestinal muscles [3]. Proctitis is inflammation of the rectum. Left-sided colitis is involvement of the descending colon, which runs along the patient's left side, up to the splenic flexure and the beginning of the transverse colon. Extensive colitis is inflammation extending beyond the reach of enemas. Pancolitis involves the inflammation of the entire colon, extending from the rectum to the cecum, beyond which the small intestine begins [4]. In addition to the extent of involvement, people may also be characterized by the severity of their disease: Mild, moderate and severe [4]. In spite of unknown causes UC is unknown; however, there are several factors such as disorder of immune system, genetics, abnormality of bacterial flora in the gut, and environmental factors are usually having a relation with UC [5-9].

This study aims to investigate the epidemiological and clinic aspects of ulcerative colitis in Mosul city, Iraq.

2. LITERATURE REVIEW

Globally, the geographic distribution of UC has the highest incidence rate in Canada, New Zealand and the UK [10,11]. The first peak of UC occurs between (15 – 25) years-old [12,13,14]. Globally, UC has variance in demographic and clinical characteristics. Phenotypic heterogeneity of UC might be related to environmental and genetic factors [15]. For instance, the investigations have revealed that UC evolution is usually less severe in Asian countries in comparison with developed western countries [16,17].

According to study in west of Iran, out of the 150 diagnosed patients with UC, 84 (56%) was women and 66 (44 %) was men and male to female ratio equal to 1.27. The patient mean age was 33.7 ± 12.5 years with the age range (17–98 years). Most of the patients (56 %) was women and living in urban areas (70.7%), also the frequency of distribution showed that holder of high school and Diploma certificate were the most (48 %), 22 were uneducated (27.5%), 54 were holders of postgraduate degree (67.5%) and 4 were in higher educated (5%) [18]. Based on results of present study, incidence and prevalence rate of ulcerative colitis in Ardebil city were 2.72 and 19.1 per 100 thousand people respectively [19].

In another investigation in the south of India, 89 (57.7%) and 68 (43.3%) of the patients were preferred home-cooked meal and outside food respectively. Out of 204 healthy persons, 67 (32.8%) of them were preferred home-cooked meal; however, 137 (67.2%) of them were had outside food. 146 (93%) patients were non-vegetarian and 11 (7%) were vegetarians. Evaluation of drinking habits showed that 135 (86%) patients used municipal water, and 22 (14%) of the patients used boiled or filtered water in UC sub-population. 157 of UC patients, only 8 (5.1%) were smokers and among the controls 25 (12.3%) were smokers. 46 (29.3%) UC patients consumed alcohol on a regular basis whereas 111 (71.7%) were non-alcoholic. [20].

In regards to extra-intestinal symptoms, inflammation of joints was 17.5% among the patients,

osteopenia and osteoporosis 30.5% and 17.1% respectively. Primary sclerosing cholangitis was 0.9% and vein thrombosis was 1.9%, 7.06% of the population was observed with cutaneous involvement [21].

3. METHODS AND MATERIALS

A prospective cross-sectional descriptive study was conducted to determine the epidemiological, clinical presentation and outcome of UC from September 2018 to April 2019. And the study is conducted at General Mosul Hospital, Mosul, Iraq. Which is the main hospital for treatment of gastro intestinal tract (GIT) diseases for many years and that has been giving routine health services for Mosul city and other referral cases from different town of Iraq.

Population for this study includes patients more than 15 years of age who had sustained UC and admitted to hospital for receiving medical care. Data collected from the medical records of 200 patients, hospitalized between September 2018 and end of April 2019. Data included age, sex, residence, educational status, symptoms of UC, environmental factors, risk factors, sensitive to foods, and family history to achieve the objectives of this investigative work, a questionnaire was used to collect data from the UC patient.

A personal interview was held for filling in the questionnaire. All interviews were conducted face to face. The questionnaire was based on the review of literature related to UC. Pre-test was used in 5% of the sample size before the study to make sure that the data collecting sheet is capable of yielding the required data for the study and some modifications were done according to the results found and to find response from patients. A questionnaire approved by some of specialized physician and health care workers.

Data obtained from this work were tabulated into Microsoft excel sheets and uploaded to SPSS (Statistical Package for Social Sciences) version 22.0 software. Percentage / correlating were used for measurement and analysis. Means used to summarize continuous variables whereas categorical variables to be summarized in form of proportions and frequency tables such as (age, gender, occupation, marital status, educational level, and risk factors). Chi-square ($\chi2$) test was used to test for significance of associations between the predictor and outcome variables in the categorical variables to find an outcome related to health issues. T-test used for comparison two means. P-value of < 0.05 was considered as statistically significant cutoff. The generated data is compiled by frequency tables, charts, and figures. EndNote program and Vancouver style was used for references citation.

4. RESULTS

Demographic characteristics of patients
Out of 200 UC infected patients, 98 (49 %) and 102 (51 %) were males and females respectively. The mean age was 46.36 ± 16.57 years (ranged from 15 to 80 years). More than 45 years old and it considered as the highest proportion of the patients 99 (49.5%). According to the occupational status, most of frequent patients were not employed 117 (58.5%), followed by employed 56 (28.0%), and then military 27 (13.5%). In addition, the majority of patient was in high school degree and illiterate in educational level 150 (75.0%) and 33 (16.5%) respectively and less frequent proportion were in postgraduate level 17 (8.5%) (Table1).

Severity of UC classifications
Overall, the patients of the study showed that the more frequency of patients were in severe condition 103 (51.5%) and lees of them were in mild condition of UC 21 (10.5) (Figure1).

Extra factors in relation to UC

More antibiotic users likely to be get UC 191 (95.5%) and the relation was significant at (p<0.001). Also, patients who used corticosteroids they will get to UC at a second proportion 81(40.5%), it was significant p=0.01. Furthermore, there was not any statistical correlation between stress and UC (Table 2).

Table 1. Demographic characteristic of patients Frequency

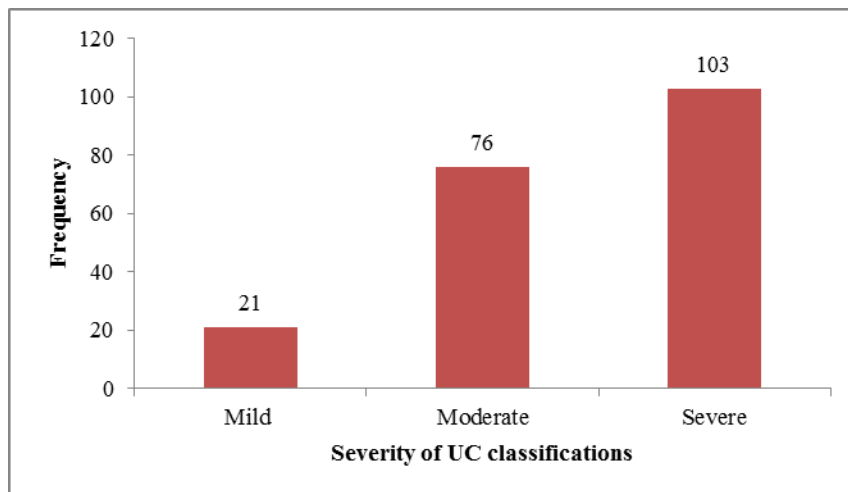| Demographic characteristic		Number	Percentage (%)
Sex	Male	98	49
	Female	102	51
Age group	< 30	41	20.5
	30-45	60	30.0
	> 45	99	49.5
Occupation	Non employed	117	58.5
	Employed	56	28.0
	Military	27	13.5
Educational level	Illiterate	33	16.5
	High school degree	150	79.0
	Graduate and postgraduate degree	17	8.5
Total		200	100

Figure 1. Severity of UC classifications. n=200

Table 2. Distribution of extra risk factors in relation to UC. (n=200)

Extra factors	No.	%	p-value
Corticosteroid uses*	81	40.5	0.01
Antibiotic uses	191	95.5	0.0001
Stress & anxiety	68	34.5	0.5

*Some patient with UC affected by more than one extra factor.

As shown in figure 2 the severity of UC is increased by continuously using antibiotic and corticosteroids 99 and 48 cases respectively.
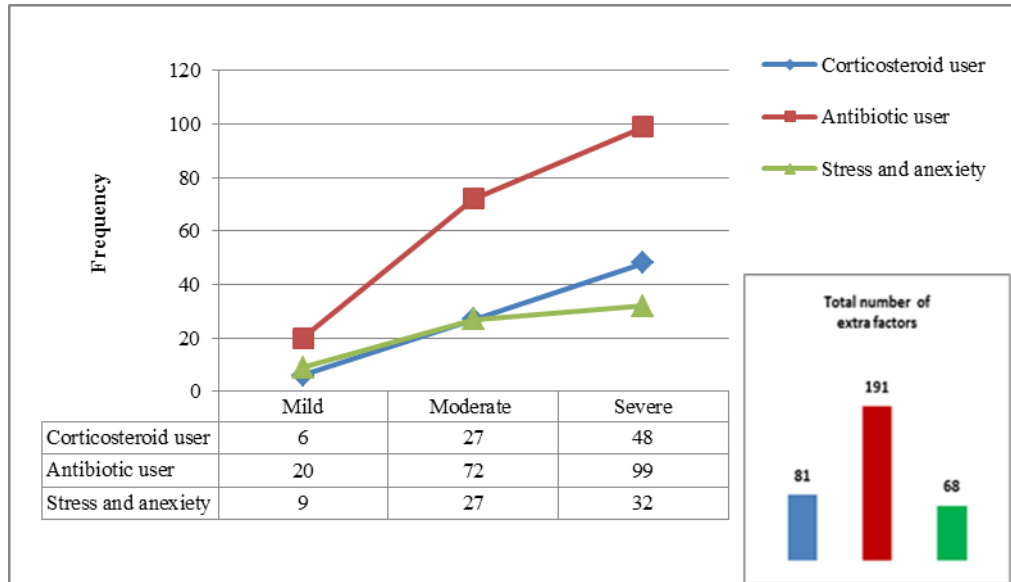

Figure 2. Effect of extra factors on UC severity.

Other risk factors to UC
Overall of the 200 patients, the study showed that 95 (47.5%) cases had a previous family history of UC, 45 females (22.5%) were used oral contraceptive pills and 47 (23.5%) with a history of appendicitis (Table 3).

Table 3. Distributions risks of UC

Demographic characteristic	No.	(%)
Family history	95	47.5
Oral contraceptive use [a]	45	22.5
Appendicitis	47	23.5
IBS, CD and Celiac disease [b]	13	6.5
Total	200	100

[a] This variable just related to female
[b] IBS= Irritable bowel disorder, CD= Crohn's disease

As shown in (Table 4), 42 (44.2%) cases with family history, 30 (66.7) with oral contraceptive uses, and 23 (48.9%) with appendicitis are in severe level of UC and there is a significant relation between UC and OCP (*p*=0.01).

Table 4. Distribution of risk factors in relation to severity of UC. n=200

Severity level	Type of risks No. (%)				p-value
	Family history	Oral contraceptive uses	Appendicitis	IBS, CD and Celiac disease [a]	
Mild	13 (13.4)	1 (2.2)	7 (14.9)	0 (0.0)	
Moderate	40 (42.1)	14 (31.1)	17 (36.2)	5 (38.5)	0.01
Severe	42 (44.2)	30 (66.7)	23 (48.9)	8 (61.5)	
Total	95	45	47	13	

[a] IBS= Irritable bowel disorder, CD= Crohn's disease

Gender in relation to UC infection and severity levels

From 102 female patients, 45 (44.1%) were more frequently under uses of contraceptive pills followed by 37 (36.3%) with family history of UC, and 16 (15.7%) with previous history of Appendicitis and these differences were statistically highly significant p<0.001 (Figure 3), additionally from 45 female patients were used oral contraceptive pills 30 (66.7%) of them are in severe cases of UC followed by 14 (31.1%) are in moderate cases (Figure 4).
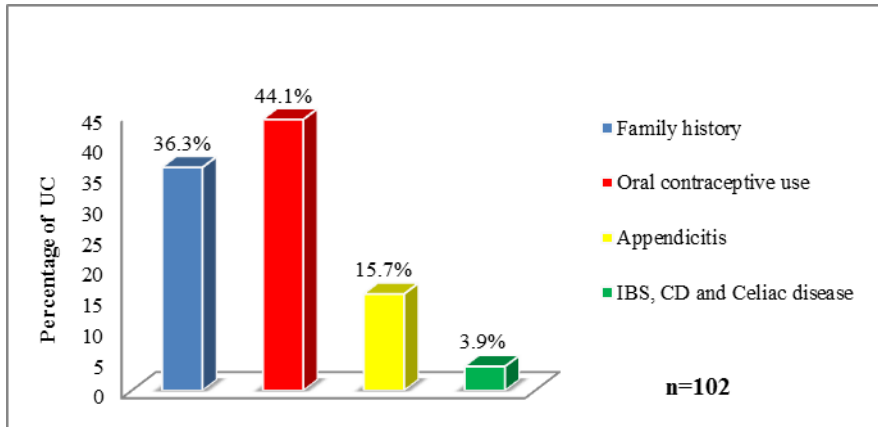

Figure 3. Distribution of risk factors in female gender relations. *p*-value= 0.001
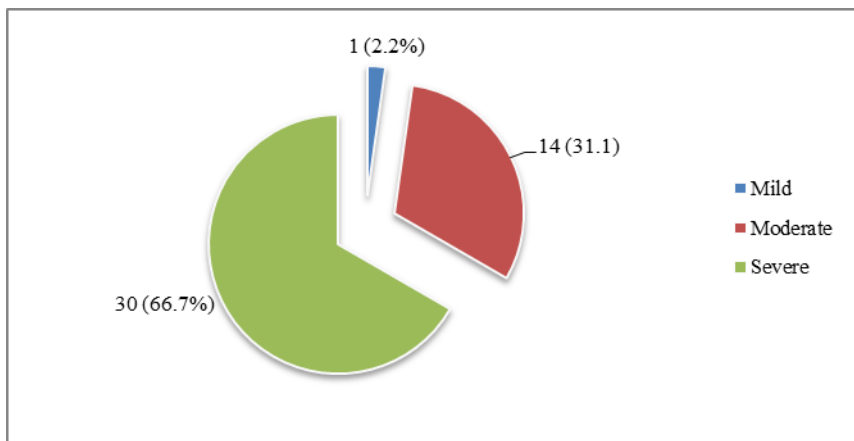

Figure 4. Distributions of severity of UC in female. n=45

As shown in (Table 5), a total of 102 females, 60 (58.8%) were in severe cases of UC followed by moderate 35 (34.3%), and from 103 severe cases, over all 200 cases, 60 of them were female. These differences statistically significant at *p*=0.05.

Table 5. Distribution of gender in relation to severity of UC.

Gender	Severity of UC No. (%)				
	Mild	Moderate	Severe	Total	*p*-value
Male	14 (14.3)	41 (41.8)	43 (43.9)	98	
Female	7 (6.9)	35 (34.3)	60 (58.8)	102	0.05
Total	21	76	103	200	

Food sensitivity: Table 6 shown that majority of patients previously were sensitive to spices 160 (80.0%) followed by fish and eggs 21 (10.5) vs. 16 (8.0%) respectively. In addition, from 160 spices sensitive patients 80 (50.5%) of them were in severe cases and 61 (38.1%) were in moderate cases. Statistically these differences are significant at p=0.04.

Table 6. Food sensitivity of UC severity.

Severity level	Type of foods No. (%)					p-value
	Spices	Grain	Fish	Milk	Eggs	
Mild	19 (11.9)	1 (50.0)	1 (4.8)	0 (0.0)	0 (0.0)	
Moderate	61 (38.1)	1(50.0)	5 (23.8)	0 (0.0)	9 (56.3)	
Severe	80 (50.0)	0 (0.0)	15 (71.4)	1 (100.0)	7 (43.8)	0.04
Total	160 (80.0)	2 (1.0)	21 (10.5)	1 (0.5)	16 (8.0)	

Age in relation to UC a severity levels and sensitive to foods: The age of the majority cases with severe UC were in those patients older than 30 years as compare with <30 years and this difference was statistically significant at p=0.01 (Table 7).

Table 7. Distribution of age group in relation to severity of UC.

Age group	Type of foods No. (%)				p-value
	Mild	Moderate	Severe	Total	
<30	7 (33.3)	21 (27.6)	13 (4.8)	41 (20.5)	
30-40	9 (42.9)	17 (22.4)	34 (23.8)	60 (30.0)	0.01
>40	5 (23.8)	38 (50.0)	56 (71.4)	99 (49.5)	
Total	21 (100.0)	76 (100.0)	103 (10.5)	200 (100.0)	

A total of 200 patients, 160 were sensitive to spices, from those 81 (50.6%) of were >40 years-old, followed by 30-40 years-old 47 (29.4%), and <30 years-old 32 (20.0%), and there was no significant relation p=0.5 (Table 8).

Table 8. Distribution of previous sensitivity in relation to age. n=160

Age group	Type of foods No. (%)					p-value
	Spices	Grain	Fish	Milk	Eggs	
<30	32 (20.0)	1 (50.0)	5 (23.8)	0 (0.0)	3 (18.8)	
30-40	47 (29.4)	1(50.0)	5 (23.8)	1 (100.0)	6 (37.5)	0.5
>40	81 (50.6)	0 (0.0)	11 (52.4)	0 (0.0)	7 (43.7)	
Total	160	2	21	1	16	

5. DISCUSSION

One of the major health issue in the developing countries is UC, it is the most frequent infection among adult population [22, 23]. In terms of health control, UC is a major problem on the community and especially elderly people are at a high risk for UC [24]. It is known that effective surveillance and early detection of UC in people help in better management of

patients and reduce emerging other infection related to UC, mortality rate, length of drug administration and associated cost [25]. In the present study, a cross-sectional study was used to determine the epidemiology of UC and factors related to it. Also, to assess the other factors related to severity of UC, and practices to prevent or decrease the occurrence of UC in Mosul city of Iraq. Few studies were conducted about epidemiology and risk factors of UC in Mosul city, Iraq [26, 27], but the current study aims to find out the factors related to UC. The factors of UC were investigated, such as the age, gender, level of UC, foods, and extra factors. Therefore, investigating the epidemiological characteristics and risk factors for UC is essential in our community to provide a better understanding of the problem and to plan preventive services.

In the present study, the mean age was 46.36 years, which is similar to the mean age reported by other studies such as 46.2 years in Baghdad, Iraq [28] and 46.26 years in Morocco [29]. Whereas, studies conducted in Iran [19], in China [30], and in India [31] showed the lowest average of age. Other two studies had a higher mean age 48.4 and 49.3 in south of India [20] and in Turkey [32] respectively than that of the current study.

In the current study, persons with > 40 years of age shows a high proportion of UC than other age groups (Table1). This finding is nearly consistent to the previous studies which are performed in Erbil, Iraq [28], Saudi Arabia [23] and in England [10]. Nevertheless, many studies around the world have reported that young age (less than 33 years old) are the most frequent groups for UC, such as in Libya [33], United State [34], Sweden [35] and New Zealand [36]. This is probably because these group (>40) in our country most of them having chronic disorder and they use corticosteroids and drugs to treat the problems. Another fact may be due to the body physiological change in our group, which makes them difficult to control.

In the current investigation, there were no statistically significant relationships between age of patients and UC, but severity of UC increased with increasing of age and it observed in the groups more than 45 years of age in comparison with the other group (Table 6). This may also be due to the immunological disorder and hypersensitivity reactions of intestinal walls overtime the age, also psychological problems.

Furthermore, (51.0%) were more affected to UC than males (49.0%) (Table1). It is nearly consistent with the other studies such as 60% in Iran [37], and 67.2% in Finland [38]. However, other two studies have different reports that males comprise a higher percentage of UC, such as 56.2% in Turkey [39], and 63.5% in in Pakistan [40]. The high percentage of female with UC in our study could be due to the increased exposure to activities or hormonal changes and contraceptive using and more antibiotic uses, females are more under stress than males and this is in agreement with the study by Sajadinejad M. [41].

Moreover, there is a significant statistical difference between the gender and severity level of UC (p=0.05), but females were found to have more severed level than males (Table 5). This could be due to the higher number of admitted female patients in comparison to the female patients or could be due to physiological state of males which is lead to decrease immunological formation of the body and cannot resist especial type of microbe. This finding is in consistence with the previous study which is done by Niv Y et al in Israel [42].

In our study, UC occurs more frequent in non-employed persons (58.5%) rather than employed person (Table 1). Many of studies around the world have similar results [24, 43, 29]. This finding is in disagreement with a study conducted by Shivananda *et al*, that showed the UC is more frequent in employed person [44]. Physical demanding occupations with regular working hours for employed person could be factors for decreasing UC.

Regarding to the extra factors manifestations of UC, we have observed that patients were used or given more antibiotic, they will be more likely to suffer from UC rather than patients with a history of arthritis and they have stress or anxiety, and these relations were statistically significant (p=0.0001) (Table 2). This finding is also similar to the previous studies in Finland and Canada [38, 45].

Regarding to the severity of UC, the study revealed that patients with antibiotic uses for log period were more likely to get severe level of UC (Figure 2 and 3). Thus could be related to the action of drugs which are lead to destroy normal flora inside the intestine and because of the chemical compounds, the wall of the intestine cannot resist those chemical and lead to develop ulcer severely. This finding is nearly in accordance to the previous study by Abbas J conducted that third degree of UC, antibiotic uses is an important factor and there was significant association found between them [46]. But another study by Xinling *et al* indicated that there was no association between antibiotic uses and level of UC [30].

This study revealed that the family history is the most risk lead to get UC (47.5%) (Table 3). This finding is nearly in agreement with the other previous studies; 46.8% in south Africa [28], 92.6% in Turkey [27], 88.54%. For this reason, genetics plays important roles to transfer growth factors for UC, especially among families who are at risk for UC.
In regarding to the association of females with oral contraceptive uses, from a total of 102 female patients, 45 (44.1%) were more frequently uses of contraceptive pills, we found that most of them were in severe cases of UC, and these association was statistically significant p=0.001 (Figure 3). This is outcome confirmed that contraceptive pills are harmful for females and has association with UC and it can be clinically important. A study by Hayder F. *et al* revealed that there was association between oral contraceptive use and ulcerative colitis incidence in Baghdad, Iraq [27]. However, a study by Hamed Kh. *et al* conducted that there was no association between oral contraceptive use and ulcerative colitis [47]. This is may be due to the using dose and types of contraceptives pills by the females.

Concerning the food sensitivity, it was found that spice food was the most effective cause for patients to develop UC especially, among late adult persons. A significant relationship was found between UC and age groups > 40 p=0.05, but other foods are in a less effect to cause UC (Table 8). This is could be due to body sensitivity reactions to those foods or neglecting of persons by repeated uses after onset of sensitivity reactions which lead to negative destroy mechanism actions of intestinal activities and outcome of UC. This finding is in agreement with the result by Xinling M *et al* [30]. There are a lot of studies about sensitivity foods found [28,41,48].

Finally, we showed that UC is a common digestive problem in our community and makes a lot of causes to develop and followed complications such as; bleeding, colon surgery or colectomy, and colon cancer. These problems are in cost for the authority and it is difficult to control this problem. In addition, we need to evaluate this issue by conducting more research in the future to find out or determine other causes which lead to UC in Mosul and other Iraqi cities.

Patients who are refractory to corticosteroid are dependent to develop UC. The identification of factors associated with the use of corticosteroid has not been extensively explored, but it has the potential to help predict the patients who are likely to develop severe UC and thus require more intensive therapy. In our study, a positive association was observed between the use of corticosteroid and Antibiotics, including receiving an initial UC diagnosis when under the age of 30, and family history of IBD, extensive colitis, hospitalization, and a history of systemic corticosteroid therapy.

Another potential mechanism is that in genetically susceptible individuals there is a lack of tolerance to commensal bacteria in the gastrointestinal tract, which leads to activate the gut immune system. Suppression of bacterial flora might lead to down-regulation of the immune system; reduction of inflammation can be achieved with reduction of total bacteria, aerobes, and anaerobes, by antibiotics [49].

4. CONCLUSION

This study concluded that the highest risk groups for UC are elderly age for females especially among those families who are living in urban area. The major extra risks for UC were antibiotic uses for long duration and most of the patients with UC are in severe condition. Furthermore, elderly patients are in a high risk for developing severe level of UC. Female patients with UC more likely to get severe level. Usage of oral contraceptive pills is a major cause for UC among females. Spicy food is a greater risk factor for UC and may plays an important role in developing severe cases of UC.

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