



A RESEARCH THESIS SUBMITTED TO THE DEPARTMENT OF INTERNAL MEDICINE,
SAINT PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE, FOR THE PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR THE SPECIALITY CERTIFICATE IN
INTERNAL MEDICINE

MAGNITUDE AND CLINICAL CHARACTERISTICS OF INFLAMMATORY BOWEL
DISEASES AMONG PATIENTS ON FOLLOW UP AT SAINT PAUL'S HOSPITAL GI
CLINIC FROM JANUARY 1, 2017 TO JANUARY 1, 2019

BY, ALIYI AHMED (medical resident)

AUGUST 21, 2019

ADDIS ABABA, ETHIOPIA



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ADDIS ABABA, ETHIOPIA

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ABSTRACT

Background: The inflammatory bowel diseases; Crohn's disease and ulcerative colitis, are chronic idiopathic disorders causing inflammation of the gastrointestinal tract. In North America and Europe, over 1.5 million and 2 million people suffer from the disease, respectively. Although the prevalence of ulcerative colitis and Crohn's disease increased in the western world in the latter half of the 20th century, little was known about the changing prevalence in other parts of the world. Moreover, reports on the clinical characteristics and presentations of inflammatory bowel disease patients from different ethnicities are also inconsistent. There was no data on prevalence of inflammatory bowel disease and data on the clinical characteristics of inflammatory bowel diseases in Ethiopia is scares.

Objective: The aim of the study was to assess magnitude and clinical characteristics of inflammatory bowel diseases among adult patients on follow up at St. Paul's Hospital Millennium Medical College, gastroenterology clinic from January 1, 2017 to January 1, 2019.

Method: Institution based retrospective cross-sectional study design was conducted from January 1, 2017 to January 1, 2019. Because of too small calculated sample size, all 61 inflammatory bowel disease patients on follow up at adult gastroenterology clinic of St. Paul's hospital millennium Medical College during the study period and who full fills the inclusion criteria were taken. Data was collected through structured questionnaire from chart record of the patients and was analyzed by SPSS version 23. Descriptive statistics was used for data analysis.

Results: A total of 61 cases of inflammatory bowel diseases with Crohn's disease 40(65.6%), ulcerative colitis 18(29.5%) and indeterminate inflammatory bowel diseases 3(4.9%) were identified. The prevalence rate of inflammatory bowel diseases, Crohn's disease and ulcerative colitis were 1.7%, 1.1% and 0.5% respectively. The sex ratio for inflammatory bowel diseases was (male: female) 1:1.26 with ulcerative colitis (1.57:1) Crohn's disease (1:1.67) and indeterminate inflammatory bowel diseases (1:2). The frequent symptom at initial presentation of inflammatory bowel diseases patients was abdominal pain and diarrhea. Crohn's disease patients present more commonly with abdominal pain, while those with ulcerative colitis had a higher frequency of rectal bleeding. In Crohn's disease patients, terminal ileum disease (47%) was most frequent with two patients having upper GI involvement. In those with ulcerative colitis, 61% had colonic disease 33% with disease limited to the rectum.

Conclusion : Our study indicated that the prevalence rate of I inflammatory bowel diseases, Crohn's disease and ulcerative colitis were 1.7%, 1.1% and 0.5% respectively and clinical features of inflammatory bowel diseases in our hospital were different from those in developed countries, in terms inflammatory bowel

diseases sub-types, sex distribution, disease location and, and the prevalence of extra-intestinal manifestations.

Recommendations: Suggest having multi-center study for inflammatory bowel diseases, which may provide useful epidemiological and clinical data.

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Abbreviations

Anti-TB - Tuberculosis chemotherapy

CD-Crohn's disease,

GI- Gastroenterology

GWA - Genome-wide association

IRB-Institutional Research Board

IBD-inflammatory bowel diseases

SPH – Saint Paul Hospital

SPHMMC- Saint Paul Hospital Millennium Medical College

UC-ulcerative colitis

UGIB- upper gastrointestinal bleeding

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1. INTRODUCTION

1.1. BACKGROUND INFORMATION

The inflammatory bowel disease (IBD) consisting of ulcerative colitis (UC) and Crohn's disease (CD) are characterized by chronic inflammation of the gastrointestinal tract in genetically susceptible individuals exposed to environmental risk factors. CD is a relapsing, transmural inflammatory disease of the gastrointestinal mucosa that can affect the entire gastrointestinal tract from the mouth to the anus. The involvement is often segmental and in a discontinuous manner and it usually spares the rectum. UC is a relapsing non-transmural inflammatory disease that is restricted to the colon and the mucosal involvement is in a continuous fashion. CD usually presents with ileo-colitis or jejuno-illitis and usually spares rectum whereas the rectum is involved in majority of UC patients (1).

The prevalence of UC ranged from 4.9 to 505 per 100,000 in Europe, 4.9 to 168.3 per 100,000 in Asia and the Middle East, and 37.5 to 248.6 per 100,000 in North

America, and the CD prevalence estimates ranged from 0.6 to 322 per 100,000 in Europe, 0.88 to 67.9 per 100,000 in Asia and the Middle East, and 16.7 to 318.5 per 100,000 in North America. Some studies from developing countries shows the prevalence of IBD might be raising, but population-based data in these countries were lacking. IBD in the West is associated with a bimodal age distribution pattern, with a peak at age 20-39 years and a second smaller peak at 60-79 years. The female to male ratio varied from 0.51 to 1.58 for UC studies and 0.34 to 1.65 for CD (2, 3, 4).

The etiology of IBD is believed to be multifactorial, whereby genetically susceptible subjects develop the disease that may be triggered by environmental factors and perpetuated by an abnormal host immune response. Several genes have been identified in association with the development of CD or UC. Linkage analysis successfully identified 9 genomic regions that showed significant association to IBD, called IBD1-IBD9. Genome-wide association (GWA) studies also identified more variants of genes, however, this explain only a small fraction of the overall heritability of the disease (5).

Some of the environmental factors that have been observed in association with IBD include increased consumption of refined carbohydrates, lack of breast feeding, appendectomy (protects against ulcerative colitis), perinatal infections (6), cigarette smoking (increased in CD, decreased in UC), the use of oral contraceptives (7).

Patients most frequently present in the second and third decades of life with rectal bleeding, abdominal pain or diarrhea. Some patients may present with extra-intestinal manifestations, perianal diseases (in CD), or surgical

complications. Given the transmural inflammation, CD patients thus have more risk of fistulizing and stenosing disease, whereas UC patients suffer more from bloody diarrhea. Anemia and weight loss may occur in both cases. There is no definitive diagnostic test exists for IBD. The diagnosis is made on the basis of the patient history and physical examination together with objective findings from endoscopic, radiological, laboratory and histological studies. Currently, there is no cure for IBD. However, effective medical treatment is available that can control the inflammation and relieve the symptoms (8, 10).

1.2. STATEMENT OF THE PROBLEM

IBD is a global disease with increasing prevalence worldwide. It is a challenging disease in terms of follow up, treatment, and establishing the diagnosis may take long time. In addition the impact of IBD on patients' physical, psychosocial and quality of life is substantial due to early onset, fluctuating disease course, frequent bowel movement and lack of cure. In elderly patients and those with more severe IBD an increased mortality from gastrointestinal disease, malignancy or respiratory disease was observed. The economic burden of IBD is correspondingly high due to involvement of younger age groups and high health care cost (2, 9, 10).

The highest prevalence was reported from western countries. In North America and Europe, over 1.5 million and 2 million people suffer from the disease, respectively and is associated with high morbidity, mortality. Cohort studies from Asia, Africa, and South America have consistently described the rising incidence of inflammatory bowel disease in countries outside the western world. The rising incidence of inflammatory bowel disease in newly industrialized countries could indicate an emerging epidemic of the disease outside the western world. This epidemiological shift, which is being seen in newly industrialized countries and in Asian immigrants to the west, mirrors the experience reported in the west more than 50 years ago, occurring with rapid socioeconomic development. Genetic heterogeneities have been shown to exist among different racial and ethnic

populations with IBD. Moreover, reports on the clinical characteristics and presentations of IBD patients from different ethnicities are also inconsistent. This observation suggests that the clinical characteristics of inflammatory bowel disease and its impact on health-care systems will need to be reassessed in the context of shifting epidemiological patterns throughout the world (2, 4, 17, 18, 20, 21, 23).

However, outside the western world burden of inflammatory bowel disease remains unclear, because a population-based epidemiologic data of IBD collected in a standardized fashion in developing nations is sparse. The greatest gap in epidemiologic features of IBD comes from the lack of data from developing nations specially African countries b/c there are only few cohort studies most of which are from hospital reports and there were poor access to diagnostic modalities in those area which will undermine the true prevalence of IBD and may have negative impact in terms of early recognition, availability of proper clinical care and outcome of patients (2, 20, 21).

Patients with IBD living in poorer countries may face barriers in access to care and their ability to afford costly drugs like biological agents. The net effect is a global IBD community with a wide variation in health outcomes, due not to differences in disease pathogenesis but rather to economic disparities. Thus, an insight into geographical and clinical patterns of the disease in those areas will help researchers and policy makers to prepare the clinical infrastructure and health-care resources needed to mitigate the burden of inflammatory bowel disease (2, 9, 21, 22, 23).

According to world economic forum report of 2018, Ethiopia has the fastest growing economy in Africa. With rapid urbanization occurring in the country the increase in epidemiology of IBD is expected as limited data from some developing countries shows similar results.

One study in Israeli compared Ethiopian origin patients with Jews, showed upper GI involvement was found more in the Ethiopians, family history for IBD and Arthritis was noted in more Ashkenazi patients. This small difference is consistent with inter-racial difference in clinical characteristics from different studies. But the number of patients is limited and possible presence of environmental influence supports the importance of further study to have more representative local data on clinical features and burden of the disease (18, 19, 20, 21, 22, 23).

There is no study done in Ethiopia on prevalence of IBD and our knowledge of prevalence and clinical characteristics of IBD in our setup is deficient which is problem for policy makers and administrative personnel to prepare the clinical infrastructure and health-care resources.

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1.3. Significance of this study

Traditionally regarded as a disease of western world, the epidemiology of inflammatory bowel disease is changing throughout the world at the turn of the 21st century with some reports of increased prevalence in developing nations.

In our country the prevalence and burden of the disease is unknown as there is no study done on inflammatory bowel diseases in Ethiopia. The possible differences in the clinical characteristics among different races also indicate the need to carry out further studies in our setup to investigate the epidemiological and clinical characteristics of patients. In addition, the access to standard investigative modalities is limited in most parts of the counties which may delay early diagnosis and proper medical management which could affect the outcome of patients. The purpose of this study is to fill the lack of data on prevalence and clinical characteristics of IBD.

This will be the first study to be done in our hospital and also probably in our country with this title and will help as a stepping stone for further future studies.

The findings of this study will help for administrative bodies of our hospital and probably policy makers at national level to allocate resources, man power and diagnostic tools and may improve accessibility of newer and effective medications so that patients with IBD will benefit from early diagnosis and standard medical service.

2. Literature Review

2.1. Literature review

2.1.1. Prevalence of IBD

A systematic literature search of MEDLINE (1950 –2010) and EMBASE (1980 – 2010) was performed to identify population based, studies to determine changes in incidence and prevalence of UC and CD with time, worldwide. Final review was done on 167 studies from Europe (1930 –2008), 52 studies from Asia and the Middle East (1950 –2008), and 27 studies from North America (1920 –2004). The highest reported prevalence values for IBD were in Europe (UC, 505 per 100,000

persons; CD, 322 per 100,000 persons) and North America (UC, 249 per 100,000 persons; CD, 319 per 100,000 persons). About 75% of CD studies and 60% of UC studies had an increasing incidence of statistical significance. There are few epidemiologic data from developing countries (3).

The retrospective epidemiological survey was done at Faroe Islands, in 1964-83. There was an increase in the incidence of ulcerative colitis from 2.1 to 12.8 per 100,000. The prevalence was 157.3/100,000 on 31 December 1983. The change in Crohn's disease was insignificant, and the incidence of CD was low compared with other countries (1.75/100,000); the prevalence was 31.8/100,000 on 31 December 1983. The increase in incidence rate of ulcerative colitis was equal among two sexes (12).

A prospective and population-based study of Crohn's disease was carried out in area of Crete over 5 years. The incidence of CD increased from 1.9 in 1990 to 3.8 in 1994. The male to female ratio was 2.4: 1. The age group 25-34 years had the highest age-adjusted incidence 6.3/100,000. The incidence of Crohn's disease was also found to be higher in smokers, in urban areas, and in people with high educational level (13).

A retrospective study of ulcerative colitis was carried out over 1961-1985 in southern Israel (Beer Sheva district,) area confined to the Jewish population. Total population at 1985 was 232 295. The prevalence was 164 at the end of study. The ratio of men to women was 0.76 (14).

The study was done in the Uppsala, Sweden, from 2005 to 2009 to investigate the clinical course and the impact of the IBD with regards to complications. Mean population in the study region was 305,381 in 2005–2006 and 642,117 in 2007–2009. The mean incidence for UC was 20.0/100,000/year and for CD it was 9.9/100,000/year. Colectomy during the first year was uncommon (2.5%). CD patients with complicated disease had longer symptom duration before diagnosis and less often diarrhea and blood in stools compared to patients with non-complicated disease. The risk for surgery during the first year was 12%. The prevalence of anemia at the time of diagnosis was 30% and after one year 18%. Anemia was more common among newly diagnosed patients with CD compared with UC (15).

Study was done in South Africa (Cape Town) between 1980 and 1984 to establish the incidence of Inflammatory Bowel Diseases. There were 134 patients with Crohn's disease, 197 with ulcerative colitis and 16 with indeterminate colitis. The incidences of Crohn's disease in the colored, white and black population groups were calculated to be 1.8, 2.6 and 0.3/100000 per year respectively and those for ulcerative colitis 1.9, 5.0 and 0.6/100000 respectively. Among Jews the incidence was higher for both Crohn's disease (10.4/100000) and ulcerative colitis (17.0/100000) (16).

2.1.2. Clinical characteristics of IBD

A cross-sectional descriptive study was done in Brazil from 2011 to 2014 on 87 patients with IBD. Of the 87 patients, 40 (46%) had Crohn's disease (CD) and 47 (54%) had ulcerative colitis (UC). Women had a higher prevalence of IBD. CD patients were younger (< 25 years old), had higher prevalence of smoking habits and were associated with urban origin, conjunctivitis, palpable mass, appendectomy and intestinal complications. UC was more prevalent in older individuals (> 25 years old), with rural origin, bloody diarrhea and rectal bleeding. Location and initial behavior of CD were ileo-colic (L3), inflammatory behavior and penetrating form of the disease. There is higher prevalence of proctitis and mild and severe forms of the UC among women. Osteoarticular and systemic manifestations predominated in both diseases (17).

A Systematic Review of 47 publications was done to provide an overview of the disease burden and clinical features of IBD in the Chinese population in 2016. The incidence rate of IBD was 1.7/100,000 person years, (CD and UC were 0.40 and 1.18 per 100,000 person years, respectively). The sex distribution analysis indicated a male predominance in both CD (sex ratio: 1.64 ;) and UC (sex ratio:

1.29 ;). The clinical characteristics were summarized using data from 2283 CD cases and 17,958 UC cases; in which the majority of CD patients were diagnosed between 17–40 years of age, with non-stricturing and non-penetrating disease. UC cases were featured with later disease diagnosis, a more severe disease course, more segmental lesions and less extra-intestinal manifestations (18).

From survey of 1159 Indian patients with IBD, in year 2012, 64.3% had UC, 35.3% CD, and 5 had indeterminate colitis. The mean duration from onset of symptoms to arriving at a diagnosis was shorter in UC than in CD. More than one half of patients had extraintestinal symptoms. Family history of IBD was present in 2.9% (UC 2.3% and CD 4.6%;). The extent of disease was pancolitis 42.8%, left-sided colitis 38.8%, and proctitis 18.3% in UC, and both small and large intestine 39.6%, isolated colonic 31.4% and isolated small intestinal 28.9% in CD. 18.8% and 4.4% of patients with CD had stricturing and fistulizing disease, respectively. Only 4% of patients with UC had undergone colectomy, 15.2% of patients with CD underwent surgical intervention (19).

A retrospective compared 68 American white patients and 85 Chinese patients with CD between 1985 and 2004 at Cleveland Clinic Florida and Hospital in China. The mean age of onset was not significantly different. About 60% of American white patients were women vs 37% of Chinese patients. Twelve percent of American patients vs 1% of Chinese patients had a family history of CD. American patients had higher rates of arthritis (32% vs 4%), abscess (19%vs 0%), rectal and perineal fistula (52%vs0%). American white patients had more colorectal sites involved and higher rates of extra-intestinal diseases (40% vs 20%). Chinese

patients had higher rates of ileocaecal disease (82% vs 52%) and deep ulcers (66% vs 24%) in the colorectal area. No differences in the incidence of smoking, perforation, intra-abdominal fistula, stenosis, bowel obstruction, toxic megacolon or granuloma formation (20).

A cross sectional study of CD patients seen at centers in the Western Cape, South Africa between 2011 and 2013 was performed. One hundred and ninety four CD subjects were identified; 35 (18%) were white, 152 (78%) were Cape Colored and 7(4%) were black. Cape Colored were significantly more likely to develop 'complicated' CD (60% vs. 9%,) during the disease course when compared to white subjects. In addition, significantly more white subjects had successfully discontinued cigarette smoking at study enrolment (31% vs. 7% reduction,). No additional inter-racial differences were found. A low proportion of IBD family history was observed among the non-white subjects (21).

A case-series study was done in Cairo University, to assess natural history, patterns and clinical characteristics of IBD in Egypt from 1995 to 2009. From a total of 157 patients, 86% were diagnosed with UC and 14% with CD. The mean ages at diagnosis were 27.3 and 29.7, respectively. There was marked increase in the frequency of both UC and CD diagnoses during the most recent 10 years of the 15 year period studied. Male: female ratio was 1:1.15 for UC and 2.6:1 for CD. Eleven patients had surgical interventions during the studied years: 4 cases of total colectomy and 7 cases of anal surgery (22).

A case control study was conducted in 7 Israeli tertiary hospitals' to compare Ethiopian origin patients with Ashkenazi Jews. Thirty-two Ethiopian patients with IBD were compared with 33 Ashkenazi Jewish patients with IBD. CD was more prevalent than UC in the Ethiopian group compared with the Ashkenazi group (94% versus 73%). No Ethiopian-origin patient had a positive family history of IBD compared with 42% of Ashkenazi. Arthritis was more common in Ashkenazi than in Ethiopian patients (27% versus 3%). One Ashkenazi patient with CD had upper gastrointestinal involvement compared with 7 (23%) in the Ethiopian group. No Ethiopian patient was diagnosed before immigration (23).

3. Objectives

3.1. General

To assess the magnitude and clinical characteristics of inflammatory bowel diseases at SPHMMC, GI clinic from January 1, 2017 to January 1, 2019.

3.2. Specific

To assess the magnitude of IBD and its sub-types at SPHMMC, GI clinic from January 1, 2017 to January 1, 2019.

To assess clinical characteristics of patients with IBD at SPHMMC, GI clinic from January 1, 2017 to January 1, 2019.

4. Methods and Materials

4.1. Study area and period

The study was conducted in St. Paul's Hospital Millennium Medical College, GI Specialty clinic. St. Paul's hospital is one of the largest tertiary referral public hospitals in the capital under the Federal Ministry of Health. The hospital has different units in it: internal medicine, pediatrics, gynecology/obstetrics, surgery, dentistry, psychiatry, ophthalmology, hospital pharmacy, dermatology. Under the department of internal medicine, there are a number of sub-specialties. Among these, GI specialty unit is one of the core areas where an outpatient and inpatient service, endoscopy, colonoscopy as well as academic activities carried out despite high work load. The data from GI clinic showed the clinic give service to around 3574patients. The study was conducted at SPHMMC adult GI clinic over 2 years period from January 1, 2017 to January 1, 2019.

4.2 Study design

A hospital based retrospective cross sectional descriptive study of all GI patients' record on follow up from January 1, 2017 to January 1, 2019 was conducted.

4.3 Population

4.3.1. Source population:

All patients on follow up at GI clinic of SPHMMC.

4.3.2. Study population:

All patients on follow up at GI clinic of SPHMMC fulfilling the inclusion criteria

4.4. Inclusion and exclusion criteria

4.4.1. Inclusion criteria

All patients on follow up at SPHMMC, GI clinic at specified time period.

4.4.2. Exclusion criteria

Age 15 years old and below

Patients whose diagnostic work up are not completed and diagnosis not settled.

4.5. Sample size determination and sampling technique

4.5.1. Sample size determination:

The sample size can be determined by

$$N = (z\alpha/2)^2 p (1-p)/d^2$$

Where N = sample size

$$z \alpha / 2 = 1.96$$

p= prevalence of IBD from literature (= 0.827% - the highest from Europe was taken and 0.076% the highest from South Africa was taken)

d= marginalized error which is 0.05 (5%)

Confidence interval= 95

n = 12 & 1 respectively

Too small to represent the study population

Therefore all IBD patients who fulfill the inclusion criteria during the study period were 61 and all were taken

$n = 61$

Sample size was also calculated by using clinical characteristics of IBD; (rectal bleeding (33%) highest and arthritis (3%) the lowest from Ethiopian Jews study) and was 354 & 44 respectively.

But since there were only 61 IBD patients and all were taken clinical characteristics assessment was also done for 61 patients.

4.5.2 Sampling technique:

All patients with established diagnosis of IBD that fulfilled the inclusion criteria during the study period were taken.

4.6 Measurement and study variables

4.6.1 Instrument

A structured checklist with the following contents was used for data collection: age, sex, chart number, occupation, area of residence, clinical presentation, duration on follow-up, colonoscopy finding, histology report, IBD type, surgical intervention history, smoking history, family history of similar illness, appendectomy, trial of Anti-TB and current medications.

4.6.2 Study variables

4.6.2.1 Lists variables

- Age, sex , occupation, Area of residency
- Prevalence of IBD
- IBD types, presentation clinical complaint, disease location, histology report, extra-intestinal manifestations, presence of complications, surgical intervention history, medications.
- History of smoking, family history, appendectomy.

4.7 Operational Definition

Inflammatory bowel disease- is comprised of two major disorders: ulcerative colitis and Crohn disease. These disorders have both distinct and overlapping pathologic and clinical characteristics

Crohn's disease- is a disorder of uncertain etiology that is characterized by transmural inflammation of the gastrointestinal tract. CD may involve the entire gastrointestinal tract from mouth to the perianal area

Ulcerative colitis- Ulcerative colitis is a chronic inflammatory condition characterized by relapsing and remitting episodes of inflammation limited to the mucosal layer of the colon.

Indeterminate colitis- was used when there was clear evidence of IBD but insufficient evidence to make a definitive diagnosis of either UC or CD.

Clinical characteristics – includes; sociodemographic features, clinical complaint of the patient, colonoscopic disease location, histology report, extra-intestinal manifestations, presence of complications (fistula, stricture, anemia) , current medications & history of surgical intervention and presence of known risk factors (- smoking history, family history, appendectomy).

Anemia – Defined as a decrease red blood cell hemoglobin concentration. According to the WHO criteria : hemoglobin levels under 12 g/dL for females and 13 g/dL for males

4.8. Data collection procedure

The medical record numbers of all IBD patients on follow-up at GI clinic of SPHMMC during the study period were collected from GI clinic HMIS logbook were the diagnosis and medical record number of all 3574 patients on follow up at GI clinic was documented. There were about 230 medical record numbers for which the diagnosis was not documented clearly. The clinical record of all of those patients was collected and their diagnosis was clarified in order not to miss IBD patients. In addition the medical record number of IBD patients was identified from colonoscopy unit registration book. By using identified medical record numbers the clinical records of the study population were collected and reviewed after cross-checking. Data was collected by the principal investigator and data collectors (three 2nd year medical residents) using a structured checklist developed by review of different literatures. Then the data were filled by the investigator and data collectors in to the questionnaire. Data was collected from February 1, 2019 to march 30, 2019.

4.9 Data quality management

Pre-test of the questionnaire was carried out on 3 records of patients that were not selected for the study, to check its clarity and completeness. The pre-test result was first discussed and necessary corrections were made on the questionnaire before the actual data collection commenced. Data quality was managed through checking if charts of the study population are complete. The data collectors were given brief orientation concerning appropriate data collection and recording. The collected data were checked for completeness, clarity and consistency by principal investigator.

4.10 Data processing and analysis

The collected data were cleaned, categorized and analyzed by the investigator; the collected data were entered into a computer using Statistical Package for Social Science (SPSS) version 23. The data were summarized and described using tables. Descriptive statistics was used to put results of the study in the form of findings and percentages. Simple frequencies and percentages were organized in tables and charts.

4.11 Dissemination of result

Finally, the result of the research was submitted to the department of Internal Medicine, reported to all concerned bodies and documented in the library of SPHMMC. The finding will be presented to staffs and students of SPHMMC and others, as possible. The findings will be also published in locally accessible or international journals.

4.12 Ethical issues

Names and other identification that reveal patients identity were kept strictly hidden and were not revealed in the checklist and only registration number were used. Letter of support was obtained from department of internal medicine, SPHMMC. Letter for cooperation from each level were obtained and ethical clearance was obtained from the Institutional Research Board (IRB) of SPHMMC.

5. Result

In this assessment of prevalence and clinical characteristics of inflammatory bowel diseases, 64 possible IBD patients MRN were identified. Of this 3 patients were excluded b/c of incomplete workup (i.e. all were appointed for colonoscopy). A total of 61 established cases of IBD were identified during the study period. All eligible patients were included and response rate is 100%. Variables; age at diagnosis, sex, area of residency, occupation, presenting complaint, extra intestinal manifestation, colonoscopy location, histology, complication, current medication, anti-TB trial, history of surgical management, smoking history, family history of IBD and appendectomy history were included

5.1 Sociodemographic Characteristics of IBD patients

The age ranges of 61 IBD patients were between 16-75 years. The median age of onset of IBD was 27 years. The overall gender distribution shows 34(55.7%) women and 27(44.3%) men. The sex ratio for IBD was 1:1.26 (male: female). Data regarding family history of IBD was available on 59 patients (97%). There was no pertinent family history of IBD among recorded cases. Thirty four patients were from Addis Ababa 15 were from other urban areas and 12 patients were from rural area. Regarding occupation 18(31.6%) of patients were civil servants, 11(19.3%) were students. Smoking details were available for 57 patients (93%). One current smoker and 3 previous smokers were recorded. (table.1)

Table.1 Sociodemographic Characteristics of IBD patients at SPHMMC GI clinic from January, 1, 2017 to January, 1, 2019

category	characteristics	Number of patients	%	Missing value
Age at diagnosis	15-30	39	63.9%	0
	31-45	16	26.2%	
	46-60	4	6.6%	
	>60	2	3.3%	
sex	Male	27	44.3%	0
	Female	34	55.7%	
Area of residency	Addis Ababa	34	55.7%	0
	Other urban	15	24.6%	
	Rural	12	19.7%	
Occupation	Student	11	19.3%	4(6.5)
	House wife	7	12.3%	
	Civil servant	18	31.6%	
	Private worker	15	26.3%	
	Farmer	5	8.8%	
	Unemployed	1	1.8%	
Smoking	Smoker	1	1.8%	4(6.5)
	Previous smoker	3	5.3%	

	None smoker	53	93%	
Family of IBD	No family history of IBD	59	100.0%	2(3.3)

5.2 Magnitude of IBD

A total of 61 patients with confirmed IBD diagnosis were on follow-up at GI clinic during the study period. Of this 40(65.6%) patients were diagnosed with CD, 18(29.5%) with UC and 3(4.9%) with indeterminate IBD. There were a total of 3574 patients on follow up at GI clinic of SPHMMC during the study period. The prevalence rate of IBD patient at GI clinic was 1.7%, CD was 1.1%, UC was 0.5% and indeterminate IBD was 0.08%.

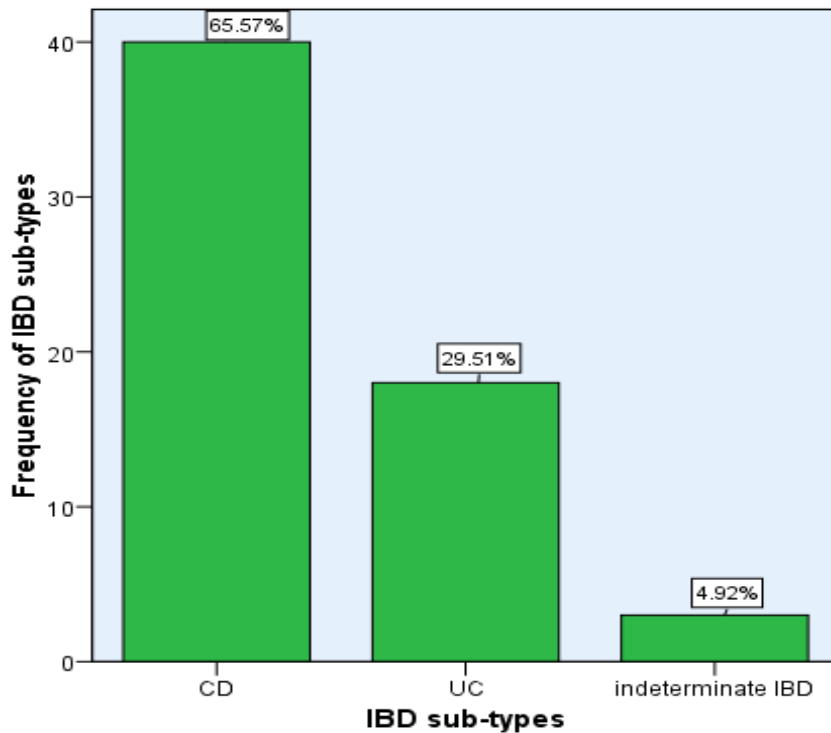


Figure1. Frequency distribution of types of IBD at SPHMMC GI clinic from January, 1, 2017 to January, 1, 2019

5.3 Clinical characteristics of IBD patients

In this study the main complaints of IBD patients at initial presentation were combined abdominal pain and diarrhea (36.1%), abdominal pain (34.4%), rectal bleeding (23%) and diarrhea (6.6%). Extra intestinal manifestation was recorded for 3 patients with 2 patients having ophthalmic symptoms and 1 patient with joint involvement. The mean duration on follow-up was 21 months (ranging from 5-62 months). The colonoscopy disease location includes; terminal ileum (32.8%), colon (26.2%), Ileocolon (23%) and Proctitis (9.8%). The histology report says nonspecific colitis in 33.3% of patients. Entero-cutaneous fistula was seen in 8

patients and anemia was found in 7 patients. During the study period 31.1% of patients were taking azathioprine and 23% were taking prednisolone.

Among subtypes of IBD patients, the median age at diagnosis for CD was 26 years and 30 years for UC. The sex ratio (male: female) of UC patients was (1.57:1), CD (1:1.67) and indeterminate IBD (1:2). CD patients present with abdominal pain in about 20(50%), abdominal pain and diarrhea combined in 19(47.5%) and rectal bleeding in 1 patient. Patients with UC presented with rectal bleeding 13(72.2%), combined abdominal pain and diarrhea in 2 patients. One UC patient had ophthalmic symptoms and 2 patients with CD had extra-intestinal manifestations; 1 with ophthalmic symptom and other with joint involvement. The colonoscopic disease location in CD patients, were terminal ileum disease in 19(47.5%), ileocolon involvement in 14(35%) and disease limited to colon in 2 patients. Two patients (5% of all CD) were having upper GI involvement. Patients with UC 11(61%) had colonic disease and 6(33%) were having disease limited to the rectum.

The histology report was suggestive of UC in 66.7% of patients, CD in 71.8%. The frequency of fistulizing and structuring disease at diagnosis was 22.5% and 7.5% respectively in CD. Anemia at diagnosis was seen in 33.3% of UC and 5% of CD patients. Previous treatment with anti-TB was found in 20(50%) patients with CD. During the study period 12(30%) of CD patients were taking azathioprine, 7(17.5%) were on prednisolone, 4 patients were on azathioprine with antibiotics and 1 patient was taking mesalamine. UC patients were taking prednisolone 7(38%) and azathioprine 6(33%). Surgical intervention was done for 7 patients with CD on 1st presentation and for 5 patients during follow-up. One patient with UC underwent surgery on follow-up. History of appendectomy was identified in 2 patients with CD diagnosis. (table. 2)

Table 2. Clinical Characteristics of IBD patients at SPHMMC GI clinic from January, 1, 2017 to January, 1, 2019

category		IBD sub-types			All IBD	Missin g value
		UC (%)	CD (%)	Indetermina te IBD (%)		
Age at diagnosis	15-30	8 (44.4)	28(70.0)	3(100.0)	39(63.9)	0
	31-45	7 (38.9)	9(22.5)	0	16(26.2)	
	46-60	2(11.1)	2(5.0)	0	4(6.6)	
	>60	1(5.6)	1(2.5)	0	2(3.3)	
sex	male	11(61. 1)	15(37.5)	1(33.3)	27(44. 3)	0
	female	7(38.9)	35 (62.5)	2 (66.7)	34(55. 7)	
Extra intestinal manfst.	Join	0	1 (2.6)	0	1(1.8)	4(6.5)
	Eye	1 (6.3)	1 (2.6)	0	2 (3.5)	
	none	15(93.8)	37(94.9 0)	2(100)	54(94. 7)	
Presenting complaint	Abdomin al pain	0	20 (50.0)	1(33.3)	21(34. 4)	0
	diarrhea	3(16.7)	0	1(33.3)	4(6.6)	
	Rectal bleeding	13(72. 2)	1 (2.5)	0	14(23. 0)	
	Abdomin al pain&diar r.	2 (11.1)	19(47.5)	1(33.3)	22(36. 1)	
Colonosco	terminal	1 (5.6)	19(47.5)	0	20(32.	

py location	ileum				8)	0
	colon	11(61.1)	2 (5.0)	3(100)	16(26.2)	
	ileocolon	0	14 (35)	0	14 (23)	
	proctitis	6 (33.3)	0	0	6 (9.8)	
	upper GI & ileocolon	0	2 (5)	0	2 (3.3)	
	No done	0	3 (7.5)	0	3 (4.9)	
histology	UC	12(66.7)	0	0	12(20.0)	1(1.6)
	CD	0	28(71.8)	0	28(46.7)	
	Non specific	6(33.3)	11(28.2)	3 (100)	20(33.3)	

category		IBD sub-types			All IBD	Missin g value
		UC (%)	CD (%)	Indetermina te IBD (%)		
complicatio ns	Stricture	0	3 (7.5)	0	3(5.0)	1(1.6)
	Fistula	0	8 (20)	0	8 (13.3)	
	Anemia at diagnosis	6 (33.3)	1 (2.5)	0	7 (11.7)	
	fistula and anemia	0	1 (2.5)	0	1 (1.7)	
	none	12(66.7)	27(67.5)	2 (100)	41(68.3)	
Current medication	Prednisolon e	7 (38.9)	7 (17.5)	0	14 (23)	0
	Azathioprin	6 (33.3)	12(30)	1 (33.3)	19(31.1)	

	e					0
	Methotrexate	0	2 (5.0)	0	2 (3.3)	
	Mesalamine	0	1 (2.5)	1 (33.3)	2 (3.3)	
	Prednisolone & Azathioprine	0	4 (10)	1 (33.3)	5 (8.2)	
	Antibiotics & azathioprine	0	4 (10)	0	4 (6.6)	
	None	5 (27.8)	10 (25.0)	0	15 (24.6)	
Surgical intervention	At presentation	0	7 (17.5)	0	7 (11.5)	5 (8.1)
	After diagnosis	1 (5.6)	5 (12.5)	0	6 (9.8)	
	None	17 (94.4)	28 (70.0)	3 (100)	48 (78.7)	
Anti-TB trial	Given	0	20 (50)	0	20 (32.8)	4 (6.5)
	Not given	18 (100)	20 (50)	3 (100)	41 (67.2)	
Appendectomy history	done	0	2 (5.3)	0	2 (3.6)	
	No history	15 (100)	36 (94.7)	3 (100)	54 (96.4)	
Smoking	smoker	0	1 (2.6)	0	1 (1.8)	
	Previous smo.	0	3 (7.7)	0	3 (5.3)	
	Non smoker	16 (100)	35 (89.7)	2 (100)	53 (93)	

6. DISCUSSION

From this study, among 61 IBD patients on follow-up 65.5 % were CD patients. The prevalence rate of IBD patient at GI clinic of SPHMMC was 1.7%, CD was 1.1%, UC was 0.5% and indeterminate IBD was 0.08% when expressed among 3574 GI patients on follow up during the study period. The prevalence of IBD was higher in our study when compared with other studies (3, 12, 14, 16). However, valid comparison regarding prevalence of IBD between our study and those studies was difficult; b/c our study was hospital based and single center study which did not reflect a population true prevalence. In addition our study lack clear denominator because our patients came from different area of the country. From the study involving Ethiopian Jews, among 32 IBD patients 94% were CD patients, which is even higher than in our study (23). In contrast, other studies different part of the world shows high rate of UC as reported from studies in Sweden (15), Brazil (17), China (18), India (19), and Egypt (22). The reason for this difference is not known, but the fact that high CD rate was found among Ethiopian Jews study may relate to population genetic factors or environmental influence.

From this study, the commonest age group at diagnosis of IBD was between 15-30 years of age with UC patients relatively older than CD patients. The median age of IBD onset was 27 years of age with that for CD being 26 years and 30 years for UC. A similar observation was reported from studies in Brazil were CD patients were diagnosed at age younger than 25 years and UC patients were

diagnosed at age older than 25 years of age (17). The study from China also showed majority of CD patients were diagnosed between 17–40 years of age, were as UC cases were featured with later disease diagnosis (18). IBD from the Western study was associated with a bimodal age distribution pattern, with a peak at age 20-39 years and a second smaller peak at 60-79 years (3). But that was not uniformly found in most studies. It is not known whether these differences in age distribution are real or represent variations in diagnostic criteria.

Overall, IBD was slightly more common in women in our study (56% female versus 44% male) and in CD (62.5% vs 37.5%) with slight male predominance in UC (39% vs 61%). Loftus et al demonstrated a similar result in large North American studies, with the overall IBD frequency for women ranging from 48-60% (4). The Brazil study also showed women had a higher prevalence of IBD (17). Opposite result was found from Crete study (13) and southern Israel study (14). The Ethiopian Jews study also shows male predominance, were about 18(56%) of patients were male as opposed to our study (23). Different western study showed that the IBD was not sex specific (3). This may explain small difference in sex distribution among IBD patients from different studies. Most of the patients (80%) were urban inhabitants. Similar results were reported from other studies (15, 17, 22).

Regarding clinical presentation the most frequent initial symptoms in order were combined abdominal pain and diarrhea (36.1%), abdominal pain (34.4%), rectal bleeding (23%) and diarrhea (6.6%). CD patients present more commonly with abdominal pain (50%), while those with UC had a higher frequency of rectal bleeding (72.2%). Different studies shows similar pattern of presentation (18, 19, 22). Extra intestinal manifestation was recorded only for 3 patients. The Ethiopian Jews study also showed low rate of extra intestinal manifestation as compared to Ashkenazi (3% versus 27%) (23). Studies from other parts of the world also reported higher rate of extra intestinal manifestations (17, 18, 19). The reason for this difference is unknown, but genetic and environmental factors may be the possible cause. History of smoking was found in 3 patients and appendectomy history in 2 patients. Both smoking and appendectomy history were lower when

compared to other studies (17, 18, 21, 23). In addition it was generally thought that a family history increases individual's risk of developing IBD (5). In our study, there was no pertinent family history identified among documented cases. Ethiopian Jews study also showed no family history of IBD. The reason for this difference is unclear, may be due to low rate of detection. The effect of genetic factors may also explain this difference, as other study shows similar result (23).

The commonest colonoscopy disease location was terminal ileum disease (32.8%) followed by disease of colon (26.2%). Proctitis was seen in (9.8%) of IBD patients. In CD patients, terminal ileum disease was commonest finding. Upper GI involvement was seen in 2 CD patients. In UC 61% of patients presented with colonic disease and 33% with disease limited to the rectum. The frequency of fistulizing and structuring diseases were 22.5% and 7.5% respectively in CD. The histology report showed suggestive features in 66.7% of UC patients and in 71.8% of CD patients. The study on Ethiopian Jews shows similar colonoscopic pattern with little difference. They observed higher UGI tract involvement (23%), higher ileocolonic involvement and higher obstructive pattern than fistulary pattern (27% vs 20%). The other international studies also show different results with some similarities with our study. Chinese patients with CD have lower rate of disease limited to terminal ileum and have higher rate of structuring disease than fistula. Study in India also shows different pattern with high rate of upper GI involvement in CD patients. The reason for this difference is unclear (17, 18, 23).

Anemia at diagnosis was identified in 33.3% of UC and 5% of CD patients. When we see other international studies, similar pattern of anemia was seen from study in China (18) but in the Sweden study anemia was more common among newly diagnosed patients with CD compared with UC (15). The reason for this difference is unknown.

Surgical intervention was done for 7 patients with CD on 1st presentation and for 5 patients during follow-up. During the study period most patients were taking azathioprine followed by prednisolone. Anti-TB trial was given for 20(50%)

patients with CD. Study in Egypt showed that, among 157 patients 11 patients underwent surgery. From Indian study 4% of patients with UC underwent colectomy while 15.2% of patients with CD underwent surgical intervention during follow up. All patients from 2 above studies were operated after diagnosis unlike our patients were more than half of patients that underwent surgery present with surgical complications at 1st presentation (17, 22). The reason for this difference is unclear, may be due to delay in seeking medical care or delay in diagnosis. From Indian study 36.7% of CD patients had received prior anti-TB treatment, compared with (7.8%) with UC. This could be due to high prevalence of tuberculosis and similar clinical presentation with CD. In addition most of patients from Indian study and from Ethiopian Jews study were taking azathioprine (18, 22).

The reason for observed difference is unclear; however it may reflect true differences in disease phenotype or may relate to the study design and relatively smaller sample size from our study. Overall direct comparison of the current study to previously published results is difficult due to methodological and population inconsistencies.

7. Strength of the study

It was the first study done at SPHMMC and probably in Ethiopia too with this topic

The study tried to address one of the emerging public health problems

8. Limitations

Difficult to assess population prevalence b/c of study design and lack of clear denominator

This is a single center study with limited number of patients and cannot be generalized to the whole population.

Assessment of other clinical parameters like treatment outcome and disease severity were difficult b/c of missing of those data on most patients charts

Small sample size

9. CONCLUSION

Our study provided information in relation to the disease magnitude and clinical characteristics. The prevalence rate of IBD patient at GI clinic was 1.7%, CD was 1.1%, UC was 0.5% and indeterminate IBD was 0.08%. Crohn's disease is the most prevalent sub-type of IBD. Our study indicated that the clinical features of IBD in our hospital were different from those in other countries, in terms IBD sub-types, sex distribution, disease location and the prevalence of extra-intestinal manifestations and presence of known risk factors.

10. RECCOMENDATION

The need to have awareness creation for health care providers at different level about IBD by policy makers in order not to miss cases and for early referral to GI centers as some patients are diagnosed post-surgery.

Suggest having multi-center study for future researchers which may provide true population prevalence and useful clinical data and will allow more reliable comparisons with similar internationally derived data. In this regard, our study finding may serve as a baseline for larger studies.

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Annex 1 : DATA COLLECTION FORMAT

- a) Data collection tool on the prevalence of IBD at SPHMMC, GI clinic (to be filled from patient's chart)

01. Chart No. _____

02. Age a. 15-30, b. 31-45, c. 46-60, d. above 60

03. Sex: 1. Male 2. Female

04. Area of residence 1. Addis Ababa 2. Other urban (specify) _____ 3. Rural

05. Marital status 1. Married 2. Single 3. Divorced 4. Widowed

06. Religion 1. muslim 2. Christian 3. Protestant 4. Other (specify) _____

07. Occupation _____

08. Clinical complaint on presentation 1. Abdominal pain 2. Diarrhea
3. Rectal bleeding 4. perianal pain or discharge 5. Vomiting 6. Weight
loss 7. Other _____

09. 7. Extra-intestinal manifestations 1. Joint 2. Skin 3. Eye 4.
others _____ 6. none

10. Duration of illness / Age at diagnosis (Years) ____/____

11. Colonoscopy done 1. **Yes** 2. No

12. If yes to question number (11); Disease location 1. Terminal ileum 2.
Colon 3. ileocolon 4. Upper GI 5. Proctitis 6. Other
important description _____

13. Biopsy taken 1. Yes 2. No

14. If yes to question number (13); 1. site _____ 2. Histology
report _____

15. Complications 1. Stricture 2. Fistula 3. Anemia 4. none

16. If anemia is present; Hgb level 1. At diagnosis _____ 2. current

17. IBD types 1. UC, 2. CD 3. Indeterminate IBD 4. others

18. Medications over the past 1 year/duration 1. _____ 2.
_____ 3. _____

19. Surgical intervention history 1. Yes, & at first presentation 2. Yes, & while on follow up 3. No

20. If yes to question number (19); indication for surgery 1. Colectomy 2, other (specify) _____

21. History of smoking 1. Yes 2. Previous smoker 3. No

22. Family history of IBD 1. Yes 2. No

23. Previous history of appendectomy 1. Yes 2. No

