ORIGINAL ARTICLE

Epidemiologic aspects of inflammatory bowel disease in the Western region of Minas Gerais State

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ABSTRACT – **Background** – Crohn's disease (CD) and ulcerative colitis (UC), two of the main inflammatory bowel diseases (IBD), have been increasingly diagnosed in South America. Although IBD have been intensively studied in the last years, epidemiologic data in Brazil are scarce. **Objective** – To study the clinical and epidemiologic profile of IBD patients treated in the Clinical Hospital of the Federal University of Uberlândia from 1999 to 2014. **Methods** – We performed a retrospective study of the medical records of patients diagnosed with IBD, according to the international classification of diseases (ICD) – ICD K50 for CD and ICD K51 for UC – confirmed by endoscopic examination in the case of both diseases. We analyzed the following variables: age; sex; ethnicity; smoking habit; primary diagnosis; site of disease manifestation; main clinical manifestations; IBD-related complications; extraintestinal manifestations; and established drug and/or surgical treatment. **Results** – We evaluated 183 IBD cases (91 UC and 92 CD cases). The estimated prevalence rate of UC was 15.06/100.000 inhabitants and of CD was 15.23/100.000. The CU and CD female to male incidence ratios were 1.7 and 1.8, respectively. The average age of patients diagnosed with UC was 39.4 years and of those diagnosed with CD was 31.1 years. White-skinned people were the most affected by UC (66.0%) and CD (69.0%). Few patients were submitted to surgical procedures as treatment alternative. **Conclusion** – The estimated prevalence of IBD in this population was low compared to that of populations of North America, but high compared to that of other regions considered to present low incidence, such as some Asian and Latin American countries.

Keywords – Epidemiologic profile; Crohn's disease; ulcerative colitis.

INTRODUCTION

Inflammatory bowel diseases (IBD) are a group of chronic diseases of still unknown causes[1,2] that trigger a chronic inflammatory reaction of the digestive tract[3,4]. The physiopathology responsible for IBD development comprises a chronic uncontrolled inflammatory process of the intestinal mucosa as a response to a potential aggressive agent. Despite the unknown etiology, genetic and environmental factors (e.g., dietary habits, lifestyle, sanitary conditions, and gut microbiota composition) are believed to be responsible for the development of these diseases[5].

The main types of IBD are Crohn's disease (CD) and ulcerative colitis (UC)[6]. Both are considered a major public health problem in many countries[1,7] due to their growing incidence and impact on the patients' quality of life, affecting them socially, psychologically and professionally[8].

Crohn's disease is chronic and recurrent and can affect any part of the digestive tract (from the mouth to the anus). The inflammation in this case is most often described as of the transmural type and can be characterized by discontinuous injuries[9]. The injuries can usually be seen on endoscopic examination, in which it is possible to evaluate their characteristics, extent and severity, and collect biopsies for microscopic analysis[10]. On the other hand, UC is limited to the colon and rectum regions, takes a relapsing-remitting course, with involvement strictly limited to the mucosal layer[11].

Over the last years, the number of IBD cases has significantly increased in Western populations[12], especially in developed countries[13], with higher occurrence in the Northern hemisphere[14,15]. However, the incidence has also increased in regions where these diseases were previously considered of low prevalence, such as Japan, South Korea, Singapore, Northern India, and Latin America[16]. Such trend is likely associated with the improvement of socioeconomic conditions in these areas[17] since, according to the hygiene hypothesis, improved health conditions coupled with lower exposure to infections during childhood may impair the immune response later in life[18].

Epidemiologic studies addressing IBD in Latin America are few. Some researches, however, have demonstrated an increasing incidence of UC and CD, as for example in Chile[19]. The incidence and prevalence of IBD in Brazil is still considered low, although some studies have shown a remarkable growth in incidence, prevalence and hospitalization for these diseases[20-23]. The lack of studies and scientific publications focused on this group of diseases contributes to delayed diagnosis and higher morbidity[1].

The objective of this research was to know the epidemiologic profile of IBD patients treated in the Clinical Hospital of the Federal University of Uberlândia (HC–UFU).

METHODS

Study location

The study took place in the city of Uberlândia (FIGURE 1), state of Minas Gerais, Southeast Brazil. Uberlândia had a Municipal Human Development Index (MHDI) of 0.789 in 2010, which was above the MHDI of Minas Gerais (0.731) and Brazil (0.727)[24].

FIGURE 1. Study area: Uberlândia, Minas Gerais State, Southeastern Brazil.

The research was conducted in the Clinical Hospital of the Federal University of Uberlândia (HC–UFU), a reference for medium and high-complexity health care serving patients of the National Unique Public Healthcare System (SUS) in the *Triângulo Mineiro* and Alto Paranaíba region[25].

Sampling design

In order to describe the clinical and epidemiologic profile of National Unique Public Healthcare System patients with IBD who received care in the HC-UFU from 1999 to 2014, we performed a retrospective descriptive study with quantitative analysis based on the medical records of inpatients and outpatients. Diagnoses were confirmed by endoscopic examination (colonoscopy) and classified according to the international classification of diseases (ICD) – K50 for CD and K51 for UC. Patients presenting colitis caused by other factors such as parasitic infections, granulomatous diseases (e.g. tuberculosis), neoplastic diseases, and acquired immunodeficiency syndrome (AIDS); and patients whose data were fed into the system but who were not diagnosed with IBD were excluded from the analysis.

We analyzed the following variables: age; sex; ethnicity; marital status; smoking habit; primary diagnosis; site of disease manifestation; main clinical manifestations; IBD-related complications; extraintestinal manifestations; established drug and/or surgical treatment; and number of hospitalizations after diagnosis.

Statistical analysis

Incidence rates were expressed as number of cases per 100,000 inhabitants. Absolute and relative frequencies were used for descriptive statistical analyses. The chi-squared test was used in the inferential analysis to compare incidence rates according to qualitative variables (sex, marital status, ethnicity, and site of disease manifestation). *P* values less than or equal to 5% (≤0.05) were considered significant. We performed the statistical tests in the IBM® SPSS® Statistics software version 23.0 and in Microsoft Excel® 2011.

We also calculated the estimated incidence (new cases/100,000 inhabitants/period) and prevalence (existing cases/100,000 inhabitants/period) rates of IBD in the HC–UFU based on the frequency of IBD cases per year and annual data of population size of the city of Uberlândia within the period from 1999 to 2014 provided by the Brazilian Institute of geography and statistics[26].

Ethical considerations

The study was approved by the Research Ethics Committee of the Federal University of Uberlândia (CAAE: 45724715.6.0000.5152) and patient confidentiality was guaranteed at all phases of the study. Informed consent was not needed because the data were retrieved from filed medical records of the HC–UFU, which are recognized instruments whose usage is exempted from the informed consent requirement.

RESULTS

We analyzed 183 medical records of patients with confirmed diagnosis of IBD seen in the HC–UFU from 1999 to 2014. We found a total of 91 (49.7%) cases of UC and 92 (50.3%) of CD.

The annual rate of new cases of IBD increased between 1999 and 2009. In 2010, significant increases were observed in the estimated incidence, reaching 18 new cases (CD=9, UC=9). The estimated incidence rate in the studied hospital was 1.32 cases/100,000 inhabitants/year in 1999, reaching a peak in 2010 with 2.98 cases/100,000 inhabitants/year. The estimated incidence per year increased progressively during the sampled period, with a greater number of new cases from 2008 to 2010 (FIGURE 2). During the studied period, the estimated prevalence of IBD at the HC–UFU was 30.29 cases/100,000 inhabitants, consisting of 15.23 cases of CD/100,000 inhabitants and 15.06 cases of UC/100,000 inhabitants.
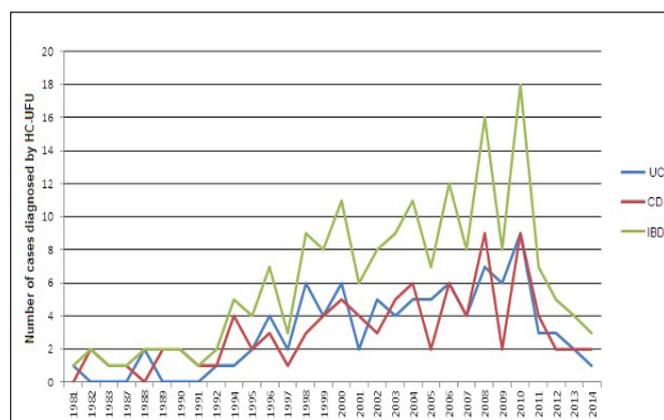

FIGURE 2. Annual incidence rates of inflammatory bowel diseases (IBD) (total), ulcerative colitis (UC), and Crohn's disease (CD) in Uberlândia, Minas Gerais, Brazil, from 1999 to 2014.

Age at diagnosis varied from 1 to 80 years, with an average of 35.2 years and a standard deviation (SD) of 15.3 years. The average age at appearance of UC and CD was 39.4 (SD=15.3) and 31.1 (SD=15.0) years, respectively. Our results showed a greater estimated incidence of CD in individuals from 21 to 30 years old, while the estimated incidence of UC was greater on individuals aged 31 to 40. FIGURE 3 shows the age distribution of patients at diagnosis of UC and CD.
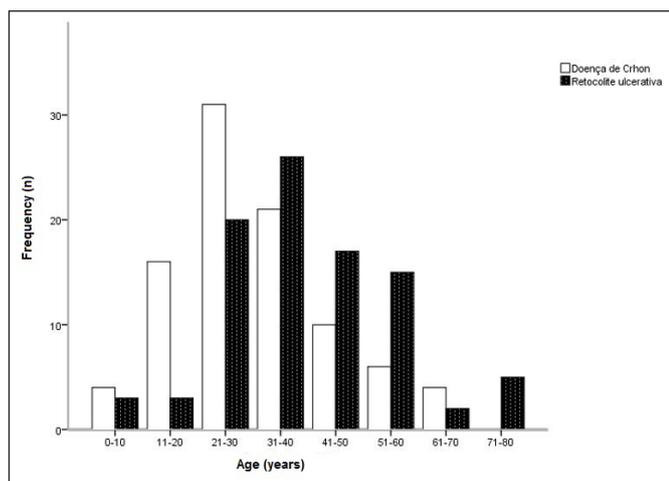
FIGURE 3. Age profile of ulcerative colitis (UC) and Crohn's disease (CD) patients in Uberlândia, Minas Gerais (Brazil), from 1999 to 2014.

There was a predominant occurrence of CD and UC in women. Female to male incidence ratios were 1.8/1.0 for CD and 1.7/1.0 for UC. The association between incidence and sex was statistically significant for both diseases (P=0.011 for CD, P=0.026 for UC). TABLE 1 shows the demographic aspects of the study subjects and characteristics of the population of Uberlândia for comparison and statistical analysis.

Regarding ethnical groups, 66.0% of UC patients were white skinned, 29.0% brown skinned, and 5.0% black skinned. Among CD patients, 69.0% were white skinned, 30.0% brown skinned, and 1.0% black skinned. As for the marital status, 95 (51.9%) patients were married, 74 (40.4%) single, 10 (5.5%) divorced, and 4 (2.2%) widowed (TABLE 1).

We analyzed some of the factors that could influence the IBD pathogenesis in this group of patients, including the recent population migration to urban centers. All CD patients and 88 UC patients (97.0%) were residents of urban areas, and only 3 (3.0%) UC patients lived in rural areas (TABLE 1).

Only 102 medical records presented information regarding the patients' smoking habits. According to these records, 62 (29 UC and 33 CD) patients reported they had never smoked, 22 (14 UC and 8 CD) patients were former smokers, and 13 (7 UC and 6 CD) patients were current smokers.

The patients' clinical characteristics can be seen in TABLE 2. Regarding the site of disease manifestation, 39.5% of the UC patients presented proctitis/proctosigmoiditis, 25.3% left colitis, and 35.2% pancolitis. Among CD patients, 42.4% had the ileocolonic region affected, 32.6% the terminal ileum, and in 25.0% the affected region was restricted to the colon.

The fistulizing behavior is considered the most aggressive clinical course and was observed in 37.0% of all CD patients.

The main clinical manifestations presented by UC patients were abdominal pain (64.8%), bloody diarrhea (60.4%), intestinal colic (52.7%), and weight loss (21.9%). These symptoms were also present

TABLE 1. Demographic characteristics of inflammatory bowel diseases (IBD) (total), ulcerative colitis (UC), and Crohn's disease (CD) patients in Uberlândia, Minas Gerais, Brazil, from 1999 to 2014.

Demographic variables	Minas Gerais total population (n=19,597,330)*	Uberlândia (MG) total population (n=604,013)*	IBD	
			CD (n=92) n (%)	UC (n=91) n (%)
Sex				
Female	9,641,877 (49%)	309,099 (51%)	59 (64%)	57 (62%)
Male	9,955,453 (51%)	294,914 (49%)	33 (36%)	34 (38%)
Chi-squared test	–	–	P=0.011	P=0.026
Marital status	–	–	44 (47.8%)	51 (56.0%)
Married	–	–	42 (45.7%)	32 (35.2%)
Single	–	–	5 (5.4%)	5 (5.5%)
Divorced	–	–	1 (1.1%)	3 (3.3%)
Widowed	–	–	P=0.121	P=0.004
Chi-squared test	45.4%	55.8%	63 (69%)	60 (66%)
Ethnicity	44.3%	34.6%	28 (30%)	26 (29%)
White skinned	9.2%	8.3%	1 (1%)	5 (5%)
Brown skinned	–	–	P=0.039	P=0.322
Black skinned	17,715,216	587,266 (88%)	92 (100%)	88 (97%)
Chi-squared test	2,882,114	82,406 (12%)	0 (0%)	3 (3%)
Residence	–	–	P=0.000	P=0.010
Urban				
Rural				
Chi-squared test				

*Source: Brazilian Institute of Geography and Statistics (IBGE, 2010, online database).

TABLE 2. Clinical aspects of patients with ulcerative colitis and Crohn's disease in Uberlândia, Minas Gerais, Brazil, from 1999 to 2014.

	IBD	
	CD (n)	UC (n)
Previous surgeries		
Not performed	75	82
Appendectomy	11	2
Cholecystectomy	4	6
Appendectomy + cholecystectomy	2	1
Site of manifestation		
Terminal ileum	30	–
Ileum and colon	39	–
Colon	23	–
Proctitis	–	36
Left colitis	–	23
Pancolitis	–	32
Extraintestinal manifestations		
Articular	23	31
Dermatological	3	6
Hepatological	3	1
Ophthalmic	2	6
Pulmonary	2	1
Urological	0	2
Renal	1	0
Vascular	0	1
IBD behavior		
Inflammatory	25	0
Stenosing	18	0
Fistulizing	34	0
Steno-fistulizing	10	0
Clinical remission	4	38
No information available in the medical records	1	5

IBD: inflammatory bowel disease; UC: ulcerative colitis; CD: Crohn's disease.

in CD patients, but bloody diarrhea (38.0%) was a less common event than bloodless diarrhea (51.0%) in this group.

Joint manifestations were the most frequent extraintestinal manifestations, affecting 25.0% of the CD patients and 34.0% of the UC patients.

Regarding surgical procedures, appendectomy was the most used in CD patients (11.9%), while cholecystectomy was the most common in UC patients (6.5%). However, 85.7% of all IBD patients had not undergone any surgical procedure.

As for treatments, 118 (64.5%) cases (22.4% CD and 42.1% UC patients) were pharmacologically treated, while 65 (35.5%) cases (27.9% CD and 7.6% UC patients) underwent both pharmacological and surgical treatment.

Among the pharmacological interventions adopted by physicians, the use of aminosalicylates was the most common (88% of all IBD patients), followed by the use of immunomodulators (48%). Besides these, corticosteroids were commonly used in UC patients (37.7%), and biological therapy (infliximab) in CD patients (42.3%).

Of all patients seen at the HC–UFU, 132 (72.0%) were hospitalized, and 51 (28.0%) received outpatient care only.

DISCUSSION

The incidence rates of CD and UC have risen throughout the world over the last decades and, due to the high complexity of these immune mediated diseases, epidemiologic trends suggest a link with the Western culture and lifestyle[15,16]. The highest incidence and prevalence rates of IBD are observed in the United States and Europe, but rates are rapidly growing in Asia, especially in Japan, India, and the Middle East[27,28]. Growing rates are also observed in Latin American countries. In Brazil, for example, in some regions the UC:CD ratio presents a distribution similar to that of countries in North America and Europe when compared to some countries in Latin America[14,29].

In Brazil, the National Unique Public Healthcare System works with a system of reference constituted by the articulation of units, from the lowest to the most complex level of care.

The HC–UFU is the only regional public hospital providing medium and high complexity care to the population of the municipalities of the *Triângulo Mineiro* and Alto Paranaíba region. This region has more than one million inhabitants; so, this hospital currently serves a population of almost three million people and provides more than 2 million consultations per year for patients from Uberlândia and other municipalities. Yet, the incidence and prevalence rates of the present study were calculated based only on the estimated annual population of Uberlândia, where the hospital is located. However, the inclusion of the population of the other cities in the *Triângulo Mineiro* and Alto Paranaíba region could lead to the underestimation of the incidence and prevalence rates.

In Brazil, the estimated prevalence of IBD in the Western region of the state of Minas Gerais was found to be high: 30.29/100,000 inhabitants (UC – 15.06/100,000 inhabitants, CD – 15.23/100.000 inhabitants). The burden of IBD in South America, especially in Brazil, is increasing at a rate possibly even greater than that of other developing regions around the world. Parente et al. (2015)[30] found a prevalence of 12.8 cases/100,000 inhabitants in a University Hospital in the state of Piauí, and Victoria et al. (2009)[21] found a prevalence of 22.6 cases/100,000 inhabitants in São Paulo, Brazil, between 2001 and 2005, in the analysis of a university hospital in the Southeast region of Brazil. The prevalence of IBD in the Western region of the state of Minas Gerais was higher (30.29/100,000 inhabitants) probably because we considered patients from the whole *Triângulo Mineiro* and Alto Paranaíba region.

Studies carried out in other regions of Brazil, similarly to the present one, have reported a high prevalence of IBD. Gasparini et al. (2018)[22] found a prevalence of IBD of 52.6 cases/100,000 inhabitants in the state of São Paulo. In a study of IBD patients who utilized the Public Medication Dispensing System of the Department of Health of Espírito Santo State, Martins et al. (2018)[23] found a prevalence of 38.2 cases/100,000 inhabitants. The estimated incidence and prevalence rates detected in the present and other studies suggest a growing trend of IBD estimated incidence and prevalence in Brazil.

The incidence of IBD in the Western region of Minas Gerais was higher than that found by Parente et al. in 2015[30] in North-eastern Brazil, who reported a peak of 1.53 cases/100,000 inhabitants. However, our results were still much lower than those found in other Brazilian regions, which have been reported to range from 7.7 to 13.30 cases/100,000 inhabitants[21-23].

There was a decrease in both prevalence and incidence in the years 2013 and 2014. In these years, only patients seen in the emergency room and in inpatient units were considered in the analysis because data from outpatients were not fed into de system due to a change in the information system.

In the present work, CD and UC predominated in women, similarly to previous findings in Brazil[20,31]. Although few studies have reported the incidence of IBD according to sex, some data suggest a greater estimated prevalence in women[30]. Although IBD are equally diagnosed in both sexes, their chronicity has a unique impact on women's lives[32]. Our study showed a significantly higher estimated prevalence in women, what can considerably affect their lives, including their sexuality and family planning[33]. Moreover, drug interventions and surgical procedures can negatively affect their self-image and quality of life. Thus, a broader discussion regarding whether or not women should receive a differentiated treatment is necessary.

The Brazilian population presents a heterogeneous ethnic phenotype represented by miscigenous ethnic characteristics. The population of Uberlândia is mostly composed by white-skinned people (55.8%), followed by brown-skinned (34.6%), black-skinned (8.3%), yellow-skinned (1.1%), and indigenous (0.2%) people[26]. Our results agree with the literature in that IBD are more common in caucasian than non-caucasian populations[34]. However, studies have shown that the burden of IBD is lower in black than in white people, but most of the studies include a small number of black patients and cross-sectional analyses[35]. In fact, in regions with characteristics of racial miscegenation and less interaction between white and black people, IBD are gradually affecting other races besides the caucasian[30,36].

Multiple environmental factors have been associated with the development of IBD and geographic variations contribute to higher incidence and modified expression[37]. The recent population migration towards urban centers has led to a positive association between the incidence of CD and UC in urban and rural areas[38]. Our results showed that 98% of the patients (100% of the CD patients and 97% of the UC patients) lived in urban areas, similarly to the observed in other regions of Brazil[21,30,31]. Rapid urbanization in the developing world has been associated with an increasing incidence of several autoimmune diseases, including IBD. Urbanization promotes environmental exposures, such as Westernization of diet, increased antibiotic use, pollution, improved hygiene status, and early-life microbial exposure, that have been shown to affect the gut microbiota and the susceptibility to IBD[39].

Smoking has a parodoxical relationship with IBD: smokers have a higher risk of developing CD and a lower risk of developing UC. In the present study, the analysis of the data showed no relationship between smoking and the development of these diseases. Thus, we did not observe any protective or injurious effects of this factor in IBD, as reported in the literature[40,41].

The most frequent inflammations in UC were proctitis/proctosigmoiditis and pancolitis, as also found in the Central-West region of Brazil[20].

In the case of CD inflammations in the ileum and colon region were the most common. A similar result as to the site of manifestation of the disease was reported for a sample of IBD patients from a mixed population in Bahia State[42] and in a study conducted in the *São José de Joinville Municipal Hospital*, Southern Brazil[43].

The main symptoms described in the literature include diarrhea, abdominal pain, gastrointestinal bleeding, weight loss, bad nutrition, and fatigue[6]. In the present casuistry, diarrhea episodes were the most reported symptom, more frequently bloody in the case of UC, and bloodless in CD. These results are important because symptoms such as abdominal pain and weight loss were reported for both diseases. A more precise correlation between symptoms and severity of IBD may favor a more specific diagnosis, since the approach to suspected IBD patients is different from that to CD patients[44].

Over a third of IBD patients are affected by extraintestinal manifestations. The most common include arthropathies, mucocutaneous and ophthalmologic manifestations, as well as conditions affecting the hepatobiliary system, in both CD and UC[45]. Our results show that most UC and CD patients had joint manifestations, as also observed in other Brazilian studies[31,46,47]. Autoimmune disorders, like rheumatoid arthritis, can lead to greater morbidity than the underlying intestinal disease, and may even be the initial symptoms of the IBD. In this regard, early recognition of these manifestations could lead to the most appropriate therapy to reduce the overall morbidity of the affected patients[48]. Single or multiple complications may occur during development of IBD. For example, fistulas may form along any segment of the intestine, abnormally communicating it with the epithelial surface of other adjacent organs. In our study, fistulas stood out as CD-related complications. Studies already point to their prevalence and suggest endoscopic treatment as an important multidisciplinary approach for IBD[49,50].

In the present study, most of the patients were treated using medication only (64.5%), with no need for surgical intervention. This results are probably due to the growing preference for immunosuppressant and/or biological therapy over surgical approach for both CD and UC[51,52]. Yet, patients who underwent more surgical procedures were those affected by CD (27.9%).

Notwithstanding the increasing ability to control inflammation with new drugs, small progress has been made to prevent intestinal inflammation from progressing to fibrosis, a complication that forces many CD patients to go through surgical procedures[53].

Antibiotics, salicylate derivatives, steroids, immunosuppressants, and biological therapy are part of the therapeutic arsenal for IBD[28]. Among the drug interventions used by patients in this study, the most common were aminosalicylates and immunomodulators (88 and 48%, respectively). Besides these, corticosteroids were common to treat UC and biological therapy (anti-TNF) to treat CD.

The treatment of IBD has improved over the years, mainly after the emergence of biological drugs that block the multiple pathways involved in inflammation. Despite the importance of conventional therapy for the treatment of IBD, these new drugs are necessary to treat moderate and severe forms of IBD[28].

Due to their chronic nature with recurrence and spontaneous remission, both UC and DC require frequent hospital visits and admissions[54]. Although the advent of biological therapies has reduced the number of hospitalizations, the clinical course of IBD is marked by relapses that result in frequent hospitalizations and

bowel surgery[55,56]. The present study showed high hospitalization rates, likewise in other national and international studies[21,43,46,55,56]. Epidemiological data on IBD in Brazil are still scarce, but the increasing frequency of hospitalizations in large urban centers has been demonstrated[21,43, 47].

We recognize that the incidence and prevalence rates found in this study do not faithfully represent the rates in the whole Western region of Minas Gerais. We present here an estimated statistical calculation. Furthermore, other aspects that may have impacted the accuracy of the data include the change in the information system of the researched institution started in 2013, which resulted in the analysis, in the years 2013 and 2014, of patients seen in the emergency and inpatient units only; poor completion of medical records; lack of available data; and incorrect classification of the diagnosis in the filing of cases. We overcame the flaws in the information from medical records through the complementary analysis of endoscopic examinations and biopsies. Finally, considering that approximately 80% of the Brazilian population depends on the National Unique Public Healthcare System and free supply of medications, data from patients covered by private insurance were not included in this study. Their inclusion could lead to over- or underestimation of incidence and prevalence rates. Studies have shown that the prevalence of IBD is higher among commercial compared to government-sponsored managed health care insured individuals. The results presented in this article are part of a master's dissertation that started in 2016 and ended in 2018. Thus, in order to make all stages of the research (collection of data from medical records, writing of the dissertation, and preparation of the article) feasible, the study analyzed data until 2014, totaling a 16-year period and 183 medical records of patients with confirmed diagnosis of IBD.

Despite the potential biases, the present study provided important and possibly representative information on the occurrence of IBD in the Western region of Minas Gerais and Southeast region of the country. The study gains further relevance when considering the small number of epidemiological studies of IBD in these regions and in the country.

CONCLUSION

We found a patient profile close to that reported in the literature. The IBD developed progressively and did not present any prevalence in the studied group. The estimated incidence rate reached a peak of 2.98 cases/100,000 inhabitants/year in this study, while the estimated prevalence was 30.29 cases/100,000 inhabitants. In the specific case of CD and UC, the prevalence was 15.23 and 15.06 cases/100,000 inhabitants, respectively. There was a predominance in middle-aged, female, married, and white-skinned people. The main symptoms were diarrhea, abdominal pain, intestinal colic, and weight loss. The most observed complications were fistulas, enterorrhagia, and intestinal obstruction, and the main extraintestinal manifestations were joint manifestations. Drug therapy was the most common frequent treatment used, and aminosalicylates and immunomodulators were the most commonly used medications. Despite some limitations, this study provides an analysis of epidemiologic data which may be helpful to implement more appropriate clinical approaches to the reality of the assisted patients.

Furthermore, the present analysis of the estimated prevalence rates showed that IBD cases are increasing and are now higher in Brazil than in regions considered to present low incidence, as some Asian and Latin American countries.

Authors' contribution

Martins KR: planning of the study, study design and organization, manuscript concept, literature research, data collection, data interpretation, writing and final revision of the manuscript. Araujo JM: literature research and writing of manuscript. Cruz AC: literature research and writing of manuscript. Luiz-Ferreira A: planning of the study, design study, manuscript concept, interpretation and statistical analysis of data, writing and final revision of manuscript.

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Martins KR, Araujo JM, Cruz AC, Luiz-Ferreira A. Aspectos epidemiológicos das doenças intestinais inflamatórias na região oeste do Estado de Minas Gerais. Arq Gastroenterol. 2021;58(3):377-83.

RESUMO – Contexto – A doença de Crohn (DC) e a retocolite ulcerativa (RCU), duas das principais doenças inflamatórias intestinais (DIIs), têm sido cada vez mais diagnosticadas na América do Sul. Embora a DII tenha sido intensamente estudada nos últimos anos, os dados epidemiológicos no Brasil são escassos. Objetivo – Estudar o perfil clínico e epidemiológico dos pacientes com DII atendidos no Hospital das Clínicas da Universidade Federal de Uberlândia de 1999 a 2014. Métodos – Foi realizado um estudo retrospectivo dos prontuários de pacientes com diagnóstico de DII, de acordo com a classificação internacional de doenças (CID) – CID K50 para DC e CID K51 para RCU – confirmado por exame endoscópico para ambas as doenças. Analisamos as seguintes variáveis: idade; sexo; etnia; hábito tabágico; diagnóstico primário; local de manifestação da doença; principais manifestações clínicas; complicações relacionadas a DII; manifestações extraintestinais; tratamentos medicamentoso e/ou cirúrgico instituídos. Resultados – Foram avaliados 183 casos de DII (91 casos de RCU e 92 casos de DC). A prevalência estimada de RCU foi de 15,06/100.000 habitantes e de DC foi de 15,23/100.000. As taxas de incidência entre pacientes do sexo feminino e masculino foram de 1,7 para RCU e 1,8 para DC. A idade média dos pacientes com diagnóstico de RCU foi de 39,4 anos e daqueles com DC foi de 31,1 anos. A raça branca foi o grupo étnico mais afetado por RCU (66,0%) e DC (69,0%). Poucos pacientes foram submetidos a procedimentos cirúrgicos como alternativas de tratamento. Conclusão – A prevalência estimada de DII nesta população foi baixa em comparação com populações da América do Norte, mas elevada em comparação com outras regiões consideradas de baixa incidência, como alguns países da Ásia e da América Latina.

Palavras-chave – Perfil epidemiológico; doença de Crohn; colite ulcerativa.

REFERENCES

1. Jairath V, Feagan BG. Global burden of inflammatory bowel disease. Lancet Gastroenterol Hepatol. 2020;5:1-2.
2. Weigmann B, Neurath MF. Th9 cells in inflammatory bowel diseases. Semin Immunopathol. 2017;39:89-95.
3. Porter RJ, Kalla R, Ho GT. Ulcerative colitis: Recent advances in the understanding of disease pathogenesis. F1000Res. 2020;9:1-13.
4. Mizoguchi E, Low D, Ezaki Y, Okada T. Recent updates on the basic mechanisms and pathogenesis of inflammatory bowel diseases in experimental animal models. Intest Res. 2020;18:151-67.
5. Crespi M, Dulbecco P, De Ceglie A, Conio M. Strictures in Crohn's Disease: From Pathophysiology to Treatment. Dig Dis Sci. 2020;65:1904-16.
6. Torres J, Colombel JF. Genetics and phenotypes in inflammatory bowel disease. Lancet. 2016;387:98-100
7. Floyd DN, Langham S, Séverac HC, Levesque BG. The economic and quality of life burden of Crohn's disease in Europe and theUnited States, 2000 to 2013: a systematic review. Dig Dis Sci. 2015;60:299-312.
8. Kawalec P. Indirect costs of inflammatory bowel diseases: Crohn's disease and ulcerative colitis. A systematic review. Arch Med Sci. 2016;12:295-302.
9. Torres J, Mehandru S, Colombel JF, Peyrin-Biroulet L. Crohn's disease. Lancet. 2017;389:1741-55.
10. Ungaro R, Mehandru S, Allen PB, Peyrin-Biroulet L, Colombel JF. Ulcerative colitis. Lancet. 2017;389:1756-70.
11. Dignass A, Eliakim R, Magro F, Maaser C, Chowers Y, Geboes K, et al. Second European evidence-based consensus on the diagnosis and management of ulcerative colitis Part 1: Definitions and diagnosis. J Crohns Colitis. 2012;6:965-90.
12. Shivashankar R, Tremaine WJ, Harmsen WS, Loftus EV Jr. Incidence and Prevalence of Crohn's Disease and Ulcerative Colitis in Olmsted County, Minnesota From 1970 Through 2010. Clin Gastroenterol Hepatol. 2017;15:857-63.
13. Bourreille A, Ignjatovic A, Aabakken L, Loftus Jr EV, Eliakim R, Pennazio M, et al. Role of small-bowel endoscopy in the management of patients with inflammatory bowel disease: an international OMED-ECCO consensus. Endoscopy. 2009;41:618-37.
14. Kotze, PG, Damiao, AOMC. Research in inflammatory bowel disease in Brazil: a step forward towards patient care. Arq Gastroenterol. 2020;57:225-6.
15. Holmes EA, Xiang F, Lucas RM. Variation in incidence of pediatric Crohn's disease in relation to latitude and ambient ultraviolet radiation: a systematic review and analysis. Inflamm Bowel Dis. 2015;21:809-17.
16. Quaresma AB, Kaplan GG, Kotze PG. The globalization of inflammatory bowel disease: the incidence and prevalence of inflammatory bowel disease in Brazil. Curr Opin Gastroenterol. 2019;35:259-64.
17. Appleyard C, Hernández G, Ríos-Bedoya CF. Basic epidemiology of inflammatory bowel disease in Puerto Rico. Inflamm Bowel Dis. 2004;10:106-11.
18. Salgado VCL, Luiz RR, Boéchat NLF, Leão IS, Schorr BC, Parente JML. Risk factors associated with inflammatory bowel disease: A multicenter case-control study in Brazil. World J Gastroenterol. 2020;26:3611-24.
19. Figueroa CC, Quera PR, Valenzuela EJ, Jensen BC. Inflammatory bowel disease: experience of two Chile an centers. Rev Méd Chile. 2005;133:1295-1304.
20. Souza MM, Belasco AGS, Aguilar-Nascimento JE. Perfil epidemiológico dos pacientes portadores de doença inflamatória intestinal do estado de Mato Grosso. Rev Bras Colo-Proctol. 2008;28:324-8.
21. Victoria CR, Sassak LY, Nunes HR. Incidence and prevalence rates of inflammatory bowel diseases, in midwestern of São Paulo State, Brazil. Arq Gastroenterol. 2009;46:20-5.
22. Gasparini RG, Sassaki LY, Saad-Hossne R. Inflammatory bowel disease epidemiology in São Paulo State, Brazil. Clin Exp Gastroenterol. 2018;11:423-9.
23. Martins AL, Volpato RA, Zago-Gomes MP. The prevalence and phenotype in Brazilian patients with inflammatory bowel disease. BMC Gastroenterol. 2018;18:1-7.
24. Atlas do Desenvolvimento Humano no Brasil. Programa das Nações Unidas para o Desenvolvimento. [cited 2020 Aug 1]. [Internet]. Available from: http://www.atlasbrasil.org.br.
25. Hospital de Clínicas de Uberlândia. [cited 2020 Aug 1]. Available from: http://www.ufu.br/hc.
26. Instituto Brasileiro de Estatística. [cited 2020 Aug 1]. [Internet]. Available from: http://www.cidades.ibge.gov.br/xtras/temas.php?lang=&codmun=317020&id-tema=67&search=minas-gerais%7Cuberlandia%7Ccenso-demografico-2010
27. de Almeida AC, de-Faria FM, Dunder RJ, Souza-Brito ARM, Luiz-Ferreira A. Recent trends in pharmacological activity of alkaloids in animal colitis: potential use for inflammatory bowel disease. Evid Based Complement Alternat Med. 2017;2017:1-24.
28. Prideaux L, Kamm MA, De Cruz PP, Chan FK, Ng SC. Inflammatory bowel disease in Asia: a systematic review. J Gastroenterol Hepatol. 2012;27:1266-80.
29. Kotze PG, Underwood FE, Damião AOMC, Ferraz JGP, Saad-Hossne R, Toro M, et al. Progression of Inflammatory Bowel Diseases Throughout Latin America and the Caribbean: A Systematic Review. Clin Gastroenterol Hepatol. 2020;18:304-12.
30. Parente JM, Coy CS, Campelo V, Parente MPPD, Costa LA, Silva RM, et al. Inflammatory bowel disease in an underdeveloped region of Northeastern Brazil. World J Gastroenterol. 2015;21:1197-1206.
31. Souza MHLP, Troncon LEA, Rodrigues CM, Viana CFG, Onofre PHC, Monteiro RA, et al. Trends in the occurrence (1980-1999) and clinical features of Crohn's disease and ulcerative colitis in a university hospital in southeastern Brazil. Arq Gastroenterol. 2002;39:98-105.
32. Nee J, Feuerstein JD. Optimizing the care and health of women with inflammatory bowel disease. Gastroenterol Res Pract. 2015;2015:1-8.
33. Loftus EVJr, Schoenfeld P, Sandborn WJ. The epidemiology and natural history of Crohn's disease in population-based patient cohorts from North America: a systematic review. Aliment Pharmacol Ther. 2002;16:51-60.
34. Barnes EL, Kochar B, Long MD, Pekow J, Ananthakrishnan A, Anyane-Yeboa A, et al. Lack of difference in treatment patterns and clinical outcomes between black and white patients with inflammatory bowel disease. Inflamm Bowel Dis. 2018;24:2634-40.
35. Nguyen GC, Chong CA, Chong RY. National estimates of the burden of inflammatory bowel disease among racial and ethnic groups in the United States. J Crohns Colitis. 2014;8:288-95.
36. Sewell JL, Inadomi JM, Yee HF. Race and inflammatory bowel disease in an urban healthcare system. Dig Dis Sci. 2010;55:3479-87.
37. Piovani D, Danese S, Peyrin-Biroulet L, Nikolopoulos GK, Lytras T, Bonovas S. Environmental risk factors for inflammatory bowel diseases: an umbrella review of meta-analyses. Gastroenterology. 2019;157:647-59.
38. Soon IS, Molodecky NA, Rabi DM, Ghali WA, Barkema HW, Kaplan GG. The relationship between urban environment and the inflammatory bowel diseases: a systematic review and meta-analysis. BMC Gastroenterol. 2012;12:1-14.
39. Zuo T, Kamm MA, Colombel J-F, Ng SC. Urbanization and the gut microbiota in health and inflammatory bowel disease. Nat Rev Gastroenterol Hepatol. 2018;15:440-52.
40. Malik TA. Inflammatory Bowel Disease: Historical Perspective, Epidemiology, and Risk Factors. Surg Clin North Am. 2015;95:1105-22.
41. Kuenzig ME, Lee SM, Eksteen B, Seow CH, Barnabe C, Panaccione R, et al. Smoking influences the need for surgery in patients with the inflammatory bowel diseases: a systematic review and meta-analysis incorporating disease duration. BMC Gastroenterol. 2016;16:1-9.
42. Cunha RF, Cury PVD, Leite RV, Leal LML, Cavalcante LN. Perfil clínico e endoscópico de pacientes com doença inflamatória intestinal procedentes de uma população miscigenada. SEPA. 2016;15:297-320.
43. Kleinubing-Júnior H, Pinho MSL, Ferreira LC, Bachtold GA, Merki A. Outpatients profile of outpatients with inflammatory bowel disease. ABCD, Arq Bras Cir Dig. 2011;24:200-3. DOI.org/10.1590/S0102-67202011000300004.
44. Leighton JA, Pasha SF. Inf lammatory disorders of the small bowel. Gastrointest Endosc Clin N Am. 2017;27:63-77.
45. Ott C, Schölmerich J. Extraintestinal manifestations and complications in IBD. Nat Rev Gastroenterol Hepatol. 2013;10:585-95.
46. da Silva BC, Lyra AC, Mendes CM, Ribeiro CPO, Lisboa SRO, Lisboa SRO, et al. The demographic and clinical characteristics of ulcerative colitis in a Northeast Brazilian population. Biomed Res Int. 2015;2015:359130.
47. Elia PP, Fogaça HS, Barros RG, Zaltman C, Elia CS. Descriptive analysis of the social, clinical, laboratorial and anthropometric profiles of inflammatory bowel disease inwards patients from the "Clementino Fraga Filho" University Hospital, Rio de Janeiro, RJ, Brazil. Arq Gastroenterol. 2007;44:332-9.
48. Colia R, Corrado A, Cantatore FP. Rheumatologic and extraintestinal manifestations of inflammatory bowel diseases. Ann Med. 2016;48:577-85.
49. Neumann H, Neurath MF, Atreya R. Endoscopic therapy in inflammatory bowel diseases. Viszeralmedizin. 2015;31:280-6.
50. Shen B. Exploring endoscopic therapy for the treatment of Crohn's disease-related fistula and abscess. Gastrointest Endosc. 2017;85:1133-43.
51. Grevenitis P, Thomas A, Lodhia N. Medical Therapy for Inflammatory Bowel Disease. Surg Clin North Am. 2015;95:1159-82.
52. Duricova D. What Can We Learn from Epidemiological Studies in Inflammatory Bowel Disease? Dig Dise. 2017;35:69-73.
53. Rieder F, Fiocchi C, Rogler G. Mechanisms, management, and treatment of fibrosis in patients with inflammatory bowel diseases. Gastroenterology. 2017;152:340-50.
54. Ghione S, Sarter H, Fumery M, Armengol-Debeir L, Savoye G, Ley D, et al. Dramatic increase in incidence of ulcerative colitis and Crohn's cisease (1988-2011): A population-based study of French adolescents. Am J Gastroenterol. 2018;113:265-72.
55. Nguyen GC, Tuskey A, Dassopoulos T, Harris ML, Brant SR. Rising hospitalization rates for inflammatory bowel disease in the United States between 1998 and 2004. Inflamm Bowel Dis. 2007;13:1529-35.
56. Ananthakrishnan AN, McGinley EL, Binion DG. Excess hospitalisation burden associated with *Clostridium difficile* in patients with inflammatory bowel disease. Gut. 2008;57:205-10.