Medical Science

pISSN 2321–7359; eISSN 2321–7367

Quality of life in patients with ulcerative colitis with surgical intervention comparing to medical treatment in King Abdulaziz University hospital in Saudi Arabia, Jeddah

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To Cite:
Alturkistani SA, Sangouf AO, Alnajjar AY, Bashawri MJ, Ismail RA. Quality of life in patients with ulcerative colitis with surgical intervention comparing to medical treatment in King Abdulaziz University hospital in Saudi Arabia, Jeddah. *Medical Science* 2023; 27: e46ms2746.
doi: https://doi.org/10.54905/disssi/v27i131/e46ms2746

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Peer-Review History
Received: 28 December 2022
Reviewed & Revised: 31/December/2022 to 09/January/2023
Accepted: 12 January 2023
Published: 14 January 2023

Peer-review Method
External peer-review was done through double-blind method.

URL: https://www.discoveryjournals.org/medicalscience

ABSTRACT

Background and aim of the work: The incidence of Ulcerative Colitis is rising globally, but so are the quality of medical care and the range of UC treatment choices. This study compared the quality of life for UC patients who underwent surgical treatment versus medical treatment to discover which is superior and to offer data for clinical use. Methods: A retrospective cohort study at King Abdulaziz University Hospital in Jeddah, Saudi Arabia was performed on a total of 352 UC patients who required hospitalization between January 2010 and October 2022 were classified based on surgical treatment. The sample size 184 was calculated using 5% margin error, 95% confidence interval. First class composed of 18 out of 34 surgically treated patients, second class composed of 166 out of 318 medically treated patients (non-surgical), QoL was measured using SF-36. Results: A total of 184 individuals with UC were included in the study; 90.2% of them were receiving medical care and 9.8% underwent surgery. Quality of life was significantly higher among medically treated patients for emotional wellbeing (64.7% ± 21.9%). Additionally, those who received medical treatment had much better overall health (56.4% 18.3). Additionally, compared to 33.3% of patients receiving surgical treatment, 44% of those receiving medicinal treatment had an overall high quality of life (P=.024). Conclusion: In terms of symptoms, flare-ups and quality of life our study showed that the medical treatment options considered to improved management of the condition. Asthma, hypertension, hyperlipidemia and diabetes mellitus were found to be unrelated according to the study.

Keywords: Ulcerative colitis, Medical treatment, Surgical treatment, King Abdulaziz University, SaudiArabia

1. INTRODUCTION

Ulcerative Colitis (UC) is an idiopathic chronic inflammatory bowel disease characterized by continuous inflammation confined to mucosa and sub mucosa; UC most likely starts at the rectum and extend proximally. Incidence of UC is increasing worldwide, but also there's an increase in the medical care and the availability of therapeutic options for UC (Da Silva et al., 2014). UC has a bimodal distribution, the first peak is at the age of 20 to 40 and another peak after 60 (Du & Ha, 2020). Clinical presentations of UC include bloody diarrhea with or without mucous, abdominal pain and tenesmus (Feuerstein & Cheifetz, 2014). Some cases may present with extra intestinal manifestations: Arthritis, osteopenia, osteoporosis and cutaneous involvement (Alharbi et al., 2014). The etiology of UC is unknown, but risk factors include positive family history and recent infection with campylobacter or salmonella. Diagnoses of UC depend on endoscopy and confirmed with biopsy (Adams & Bornemann, 2013).

Currently, UC can be treated either medically or surgically according to the symptoms of the patient and the clinical presentation, medical treatment options include a wide variety of drug choices that can be classified by the activity and the severity of the disease (Meier & Sturm, 2011), which include: 5-ASA, corticosteroid or tumor necrosis factor (TNF) -α blocker Infliximab (IFX) (Bennis & Tiret, 2012). Despite evolving in medical treatment, about one-third of patients require surgery which is curative for UC. In acute situations, surgery is indicated if medical management does not improve the episode of severe acute colitis, the procedure of choice is initially end ileostomy and step wise colectomy with preservation of the rectal stump. Elective surgery is indicated when there's failure of medical management or malignant transformation, conventional rectal resection with ileostomy or Kock's continent ileostomy, as well as colectomy with ileorectal anastomosis, are surgical options. Restorative proctocolectomy with anastomosis is the current gold standard, which consisted of a J-pouch with a stapled anastomosis with temporary fecal drainage via a loop ileostomy. Laparoscopic pouch surgery is a safe option with great cosmetic benefits (Portela et al., 2020).

Even though medical and surgical treatment are both options to treat UC, they vary in the outcome and impact on quality of life, a retrospective, cross-sectional study in Portugal in 2020 that included 157 patients, 65 surgically treated patients concluded that although surgical interventions are more feared by patients, it has a limited impact on UC patients compared to medical management with immune modulatory drugs (Van Gennep et al., 2017), which was supported by another matched cohort study on 59 UC patients who were treated with anti-TNF and another 59 UC patients were treated with IPAA took place in University Hospitals Leuven in Belgium, deducted that patients who underwent surgery (restorative proctocolectomy with IPAA) reported better overall outcome than people who were treated with anti TNF (Malik et al., 2013).Moreover, a study published in 2013 stated that colectomy is a curative procedure in which the disease and many of the limitations and symptoms associated with it and its surveillance are eliminated; there are no chances of disease progression or consequences. Colectomy also allows patients to avoid the dangers of continued medical treatment, such as steroid dependency, immunosuppression and an increased risk of opportunistic infections required if the surgery is not performed (Winsdor et al., 2013). In this study we aim to compare medical versus surgical treatment and to determine which is superior in terms of quality of life for UC patients and provide evidence to be used as a clinical reference.

2. METHODOLOGY

Study design

A retrospective cohort study was conducted at King Abdulaziz University Hospital,which is a tertiary care center in Jeddah, Saudi Arabia.

Population

A total of 352 patients with UC needed to be hospitalized between January 2010 and October 2022 were stratified based upon surgical intervention. The required sample size 184 was calculated with 5% margin error and 95% confidence interval. The first group consisted of 18 out of 34 patients with surgical intervention, The second group consisted of 166 out of 318 patients treated medically (without surgical intervention) were studied, Proportional simple random technique was used upon both strata. For inclusion criteria the surgical procedure had to be done for more than one year. Patients below age of 14, underwent surgical intervention due to disease complications were excluded.

Questionnaire

The patients who agreed to participate were completed a self-administered questionnaire that divided into three sections. First section surveyed socio-demographic factors including age, gender and marital status. Second section surveyed clinical characteristics which including smoking status, body mass index, Comorbidities and compliance to medications. Third section,

health related quality of life was measured using Short Form-36 which is a short questionnaire with 36 items measured eight domains. Physical activity, mental health, social functioning, vitality, pain, general condition of health and health over past year.

Ethical consideration

This study was approved by the Biomedical Ethics Research Committee at King Abdulaziz University (Reference No 354-22). Data were obtained from self-administered questionnaire and were only accessed by the authors.

Statistical analysis

The data were collected, reviewed and then fed to Statistical Package for Social Sciences version 21 (SPSS: An IBM Company). All statistical methods used were two tailed with alpha level of 0.05 considering significance if P value less than or equal to 0.05. Regarding patient's quality of life, SF-36 was scored using 0-100 scale measure for different domains. Overall score less than 50% was considered poor, 50- < 75% was considered intermediate while score of ≥ 75% was considered good.

Descriptive analysis was done by prescribing frequency distribution and percentage for study variables including patient's treatment method, medical history, personal data, BMI and overall quality of life was graphed. Mean with standard deviation was used for comparing quality of life domains by treatment method using independent samples t-test. Cross tabulation for showing distribution of patient's overall quality of life by their personal data and other factors using Pearson chi-square test for significance and exact probability test if there were small frequency distributions.

3. RESULTS

A total of 184 patients with UC were included of which, 166 (90.2%) were on medical treatment while 18 (9.8%) were managed surgically. Patients age ranged from 18 to more than 55 years with mean age of 32.3 ± 13.9 years old (30.2 ± 12.8 vs. 34.8 ± 14.2 years old for medical and surgical groups, respectively; P=.218). As for gender, 95 (51.6%) of patients were females (13.3% vs. 27.8%, respectively=.726). Exact of 105 (57.1%) patients were married (55.4% vs. 72.2%, respectively; P=.339). Also, 44.6% of the patients were overweight/obese (44.6% vs. 44.4%, respectively; P=.998). A total of 25 (13.6%) were smoker (13.9% vs. 11.1%, respectively; P=.747) (Table 1).

Table 1 Personal data of study patients with ulcerative colitis according to management method (group)

Personal data	Total		Group				p-value
			Medical (n=166)		Surgical (n=18)		
	No	%	No	%	No	%	
Age in years							
< 25	45	24.5%	43	25.9%	2	11.1%	
25-40	80	43.5%	71	42.8%	9	50.0%	.218$
41-55	32	17.4%	30	18.1%	2	11.1%	
> 55	27	14.7%	22	13.3%	5	27.8%	
Gender							
Male	89	48.4%	81	48.8%	8	44.4%	.726
Female	95	51.6%	85	51.2%	10	55.6%	
Marital status							
Single	73	39.7%	68	41.0%	5	27.8%	
Married	105	57.1%	92	55.4%	13	72.2%	.339$
Divorced / widow	6	3.3%	6	3.6%	0	0.0%	
Body mass index							
Normal weight	102	55.4%	92	55.4%	10	55.6%	
Overweight	52	28.3%	47	28.3%	5	27.8%	.998
Obese	30	16.3%	27	16.3%	3	16.7%	
Smoking							
Smoker	25	13.6%	23	13.9%	2	11.1%	.747$
Non-smoker	159	86.4%	143	86.1%	16	88.9%	

P: Pearson X2 test $: Exact probability test

A total of 16.8% of the study patients complained of HTN (16.9% vs. 16.7%, respectively; P=.983). DM was detected among 14.1% (13.3% vs. 22.2%, respectively; P=.299). Also, 9.8% complained of Hypercholesterolemia (9.6% vs. 11.1%, respectively; P=.842). Asthma was reported among 5.4% patients (6.0 % vs. 0.0%, respectively; P=.284) and 1.6% of the patients were diagnosed with cancer (1.2% vs. 5.6%; P=.049). As for medications, it was taken by 78.9% of the medically treated group where 81.7% of them had the medications regularly. The main reasons for non-compliance among others were forgetting (25%), absence of symptoms (25%), difficulty obtaining medication (20.8%) and being expensive (12.5%) (Table 2).

Table 2 Drug and medical history among study patients with ulcerative colitis according to management method (group)

Drug & medical data	Total		Group				p-value
			Medical (n=166)		Surgical (n=18)		
	No	%	No	%	No	%	
Do you take any medications for ulcerative colitis?							
Yes	131	78.9%	131	78.9%	0	0.0%	-
No	35	21.1%	35	21.1%	0	0.0%	
Do you take your prescribed medications regularly?							
Yes	107	81.7%	107	81.7%	0	0.0%	-
Sometimes	24	18.3%	24	18.3%	0	0.0%	
If no, why?							
Difficulty obtaining medication	5	20.8%	5	20.8%	0	0.0%	
Expensive	3	12.5%	3	12.5%	0	0.0%	
Forgetting	6	25.0%	6	25.0%	0	0.0%	-
No symptoms	6	25.0%	6	25.0%	0	0.0%	
No improvement	2	8.3%	2	8.3%	0	0.0%	
Others	2	8.3%	2	8.3%	0	0.0%	
HTN							
Yes	31	16.8%	28	16.9%	3	16.7%	.983
No	153	83.2%	138	83.1%	15	83.3%	
DM							
Yes	26	14.1%	22	13.3%	4	22.2%	.299$
No	158	85.9%	144	86.7%	14	77.8%	
Hypercholesterolemia							
Yes	18	9.8%	16	9.6%	2	11.1%	.842$
No	166	90.2%	150	90.4%	16	88.9%	
Coronary heart disease							
Yes	8	4.3%	4	2.4%	4	22.2%	.001*$
No	176	95.7%	162	97.6%	14	77.8%	
Asthma							
Yes	10	5.4%	10	6.0%	0	0.0%	.284$
No	174	94.6%	156	94.0%	18	100.0%	
Cancer							
Yes	3	1.6%	2	1.2%	1	5.6%	.049*$
No	181	98.4%	164	98.8%	17	94.4%	

P: Pearson X2 test $: Exact probability test * P < 0.05 (significant)

The highest level of QoL was for Physical functioning (78.8% ± 23.4%) followed by pain (71.6% ± 26.0%) and social functioning (70.0% ± 26.5%) while lowest level of QoL was for general health (55.6% ± 18.1%). QoL was significantly higher among medically treated patients for emotional wellbeing (64.7% ± 21.9% vs. 56.9% ± 23.3%; P=.048). Also, general health was significantly higher for medically treated patients (56.4% ± 18.3% vs. 48.3% ± 13.8%; P=.042) (Table 3).

Table 3 Quality of life scores by domains among study patients with ulcerative colitis according to management method (group).

Drug & medical data	Total		Group				p-value
			Medical (n=166)		Surgical (n=18)		
	No	%	No	%	No	%	
Do you take any medications for ulcerative colitis?							
Yes	131	78.9%	131	78.9%	0	0.0%	-
No	35	21.1%	35	21.1%	0	0.0%	
Do you take your prescribed medications regularly?							
Yes	107	81.7%	107	81.7%	0	0.0%	-
Sometimes	24	18.3%	24	18.3%	0	0.0%	
If no, why?							
Difficulty obtaining medication	5	20.8%	5	20.8%	0	0.0%	
Expensive	3	12.5%	3	12.5%	0	0.0%	
Forgetting	6	25.0%	6	25.0%	0	0.0%	-
No symptoms	6	25.0%	6	25.0%	0	0.0%	
No improvement	2	8.3%	2	8.3%	0	0.0%	
Others	2	8.3%	2	8.3%	0	0.0%	
HTN							
Yes	31	16.8%	28	16.9%	3	16.7%	.983
No	153	83.2%	138	83.1%	15	83.3%	
DM							
Yes	26	14.1%	22	13.3%	4	22.2%	.299$
No	158	85.9%	144	86.7%	14	77.8%	
Hypercholesterolemia							
Yes	18	9.8%	16	9.6%	2	11.1%	.842$
No	166	90.2%	150	90.4%	16	88.9%	
Coronary heart disease							
Yes	8	4.3%	4	2.4%	4	22.2%	.001*$
No	176	95.7%	162	97.6%	14	77.8%	
Asthma							
Yes	10	5.4%	10	6.0%	0	0.0%	.284$
No	174	94.6%	156	94.0%	18	100.0%	
Cancer							
Yes	3	1.6%	2	1.2%	1	5.6%	.049*$
No	181	98.4%	164	98.8%	17	94.4%	

P: Pearson X2 test $: Exact probability test * P < 0.05 (significant)

Exact of 44% of patients with medical treatment had overall good quality of life compared to 33.3% of others on surgical treatment (P=.024) (Figure 1).

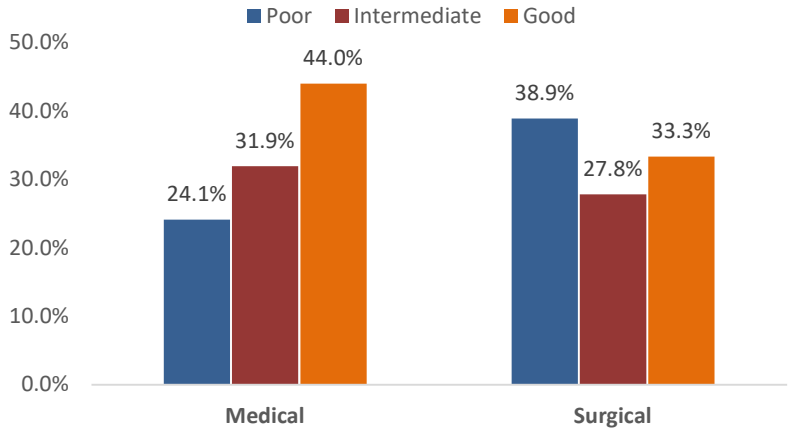

Figure 1 Overall quality of life patients with ulcerative colitis according to management method (group)

Exact of 43.6% of patients with no cancer had good QoL versus none of others who were diagnosed with cancer (P=.012). No other factor was significantly associated with patients (Table 4).

Table 4 Factors associated with quality of life of patients with ulcerative colitis

Factors	Overall QoL						p-value
	Poor		Intermediate		Good		
	No	%	No	%	No	%	
Gender							
Male	28	31.5%	22	24.7%	39	43.8%	.085
Female	19	20.0%	36	37.9%	40	42.1%	
Age in years							
< 25	9	20.0%	17	37.8%	19	42.2%	
25-40	21	26.3%	19	23.8%	40	50.0%	.324
41-55	11	34.4%	12	37.5%	9	28.1%	
> 55	6	22.2%	10	37.0%	11	40.7%	
Body mass index							
Normal weight	29	28.4%	27	26.5%	46	45.1%	
Overweight	11	21.2%	18	34.6%	23	44.2%	.424
Obese	7	23.3%	13	43.3%	10	33.3%	
Marital status							
Single	17	23.3%	21	28.8%	35	47.9%	
Married	28	26.7%	34	32.4%	43	41.0%	.613$
Divorced / widow	2	33.3%	3	50.0%	1	16.7%	
Smoking							
Smoker	9	36.0%	5	20.0%	11	44.0%	.292
Non-smoker	38	23.9%	53	33.3%	68	42.8%	
HTN							
Yes	9	29.0%	12	38.7%	10	32.3%	.411
No	38	24.8%	46	30.1%	69	45.1%	
DM							
Yes	8	30.8%	8	30.8%	10	38.5%	.790
No	39	24.7%	50	31.6%	69	43.7%	
Hypercholesterolemia							.289
Yes	7	38.9%	6	33.3%	5	27.8%	

No	40	24.1%	52	31.3%	74	44.6%	
Coronary heart disease							
Yes	4	50.0%	1	12.5%	3	37.5%	.226$
No	43	24.4%	57	32.4%	76	43.2%	
Asthma							
Yes	1	10.0%	6	60.0%	3	30.0%	.127
No	46	26.4%	52	29.9%	76	43.7%	
Cancer							
Yes	3	100.0%	0	0.0%	0	0.0%	.012*$
No	44	24.3%	58	32.0%	79	43.6%	

P: Pearson X2 test $: Exact probability test * P < 0.05 (significant)

4. DISCUSSION

This study aimed to compare medical versus surgical treatment to determine which improves the quality of life for UC patients and provide evidence to be used as a clinical reference. Among the 184 patients with UC included in our study at King Abdulaziz University Hospital, patients were treated medically more than those who were treated surgically; 166 (90.2%) were on medical treatment while 18 (9.8%) were managed surgically. This is in agreement with previous studies. A study was done in United State showed that the first-line treatment is medical therapy. Surgical intervention is indicated for severe disease when medical management has been ineffective (Adams & Bornemann, 2013). Patients' ages ranged from 18 to more than 55 years with a mean age of 32.3 ± 13.9 years old (30.2 ± 12.8 vs. 34.8 ± 14.2 years old for medical and surgical groups, respectively). They mentioned in their study that the UC peak's age occurs at 30–40 years and the second peak occur at 60–70 years (Cosnes et al., 2011). Moreover, our findings showed that women are more common to have UC than men. In a cross-sectional study was conducted in Northern Portugal and Galicia, in Portugal most UC patients were women (57%) which proves our result (Barreiro-de Acosta et al., 2010). In another study that supported our study; they stated that women are more prone to get affected by UC than men (Teruel et al., 2012). In contrast, they state that men are more likely to get UC than women (Cosens et al., 2011). They Support the findings that men are more prone to have UC than women (Loftus, 2004). We believe that the difference between our results and other studies are due to cultural difference.

Our findings showed that the majority of participants with UC didn't have HTN, DM, hypercholesterolemia, asthma. There is no significant association between UC and these comorbidities. Whereas other studies did not support our results. In a prospective observational cohort study was conducted in the UK revealed UC is a significant risk factor for HTN and DM; the systemic inflammation increases endothelial damage risk. Moreover, steroids and immunosuppressive agents use are risk factors for hypertension (He et al., 2022). It was clarified that hyperglycemia and corticosteroid-induced diabetes are the most common systemic manifestations problem in UC relapsing episodes (Maconi et al., 2014). In contrast, they stated that there is a significantly higher lipid profiles were seen in UC patients than in those who were in remission and healthy individuals (Ternushchak et al., 2015). In a case-control study was conducted in Japan showed that asthmatic patients without UC compared to asthmatics with UC revealed increased airway obstruction and airway hyper-responsiveness. Additionally, in asthmatics with UC, vascular endothelial growth factor (VEGF) level and airway vascular permeability index were related to the degree of airway obstruction and hyper-responsiveness (Kanazawa & Yoshikawa, 2005).

While some studies support our results. A study was conducted in Korea revealed that Patients with CD had a considerably higher risk of developing diabetes than those with UC (Kang et al., 2019). They mentioned that high lipid profile is associated with CD not UC (Soh et al., 2020). Another study that supports our results conducted in London showed that IBD was more common in all types of airway disease, except for asthma (Raj et al., 2008). However, due to the fact that 68% of our population was under the age of 40, we concluded that HTN, diabetes, hypercholesterolemia and asthma were not significant in our study. Of our patients treated medically; the majority of them took their medications regularly (81.7%). Others are non-compliant to their medications. The main reasons for non-compliance among others were forgetting (25%), absence of symptoms (25%), difficulty obtaining medication (20.8%) and being expensive (12.5%). They mentioned that most UC patients showed poor adherence to their medications; the reasons were lack of medical supervision, adverse effects and prescription costs, as well as an excessive number of pills that some people did not think they needed (Lachaine et al., 2013). A study showed that pharmacological therapy can lower the risk of colorectal cancer in ulcerative colitis patients (Pinczowski et al., 1994). We think that the discrepancy between the results is due to our population as we said; they are less than 40 years old and they are well-educated. Moreover, we found that there is significant

association between coronary artery disease and UC in our study (P=.001). As it was proved by another study was published in 2020 stated that some studies have shown that inflammation plays a critical role in the development of atherosclerosis. An interaction between pro-atherogenic inflammatory and anti-inflammatory mediators controls this process, which can result in thrombosis and raise the risk of coronary artery disease (CAD) (Kondubhatla et al., 2020).

Additionally, as we know there is increased risk of cancer for patients with ulcerative colitis which was supported by our results that showed significant correlation between cancer and UC (P=.049). Another study was conducted in 2014 stated that one of the most important complications of chronic active UC or Crohn's disease (CD) is developing of colorectal cancer (CRC) (Rogler, 2014). Furthermore, cancer could be a contributing factor that's affecting QoL in patients with UC, this hypothesis was supported by our results that showed more significantly poor QoL in UC patients with cancer than others with no cancer (P=.012). This is in agreement with another study was conducted in 2021 showed that there is a decreased quality of life and higher risk of colorectal cancer at the individual level (Tripathi et al., 2021).

As well, general health and emotional well-being were significantly higher for medically treated than surgically treated patients. Furthermore, Overall quality of life for UC patients; medical treatment had an overall good quality of life compared to others on surgical treatment. A study showed that JAK inhibitors and biological therapies have improved overall management and are linked to both clinical and patient QoL advantages (Armuzzi & Liguori, 2021). They mentioned that patients with UC may have an improvement in QoL with biologic agents. IFX appears to improve QoL in UC patients receiving induction therapy, according to high-quality evidence. Vedolizumab appears to improve QoL in UC patients re-receiving maintenance medication, according to moderately high-quality data. These results are significant because there aren't many UC treatments that work well and can both reduce disease activity and enhance QoL (LeBlanc et al., 2015). Another study revealed that some of the benefits of the discovery of biological agents are lower surgical rates and improved long- term clinical and patient-reported outcomes (Weisshof et al., 2018). In contrast, a study was conducted in Toronto showed that surgery is typically beneficial in enhancing UC patients' QoL (McLeod et al., 1991). Moreover, they mentioned that the standard of care for UC has been transformed by IPAA. With a low mortality rate of (0.2% – 0.4%) and an acceptable morbidity rate (19% – 27%), the disease can be cured by surgery and it is reliable and secure (Grucela & Steinhagen, 2009).

The gold standard surgical treatment for UC is proctocolectomy with IPAA, which has been demonstrated to have much higher QoL, functional outcome and a favorable benefit and risk profile. The morbidity of surgical intervention increases due to delayed patients by extended escalations that are not necessary for ineffective drugs. In addition, given the biological agents are more expensive and that colectomy is still necessary (Devaraj & Kaiser, 2015). Another study that supports our hypothesis was conducted in United State and showed that the only effective treatment for UC is surgery. The functional outcomes are consistently favorable and the rate of complications is low. The majority of patients say their QoL is actually on par with that of people who are generally healthy. IPAA is a type of definitive surgical therapy; that makes UC patients resume healthy and normal lives with a high QoL. Also, early planned surgical therapy should be encouraged due to the probable emergent surgery, the requirement for surveillance procedures due to the risk of malignancy, the annual financial costs of prolonged medical therapy and the risk of medical therapy failure (Cima & Pamberton, 2004). We suggest that our result was a likelihood that medical treatment is better due to our population who take medical therapy more than those who seek surgical therapy. But we believe that surgical therapy is much better than medical therapy. Due to Difficulty communicating with the old age group, lack of credibility when responding to inquiries and some data revealing that the patients were deceased. Finally, incomplete documentation of patients' may have influenced the results.

5. CONCLUSION

The pharmacological treatment showed much higher control of the disease in comparison to surgical treatment, in terms of symptoms, flares and quality of life. The study also shows no significant association between asthma, hypertension, hyperlipidemia and diabetes mellitus. This might be due to 68% of the sample being early middle age Patients (<40 years old). We recommend further multicenter studies to evaluate the disease according to age and dose extending to a more current date.

Ethical approval

This study was approved by the Biomedical Ethics Research Committee at King Abdulaziz University (Reference No 354-22).

Acknowledgement

The authors would like to thank: Sama'a O Sangoof, Tala A Qalai, Rahaf MAlmuhanna, Ghareed A Ismail for their massive

contributing effort.

Author Contributions

Suhail A Turkistani, Abdulrhman O Sangouf formulated the idea and designed the study. Abdulrhman O Sangouf, Mahmoud J Bashawri, Abdulrahman Y Alnajjar, Raghad A Ismail allowed the research protocols, handled the data and conducted the statistical analysis. Moreover, they share writing the manuscript. Suhail A Alturkistani reviewed and edited the article. All authors approved the final version of the manuscript.

Funding

This study has not received any external funding.

Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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