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STUDY THE PREVALENCE OF MALNUTRITION AMONG CRHON'S DISEASE PATIENTS DURING CLINICAL REMISSION

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Abstract

Purpose: People with Crohn's disease are at risk of nutritional deficiency, especially those subject to strict diet. Aim of this study is to study the relationship between malnutrition and Crohn's disease during clinical remission.

Methods: The patients were randomized from the Benghazi Medical Center. The total of the patients was 50 patients with 26 males and 24 females aged from 18 years and over was performed between the January 2017 to April 2017. Self-administered questionnaire was used to collect personal information. The questionnaire included socio-economic characteristics, anthropometry, 24hr.recall method to find out whether they are malnourished or not.

Result: approximately 82% of patients had their weight within the normal range, while 8% of their weight was below the normal range among of them approximately 6% represented with men according to the BMI. As for skin fold thickness, it appeared that 36% of patients have ideal fat levels, 26% have lower fat levels, while ,22% have medium fat levels, whereas the rest (14%) have higher fat levels. Regarding the 24-hour recall method shows that most patients had their daily calories at a low rate and the maximum daily calorie consumption was 1115Kcal , while the minimum was 305Kcal.

Conclusion: We conclude that the relationship between Crohn's disease and malnutrition is does not exist based on our study. Our study may lack some laboratory investigations of patients. Future studies will be needed to document the relation between malnutrition and Crohn's disease.

Key words*:* *Crhon's disease, malnutrition, nutrition status, nutritional deficiency, clinical remission.*

INTRODUCTION

Crohn's disease is a type of inflammatory bowel disease (IBD) that may affect any part of the gastrointestinal tract from mouth to anus [1].A chronic inflammatory condition of the gastrointestinal tract, characterized by transmural granulomatous inflammation, a discontinuous pattern of distribution, and fistulae [2]. Although any part of the digestive tract from mouth to anus may be affected, Crohn's disease most frequently occurs in the terminal ileum, ileocecal region, colon, and perianal region as demonstrated in figure 1.

The disease may be further classified into inflammatory, fistula ting, and structuring disease[3]. Crohn's disease tends to start in the teens and twenties, although it can occur at any age. [1] Males and females are equally affected. [1] It manifests in childhood or

adolescence in up to 25% of cases. .To date, the main cause of the disease is unknown, but it seems to be due to a combination of environmental factors and genetic predisposition for the disease (4). People with Crohn's disease suffer from mouth ulcers often include abdominal pain, diarrhea (which may be bloody if inflammation is severe), fever, and weight loss. [1] Abdominal pain may be the initial symptom of Crohn's disease usually in the lower right area. [4]. Crohn's disease, like many other chronic, inflammatory diseases, can cause a variety of systemic symptoms[4]. Among children, growth failure is common. Many children are first diagnosed with Crohn's disease based on inability to maintain growth [5].

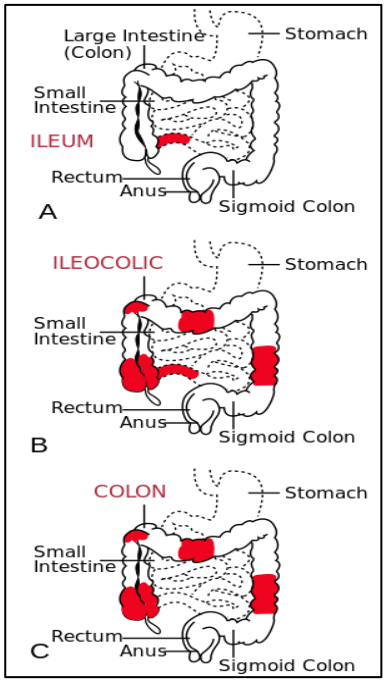


Figure (1)

Diagnosis of Crohn's disease can be difficult and must do a number of tests to help the doctor's diagnosis (6). Even after doing all the tests, it may not be possible to diagnose Crohn's with complete confidence; colonoscopy almost is effective by 70% in diagnosis of the disease, Crohn's disease can lead to several mechanical complications within the intestines, including, obstruction fistulae, abscesses malnutrition [7,8,9].

Malnutrition is well documented in patients with Crohn’s disease, it thought to have multi-factorial causes and as a result of complex patho-physiological processes which include poor nutritional intake secondary to postprandial pain, diarrhea, malabsorption, loss of appetite, and maldigestion process owing to active disease, previous bowel resection or bypass surgery (9). During relapse, patients are usually present with diarrhea, increase intestinal loss and malabsorption, food intake was found to be inversely associated with disease activity, which usually leads to significant weight loss and negative impact on body mass index, however undernutrition, is frequently seen in active Crohn’s disease (10). Several studies showed that Crohn’s disease could cause decreased parameters of metabolically active tissue, such as lean body mass, mid arm muscle circumference or

appendicular muscle mass on the other hand other studies demonstrated that lean body mass is normal or even increased (4). Weight loss is well documented in Crohn's disease, it occurs in 70 to 80% of hospitalized patients and 20 to 40% of outpatients (11), The assessment of malnutrition in patients with Crohn's disease should be carried out during remissions state, as it is well known that malnutrition is prevalent and markedly influenced by the activity and extent of the disease, during flare up there are metabolic disturbances, which might be caused by malnutrition or by the inflammation itself (12). The disease activity is usually measured by Cohn's Disease Activity Index (CDAI), score of <150 is an indication of inactive disease (11), Table [1] showing CDAI. Remission of Crohn's disease is defined as CDAI of less than 150 and severe disease is defined as a value of more than 450 (12).

Table – 1 CDAI, (Best et al, 2003). (12)

Number of liquid or soft stools each day for 7 days.	X 2
Abdominal pain (from 0 to 3 on severity) each day for 7 days.	X 5
General wellbeing, subjectively assessed (0 =well to 4 =terrible)	X 7
Each day for 7 days.	X 20
Presence of complications*	X 30
Taking Lomitil or opiates for diarrhea.	X 10
Presence of abdominal mass (0 =none, 2 = questionable, 5 = definite).	X 6
Hematocrit of <0.47 in men and <0.42 in women.percentage deviation from standard weight.	X1

Present research was therefore designed to study the prevalence and relation between malnutrition and patients with Crohn's disease during clinical remission aged 18 and over in Benghazi during 2017.

METHODOLOGY

Study Design, Setting and Subjects

It was cross-sectional study random sample conducted at Benghazi Medical Centre Libya, to determine the prevalence of malnutrition in Crohn's disease patients in clinical remission for 2 months from January 2017 to April 2017. Disease activity was assessed with according to Crohn's Disease Activity Index (CDAI <150 in remission phase). The target of study consisted of patients with Crohn's disease and at risk of malnutrition aged 18 and over for both sex with Libyan nationality. Our study was excluding the CD patients have other complication of Crohn's disease rather than malnutrition, Any patients with metabolic diseases that has an impact on BMI e.g. Diabetes Mellitus, Thyroid Diseases, polycystic ovary etc., patients treated with Steroid in the last 6 months or had major

surgery in the last 3 months or suffer any other illness which affect BMI e.g. Anorexia or Bulimia, patients receiving any nutritional supplements and pregnant ladies Total sample was 50 CD patients aged 18 years and over the mean age was 35 about 24% were male and 26% were female.

Procedure and Materials:

The study has been carried out over two months ethical approval should be sought from the local Research Ethics Committee both at Benghazi University and Benghazi Medical Centre – Libya. The researcher will seek approval to conduct the study and to discuss access with site mangers. Researchers should be set to meet with participants to discuss the study, obtaining an informed consent, measurements, and data collections.

Researchers were set to meet with participants, the study was explained, and an informed consent obtained. The following materials were used:

- Proforma (, questionnaire, 24 hours dietary recall, anthropometric,)
- Instruments including; flexible tape measure, stadiometer, weight scale

Data collection

Self-administered questionnaire was used to collect personal information. The questionnaire included socio-economic characteristics, anthropometry, 24hr.recall method.

Assessment of nutritional status

As no single measure predicts overall nutritional status in patients with CD, a multidimensional approach has been proposed to include measurement of body composition, dietary intake, biochemical measures and muscle strength (27). However, this is clearly not practical for all patients in routine clinical practice and therefore the use of nutritional screening tools, such as the Malnutrition Universal Screening Tool (MUST) which incorporates important measures such as body mass index should be applied to the general CD population to identify patients at risk of malnutrition. Selected patients should then undergo more detailed assessment, including dietary intake, anthropometric evaluation and measurement of vitamins and trace elements (27). Despite , MUST tool is important for the assessment , however , there is difficulty in practical application as the patients lack some relevant information such as percentage unplanned weight loss in post 3-6 months, therefore MUST tool cannot be applied. Serum albumin level and body mass index (BMI) were the most predictive parameters of malnutrition (27). However, the nutritional status of patients was assessed by extensive anthropometric measurements and skin fold thickness. Whereas the biochemical markers of nutrition such as serum albumin was unavailable. Full evaluation of anthropometric measurements (weight, height, body mass index, skin fold thickness, neck circumference, waist circumference, hip circumference, and waist hip ratio) was collected. SFT was calculated using the US Navy Method Skin Fold thickness alternative methods (29). Appendix (4).

RESULT

The aim of this study was to study the prevalence of malnutrition among patients with Crohn's disease in remission or in a stage of low activity of disease CDAI<150. A total of 50 Crohn's disease patients that follow gastro clinic at Benghazi Medical Centre were recruited for the study, the age ranges was between (18-70years), the mean age was 35.12.

The results showed the participants involved in this study are 26 female and 24 male. The tables below (1, 2) shows all the previously mentioned.

Table 1: Distribution of sex

GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	24	48.0	48.0	48.0
	female	26	52.0	52.0	100.0
	Total	50	100.0	100.0	

Table 2: Distribution of age and sex

	N	Minimum	Maximum	Mean	Sad. Deviation
Age	50	18.00	70.00	35.00	13.48263
Age. Onset	50	10.00	53.00	18.00	8.18520

The result demonstrated that the prevalence of CD among both sex was no difference as shown in (table 3). We found no differences between the rate of being underweight or at risk of being malnourished among genders either in BMI or SFT.

Table3: prevalence of Crohn's disease in both sexes

GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	24	48.0	48.0	48.0
	female	26	52.0	52.0	100.0
	Total	50	100.0	100.0	

Body mass index (BMI) was the most predictive parameters of malnutrition as shown in the result (Table 4) most patients with Crohn's disease were well nourished according to the body mass index. The total number of patients with normal BMI (18.5-24.9kg; m2) was 82%. Regarding with women group the normal BMI was 44% however 38% was among males group .On the other hand, patients with low BMI (<18.5kg;m2) was 8% . The most was among males group than female group 6% and 2% respectively. While the

total number of patients with overweight (BMI>25kg; m2) was 10%. Overweight appeared more among female group than males group 6% and 4% as shown in Table 4.

Table 4 : distribution of BMI and gender

BMIGROUP * GENDER Crosstabulation

			GENDER		
			male	female	Total
BMIGROUP	low	Count	3	1	4
		% within BMIGROUP	75.0%	25.0%	100.0%
		% of Total	6.0%	2.0%	8.0%
	normal	Count	19	22	41
		% within BMIGROUP	46.3%	53.7%	100.0%
		% of Total	38.0%	44.0%	82.0%
	overweight	Count	2	3	5
		% within BMIGROUP	40.0%	60.0%	100.0%
		% of Total	4.0%	6.0%	10.0%
Total		Count	24	26	50
		% within BMIGROUP	48.0%	52.0%	100.0%
		% of Total	48.0%	52.0%	100.0%

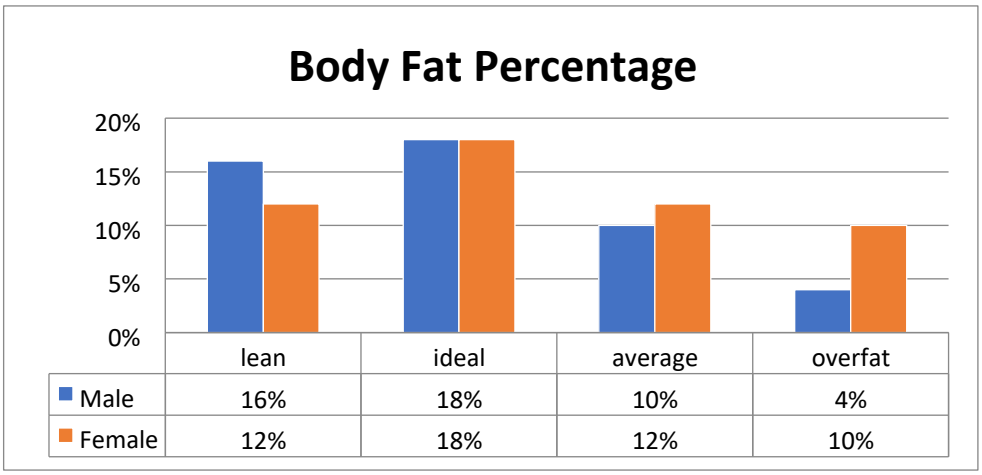
With regard to other nutritional parameters which was skin fold thickness the (Tab. 5 & bar chart 1) below shows that the Skin folds Thickness of most patients were an ideal body fat (36%), Regarding the male group with ideal body fat was 18%, similarly the female group was 18%, while the total percentage of patients with lean body fat were 28%, although 16% were male group and other 12% were female group. In addition, the total percent of patients with Average body fat was 22%, however, 12% were female group, and the 10% were males group. On the other hand, the total percent of patients with over fat was 14%, whereas 10% was female group and the other 4% was male group.

Table (5) Distribution of body fat among sex

FATCLASS * GENDER Crosstabulation

			GENDER		
			male	female	Total
FATCLASS	lean	Count	8	6	14
		% within GENDER	33.3%	23.1%	28.0%
		% of Total	16.0%	12.0%	28.0%
	ideal	Count	9	9	18
		% within GENDER	37.5%	34.6%	36.0%
		% of Total	18.0%	18.0%	36.0%
	average	Count	5	6	11
		% within GENDER	20.8%	23.1%	22.0%
		% of Total	10.0%	12.0%	22.0%
	overfat	Count	2	5	7
		% within GENDER	8.3%	19.2%	14.0%
		% of Total	4.0%	10.0%	14.0%
Total		Count	24	26	50
		% within GENDER	100.0%	100.0%	100.0%
		% of Total	48.0%	52.0%	100.0%

Bar chart 1: distribution of body fat in both sexes



About the relation between Crohn's disease and malnutrition and intake our results show that 82% of the patients are well nourished, about 44% of them were female and 38% were male. Only 8% of the patients were malnourished, 6% was male, however, 2% was female as illustrates in table (6). Based on the results there was no relation between CD and malnutrition. on the other hand the results clarified that the maximum calories intake was 1115 calories, whereas, the minimum intake was 305 calories regarding with male group , however, among female group the maximum intake was 1110 calories and the minimum intake was 390 calories, the table below (6) shows all the previously mentioned. Finally, although the total calorie intakes of patients were low, CD patients were malnourished neither from disease itself nor from low calorie intakes.

Table 6: calorie intakes among both sexes

	Calories				
	N	Mean	Minimum	Maximum	Std.Deviation
Male	24	708.4167	305.00	1115.00	173.53484
Female	26	724.2692	390.00	1100.00	178.63405

DISCUSSION

Increase the prevalence of malnutrition among Crohn's disease patients is remains a matter of active investigation. This study was conducted to identify the prevalence and relation between malnutrition and patients with Crohn's disease during clinical remission. As shown in our result the prevalence of malnutrition among CD patients was observed well-nourished according to the body mass index and skin fold thickness in most patients. Two studies were done by Valentini et al, 2008(13); Vadan etal,2011(14) examined the nutritional status in patients with Crohn's disease. Both studies had similar observation with our result. Similarly, study was made by Bin et al (2010) reveals that the presence

of normal BMI with normal serum albumin concentration among CD patients (15). Nevertheless, the Donnellan et al. (2013) (16) was identified clear risk factors for malnutrition in CD patients, Notably, malnutrition was associated with patients who admitted to hospital and increased length of stay(16). As illustrates in the result most patients with Crohn's disease were with normal body fat. However, it is generally believed that Crohn's disease (CD) causes more disturbances in nutritional status and body composition. The majority of studies were done among CD patients by Nic Suibhne et al 2005(17); Filippi et al 2006(18) ; &- Jahnsen et al 2003(19) most of them demonstrate that decreased parameters of metabolically active tissue, like lean body mass , mid-arm muscle circumference , or appendicular muscle mass . But some conclude that LBM is normal or even increased.

As reveals in our result the prevalence of CD in both sexes had noted him no difference. However, three studies were done by Jahnsen et al 2003(19); Geerling et al2005(20); Geerling et al 2008(21) indicate that nutritional status is more affected in men than women (19;20;21). Similarity study done by Bernstein et al.(2003)& Russel et al (2006) (22,23) were found that the incidence of Crohn's disease was substantially higher among females than among males. However, an interesting finding from those studies was an inversion of the sex ratio for Crohn's disease among those aged 10-19 years (22,23). Although such a finding could indicate intrinsic age-related factors such as hormonal changes. While other study was done by Suibhne et al 2005(17)find that there were no gender related differences . AS demonstrates in results ,there is no relation between CD and their low calories Intakes . While other study done by Gee et al(1985) (24) was conducted to find malnutrition in gastroenterology outpatients and to ascertain whether poor food intake is a contributing factor using 48-hour recall method to collect dietary data from patients (87 women and 67 men) only (16%) of the women and (14%) of the men were classified having malnutrition on the basis of abnormal anthropometric and low serum albumin concentration. The data suggest that gastrointestinal outpatients are at high risk of malnutrition and that one of the factors contributing to the problem is inadequate food intake.

CONCLUSION

In CD patients' weight could be maintained to normal and even with a restrictive diet. The majority of CD patients were well nourished according to the BMI and SFT, Farther study to be done with use more accurate tools to detect malnutrition among CD patients .

RECOMMENDATIONS

Dietary management of Crohn's disease is often confusing. Many people receive information to avoid entire food groups or specific foods. However, restrict as few foods as possible to increase the chances to receive a balanced, nutritious diet. This is important for maintaining the function of digestive tract and overall health(17).

In addition, the medication used to treatment of CD have nutritional side effect for example Prednisone causes decreased absorption of calcium and phosphorus from the small intestine. It also causes increased losses of calcium, zinc, potassium and vitamin C. with continual use of high doses of prednisone. In addition, remove the portions of intestine

can affect nutritional status, so surface area for absorption of nutrients is decreased and absorption of nutrients may be affected. Malnutrition and nutrient deficiencies can result. Therefore, nutritional need for patients with CD are different(17). An 'elimination–reintroduction' diet was one of the earliest described modification diets evaluated for disease maintenance in CD. 'Elimination' involves remission induced by elemental feeds, followed by careful and slow 'reintroduction' of single food types to enable identification of those that precipitate symptoms. Finally, current dietary modifications do not provide any prognostic benefit but may be of value in addressing symptom control.

Study limitations : Is the cross-sectional design, which introduces uncertainties regarding the sequence of cause and effect of the observed associations Tools used to assessment of nutritional status for CD patients were in accurate. Serum albumin was unavailable for most patients. As well we used 24hrs recall method to assess the dietary intakes of CD patients, this method relied on memory to self-report dietary intakes and thus could be influenced by misreporting and also because a single administration of a 24HR is unable to account for day-to-day variation. Our study was with low number of cases in the subgroup analysis , most patients were followed OPD gastro-clinic was in acute stage of disease, however our study was for patients during clinical remission . Further studies should increase the number of participants to have far-reaching clinical implications. Although our study was conducted in outpatient population is irregular follow up and un-cooperative. We acknowledge that it may not be as representative as a multicenter survey.

References

Alhagamhmad MH, Day AS, Lemberg DA, Leach ST(2012). An update of the role of nutritional therapy in the management of Crohn's disease. Journal of gastroenterology. 1;47(8):872-82.

Beattie RM, Croft NM, Fell JM, Afzal NA, Heuschkel RB .(2006) "Inflammatory bowel disease". Archives of Disease in Childhood. 91 (5): 426–32.

Bernstein CN, Blanchard JF, Rawsthorne P, Wajda A.(1999) Epidemiology of Crohn's disease and ulcerative colitis in a central Canadian province: a populationbased study. American journal of epidemiology. 15;149(10):916-24.;149(10):916-922 23.

Best WR, Becktel JM, Singleton JW, Kern F.(1976) Development of a Crohn's disease activity index: National Cooperative Crohn's Disease Study. Gastroenterology. 1;70(3):439-44.

Bin CM, Flores C, Alvares-da-Silva MR, Francesconi CF.(2010) Comparison between handgrip strength, subjective global assessment, anthropometry, and biochemical markers in assessing nutritional status of patients with Crohn's disease in clinical remission. Digestive diseases and sciences. 1;55(1):137-44.

Burisch J, Munkholm P. Inflammatory bowel disease epidemiology.(2013) Current opinion in gastroenterology. 1;29(4):357-62.

Carter MJ, Lobo AJ, Travis SP.(2004) Guidelines for the management of inflammatory bowel disease in adults. Gut. 1;53(suppl 5):v1-6.. Gut 2004;53(Suppl 5):V1–V16. PMC free article]

Donnellan CF, Yann LH, Lal S.(2013) Nutritional management of Crohn's disease.

Filippi J, Al-Jaouni R, Wiroth JB, Hébuterne X, Schneider SM(2006). Nutritional deficiencies in patients with Crohn's disease in remission. Inflammatory bowel diseases 1;12(3):185-91.

Gee MI, Grace MG, Wensel RH, Sherbaniuk R, Thomson AB.(1985) Protein-energy malnutrition in gastroenterology outpatients: increased risk in Crohn's disease. Journal of the American Dietetic Association. ;85(11):1466-74.

Geerling BJ, Badart-Smook A, Stockbrügger RW, Brummer RJ.(1998) Comprehensive nutritional status in patients with long-standing Crohn disease currently in remission. The American journal of clinical nutrition. 1;67(5):919-26. 22.

Geerling BJ, Badart-Smook A, Stockbrügger RW, Brummer RJ.(2000) Comprehensive nutritional status in recently diagnosed patients with inflammatory bowel disease compared with population controls. European journal of clinical nutrition.;54(6):514.

Hanauer SB, Sandborn W. Management of Crohn's disease in adults.(2001) The American journal of gastroenterology. ;96(3):635.

Henckaerts L, Figueroa C, Vermeire S, Sans M.(2008) The role of genetics in inflammatory bowel disease. Current drug targets. 1;9(5):361-8.

Jahnsen J, Falch JA, Mowinckel P, Aadland E(2003) Body composition in patients with inflammatory bowel disease: a population-based study. The American journal of gastroenterology.;98(7):1556.

Molodecky NA, Soon S, Rabi DM, Ghali WA, Ferris M, Chernoff G, Benchimol EI, Panaccione R, Ghosh S, Barkema HW, Kaplan GG.(2012) Increasing incidence and prevalence of the inflammatory bowel diseases with time, based on systematic review. Gastroenterology. 1;142(1):46-54.

NDDIC. (2014). "Crohn's Disease". National Digestive Diseases Information Clearinghouse

Prideaux L, Kamm MA, De Cruz PP, Chan FK, Ng SC.(2012) Inflammatory bowel disease in Asia: a systematic review. Journal of gastroenterology and hepatology. 27(8):1266-80..

Russel MG, Stockbrügger RW.(1996) Epidemiology of inflammatory bowel disease: an update. Scandinavian journal of gastroenterology. 1;31(5):417-27 24.

T Suibhne N, O'Morain C, O'Sullivan M.(2005) Protein undernutrition in Crohn's disease: an unrecognised problem?. InGastroenterology (Vol. 128, No. 4, pp. A312A312). INDEPENDENCE SQUARE WEST CURTIS CENTER, STE 300, PHILADELPHIA, PA 19106-3399 USA: WB SAUNDERS CO.

Therapeutic advances in gastroenterology;6(3):231-42.

Vadan R, Gheorghe LS, Constantinescu A, Gheorghe C.(2011) The prevalence of malnutrition and the evolution of nutritional status in patients with moderate to severe forms of Crohn’s disease treated with Infliximab. Clinical Nutrition. 1;30(1):86-91.

Valentini L, Schaper L, Buning C, Hengstermann S, Koernicke T, Tillinger W, Guglielmi FW, Norman K, Buhner S, Ockenga J, Pirlich M.(2008) Malnutrition and impaired

muscle strength in patients with Crohn's disease and ulcerative colitis in remission. Nutrition. 1;24(7-8):694-702.

Warrell DA, Benz Jr EJ, Cox TM, Firth JD, editors.(2003) Oxford textbook of medicine. Oxford University Press, USA; .

What I need to know about Crohn's Disease"(2015). www.niddk.nih.gov. Retrieved -12-11.