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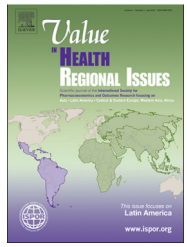

Inflammatory Bowel Disease in Latin America: A Systematic Review

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ABSTRACT

Background: Inflammatory bowel disease (IBD) is the name given to two inflammatory diseases of the colon and/or small intestine: Crohn disease (CD) and ulcerative colitis (UC). There is no information summarizing the complete body of evidence about IBD in developing regions, including Latin America. **Objectives:** To estimate the burden of IBD in Latin America. **Methods:** We conducted a systematic review searching published and unpublished studies on major international and regional databases from January 2000 to September 2015. Outcomes considered were incidence, prevalence, mortality, hospitalization attributable, treatment patterns, comparative effectiveness, patient-reported outcomes, and adherence to treatment. Pairs of reviewers independently selected, extracted, and assessed the risk of bias of the studies. Discrepancies were solved by consensus. **Results:** We retrieved 3445 references, finally including 25 studies. Only 19% of the observational studies had a low risk of bias for participant selection and 60% were based on registries. The incidence ranged from 0.74 to 6.76/100,000 person-years for UC and from 0.24 to 3.5/100,000 person-years for CD. The prevalence rate ranged from 0.99 to 44.3/100,000 inhabitants for UC and 0.24 to 16.7/100,000 inhabitants for CD. Mortality rates ranged from 0.60 to 1.02 for UC and from 0.23 to 0.40 for CD. Patient-reported outcomes showed a decrease in quality of life associated with depression and anxiety and correlated with the time of diagnosis. The most frequently used medication in the studies was mesalazine. **Conclusions:** The burden of IBD in Latin America seems to be important, but there is a considerable gap of high-quality evidence in the region.

Keywords: burden of disease, Crohn disease, epidemiology, inflammatory bowel disease, Latin America and the Caribbean, ulcerative colitis.

Introduction

Inflammatory bowel disease (IBD) is the name given to two inflammatory diseases of the colon and/or small intestine: Crohn disease (CD) and ulcerative colitis (UC) [1]. Diagnosis is based on clinical presentation, endoscopic findings, and other imaging and histopathologic findings. Both diseases are chronic and intermittent with remissions and relapses, possibly because of an interaction between genetic and environmental factors. Differentiation between UC and CD is not always clear because the extra-intestinal clinical heterogeneity can be similar in both diseases, resulting in cases that remain with a nonspecific diagnosis [2]. Treatment of IBD includes lifestyle alterations (e.g., smoking cessation for patients with CD), medical management, and surgical interventions. A seminal advance was the introduction of treatment with anti–tumor necrosis factor-α monoclonal antibodies, which are particularly effective in CD [1].

IBDs have a major impact on life expectancy, quality of life, and medical costs. According to a meta-analysis, patients with Crohn disease have a more than 50% higher risk of dying than someone in the general population of the same age. Moreover, CD diagnosed before the age of 20 years reduces life expectancy by 7 to 13 years. Although the risk of death by UC is low, it increases the risk of colorectal cancer, with an incidence rate of 1.58/1000 patient-years (95% confidence interval [CI] 1.39–1.76) [3]. IBD burden derives from an important increase in direct medical costs. A Canadian study shows that an IBD case doubles the cost of controls. In addition, CD was on average 20% costlier than UC [4].

IBD is well characterized in developed countries. In the United States, incidence rates range from 2.2 to 19.2 cases/100,000 person-years for UC and from 3.1 to 20.2 cases/100,000 person-years for CD [5,6]. Recently, efforts have been made to describe IBD in some developing regions such as Latin America, showing differences in the burden of the disease among countries [7]. Environmental factors such as socioeconomic status, exposure to infections, use of antibiotics, and issues of hygiene might help explain the epidemiological differences between populations [6].

Information about IBD in the region could assist Latin American decision makers to design proper health policies to better

Conflicts of interest: The authors declare that they have no conflicts of interest.

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address IBD-related problems and finally deliver high-quality patient-centered care for this disease. Therefore, it is imperative to summarize the complete body of evidence of IBD in Latin America. Our objective was to estimate the epidemiology and burden of IBD in Latin America through a systematic review of literature.

Methods

We followed the Meta-analysis Of Observational Studies in Epidemiology guidelines [8] and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement [9,10] for reporting systematic reviews and meta-analyses.

Search Strategy and Selection Criteria

We searched published and unpublished studies on major international and regional databases: MEDLINE, Embase, LILACS, and CENTRAL. We included randomized controlled trials, cohort studies, case control studies, cross-sectional studies, case series, and economic evaluations that included only Latin American participants. Outcomes considered were incidence, prevalence, mortality, hospitalization attributable, treatment patterns, comparative effectiveness, patient-reported outcomes, and adherence to treatment. Studies were included only if they reported at least 50 cases. No language restriction was placed. Only studies published or reported since 2000 were included. We searched unpublished studies in the reference list of included studies and looked for full-text abstracts of medical congresses obtained from the search strategy.

If we found data or data subsets reported in more than one publication or overlapping from the same period of time, we selected the one with the largest sample size and most representative of the country's population. The search strategy is detailed in Appendix 1 in Supplemental Materials found at https://doi.org/10.1016/j.vhri.2018.03.010.

Screening and Data Extraction

Pairs of independent reviewers screened titles and abstracts of all identified references. They categorized the articles into one of the following categories: excluded, related reference, related review (references were searched), low/moderate probability of inclusion, or high probability of inclusion. We obtained the full-text versions of all articles not excluded. Except those categorized as excluded, the rest of the articles were retrieved in full text for further analysis. As a second screening process, two reviewers independently extracted and assessed the risk of bias of each full-text article. All phases of the study selection were completed using the Early Review Organizing Software (IECS, Buenos Aires, Argentina), a Web-based platform designed to facilitate the independent selection and quality assessment of studies for systematic reviews [11].

Authors of articles were contacted when necessary to obtain missing or supplementary information.

Assessment of Risk of Bias

The risk of bias of observational studies was assessed using a checklist of essential items based in the Strengthening the Reporting of OBservational studies in Epidemiology statement [12] and complemented with several methodological articles: Sanderson et al. [13], Fowkes and Fulton [14], Wong et al. [15], and Berra et al. [16]. Risk of bias was assessed using a checklist of essential items: selection of participants, control of confounders, measurement of exposure and outcomes, and conflicts of interest.

Randomized controlled trials, quasi-randomized controlled trials, cohort studies, and case control studies were assessed considering noncomparative data (i.e., control arms of intervention studies or the whole population if the expositions represented the expositions of patients with IBD).

Randomized controlled trials for comparative data were assessed with the Cochrane tool [17].

Pairs of independent reviewers assessed the risk of bias through the Early Review Organizing Software. Discrepancies were solved by consensus of the whole team.

The protocol was registered in PROSPERO, an international prospective register of systematic review protocols (registration number: CRD42016035479).

Results

The search retrieved 3445 references after removing duplicates, and 3048 references were excluded by title and abstract. Out of 397 full-text studies retrieved for detailed evaluation, 25 met the inclusion criteria. The flow diagram of the systematic review is shown in Figure 1.

Most studies were conducted in South America (68%), particularly in Brazil (48%). The years of publication of included studies ranged from 2002 to 2015, with a mode in 2011. Moreover, most of the included studies (56%) reported only UC and CD jointly. Out of the 25 included studies, 1 was a case series (4%), 15 were registries/surveillance studies (60%), 7 were cross-sectional studies (28%), and 2 were control arms of randomized controlled trials (8%). The main characteristics of the included studies are presented in Table 1.

The risk of bias was reported separately by type of study and by risk-of-bias domain (Table 2). Most observational studies had moderate risk of bias for participant selection and one of the two randomized controlled trials had a high risk of bias in most of the risk-of-bias domains.

Incidence

Six studies described the incidence of IBD in Latin America. Three were Brazilian studies that reported data from hospital records in different study periods: 1988 to 2012, 1986 to 2005, and 1980 to 1999 [18–20]. The other three studies were from Uruguay [21], Puerto Rico [22], and Barbados [23] and used data from their national registries. For UC, incidences ranged from 0.74 to 6.76/100,000 inhabitants; for CD, from 0.24 to 3.50/100,000 inhabitants; and for nonspecified IBD, from 0.42 to 2.46/100,000 inhabitants. Only one study reported outcomes without specifying the IBD type.

Information from the studies and their study periods is detailed by type of IBD in Table 3.

Prevalence

Five studies described the prevalence of IBD. The characteristics of four of them [18,19,22,23] have been presented in Table 3. The fifth study [24] was based on information from a major health insurance company in Puerto Rico, which offered commercial health insurance and a government-sponsored managed care plan for the low-income, medically indigent population that previously received services directly from the Puerto Rico Department of Health. All the studies and their results are presented in Table 4. The prevalence ranged from 0.99 to 44.3/100,000 inhabitants for UC, from 0.24 to 14.90/100,000 inhabitants for CD, and from 0.42 to 38.22/100,000 inhabitants for nonspecified IBD.

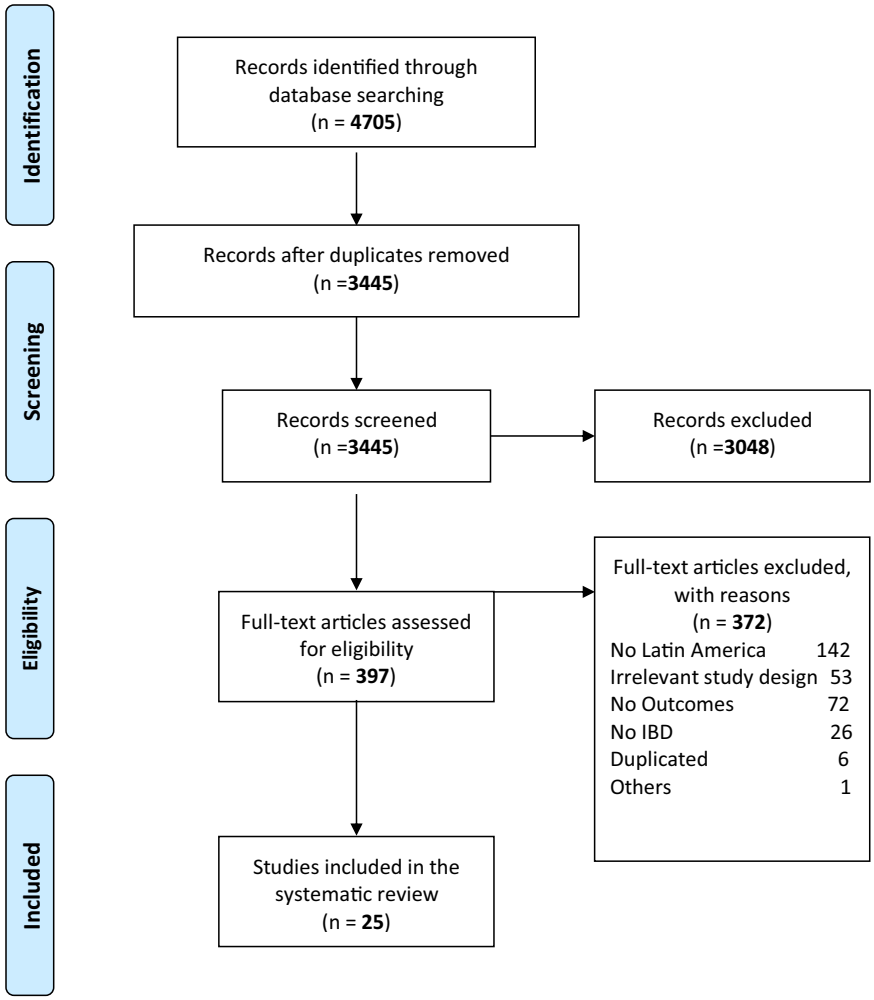

Fig. 1 – Flow diagram of the systematic review. IBD, inflammatory bowel disease; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Mortality Rate

Only one study [25] reported the mortality rate in Latin America. This study compared the geographic distribution of mortality of peptic ulcer compared with that of IBD. Mortality rate data from 27 countries were analyzed, including 3 countries in Latin America. Causes of death were recorded according to the 9th and 10th revisions of the *International Classification of Diseases*. The annual mortality rate is presented in Table 5.

Case-Fatality Rate

The main results of the included studies for case-fatality rate are presented in Table 6. We found four studies [20,26–28] that described this outcome in the IBD population from Latin America.

A Brazilian study [20] showed the case-fatality rate of IBD (UC and rectocolitis) in a university hospital. Another study carried out in Brazil [26] retrieved information on the incidence of intestinal and extra-intestinal neoplasia among patients with IBD attending a tertiary health care hospital.

A descriptive observational study from Colombia [27] included all patients with IBD who attended the emergency unit or received ambulatory care services or were hospitalized. The last study from Cuba [28] described the frequency and socioepidemiological characteristics of all patients younger than 19 years with verified diagnosis of IBD on the basis of a surveillance in pediatric centers.

Hospitalization Rate and Length of Stay

Hospitalization rate and length of stay are presented in Appendix 2 Tables 1 and 2, respectively, in Supplemental Materials found at https://doi.org/10.1016/j.vhri.2018.03.010. Four out of five included studies were from Brazil [20,29–31]; the fifth study was from Colombia [27]. One of the Brazilian studies evaluated the classification and severity (hospitalization in the last year) of CD in different racial groups and found higher frequency of hospitalization in the last year in nonwhite patients compared with white patients (14.3 vs. 36.4; $P = 0.07$) [29]. The Colombian study [27] found an association between hospitalization rate and the use of steroids for UC ($P < 0.001$) and CD ($P = 0.039$) and between the hospitalization rate and the use of biological therapy in UC (91.7%; $P < 0.001$) and CD (93.3%; $P = 0.041$).

One of the studies that described length of stay was a descriptive epidemiological study [30]. The other one was a randomized controlled clinical trial [31] that evaluated the effect of azathioprine (AZA) compared with mesalazine on the incidence of rehospitalizations due to all causes and due to CD-related surgeries.

Table 1 – Characteristics of included studies.

Study	Country	Type of study	Type of IBD*	Outcome	Population age	Year data set	n	Specific group
Souza et al. [20]	Brazil	Registry	UC/CD	Incidence Case-fatality rate Hospitalization	>18 y	1980–1999	252	Hospital-based
Santana et al. [29]	Brazil	Cross-sectional	CD	Hospitalization	>18 y	2006	65	Hospital-based
Victoria et al. [19]	Brazil	Registry	IBD	Incidence Prevalence	15–74 y	1986–2005	115/533,508	Hospital-based
Cornelio et al. [41]	Brazil	Cross-sectional	CD	Adherence to treatment	18–65 y	2006–2007	100	Hospital-based
Cohen et al. [32]	Brazil	Cross-sectional	UC/CD	Patient-reported outcomes	18–60 y	NR	50	City-based
Oliveira et al. [30]	Brazil	Registry	UC/CD	Hospitalization/length of stay	NR	1998–2005	363	Hospital-based
Souza et al. [33]	Brazil	Cross-sectional	UC/CD	Treatment patterns Patient-reported outcomes	27–52 y	2006–2007	103	Pharmacy registry
de Souza [31]	Brazil	RCT	CD	Hospitalization/length of stay	18–65 y	2003–2007	72	Hospital-based
Campos et al. [26]	Brazil	Case series	UC/CD	Case-fatality rate	NR	1984–2007	1,607	Hospital-based
Vidigal et al. [42]	Brazil	RCT	CD	Comparative effectiveness	18–65 y	NR	72	Hospital-based
Parente et al. [18]	Brazil	Registry	UC/CD	Incidence Prevalence	>18 y	1988–2012 1988–2007	252	Hospital-based
Freitas et al. [34]	Brazil	Cross-sectional	UC/CD	Patient-reported outcomes	31–59 y	NR	147	Hospital-based
Juliao Baños et al. [27]	Colombia	Registry	UC/CD	Case-fatality rate Hospitalization	2–77 y	2001–2009	202	Hospital-based
Meyer et al. [36]	Chile	Registry	UC/CD	Treatment patterns	16–86 y	1976–2013	356	Hospital-based
Figueroa et al. [35]	Chile	Registry	UC/CD	Treatment patterns	14–78 y	1990–2009	282	Hospital-based
Buenavida et al. [21]	Uruguay	Registry	UC/CD	Incidence	>14 y	2007–2008	34/645,695	Multicenter
Yamamoto-Furusho [37]	Mexico	Registry	UC	Treatment patterns	All ages	1987–2006	848	Hospital-based
De la Cruz-Guillén [39]	Mexico	Registry	IBD	Treatment patterns	All ages	1990–2008	85	Hospital-based
Bosques-Padilla et al. [38]	Mexico	Registry	UC	Treatment patterns	All ages	2004–2008	104	Hospital-based
Appleyard et al. [22]	Puerto Rico	Cross-sectional	IBD	Incidence Prevalence	13–85 y	1996–2000 2004	202	Nationwide
Melendez et al. [40]	Puerto Rico	Registry	UC/CD	Treatment patterns	All ages	1995–2007	507	Nationwide
Vendrell et al. [24]	Puerto Rico	Registry	IBD	Prevalence	NR	2002–2005	477/1,247,792	Health Insurance records
Fragoso Arbelo et al. [28]	Cuba	Cross-sectional	UC/CD	Case-fatality rate	6 mo to 19 y	NR	88	Multicenter
Edwards et al. [23]	Barbados	Registry	UC/CD	Incidence Prevalence	All ages	1980–2005	168	Hospital-based
Sonnenberg [25]	Argentina, Chile, Mexico	Registry	UC/CD	Mortality rate	All ages	1991–2004	NR	Nationwide

CD, Crohn disease; IBD, inflammatory bowel disease; NR, not reported; RCT, randomized controlled trial; UC, ulcerative colitis.
* IBD includes CD, UC, and nonspecified IBD.

Table 2 – Risk of bias of included studies by type of study.

Study	Risk of bias							
	Masking	Blindness of researchers	Blindness of participants	Conflict of interest	Randomization	Other risks	Incomplete report of data	Selective report
Risk of bias of included randomized controlled trials								
de Souza et al. [31]	Low	Low	Low	Unclear	Low	Low	Unclear	Unclear
Vidigal et al. [42]	High	High	High	High	Unclear	High	Low	Low

Author	Risk of bias			
	Conflict of interest	Confounder control	Exposure and outcome measurements	Participant selection
Risk of bias of included case series, surveillance/registry, and cross-sectional studies				
Campos et al. [26]	Low	Low	Low	Moderate
Bosques-Padilla et al. [38]	Unclear	Low	Low	Moderate
Buenavida et al. [21]	Low	Low	Low	Low
De la Cruz-Guillén [39]	Unclear	Low	Low	High
Melendez et al. [40]	Low	Low	Unclear	High
Meyer et al. [36]	Low	Low	Low	Moderate
Juliao Baños et al [27]	Unclear	Low	Low	Moderate
Oliveira et al. [30]	Unclear	Low	High	Moderate
Parente et al. [18]	Unclear	Low	Low	Low
Vendrell et al. [24]	Unclear	Low	High	Low
Edwards et al. [23]	Unclear	Low	Low	Moderate
Figueroa et al. [35]	Unclear	Low	Low	Moderate
Sonnenberg [25]	Unclear	Low	High	High
Souza et al. [20]	Unclear	Low	Unclear	Low
Victoria et al. [19]	Unclear	Low	Low	Moderate
Yamamoto-Furusho [37]	Low	Low	High	Moderate
Cohen et al. [32]	Unclear	Low	Low	High
Freitas et al. [34]	Low	Low	Low	Moderate
Souza et al. [33]	Unclear	Low	Low	Moderate
Appleyard et al. [22]	Unclear	Low	Moderate	Moderate
Cornelio et al. [41]	Unclear	Low	Low	Moderate
Fragoso Arbelo et al. [28]	Unclear	High	Low	Moderate
Santana et al. [29]	Unclear	Low	Low	Moderate

Patient-Reported Outcomes

Three Brazilian studies [32–34] evaluated quality of life in adults with IBD. The population, quality-of-life tools used, and main results are presented in Appendix 2 Table 3 in Supplemental Materials found at https://doi.org/10.1016/j.vhri.2018.03.010.

Treatment Pattern

The main results of studies reporting treatment patterns are presented in Appendix 2 Table 4 in Supplemental Materials found at https://doi.org/10.1016/j.vhri.2018.03.010. Only one of the included studies was from Brazil [33], two were from Chile [35,36], two from Mexico [37–39], and one from Puerto Rico [40]. One of the Chilean studies was descriptive and retrospective [35] and characterized the clinical features of IBD comparing the experience of patients from two medical centers. From the three Mexican studies, one was a large cohort from a referral hospital in Mexico City [37], and the other two were descriptive retrospective studies [38,39]. The study from Puerto Rico [40] retrieved data from the IBD Registry, a database of demographic and medical information obtained from interviews and medical record reviews of patients with IBD and collected nationwide.

Adherence to Treatment

The only study [41] that evaluated the prevalence of nonadherence to therapy in patients with CD and determined possible associated risk factors was from Brazil. This cross-sectional study included 100 patients aged between 18 and 65 years who attended the Center for Inflammatory Bowel Diseases. Before their doctor's appointment, patients were asked to respond to the modified Morisky-Green test to assess their adherence to therapy. This questionnaire showed a prevalence of nonadherence of 64%. When analyzing possible risk factors, the study demonstrated an increase in nonadherence in younger ($P = 0.07$) and nonwhite patients ($P = 0.06$). No correlation was observed with psychological or drug therapy variables.

Table 3 – Main results of studies reporting the incidence of IBD in Latin America.

Study	Country	Age (y) (mean)	Data set year	Incidence/100,000 inhabitants		
				UC	CD	Nonspecified IBD
Parente et al. [18]	Brazil	>18	1988–2012	0.08 (1988)*		
				1.53 (2007)*		
Victoria et al. [19]	Brazil	15–74 (37.95)	1986–1990	0.74	0.24	–
			1991–1995	3.86	0.68	–
			1996–2000	6.76	1.48	0.42
			2001–2005	4.48	3.50	1.75
Souza et al. [20]	Brazil	>18	1980–1984	2.0†	1.5	Not reported
			1985–1989	2.8†	3.0	
			1990–1994	2.5†	2.4	
			1995–1999	2.2†	3.5	
Buenavida et al. [21]	Uruguay	>14	2007–2008	2.25	0.39	Not reported
Appleyard et al. [22]	Puerto Rico	13–85 (39)	1996	1.96	0.49	0.61
			2000	3.32	1.96	2.46
Edwards et al. [23]	Barbados	Not reported	1980–1984	1.30	0.28	Not reported
			1985–1990	1.92	0.64	
			1991–1994	2.30	1.30	
			1995–2000	2.34	0.71	
			2000–2004	1.58	0.61	

CD, Crohn disease; IBD, inflammatory bowel disease; UC, ulcerative colitis.
* Data for any IBD type.
† Rectocolitis.

Table 4 – Main results of studies including prevalence of IBD in Latin America.

Study	Country	Age (y) (mean)	Data set year	Prevalence/100,000 inhabitants		
				UC	CD	Nonspecified IBD
Parente et al. [18]	Brazil	>18	2012	12.8*		
Victoria et al. [19]	Brazil	15–74 (37.95)	1986–1990	0.99	0.24	–
			1991–1995	4.77	0.90	–
			1996–2000	11.20	2.32	0.42
			2001–2005	14.81	5.65	2.14
Vendrell et al. [24]	Puerto Rico	Not specifically reported	2002	21.72	11.43	33,23
			2003	20.46	11.96	32.42
			2004	24.33	12.93	37.36
			2005	23.32	14.90	38.22
Appleyard et al. [22]	Puerto Rico	13–85 (39)	1996–2000	12.53	5.89	6.39
Edwards et al. [23]	Barbados	>18	2004	44.3	16.7	Not reported

CD, Crohn disease; IBD, inflammatory bowel disease; UC, ulcerative colitis.
* Data for any IBD type.

Table 5 – Main results of studies including mortality of IBD in Latin America.

Study	Country	Population	Age (y)	Data set year	Annual mortality rate per million inhabitants	
					UC	CD
Sonnenberg [25]	Argentina	Nationwide	All ages	1991–2004	0.67	0.29
	Chile			1991–2003	1.02	0.40
	Mexico			1991–2004	0.60	0.23

CD, Crohn disease; IBD, inflammatory bowel disease; UC, ulcerative colitis.

Table 6 – Main results of studies including the case-fatality rate of IBD in Latin America..

Study	Country	Population	Age (mean)	Data set year	Case-fatality rate	
					UC	CD
Souza et al. [20]	Brazil	University hospital	20–50 y	1988–1999	9/73* (12.2%)	11/102 (10.8%)
Campos et al. [26]	Brazil	Tertiary care hospital	Not reported	1984–2007	13/804 (1.6%)	13/804 (1.6%)
Juliao Baños et al. [27]	Colombia	Pablo Tobon Uribe Hospital	2–77 y (38.46)	2001–2009	5/202 (2.4%)	6/202 (3.0%)
Fragoso Arbelo et al. [28]	Cuba	Centers of pediatric gastroenterology	6 mo to 19 y	1982–2002	3/73 (4.1%)	1/15 (6.1%)

CD, Crohn disease; IBD, inflammatory bowel disease; UC, ulcerative colitis.
* Rectocolitis.

Comparative Effectiveness

We found one study conducted in Brazil [42] that determined the effectiveness of AZA for the prevention of recurrent bowel obstruction. Data were drawn from a 3-year multicenter, randomized, investigator-blind, controlled trial that compared AZA with mesalazine in 72 patients with CD. According to this study, the cumulative rate was significantly lower in patients with recurrent subocclusion in the AZA group (56%) compared with patients in the mesalazine group (79%; odds ratio 3.34; 95% CI 1.67–8.6; $P = 0.003$). A rate of 3.7 favoring AZA was needed to prevent one subocclusion episode. The occlusion-free time interval was longer in the AZA group compared with that in the mesalazine group (28.8 vs. 18.3 months; $P = 0.000$). The occlusion-free survival at 12, 24, and 36 months was significantly higher in the AZA group (91%, 81%, and 72%, respectively) than in the mesalazine group (64.7%, 35.3%, and 23.5%, respectively; $P < 0.05$ for all comparisons).

Economic Evaluations

We found only two economic evaluations in Latin America but these were not included because they were abstracts presented in medical congresses.

Discussion

In this article, we have presented a comprehensive review following a rigorous systematic methodology about IBD data in Latin America. We identified 25 studies addressing the incidence, prevalence, mortality, patient-reported outcomes, treatment patterns, adherence to treatment, and comparative effectiveness in the Latin American population.

Three studies from Brazil reported IBD incidence on the basis of non-nationwide registries from 1986 to 2012. They reported data from the state of Piuai (described as a region with poor living conditions) [18] and Sao Paulo (an industrialized region) [19,20]. The incidence was lower in the study from Piuai in comparison with the results from Sao Paulo; nevertheless, it showed an increase from 1998 to 2007 (0.08–1.53/100,000 person-years). Despite the data periods, the other two Brazilian studies from Sao Paulo were different when compared with each other. This difference can be partially explained by the differences in hospital databases: higher incidences were reported in the study in which the database was from a referral medical center of the 30 municipal districts [19] than in the study using data from a medical school university [20]. Moreover, the second study measured ulcerative rectocolitis instead of ulcerative colitis. A nationwide study from Puerto Rico showed an increase in the incidence of UC, CD, and nonspecified IBD from 1996 to 2000 [22]. Another study from Barbados presented results by periods, showing an increase in the incidence from 1980 to 1994 followed by a decrease until 2004 [23]. A multicenter study from Uruguay reported a punctual incidence from 2007 to 2008 within the range of the other studies [21]. Incidences of UC were consistently higher than incidences of CD. The incidence in developed countries ranged from 2.2 to 19.2 cases/100,000 person-years for UC and from 3.1 to 20.2 cases/100,000 person-years for CD [5,6].

One Brazilian study [18] reported an IBD prevalence rate of 12.8/100,000 inhabitants and another Brazilian study [19] presented data from periods until 2005, reaching 14.81/100,000 inhabitants for UC, 5.65/100,000 inhabitants for CD, and 2.14/100,000 inhabitants for nonspecified IBD. One study from Puerto Rico presenting data from a major health insurance showed higher prevalence rates in 2005 of 23.32/100,000 inhabitants for UC and 14.90/100,000 inhabitants for CD [24]. Another study from Puerto Rico (nationwide) showed remarkably lower prevalence rates from 1996 to 2000, with 12.53/100,000 inhabitants for UC, 5.89/100,000 inhabitants for CD, and 6.39/100,000 inhabitants for nonspecific IBD [22]. In contrast, a high prevalence rate was reported in the study from Barbados: 44.3/100,000 inhabitants for UC [23]. The highest reported prevalence rates for IBD are from Europe (UC 505/100,000 persons; CD 322/100,000 persons) and North America (UC 249/100,000 persons; CD 319/100,000 persons), whereas Latin America has reported considerably lower prevalence rates than other regions [5].

The only study describing mortality rates [25] showed data from Argentina, Chile, and Mexico, with rates lower than 1.5/100,000 inhabitants. These rates are remarkably lower compared with those in other countries such as the United Kingdom in which the mortality rate for IBD was 17.1/1000 person-years overall and a high hazard ratio for UC was among the 40- to 59-year-olds (1.79; 95% CI 1.42–2.27) and for CD among the 20- to 39-year-olds (3.82; 95% CI 2.17–6.75) [43]. The great variability in Latin American rates and the differences with other regions could be probably explained by deficiencies of the registries, including lack of standard protocols.

Case-fatality rates of IBD were up to 12% in the selected studies. Hospitalization rate information was heterogeneous among studies, with a range of 43% to 63% in UC, 29% to 83% in CD, and 28% in nonspecified IBD.

We also found that the time elapsed since diagnosis was associated with more anxiety and depression and that IBD was highly correlated with worse quality of life. These results were consistent with the results of other studies that evaluated quality of life, reporting its decrease in people with IBD. One study from the United States showed that the main aspect that determined the loss of quality of life was the stage of disease activity and severity [44].

Surgery was more common in CD than in UC—less than 50% of the patients with UC reported in these studies were treated through surgery. Less than 13% of patients used anti–tumor necrosis factor in UC, and the most frequently used medication was mesalazine. The only study reporting adherence to

treatment [41] showed a result of 64% (64 of 100) related to young age and the nonwhite race, without a clear association with physiological or therapeutic aspects. Only one randomized controlled trial was identified that studied comparative effectiveness in the Latin American population and that showed that AZA was better than mesalazine in the prevention of subocclusions in patients with CD.

Despite the rigorous methodology followed, our study has limitations. The most important one is the heterogeneity that precludes to perform meta-analysis, and the scarcity of high-quality epidemiological studies on IBD in Latin America. Moreover, most of the studies were based on registries and not on population-based data, which would have been more representative of the country. Despite these difficulties, our study provides an exhaustive picture of the available evidence in the region and has highlighted important evidence gasps.

Conclusions

The burden of IBD in Latin America seems to be important but there is a considerable gap of evidence in the region. More studies of adequate methodological quality from representative samples and the use of standardized definitions and outcomes are required. This information could assist Latin American decision makers to design strategies to deliver high-quality, patient-centered care for the population with IBD.

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Supplemental Materials

Supplemental material accompanying this article can be found in the online version as a hyperlink at https://doi.org/10.1016/j.vhri.2018.03.010 or, if a hard copy of article, at www.valueinhealthjournal.com/issues (select volume, issue, and article).

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