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Risk factors in patients with ulcerative colitis: Case control study

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Abstract

Background: Ulcerative colitis is a chronic inflammatory bowel condition with unclear etiology and no medical cure. This illness is mostly responsible for morbidity and the use of medical resources. The rapid growth in ulcerative colitis (UC) frequency in industrialized nations, the presence of CD in spouses, and the absence of perfect concordance in monozygotic twins are all compelling reasons for the significance of environmental variables in inflammatory bowel disease (IBD).

Methods: A descriptive case-control study was carried out at Al-Najaf City/Al-Najaf Al-Ashraf Health Directorate / at the Specialized Hospital for Gastroenterology and Hepatology (SHFGH). The study was begun from November 1st, 2022 to May 1st, 2023. The study aims of the study to evaluate potential risk factors among patients with ulcerative colitis and find out the relationship between the patient's risk factors and their socio-demographic characteristics. A specially designed questionnaire was used to gather the data. It was divided into three sections: six items in the first section included sociodemographic characteristics; four items in the second section dealt with medical history; and finally, the final section included information on ulcerative colitis risk factors. Seven professionals with years of experience in the nursing area validate the study instrument.

Results: Results of the study show that the current study results reported that the possible risk factors for patients with ulcerative colitis were (age, gender, level of education, and occupation). In addition, the results showed that the patient eats spicy, Sugar food), and the patient eats low vegetable food and is also riskier for ulcerative colitis at p-values 0.05 and 95% CI.

Conclusion: The study suggests that the majority of ulcerative colitis patients were male and at young adult age and patient with ulcerative colitis is associated with many risk factors, such as Spicy, Sugar, Vegetable, Stress, Smoking, Appendectomy, Appendectomy, Measles and Parasite.

Recommendations: The study recommends that people should avoid food rich in sugars, spices, and fats, which increase gastrointestinal infections, especially ulcerative colitis. Also, the study recommended that a population-based study should be conducted to increase population awareness about the risk factors of ulcerative colitis especially among young males.

Keywords: Risk factors, ulcerative, colitis

Introduction

Ulcerative colitis (UC) is a chronic inflammatory disease of the intestines, for which no cause or cure is known. It leads to a lot of sickness and requires significant healthcare resources^[1]. The disease causes inflammation of the gut's mucosa, which comes and goes^[2]. Despite advances in the medical treatment of UC, up to 35% of patients with UC will ultimately require colectomy.

A variety of environmental risk factors have been investigated in Western nations. Stress, as well as a large consumption of spicy food and sweets, may increase the chance of having UC. Smoking and appendectomy in the last 10 years, has turned into a topic for discussion and research among experts in the field searching for a possible connection between ulcerative colitis (UC), a chronic bowel inflammatory disease, and the appendectomy. A number of investigations that probe the link between appendectomy and UC have been conducted, in which the possibility of appendectomy causing UC is scrutinized, while the course of UC in people who already have been diagnosed is also examined. It has been hypothesized that there might be a relation between one's appendix removal and the decrease among the UC risk. One population-based study conducted by Andersson *et al.* (2001)^[3], which has shown a decrease in UC among appendectomy performed individual compare to

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those who did not perform appendectomy. Likewise a group of researchers Led by Huang *et al* in the year 2014^[4, 5], performed a meta-analysis of multiple studies to support idea of decreased risk of occurrence of UC after appendectomy. Nevertheless, the question between appendectomy and the possible cause of UC stays difficult and even controversial. Some researches give negative results, while others are rather ambiguous. A case-control study by Frisch *et al.* (2001) has been shown not to have found any linearly significant association between appendectomy and increasing risk of ulcerative colitis. In addition, certain studies indicate that appendectomy can have variable consequences on youngsters who undergo the procedure or adult patients with low-grade colonic involvement in UC. The exact interworking of such an association is not entirely clear and thus, the study was built around the mechanism that has informed the study. It has been suggested that the appendix could be a place where good gut bacteria is stored for the specific regulation of the immune response taking place within the gut. It is hypothesized that appendectomy will probably distort the gut microbiome and impact the immunity reactions which might ultimately be associated with UC in its course or development.

In Western populations. Environmental variables may impact the development of UC and provide crucial insights to the disease's origin^[7]. The data pertaining to smoking are particularly intriguing because, as demonstrated by twin studies, this component appears to modify the genotype, leading to the phenotypes of UC that vary greatly. Apart from smoking, multiple epidemiological studies have demonstrated that prior appendectomy guards against UC, as demonstrated by a meta-analysis, and oral contraceptive use has been recognized as a risk factor. It is challenging to separate infant hygiene from family aggregation, yet it may be a risk factor for UC^[8].

Materials and Methods

Design of the study: To accomplish the previously mentioned aims, the current research conducted a descriptive case-control study. The research started on November 1st, 2022, and will end on May 1st, 2023.

The setting of the Study

The study was carried out in the Specialized Hospital for Gastroenterology and Hepatology (SHFGH) in Al-Najaf City, at the Al-Najaf Al-Ashraf Health Directorate.

Sample of the Study

A non-probability (Purposive) sample of (125) ulcerative colitis patients as the case group selected from SHFGH and (81) healthy persons as the control group are involved in the sample study. Note that these patients are referred to the Digestive Center by private clinics, and many cases are diagnosed in the same center based on histological examinations, such as taking a colon biopsy, as well as with the help of imaging studies and endoscopy. With respect to a number of cases of cancer as shown by some studies, some reasons may be the significant role of some factors in this finding. Another potential way is by the fact that the study participants maybe are people with longstanding colon ulcers, which are probably the risk factors so far found for developing CRC over the time. Moreover, underlying diseases such as disease aggressive, extent of colonic involvement, and length of colonic inflammation may interplay with the risk threshold of colorectal cancer patients with ulcerative colitis.

Study Instrument

The researcher creates the study tool to evaluate ulcerative colitis risk variables. The entire study tool is divided into three sections:

Part I: Patient demographic information.

Part II: Items related to the patient's medical history, such as the patient's family history of ulcerative colitis, ulcerative colitis status, and complications, made up of the patients' past medical history.

Part III: Risk Factors was concerned with Risk Factors which include (Medical treatment, Lifestyle, Smoking, and Diet).

Data Collection

The subjects were interviewed one-on-one at the Specialized Hospital for Gastroenterology and Hepatology using the English version of the questionnaire. All of the subjects in the study sample were interviewed in a similar way at the same location using the same questionnaire. Structured perform created especially for this study and structured interviewing techniques were used to get the data.

Validity of the Instrument

A panel of professionals (A team of experts with over ten years of expertise in the nursing sector assessed the study instrument's face validity.

Ethics approval and consent to contribute

This study obtained approval from the Menoufia University Ethical and Research Committee Decision (No. 728). Patient consent is one of the most important parts of research, after the researcher explains the study's purpose and provides the participants with confidentiality as well as voluntary cooperation according to the person's consent form to participate in research. Furthermore, ulcerative colitis is a very individual and possibly delicate medical condition; patient information must be protected with strict safeguards. Wherever feasible, data should be pseudonymized or made anonymous. In addition to that, patients have right to withdraw from the study without any penalty when any potential pain or injury, whether it is physical or psychological, limit it as much as possible, and communicate this information to the participants in advance in a clear and concise manner.

Statistical Analysis

Data are analyzed through the use of the SPSS (Statistical Package for Social Science) version (23) application, including:

1. Descriptive data analysis

- Tables (Frequencies, and Percentages).
- Odd Ratio (to determine the risk factors).

2. Inferential data analysis

These were used to accept or reject the statistical hypotheses, which included the following:

1. Fisher Exact Probability test is computed when a Contingency table has rank 2 x 2 only.
2. Pearson Chi-Square test for testing the hypothesis that the row and column variables are independent, without indicating the strength of Risk Factors.

Results

Table 1: Statistical Distribution of the Case and Control Groups Socio-Demographic Characteristic

		Case		Control	
		Frequency	Percent	Frequency	Percent
Age	<= 20	13	10.4	8	9.9
	21-28	35	28.0	40	49.4
	29-36	42	33.6	12	14.8
	37-44	20	16.0	13	16
	45-52	5	4.0	5	6.2
Gender	53+	10	8.0	3	3.7
	Male	71	56.8	32	39.5
Residency	Female	54	43.2	49	60.5
	Rural	21	16.8	15	18.5
Level of Education	Urban	104	83.2	66	81.5
	Unable to read and write	1	.8	0	0
	Able to read and write	6	4.8	2	2.5
	Primary school graduated	16	12.8	8	9.9
	Intermediate school graduated	19	15.2	6	7.4
	Secondary school graduated	21	16.8	32	39.5
Occupation	College/ Institute graduated	62	49.6	33	40.7
	Governmental	61	48.8	15	18.5
	Private	15	12.0	13	16.0
	Housewife	16	12.8	20	24.7
	Retired	9	7.2	2	2.5
Socio-Economic Status	Student	15	12.0	28	34.6
	Jobless	9	7.2	3	3.7
	Satisfied	37	29.6	26	32.1
Total	-Satisfied to some extent	70	56.0	40	49.4
	Unsatisfied	18	14.4	15	18.5
	Total	125	100.0	81	100.0

Table (1) reveals that the highest percentage of study groups were within age groups (29-36) years, (33.6%) and control within (21-28), (49%). of age group. In addition, the table shows that the highest percentages of participants in study group (56.8%) were males, while the majority of the control group were female (60.5%). Concerning residency, (83.2%) of the study group and (81.5%) of the control group were

urban residents. Relative to the level of education, the highest percentage of study and control groups (49.6%), (40.7%) graduated from institute or college. Finally, the table also shows that the socioeconomic status in terms of (Satisfied, Satisfied to some extent, and Unsatisfied), the greatest percentage were (56.0%) in the study group and (49.4%) in the control group were satisfied to some extent.

Table 2: Statistical Distribution of case group according to medical history

		Frequency	Percent
Family history which includes: collection of information on affected relatives. Your relatives include siblings, parents, and second degree relatives (grandparents, aunts, uncles, nieces, nephews, etc.).	Yes	29	23.2
	No	96	76.8
Extent of disease	Left colitis	31	24.8
	Extensive Colitis	55	44.0
	Proctitis	39	31.2
Age at UC	> 40 years	13	10.4
	< 40 years	112	89.6
Severity: Based on clinical symptoms, endoscopic and histopathological findings, laboratory markers, and disease activity indices	Mild	27	21.6
	Moderate	60	48.0
	Sever	38	30.4
Duration of disease\ Years	<= 2	34	27.2
	3-7	54	43.2
	8-12	22	17.6
	13-17	8	6.4
	18-22	5	4.0
	23-27	1	.8
	28+	1	.8
Total	125	100.0	

Table (2): shows the medical history of the study group, in this table the majority of the study group have no family history (76.8%). A high percentage of the study group (44.0%) has Extensive Colitis related to the extent of the disease. Also, the results show the majority of the study

group (89.6%) < 40 years age at UC. In relation to severity the high percentage of the sample (48.0%), is moderate. Finally, the most of study group (43.2%) have 3-7 years in related to the duration of disease.

Table 3: Statistical Distribution of case groups according to their complication

		Frequency		Percent	
Colorectal Cancer	No	120	96.0		
	Yes	5	4.0		
Duodenal Ulcer	No	99	79.2		
	Yes	26	20.8		
Toxic Megacolon	No	115	92.0		
	Yes	10	8.0		
Perforation	No	113	90.4		
	Yes	12	9.6		
Iron Deficiency	No	41	32.8		
	Yes	84	67.2		
Loss weight	No	69	55.2		
	Yes	56	44.8		
Pseudopolyps	No	118	94.4		
	Yes	7	5.6		
Arthritis	No	56	44.8		
	Yes	69	55.2		
Liver disease	No	113	90.4		
	Yes	12	9.6		
Skin disease	No	82	65.6		
	Yes	43	34.4		
Eye disease	No	87	69.6		
	Yes	38	30.4		
	Total	125	100.0		

Table (3): This table shows that most patients with ulcerative colitis suffer from many complications but in different proportions. Among the most common

complications seen in this study are iron deficiency and arthritis (67.2%), (55.2%).

Table 4: Statistical distribution of case and control groups according to their risk factors

Possible risk factors	Grouping			OR in CI 95%	Chi. S. P-Value
		Yes	No		
Spicy	Case	62	63	2.204	7.072 .008
	Control	25	56		
Sugar	Case	107	18	37.8	104.184a .000
	Control	11	70		
Vegetable	Case	18	107	26.1	91.586a .000
	Control	15	81		
Emotional Stress?	Case	121	4	24.20	185.877a .000
	Control	1	80		
Smoking	Case	102	23	35.4	98.278a .000
	Control	9	72		
Appendectomy	Case	116	9	91.5	133.937a .000
	Control	10	71		
NSAIDs	Case	49	76	.599	3.190a .074
	Control	42	39		
Measles	Case	85	40	4.760	27.239a .000
	Control	25	56		
Parasite	Case	85	40	6.481	36.889a .000
	Control	20	61		

Table 5: Possible risk factors related to demographic data of ulcerative colitis patients based on odd ratio (to determine the risk), pearson Chi-Square

		Study		Control	
		Frequency	Percent	Frequency	Percent
Spicy	Non or Rare	63	50.4	25	30.9
	Light	49	39.2	40	49.4
	Heavy	13	10.4	16	19.8
Sugar	Non or Rare	18	14.4	11	13.6
	Light	74	59.2	35	43.2
	Heavy	33	26.4	35	43.2
Vegetable	Vegetarian	18	14.4	15	18.5
	Meat eaters	64	51.2	42	51.9
	Balance Diet	43	34.4	24	29.6
Stress	None	4	3.2	1	1.2
	Occasional	45	36.0	28	34.6
	Often	76	60.8	52	64.2

Smoking	Yes	23	18.4	9	11.1
	No	102	81.6	72	88.9
Breast feeding	Yes	95	76.0	63	77.8
	No	30	24.0	18	22.2
Appendectomy	Yes	9	7.2	10	12.3
	No	116	92.8	71	87.7
NSAIDs	Yes	76	60.8	42	51.9
	No	49	39.2	39	48.1
Measles	Yes	40	32.0	25	30.9
	No	85	68.0	56	69.1
Parasite	Yes	40	32.0	20	24.7
	No	85	68.0	61	75.3
Contraceptive	Yes	14	11.2	4	4.9
	No	111	88.8	77	95.1
	Total	125	100.0	81	100.0

Table 6: Distribution, odds ratios (ORs) and confidence intervals (CIs) of possible risk factors

Possible Risk Factors	Rating			OR in CI 95%	Chi. S., P-Value
		Case	Control		
Age	<= 30	62	56	2.204	7.666a
	31 years and more	63	25		.006
Gender	Male	71	32	2.013	5.880a
	Female	54	49		.015
Residency	Rural	21	15	.888	.101a
	Urban	104	66		.751
Level of Education	Educated	83	71	.278	11.766a
	Uneducated	42	10		.001
Occupation	Employed	92	28	5.277	30.791a
	Unemployed	33	53		.000
Socioeconomic status	Satisfied	37	26	.889	.145a
	Unsatisfied	88	55		.704

Table (6) this table shows a highly significant difference between the study and control groups in relation to the risk factors. In fact, the study results indicate a strong interaction between (Spicy, Sugar, Vegetable, Stress, Smoking, Appendectomy, Measles, and Parasite) as risk factors for UC (OR=2.204), (OR=37.8), (OR=26.1), (OR=24.20), (OR=35.4), (OR=91.5), (OR=4.760), (OR=6.481).

Discussion of the Results

Discussion for Patients' Socio-Demographic Data

Ulcerative colitis is a common and widespread disease nowadays, and it is associated with many risk factors in our daily lives. In addition, socio-demographic data has a significant impact on the disease mentioned above. Data was collected using a scale acceptance of the AIS disease (The Acceptance of Illness Scale) and a questionnaire of our own design. Data was analysed using non-parametric tests Pearson chi ^[2].

Despite UC involving all age groups, in the majority of cases it affects mainly young adults aged 20 to 40. In our study, most respondents are young adult age. Glińska *et al.* ^[9] in their study established that older patient better adapt to living with inflammatory bowel disease. The authors explain this phenomenon by a more stable and grounded financial situation as well as professional status. Unfortunately, this observation has not been confirmed in our study.

The results of this study showed that most of them work in government jobs. These results came because, in fact, ulcerative colitis occurs at an early age and affects men more because they are more vulnerable to psychological stress than women, and most of them eat fast food because most of them spend a lot of time at work and do not have enough time to prepare food ^[8, 10], in their study "Cumulative Incidence and Risk Factors for Hospitalization and Surgery in a Population-based Cohort of Ulcerative

Colitis" pointed in their study that the highest percent were male and most study sample age less than 40 years (59%) ^[1].

Possible Risk Factors of Patients with Ulcerative Colitis

The current study results reported that the possible risk factors for patients with ulcerative colitis were (age, gender, level of education, and occupation). In addition, the results showed that the patient eat spicy, Sugar food), and the patient eats low vegetable food also riskier for ulcerative colitis at p-value 0.05 and 95% CI.

Moreover, patients' with (Stress, Smoking, Appendectomy, Measles and Parasite) they have more chance of getting ulcerative colitis at p-value 0.05 and 95% CI. In our investigations, the rate of life-threatening organism's infection combined the methods of several tests. As a first measure, we reviewed the documented sampling data that includes the results of blood tests, mucosal biopsies, or stool examinations if they were available, confirming the detection of parasites. Further, we re-evaluated the medical records at hand in order to find out any past history that the patient might have had with parasites diagnosis or parasitic treatment purposes. Nevertheless, in such situations where we lacked documentary evidence, we mostly relied on patient self-recording. In order to help us with that we used patients' response along with medical records as soon as it was available. Moreover, the role of patient-reported data needs to be undoubtedly accepted, taking into account recall bias and the possible different degree of knowledge on this matter. While feeding the diversity of testing ways, such as objective tests as well as patient self-report approach, we tried to make a complete stand for exposure to parasites in our study sample that we were investigating.

We sought to identify the treatment-interval of pre-existing appendicitis prior to the diagnosis of IBD through our study to demonstrate whether it affects the risk or severity of the

disease. The setup of our analysis involves describing the patient in the age at their time of surgery and making a distinction of IBD surgery performed either before or after the diagnostics. In the discussion, the emphasis lay on the pressing issue of crossover effect between these data and those of previous studies exposing protective effect of appendectomy against IBD and its role as modulator of risk. Disagreements with previous investigations were resolved by analyzing the discrepancies that could be a result of different study patient's populations, study methods as well as the changing understanding of the role of appendectomy in IBD pathogenesis. On the other hand, we also went through the topics of the surgical samples as well as pathology reports and underlined the fact that cellular and pathological analyses may facilitate the evaluation of the underlying mechanisms. Disagreement of current literature on the previous researches is the main bias. Which is supported by the use of quotes regarding new findings and insights of IBD and appendectomy relationship.

A study done by Silva *et al.*, (2020) ^[11], Because tobacco smoke contains carcinogens such aromatic amines, nitrosamines, heterocyclic amines, and polycyclic aromatic hydrocarbons, which can result in the formation of aberrant DNA and mutations, their investigation revealed that active smoking was the greatest risk factor discovered in UC patients.

Sicilia *et al.* (2008) ^[12], mentioned in this study " Risk factors for ulcerative colitis: A population-based, case-control study in Spain" as a recent high-quality meta-analysis has established that smoking patient have a good correlation with Inflammatory Bowel Diseases (IBD): smoking at present increases the risk of CD (OR = 1.76) and protects against UC (OR = 0.58), whereas smoking in the past increases the risk of UC (OR = 1.79). Also, mentioned there is a strong relationship between appendectomy and ulcerative colitis.

A Chinese study done by Qiu *et al.*, (2019) ^[13], titled " Risk factors and long-term outcome of disease extent progression in Asian patients with ulcerative colitis: a retrospective cohort study" their result revealed that a close association between risk factors such as age, gender, etc., as well as risk factors such as the wrong diet, such as fast food and sugars, previous operations in the digestive system, failure to receive vaccinations, etc., and the occurrence of ulcerative colitis.

In addition to, Chrobak-Bień, *et al.*, 2018 ^[6], stated that a young people predominated in the study group. The average age of respondents was 38,82. Analysis of the results showed a reduced degree of acceptance of the disease among patients in the phase of exacerbation of the disease. The mean point score of the AIS scale for the study group was 29,65, which indicates the average level of acceptance of the disease among respondents.

Conclusion

1. The results of this study revealed that the majority of ulcerative colitis patients were male and at young adult age.
2. Urban residents are more vulnerable to UC, compared with rural residents.
3. The study concluded that the patient with ulcerative colitis is associated with many risk factors, such as: Spicy food, Sugar, Low eat Vegetable, Stress, Smoking, Appendectomy, Appendectomy, Measles and Parasite

Conflict of Interest

Not available.

Financial Support

Not available.

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