

Demographic Profile and Clinical Presentation of Ulcerative Colitis in Trimurti Hospital from 2007 to 2014

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Received: April 20, 2017; Published: May 30, 2017

Abstract

Background: There is paucity of clinical and demographic information of Ulcerative Colitis(UC) in rural area of Gujarat. Evidently high number of cases diagnosed with UC inspired this study.

Objective: To provide clinical and demographic data of UC patients seen in our hospital.

Methods: A review was performed in all cases of Ulcerative Colitis seen in the hospitals from 2007 - 2014 by retrieval from Medical record department.

The diagnosis of UC was based on a combination of clinical, endoscopic and histological findings consistent with UC. Study also focused on food habits which included self-identified food triggers and tobacco chewing. Along with this extraintestinal manifestation were also taken into account. As the duration of study was quite long and data were obtained by primary questionnaire and follow up.

Patient were asked to come to hospital for filling up a questionnaire which included their current disease condition tobacco chewing habits, smoking history food habits, presumed food triggers Analysis was performed using the Microsoft Excel and Graphpad prism.

Results: A total of 47 patients with UC consulted over the eight-year study period (2007 - 2014). The mean annual incidence of UC from 2007 - 2014 was 17.9 new cases: 100,000 new consults per year. An increase in the mean annual incidence from 9.9 in 2007 - 2010 to 25.9 in 2011 - 2014 was noted.

Astonishing fact is that none of the patient required surgical intervention and their symptoms are usually controlled by medicines therapy. None of the patients had gut obstruction, massive intestinal bleed or toxic megacolon. Mean ESR was compared for both the groups was statistically significant.

Weight loss and anemia were one of the key features of UC patients. Extraintestinal manifestation: 8.6% had episcleritis, 23.4% patients had mouth ulcers, 2.1% patient had erythema nodosum and 17% (8) patient had complain of hairfall and itching. 31.9% patient had pain while defecation and could not sit longer, who were later diagnosed with sacroiliitis. None of the patient had cholangitis.

Conclusion: The incidence of UC in our study is higher than Indian and other Asian country estimates but our rates may be an over-estimation of the true regional incidence since our hospital and associated centers are >>>>? referral centers. Clinical presentation is similar to neighboring state and countries except for higher appearance of extraintestinal symptoms and no surgical intervention. Extensive research is required to understand food habits, tobacco chewing and reason or pattern of high incidence of disease in this region.

Keywords: Ulcerative Colitis; Small Intestine; Ulcerative Colitis; Annual Incidence; Demographic Data; Clinical Presentation

Introduction

Ulcerative colitis (UC) is the type of inflammatory bowel diseases (IBD). UC is idiopathic chronic inflammatory disorder of Large intestine and rectum. Many of studies in Asia has discussed increase in Incidence and prevalence of this disease [1,2] in Asia has been discussed in many studies and in some of it trend is towards the increase of the disease (a35-36). An increased incidence is also reported from the

previously low incidence rate in areas of Australia and Europe [3,4]. Incidence rate of UC in north India has been reported to be 6.02 cases per 100,000 inhabitants which is highest reported incidence rate in India [5,6].

This disease may affect any age group, but it is most prevalent in individuals in the age groups 15-30 and 50-70 yr. There is scant information about UC and prevalence of UC in other region of India [7]. This therefore is an effort to highlight incidence of UC in rural area of state of Gujarat. This study also includes general clinical presentation and extraintestinal manifestation accompanying the disease.

This study and resultant data are from a regional Trimurti Hospital serving a well-defined catchment area. This study also include data from Dhoraji - Trimurti hospital and charitable camps by associated with Bhavanben Chikhaliya foundation. Trimurti hospital which is located in district of Junagadh, a district in south west of state of Gujarat. Increasing number of UC patient was inspiration of study with aim being collecting, analyzing and reporting data of incidence and clinical symptomology of UC in patient of this region.

Materials and Methods

Setting

Trimurti Hospital is one of the largest tertiary hospitals in the Junagadh. Our institution receives patients from all parts of the Junagadh although the majority comes from rural area of Junagadh, Amreli, Porbandar, Gir Somanath and Veraval District. The total number of new admissions, outpatient and emergency consults from 2007 to 2014 is about 2,62,728. 1,34,000 with an average annual consult of 32,841 16,700 patients per year.

Case Ascertainment

All files of inflammatory bowel disease patients seen at Trimurti Hospital from 2007 to 2014 were retrieved at from the medical records department. Since charts have been organized into type of disease according to the ICD-10 format, patients with diagnosis of ulcerative colitis were identified. We likewise performed a separate inspection of histopathology reports and patient logbooks of general surgery, colorectal surgery and gastroenterology sections.

The diagnosis of UC was based on a combination of clinical, endoscopic and histological findings consistent with UC. Typical clinical features include diarrhea - usually sanguineous, rectal bleeding, passage of mucus, abdominal pain, anorexia and weight loss. Lower endoscopic findings consistent with UC are presence of ulcerations, pseudopolyps, increased contact bleeding, and mucous production, Tenesmus, and hematochezia, transmural inflammatory infiltration. The following are the histological findings of UC: distorted epithelial architecture, crypt abscesses in some cases, ulcerations, non-caseating granuloma, transmural inflammatory infiltration and inflammatory cells in the lamina propria. Study also focused on food habits which included self-identified food triggers and tobacco chewing. Along with this extraintestinal manifestation were also taken into account. As the duration of study was quite long and data were obtained by primary questionnaire and follow up.

Data Collection

Patient files with the diagnosis of UC were revisited. Clinical data at the time of initial consult were collected, which included age, gender, food habits, self-identified (presumed) food triggers, occupation, area of living, tobacco chewing habits, smoking history, past medical history, family medical history and symptomatology. Initial physical examination and impression were listed. Laboratory, colonoscopic and histopathology findings also were gathered. Patient were asked to come to hospital for filling up a questionnaire which included their current disease condition tobacco chewing habits, smoking history food habits, self-identified (presumed) food triggers.

Statistical Analysis

Collated data were entered into a computer using Microsoft Excel. Statistical analysis was performed using the Microsoft Excel and Graphpad prism. Measured values were expressed as mean + standard deviation, comparison includes paired t-test and correlation statis-

tics. Incidence rate for UC was calculated by number of UC cases divided by the total number of new consults per year over an eight-year period.

Results

A total of 47 patients with UC consulted Trimurti Hospital over the eight-year study period (2007 - 2014). All patients were diagnosed with UC with Symptomology, blood investigations, Stool reports, Endoscopy findings and Histopathology of Biopsy and Symptomology.

Some were initially managed as cases of infectious proctocolitis at the outpatient clinic. These patients did not respond to appropriate antibiotics but later improved when shifted to Mesalazine therapy.

The number of UC patients diagnosed per year is tabulated below (Table 1). The mean annual incidence of UC from 2007 - 2014 was 17.9 new cases: 100,000 new consults per year. Majority of these patients presented during the last four years of the study. There was an increase in the mean annual incidence from 9.9 new UC cases per 100,000 new consults per year in 2007 - 2010 to 25.9 new UC cases per 100,000 new consults per year in 2011 - 2014.

Year	Number of Cases of UC
2007	2
2008	4
2009	3
2010	4
2011	6
2012	7
2013	10
2014	11

Table 1: Number of UC patients in Trimurti Hospital per year from 2007 – 2014.

There was male predominance with a male/female ratio of 1.37:1 (N = 47). During period of observation, 2 females were pregnant and gave birth to healthy baby. Data of all 47 patients was completely retrievable and follow up was regular. The age ranged from 13 to 75 years and mean age was computed as 40.5 + 14.4 SD years. Maximum number of patients was in age group of 21 - 30 year of age but there is no significant difference in number of patients compared to other age groups which is third, fourth and fifth decade of life. At later age, which is 61 years onwards there is decline in number of new patient diagnosed with UC.

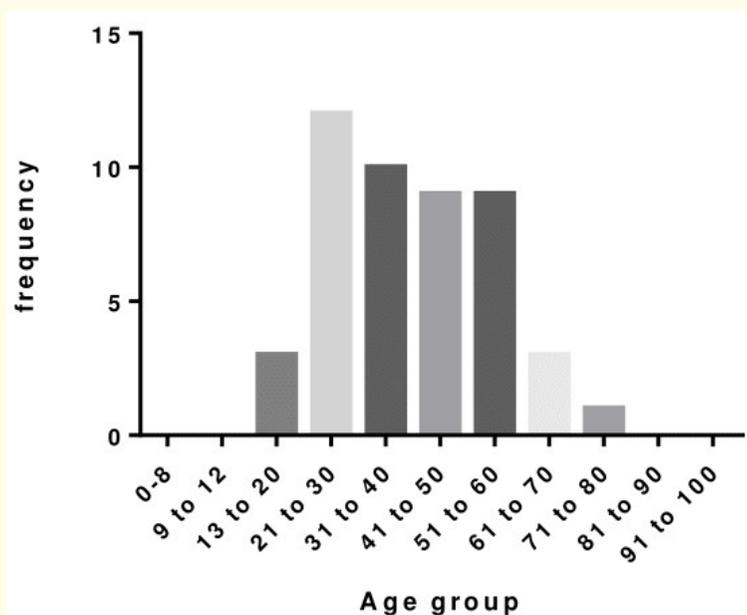


Figure 1: Age distribution of patients of UC.

Out of forty-seven patients 47, 29.8 % (14) patients were chronic regular tobacco chewer, 2.1% (1) were regular smokers and 2.1% (1) patient consumed alcohol regularly (all tobacco chewers and smokers were male). There were 17% (8) patients with family history of UC. There were 19.1% patients who used to eat very spicy food regularly until they associated it with the flare up. Only 6.4% (3) were non-vegetarians. There were 68.1% of the patient from rural area and were laborers (Mostly in farms). 91.5% (43) patient stayed away from milk presuming it would trigger flare up UC. Some patients (17% (8)) mentioned products of gram and gram flour as triggers.

The two most common diagnoses during the initial evaluation were gastrointestinal tuberculosis (27.2%), (18.2%) and infectious proctocolitis (18.2%). Other initial impressions include acute cholecystitis, post-operative adhesions, lupus mesenteric vasculitis Hirschsprung disease. Patients with confirmed UC were subjected to stool examination during each flare up to rule out infective proctocolitis ulcerative colitis.

Diarrhea, lower abdominal pain and lower gastrointestinal bleed were the top reasons for consult or admission. Among UC patients 31.9% patients had painless UC. Severe pain was complaint of 6.4% (3) and others had mild to moderate colic pain. Also, frequency of stool, presence of blood/mucous and abdominal pain during flare up and remission is shown in chart. At the time of collection of data 30 patients were in remission and 17 patients had flare up of UC. All the patients were hospitalized at least once.

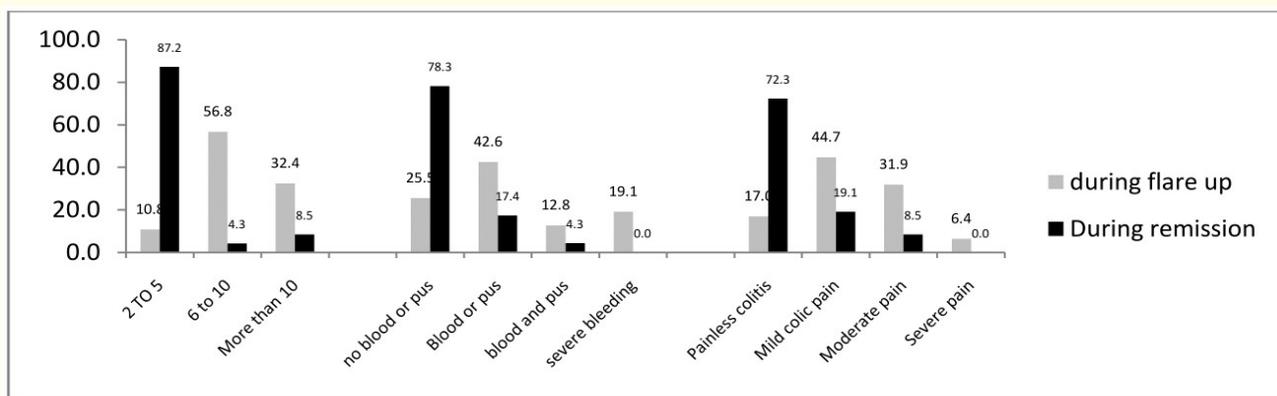


Figure 2: Comparison of symptoms in patients during flare up and remission stages of UC.

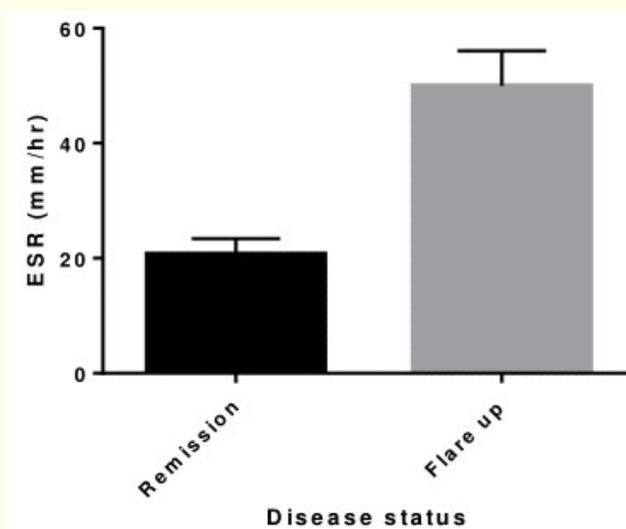


Figure 3: Comparison of ESR in patients in remission and flare up.

Mean ESR was compared for both the groups and it was 21.8 + 6.6 mm/hr and 51.1 + 10.7 mm/hr for remission and flare up respectively and the difference between two was statistically significant (P < 0.05, (95% CI, 24.90 to 37.45).

Weight loss and anemia were one of the key features of UC patients in this study. Weight loss was more than 8 kg in 17% patients (8) and more than 15 kg in 4.3% (2) patients after first appearance of symptoms.

Extraintestinal manifestation: 8.6% had episcleritis, 23.4% (11) patients had complain of mouth ulcers, 2.1% (1) patient had erythema nodosum and 17% (8) patient had complain of hairfall and itching. 31.9% (15) patient had pain while defecation and could not sit longer, who were later diagnosed with sacroiliitis. None of the patient had cholangitis in duration of disease.

Area of living	Number (%)
Rural	32 (68.1%)
Subrural	5(10.6%)
Urban	10(21.3%)
Oil used for cooking	
Cotton seed oil	16 (34.0 %)
groundnut oil	27 (57.4%)
Sunflower oil	2(4.3%)
Corn kernel oil	2(4.3%)

Table 2a: Demographics of Ulcerative Colitis patients.

Type of Ulcerative Colitis	
Proctitis	26 (55.3%)
Left sided Colitis	14 (29.8%)
Pancolitis	7 (14.9%)
Hemoglobin	
> 9mg/dl	25 (53.2%)
7 - 9 mg/dl	10 (21.5%)
< 7 mg/dl	12 (25.5%)
Co morbidities	
Diabetes mellitus	2 (4.3%)
Hypertension	5 (10.6%)
Constipation	3 (6.4%)
Arthritis	2 (4.3%)
Appendicitis followed by appendicectomy	1 (2.1%)
Psychiatric illness	1 (2.1%)
Extraintestinal Manifestation	
Mouth Ulcers	11 (23.4%)
Episcleritis	4 (8.6%)
Erythema Nodosum	1 (2.1%)
Sacroiliitis	15 (31.9%)
Cholangitis	0 (0%)

Table 2b: Clinical features of Ulcerative colitis patients.

Discussion

There have been many studies to get the data of demographics of ulcerative colitis in India [7-15], but for our region, this is the first study which may provide the incidence data of the disease.

Total number of patients diagnosed with UC during 8 years of duration were 47. Files were available, regular follow up by patients and information of their current disease status lead us to include all 47 patients who provided us complete data. The patients were asked to come to answer the basic questionnaire which included questions for understanding life style and current disease status.

The mean annual incidence of UC over past 8 years was 17.9 new cases per 1,00,000 new consults/year. Maximum number of the cases was identified in last few years which can also be interpreted from rise in incident rate from 9.9 in 2007 to 2010 to 25.9 in 2011 to 2014. This data is similar/identical to slight higher than one carried out in the south Indian migrant study from Leicestershire England where UC incidence rate ranged from 13.9 to 17.2 per 10⁵ person years [16,17]*. The range is higher than highest rate found out in state of Punjab (North India) which was 6.02 per 105 person years [5]. Though, incidence rate found out in our study is comparable to Northern American and European range which is from 6.2 to 31.2 patients per 100000 person years [18]. In our study, incidence rate increased sharply in last four year of observation. Incidence in this period was highest.

One more fact we found is that there was not a single patient diagnosis of Crohn's disease during this period. There is data where incidence of crohn's disease is less than UC [19] but this region is found to have very less amount of Crohn's disease patient that none of the case was diagnosed in our hospital. For this we need extensive survey from all the health care set ups of all regions. Ulcerative colitis appears to be more common than CD in Asia [19]. We still need extensive research to find out actual number of IBD patients of the region.

In our study UC patients had male slight dominance which is comparable to other demographic findings [5,20-24]****. Mean age was found to be 40.5±14.4 years which is comparable to [6]****. Here we found equal distribution of age of patient diagnosed with UC***. This data is bit different than other studies, for example hospital based study of Philippines General Hospital had bimodal frequency distribution between two age groups [6]**. In our study, maximum number of patients was are in age group of 21 - 30 but there is no significant difference in number of patients compared to other age groups which is third, fourth and fifth decade of life. Though it is comparable to a Japanese nationwide survey where the peak age of onset was 20 - 29 years for UC [25]. At later age, which is 61 onwards there is decline in number new patient diagnosed with UC is there. This decline at later age (70 years onwards) is may be due to mentality of correlating deteriorations in general condition to age and not reporting it or going for higher investigation. (life expectancy is quite low in this region).

Among all UC patients, 17%(8) patient had at least one person in blood relation with history of UC. This data is comparable with the Iranian study where 13.4% of UC patient had family history of UC [26,27].

Most of the patients were from lower socioeconomic class. For 19% of the patients daily work was of more than 10 hr which included heavy labor work. These patients were farmers or laborers. Some reports are there which showed mental stress as trigger for flare up [28]**. We had two patients who mentioned that they had first episode of UC after emotional trauma. Other 69% of the patient had 6 to 10 hr of mild activity. These people patients included retail shop owners, school going children and house wives. Other 12% patients were old or retired from work. This data is different than other part of the world where people with white color job is more affected with UC than the people who had physical stress at work [29,30]***.

We also analyzed food pattern and addictions of the patient. From 47 UC patients 2.1% (1) were smokers and 2.1% (1) were alcoholic but there was a huge number (29.8%) of patients who were regular tobacco chewer. These patients can give data on effect of nicotine in igniting flare up or keeping UC in remission for longer amount of time. Future studies are required to understand the effect as data from our study is limited.

Main oil for cooking food was peanut groundnut oil (57.4%) and cotton seed oil (34%). We did not find any kind of correlation between this as the amount of oil consumed per day or duration was not much clear or detailed. Some studies show oil and UC****.

There are several opinions on to have milk or not in different population races *[31,32]. Here patient (91.5%) presumably avoided milk when they were diagnosed with UC. Further study taking the control group from normal population can be done to check the lactose or similar type of intolerance to milk content in population of Junagadh and this can be compared with actual intolerance to milk content in patients with UC.

Self-reported allergy to food included flare up or just increase in frequency of stool or blood or increase in abdominal pain or complete flare up was with gram flour and related products. Seventeen (17% - 8 patient) reported this in our study. There are reports where some patients with UC are not comfortable taking legumes [33]*.

Weight loss and anemia can directly be linked to malabsorption during prolonged active stage of the disease and bleeding was comparable to this is in line with the study ****[39-41].

Types of ulcerative colitis with context of affected area of intestine are given in table 2a. The anatomic involvement of UC is highly variable in different Asian centers. In India, China and Singapore, majority of patients presented with pancolitis [5,22,34]. Predominantly left-sided colitis is found in Thai and Caucasian populations [35,36]. The types and distribution found in our study is comparable to two Iranian studies [37,38].

ESR was compared was found significantly different in patients with active disease with patient in remission.

Here we have interesting data of extraintestinal manifestation in (listed in table 2b). Extra-intestinal manifestations have been reported in 2 - 34% of patients with UC [39-41]. Our study revealed high number of patients with episcleritis, Scleritis, and Mouth ulcer. None of the patients had Colingitis.

Study had three female patients who conceived and delivered after having UC diagnosed. All three had pregnancy in remission period and was uneventful. To the knowledge, all three babies do not show any symptom of UC till the time study was being analyzed.

One more fact is slight correlation between Pancolitis and severity of disease (in terms of ESR, anaemia, frequency of stool). This may be due to lack of diagnostics in rural area (from where majority of patients of our study came from). So, when the patient reaches our hospital extent and severity of disease is increased. One more astonishing fact is that none of the patient required surgical intervention. Survival rate is 100%. This is data is different than what we have from other part of the Asia and world. Reason might be patients refraining from having surgical intervention or they find it more convenient to go for end point medical treatment. More extensive and a collected hospital based study of the region may be help us understand this data.

Conclusion

The incidence of UC in our study is higher than Indian and other Asian country estimates but our rates may be an overestimation of the true regional incidence since our hospital and associated centers are >>>>? referral centers. There appears to be an increasing incidence in recent years. Clinical presentation is similar to neighboring state and countries except for higher appearance of extraintestinal symptoms and no surgical intervention. It appears that most of the patient is diagnosed at later stage and high severity of disease. Extensive research is required to understand food habits, tobacco chewing and reason or pattern of high incidence of disease in this region.

Bibliography

1. F Molinie., *et al.* "Opposite evolution in incidence of Crohn's disease and ulcerative colitis in Northern France". *Gut* 53.6 (2004): 843-848.

2. I Vind., *et al.* "Increasing incidences of inflammatory bowel disease and decreasing surgery rates in Copenhagen City and County, 2003-2005: A population based study from the Danish Crohn colitis database". *American Journal of Gastroenterology* 101.6 (2006): 1274-1282.
3. Z Jovanovic. "Epidemiology of Crohn's disease in Rijeka-Istra region (in Serbo-Croatian)". *Liječnički vjesnik* 121 (1999): 8-13.
4. PF Anseline. "Crohn's disease in the Hunter Valley region of Australia". *Australian and New Zealand Journal of Surgery* 65.8 (1995): 564-569.
5. A Sood., *et al.* "Incidence and prevalence of ulcerative colitis in Punjab, North India". *Gut* 52.11 (2003): 1587-1590.
6. Sherwin Feir. "Demographic profile and clinical presentation of inflammatory bowel disease in the philippine general hospital from 1999-2004". *Philippine Society of Gastroenterology* 2 (2006): 95-102.
7. Khosla S. "Ulcerative colitis in India". World Congress of Gastroenterology Abingdon. The Medicine Group (1990): 576.
8. N Morita., *et al.* "Incidence and prevalence of inflammatory disease in Japan: nationwide epidemiology survey during the year: 1991". *Journal of Gastroenterology* 30.8 (1995): 1-4.
9. Y Yoshida and Y Murata. "Inflammatory bowel disease in Japan: studies of epidemiology and etiopathogenesis". *Medical Clinics of North America* 74.1 (1990): 67-90.
10. SK Yang., *et al.* "Incidence and prevalence of ulcerative colitis in the Songpa Kangdong district, Seoul Korea 1986-1997". *Journal of Gastroenterology and Hepatology* 15.9 (2000): 1037-1042.
11. CL Lai., *et al.* "Clinical features of ulcerative proctocolitis in Hong Kong Chinese: a review of three decades". *American Journal of Proctology, Gastroenterology and Colon and Rectal Surgery* 36.1 (1985): 14-19.
12. WP Fung., *et al.* "Non-specific ulcerative colitis in Chinese and Indians in Singapore". *Medical Journal of Australia* 2 (1971): 361-365.
13. SK Lee. "Crohn's disease in Singapore". *Medical Journal of Australia* 1.8 (1974): 266-269.
14. B Al-Nakib., *et al.* "Inflammatory bowel disease in Kuwait". *American Journal of Gastroenterology* 79.3 (1984): 191-194.
15. S Radhakrishanan., *et al.* "Ulcerative colitis in Oman. A prospective study of the incidence and disease pattern from 1987 to 1994". *Digestion* 58.3 (1997): 266-270.
16. I Carr and JF Mayberry. "The effects of migration on ulcerative colitis: A three-year prospective study among Europeans and first- and second-generation South Asians in Leicester (1991-1994)". *American Journal of Gastroenterology* 94.10 (1999): 2918-2922.
17. CS Probert., *et al.* "Epidemiological study of ulcerative proctocolitis in Indian migrants and the indigenous population of Leicestershire". *Gut* 33.5 (1992): 687-693.
18. EV Loftus. "Clinical Epidemiology of Inflammatory Bowel Disease: Incidence, Prevalence, and Environmental Influences". *Gastroenterology* 126.6 (2004): 1504-1517.
19. Qin Ouyang., *et al.* "Management consensus of inflammatory bowel disease for the Asia-Pacific region". *Journal of Gastroenterology and Hepatology* 21.12 (2006): 1772-1782.
20. YM Lee., *et al.* "Racial Differences in the Prevalence of Ulcerative Colitis and Crohn's Disease in Singapore". *Journal of Gastroenterology and Hepatology* 15.6 (2000): 622-625.
21. Thein-Htut and M Kudva. "Ulcerative colitis in Malaysians: A Review of 23 Patients". *Singapore Medical Journal* 30.4 (1989): 385-387.

22. SK Yang, *et al.* "Epidemiology of inflammatory bowel disease in Asia". *Inflammatory Bowel Disease* 7.3 (2001): 260-270.
23. Tominaga M. "Clinical Features of Crohn's Disease: relationship of Disease Type and Severity to Clinical Findings at the Time of Diagnosis in 166 Cases". *Fukuoka Igaku Zaasshi* 83.1 (1992): 6-20.
24. GD Dayrit, *et al.* "Crohn's Disease and Ulcerative Colitis: A Four-Year Review at St. Luke's Medical Center"
25. N Morita, *et al.* "Incidence and prevalence of inflammatory bowel disease in Japan: nationwide epidemiological survey during the year 1991". *Journal of Gastroenterology* 30.8 (1995): 1-4.
26. Y Niv, *et al.* "Epidemiology of Crohn's disease in Israel: A survey of Israeli kibbutz settlements". *American Journal of Gastroenterology* 94.10 (1999): 2961-2965.
27. YF Wang, *et al.* "Clinical manifestations of inflammatory bowel disease: East and West differences". *Journal of Digestive Diseases* 8.3 (2007): 121-127.
28. M Wahed, *et al.* "Anxiety and psychological stress in acute severe ulcerative colitis: Prevalence and effect on outcome". *Gut* 60 (2001): A222.
29. Sheetal R Marri and Alan L Buchman. "The Education and Employment Status of Patients with Inflammatory Bowel Diseases". *Inflammatory Bowel Disease* 11.2 (2005): 171-177.
30. Amnon Sonnenberg. "Disability from inflammatory bowel disease among employees in West Germany". *Gut* 30.3 (1989): 367-370.
31. BJ Henry, *et al.* "Intolerance to milk in ulcerative colitis". *The American Journal of Digestive Diseases* 11.11 (1966): 858-864.
32. Richa Gupta, *et al.* "Evaluation of lactose and milk intolerance, and bone mineral density in Indian patients with inflammatory bowel disease". *The National Medical Journal of India* 25.6 (2012): 327-331.
33. Ajit Sood, *et al.* "Self-reported Food Intolerance in Patients with Ulcerative Colitis in India". *Journal, Indian Academy of Clinical Medicine* 4.1 (2003): 30-33.
34. Q Cao, *et al.* "Clinical Presentation of Inflammatory Bowel Disease: A Hospital-based Retrospective Study of 379 Patients in Eastern China". *Chinese Medical Journal* 118.9 (2005): 747-752.
35. S Pongprasobchai, *et al.* "Ulcerative Colitis in Thailand: A Clinical Study and Long-term Follow-up". *Journal of Medical Associations of Thailand* 84.9 (2001): 1281-1288.
36. DC Nyam, *et al.* "Surgery for Inflammatory Bowel Disease". *Singapore Medical Journal* 37.5 (1996): 517-518.
37. R Aghazadeh, *et al.* "Inflammatory bowel disease in Iran: a review of 457 cases". *Journal of Gastroenterology and Hepatology* 20.11 (2005): 1691-1695.
38. H Vahedi, *et al.* "Epidemiologic characteristics of 500 patients with inflammatory bowel disease in Iran studied from 2004 through 2007". *Archive of Iranian Medicine* 12.5 (2009): 454-460.
39. YM Tan and KL Goh. "Ulcerative colitis in a multiracial Asian country: racial differences and clinical presentation in Malaysian patients". *World Journal of Gastroenterology* 11.37 (2005): 5859-5856.
40. XL Jiang and HF Cui. "An analysis of 10218 ulcerative colitis cases in China". *World Journal of Gastroenterology* 8.1 (2002): 158-161.
41. NM Law, *et al.* "Crohn's disease in the Singapore Chinese population". *Journal of Clinical Gastroenterology* 26.1 (1998): 27-29.

Volume 3 Issue 1 May 2017

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