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Comparison of 1-Year Clinical Course in Patients With Newly Diagnosed Inflammatory Bowel Disease Between Vietnam and Korea: A Multinational, Multicenter Retrospective Cohort Study

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ABSTRACT

Background/Aims: The differences in the clinical course of Crohn's disease (CD) and ulcerative colitis (UC) among Asian countries remain unknown. Thus, we compared the clinical characteristics, treatment, and one-year outcomes of newly diagnosed inflammatory bowel disease (IBD) patients between Vietnam and Korea.

Methods: A retrospective cohort study was conducted at seven tertiary hospitals in these countries between January 2020 and January 2021. Data on demographics, diseases, treatment, and outcomes during 1 year after diagnosis were collected.

Results: Among 225 patients (60 from Vietnam and 165 from Korea), 140 and 85 were diagnosed with UC and CD, respectively. Severe activity ($p < 0.01$) and extensive colitis ($p < 0.01$) in UC, along with complicated behavior in CD ($p < 0.01$), were more frequently observed in Vietnamese patients compared to Korean patients. The proportion of UC patients using corticosteroids ($p < 0.01$), immunomodulators ($p < 0.01$), and biologics ($p = 0.026$) was significantly higher in Vietnam. In contrast, the proportion of UC patients using topical mesalamine ($p < 0.01$) was significantly higher in Korea. The intervals from CD diagnosis to biologic therapy initiation ($p = 0.04$), as well as from UC diagnosis to corticosteroid ($p < 0.01$), immunomodulator ($p < 0.01$), and biologic therapy ($p < 0.01$) commencement, were significantly shorter in Vietnamese patients compared to Korean patients. However, the proportions of endoscopic healing and complications at 1-year follow-up did not significantly differ between the countries ($p > 0.05$).

Conclusions: Although Vietnamese IBD patients had higher baseline clinical and phenotypic severity than their Korean counterparts, no significant differences in short-term outcomes were observed, potentially reflecting the impact of the higher rate and early biologic usage in Vietnamese patients.

1 | Introduction

Inflammatory bowel disease (IBD), including Crohn's disease (CD) and ulcerative colitis (UC), is an idiopathic chronic inflammatory condition of the gastrointestinal tract characterized by a relapsing and remitting clinical course [1]. IBD is a progressive disease that can lead to bowel damage and complications, including frequent hospitalizations and bowel surgery [2]. Recent studies have found that anti-tumor necrosis factor (anti-TNF) can help decrease surgery rate and prevent or retard IBD progression [3–7]. However, the use of biologics, including anti-TNF agents, may cause some adverse effects [8, 9]. Of these, serious infections and tuberculosis (TB) reactivation are among the important complications of anti-TNF therapy in Asian countries [10, 11].

IBD was first recognized in developed countries in Western and Northern Europe and North America [1]. However, IBD has recently become a global disease with dramatically increasing incidence in developing countries within Asia and Africa [1, 12, 13]. Even within Asia, the burden of IBD varies according to geography and ethnic groups [14]. In East Asia, a 30-year population-based study showed that the annual UC incidence in Korea had increased approximately 20-fold, while the annual CD incidence had increased 40-fold during the study period [15]. The prevalence of IBD in Korea was estimated at 0.1%–0.2% of the general population in 2014–2015 [12, 16]. However, information on IBD is scarce in Vietnam [17]. Despite this, available data in other comparable countries in Southeast Asia showed that IBD incidence and prevalence vary among countries in this region due to geographic differences, but the annual IBD incidence is lower than that in East Asia, where Korea is located [17, 18]. Similarly, there are geographic differences in IBD characteristics and short-term outcomes between patients in different Asian countries [12, 14]. The clinical characteristics and natural history of IBD in many Asian countries, particularly in Southeast Asia, including Vietnam, have not been thoroughly studied. Therefore, this multinational study was conducted in Vietnam and Korea to compare the baseline characteristics of IBD at diagnosis, medical therapy, and short-term outcomes 1 year after diagnosis in newly diagnosed IBD patients between the two countries.

2 | Methods

2.1 | Study Design and Context

A retrospective cohort study was conducted in Vietnam and Korea from 1st January 2020 to 31st January 2021. In Vietnam, the study was conducted at four large referral hospitals (Bach Mai Hospital, University Medical Center of Ho Chi Minh City, Ha Noi Medical University Hospital, and 108 Military Central Hospital). In Korea, the study sites included three tertiary referral hospitals (Kyungpook National University Hospital, Yeungnam University Medical Center, and Keimyung University Dongsan Medical Center). The Ethics Committees of the University Medical Center of Ho Chi Minh City in Vietnam approved this study (approval number: 711/HDDD-DHYD).

2.2 | Study Participants and Data Collection

All patients aged > 18 years with newly diagnosed IBD were included in the study. The diagnosis of IBD was made based on a combination of clinical evaluation and endoscopic, histological, radiological, and/or biochemical investigations [19]. Exclusion criteria included a diagnosis of indeterminate colitis and loss to 1-year follow-up after diagnosis. Health records of the included patients were reviewed, and information on the demographic and clinical characteristics at admission, medications used within 1 year post-diagnosis, and short-term outcomes 1 year after diagnosis were extracted.

The baseline UC characteristics included the disease extension and activity. UC extension was defined according to the Montreal classification (proctitis [E1], left-sided colitis [E2], and extensive colitis [E3]) [20]. UC disease activity was defined based on the Truelove & Witt criteria in Vietnam and the Mayo score in Korea [21, 22]. We assessed the endoscopic activity of UC patients by using the Mayo Endoscopic Subscore (MES) in Vietnam and the Ulcerative colitis endoscopic index of severity (UCEIS) in Korea [21, 23].

The baseline CD characteristics included location (ileal [L1], colonic [L2], ileocolonic [L3], and upper gastrointestinal modifier [L4]), behavior (inflammation [nonstricturing nonpenetrating] [B1], stricturing [B2], penetrating [B3], and perianal disease modifier [p]), and activity. CD location and behavior were also defined according to the Montreal classification [20]. Perianal fistulae, abscesses, or anal ulcers were defined as perianal disease [21]. The Crohn's Disease Activity Index (CDAI) was used to assess CD activity [19].

Information on treatment included types of medications (oral or topical mesalamine, corticosteroids, immunomodulators, biologics, and tofacitinib). Biologic agents comprised anti-TNF, anti-interleukin-12/23 (ustekinumab), and anti-integrin (vedolizumab).

Short-term outcomes at 1 year after diagnosis included endoscopic healing, hospitalization, serious infection, TB reactivation, and bowel surgery. In CD, endoscopic healing was defined by the absence of ulceration. In UC, endoscopic healing was defined by 0 MES points in Vietnam and < 2 UCIES points in Korea [21]. Hospitalization was only recorded when it was related to IBD. Similarly, only bowel surgeries related to IBD were recorded. Serious infection was defined as a diagnosis of an infection requiring hospitalization and intravenous antibiotics.

2.3 | Statistical Analysis

SPSS version 25 (IBM Corp, Armonk, New York) was used for data analysis. Categorical variables were presented as an absolute count and percentage and compared using Fisher's exact test. Non-normally distributed continuous variables were presented as median (interquartile range [IQR]) and compared using the Wilcoxon rank-sum test. Time-to-event curves representing the periods from disease diagnosis to the use of medications were constructed according to the Kaplan–Meier method

and compared using the Mantel–Haenszel log-rank test. To account for the different follow-up durations and baseline disease severities in each cohort, we performed multivariable logistic regression models for each of the treatment outcomes (mucosal healing, serious infection, tuberculosis, IBD-related hospitalization, and IBD-related surgery). In the UC cohort, the models included covariates nation, baseline UC disease severity, baseline UC disease extension, and follow-up duration. In the CD cohort, the models included covariates nation, baseline CD disease activity, baseline CD disease behavior, and follow-up duration. Results from the models were reported by odds ratios (ORs) and the corresponding 95% confidence intervals (CIs) and p-values. Alpha was set at a 5% level.

3 | Results

3.1 | Baseline Characteristics of Study Participants

A total of 225 newly diagnosed IBD patients, including 60 patients from Vietnam and 165 patients from Korea, participated in the study (Figure 1). Of these, 140 patients were diagnosed with UC (28 from Vietnam, 112 from Korea), whereas 85 patients were diagnosed with CD (32 from Vietnam, 53 from Korea). The median follow-up duration of Korean patients was statistically longer than that of Vietnamese patients (17.4 vs. 13 months, $p < 0.01$) (Table 1). In contrast, the median period from the onset to CD diagnosis among Korean patients was statistically shorter

than that of Vietnamese patients (3 vs. 6 months, $p = 0.048$). Korean and Vietnamese patients significantly differed in UC disease extension ($p = 0.014$) and severity ($p < 0.01$). Specifically, the proportion of proctitis in Korean patients was 31.2%, while that in Vietnamese patients was 7.1%. In contrast, the proportions of extensive colitis (53.6% vs. 32.1%) and severe UC (46.4% vs. 0.9%) in Vietnamese patients were higher than those in their Korean counterparts. Furthermore, Korean and Vietnamese patients showed a statistically significant difference in CD disease activity ($p < 0.01$) and behavior ($p < 0.01$). The proportion of perianal disease was significantly higher in Korean patients compared to Vietnamese patients (39.6% vs. 12.5%, $p < 0.01$). In contrast, the proportion of stricturing (25% vs. 13.2%) and penetrating (28.1% vs. 5.9%) behaviors was higher in Vietnamese patients than in Korean patients. Finally, age at diagnosis, sex, family history of IBD, smoking status, the period from the onset to UC diagnosis, and CD disease location showed no statistically significant differences between the two countries ($p > 0.05$).

3.2 | IBD Treatment Within 1 Year After Diagnosis

Regarding UC treatment, the numbers of Vietnamese patients using corticosteroids (39.3% vs. 85.7%, $p < 0.01$), immunomodulators (23.2% vs. 71.4%, $p < 0.01$), and biologics (9.8% vs. 28.6%, $p = 0.026$) were statistically higher than those in Korea (Table 2). In contrast, the number of Vietnamese patients using topical mesalamine (57.1% vs. 86.6%, $p < 0.01$) was statistically smaller
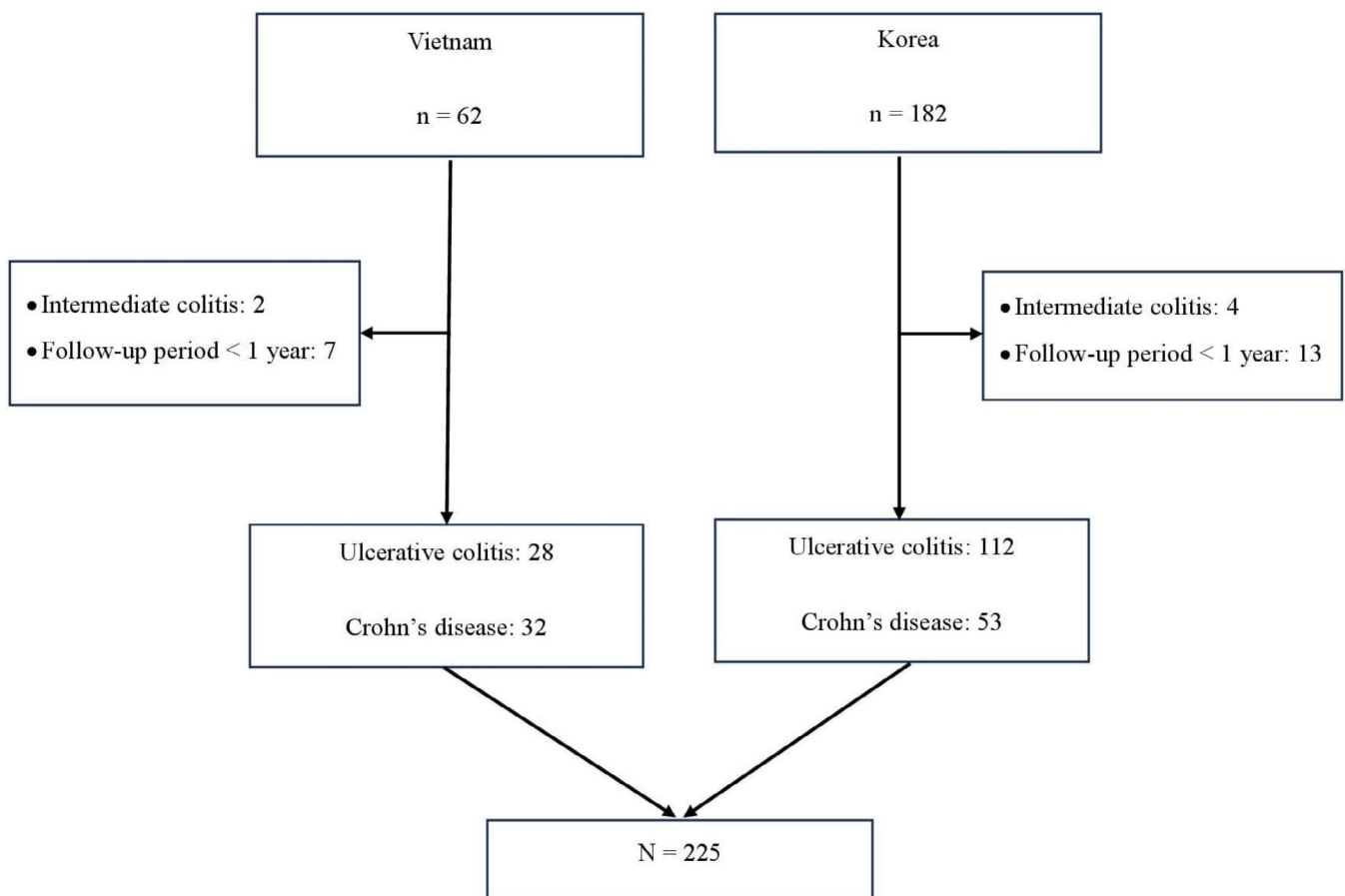
FIGURE 1 | Flowchart of study participants.

TABLE 1 | Baseline characteristics of 225 study participants.

Characteristics[a]	Total population (n = 225)			Ulcerative colitis (n = 140)			Crohn's disease (n = 85)		
	Korea (n = 165)	Vietnam (n = 60)	p[b]	Korea (n = 112)	Vietnam (n = 28)	p[b]	Korea (n = 53)	Vietnam (n = 32)	p[b]
Age at diagnosis	32 (24–43)	33 (27.8–44.2)	0.176	36.5 (27–46.2)	40.5 (28.8–47.5)	0.322	23 (20–31.0)	31.0 (24–37.2)	<0.01
Male	110 (66.7)	32 (53.3)	0.085	70 (62.5)	17 (60.7)	1	40 (75.5)	15 (46.9)	0.01
Family history of IBD	0 (0.0)	1 (1.7)	0.267	0	0		0	1	0.376
Smoking status			0.475			0.353			1
Never	118 (71.5)	40 (66.7)		79 (70.5)	17 (60.7)		39 (73.6)	23 (71.9)	
Ex-smoker	22 (13.3)	12 (20.0)		13 (11.6)	6 (21.4)		9 (17.0)	6 (18.8)	
Current smoker	25 (15.2)	8 (13.3)		20 (17.9)	5 (17.9)		5 (9.4)	3 (9.4)	
Empirical anti-TB therapy							3 (5.7)	3 (9.4)	0.668
Time from onset to diagnosis, mo	3 (1–8)	4 (2–7)	0.154	2 (1–7)	3 (1–5.2)	0.613	3 (1–13.5)	6 (4–16.5)	0.048
Duration of follow-up period, mo	17.4 (11.4–24.2)	13 (11.8–15.5)	<0.01	15.5 (11.3–23.1)	12.9 (12.0–14.7)	0.048	20.5 (12.0–24.4)	13.0 (11.6–15.8)	<0.01
UC disease extension						0.014			
Proctitis (E1)				35 (31.2)	2 (7.1)				
Left-sided colitis (E2)				41 (36.6)	11 (39.3)				
Extensive colitis (E3)				36 (32.1)	15 (53.6)				
UC disease severity						<0.01			
Remission				6 (5.4)	0				
Mild				57 (50.9)	1 (3.6)				
Moderate				48 (42.9)	14 (50)				
Severe				1 (0.9)	13 (46.4)				

(Continues)

TABLE 1 | (Continued)

Characteristics[a]	Total population (n = 225)			Ulcerative colitis (n = 140)			Crohn's disease (n = 85)		
	Korea (n = 165)	Vietnam (n = 60)	p[b]	Korea (n = 112)	Vietnam (n = 28)	p[b]	Korea (n = 53)	Vietnam (n = 32)	p[b]
CD disease location									0.905
Terminal ileum (L1)[c]							11 (20.8)	5 (15.6)	
Colon (L2)[c]							11 (20.8)	7 (21.9)	
Ileocolon (L3)[c]							31 (58.5)	20 (62.5)	
Upper GI modifier (L4)[c]							1 (1.9)	4 (12.5)	0.064
CD disease activity (CDAI)							158 (87–224.2)	251 (208.2–330.2)	**< 0.01**
CD disease behavior									**< 0.01**
Nonstricturing, nonpenetrating (B1)[c]							43 (81.1)	15 (46.9)	
Stricturing (B2)[c]							7 (13.2)	8 (25)	
Penetrating (B3)[c]							3 (5.9)	9 (28.1)	
Perianal disease modifier (p)[c]							21 (39.6)	4 (12.5)	**0.007**

Note: Bold values: $p < 0.05$.

Abbreviations: CD, Crohn's disease; IBD, inflammatory bowel disease; TB, tuberculosis; UC, ulcerative colitis.

[a]Categorical variables are presented as No. (%), and continuous variables are presented as median (IQR).

[b]Fisher's exact test for categorical variables, and Wilcoxon rank-sum test for continuous variables.

[c]Not mutually exclusive.

TABLE 2 | Inflammatory bowel disease treatment within 1 year after diagnosis among 225 study participants.

Disease and treatment[a]	Korea (n = 165)	Vietnam (n = 60)	p[b]
Ulcerative colitis	(n = 112)	(n = 28)	
Oral mesalamine	101 (90.2)	25 (89.3)	1
Topical mesalamine	97 (86.6)	16 (57.1)	**< 0.01**
Corticosteroids	44 (39.3)	24 (85.7)	**< 0.01**
Thiopurine	26 (23.2)	20 (71.4)	**< 0.01**
Biologics	11 (9.8)	8 (28.6)	**0.026**
Tofacitinib	4 (3.6)	1 (3.6)	1
Crohn's disease	(n = 53)	(n = 32)	
Oral Mesalamine	47 (88.7)	12 (37.5)	**< 0.01**
Corticosteroids	37 (69.8)	23 (71.9)	1
Thiopurine	50 (94.3)	31 (96.9)	1
Biologics	16 (30.2)	14 (43.8)	0.245

Note: Bold values: p < 0.05.
[a] Data are presented as No. (%).
[b] Fisher's exact test.

than that in Korea. The use of oral mesalamine and tofacitinib demonstrated no statistical difference among patients in the two countries ($p > 0.05$). Regarding CD treatment, the number of Vietnamese patients using oral mesalamine was smaller than that in Korea (37.5% vs. 88.7%, $p = 0.01$), while the use of other medications demonstrated no statistical difference between the two countries ($p > 0.05$).

For UC, the periods from diagnosis to the use of corticosteroids ($p < 0.01$), immunomodulators ($p < 0.01$), and biologics ($p < 0.01$) in Vietnamese patients were significantly shorter compared to Korean patients (Figure 2). In contrast, the period from diagnosis to the use of topical mesalamine ($p < 0.01$) in Korean patients was significantly shorter compared to Vietnamese patients. Finally, the periods from diagnosis to the use of oral mesalamine and tofacitinib demonstrated no statistically significant difference among patients in the two countries ($p > 0.05$). Regarding CD, the period from diagnosis to the use of oral mesalamine in Korean patients was significantly shorter than in Vietnamese patients ($p < 0.01$) (Figure 3). In contrast, the period from diagnosis to the use of biologics in Vietnamese patients was significantly shorter compared to Korean patients ($p = 0.036$). Furthermore, the periods from diagnosis to the use of corticosteroids and immunomodulators showed no statistically significant difference among patients in the two countries ($p > 0.05$).

3.3 | Clinical Outcomes at 1 Year After Diagnosis

39.1% of all study participants achieved endoscopic healing at 1 year post-diagnosis (Table 3). Regarding UC, no surgery was recorded during the study period, while hospitalization, TB

reactivation, and serious infection accounted for 16.4%, 8.6%, and 8.6%, respectively. The proportions of endoscopic healing, serious infection, TB reactivation, and hospitalization showed no statistically significant difference among patients in the two countries ($p > 0.05$). Regarding CD, surgery (7.1%), hospitalization (36.5%), TB reactivation (4.7%), and serious infection (16.5%) were documented in the whole patient cohort. Similar to UC, the proportions of endoscopic healing, surgery, hospitalization, TB reactivation, and serious infection showed no statistically significant difference among patients with CD in the two countries ($p > 0.05$). After controlling different baseline characteristics between groups including follow-up duration, disease extent (UC), disease behavior (CD), and disease activity, multivariate analysis also showed no difference in the above clinical outcomes between patients in the two countries (Supplementary Tables 1 and 2).

4 | Discussion

This study found that Vietnamese IBD patients presented with higher baseline disease severity than their Korean counterparts, notably in UC extension and CD complications. Despite this, short-term clinical outcomes at one year were comparable between the two countries. This suggests that early and aggressive treatment strategies, particularly the increased use of biologics in Vietnam, may offset the impact of initial disease severity. These findings underscore the importance of geographically tailored approaches to IBD management.

Regarding the baseline characteristics of UC patients, the proportions of extensive colitis and severe UC among Vietnamese patients were higher than in Korean patients (53.6% vs. 32.1% and 46.4% vs. 0.9%, respectively). We also found that Vietnamese patients had more severe and complicated CD than their Korean counterparts. In detail, the proportions of CD patients developing stricturing and penetrating complications in the Vietnamese cohort were 25% and 28.1%, respectively, compared with 5.9% and 13%, respectively, in the Korean cohort. Complications are not uncommon in Asian patients with CD. Other large studies showed that 13.3%–23% and 11%–13% of Asian patients with CD have stricturing and penetrating behavior at diagnosis, respectively [18, 24, 25]. IBD is an emerging disease in Southeast Asia, including Vietnam [17]. We suggest that the low awareness of IBD among the Vietnamese physicians and patients might be one of the reasons for the high proportion of patients with severe and complicated behaviors referred to our study hospitals. In Korea, where IBD prevalence was higher than in Vietnam, public understanding of IBD might be greater [17]. Various conferences have been regularly held, with published guidelines for diagnosis and management to increase IBD awareness [26–28]. Therefore, patients with milder disease could be detected and referred to our study hospitals in Korea. These trends in IBD patterns have been similarly reported in China. Chinese studies conducted in the early 2000s reported high proportions of complicated behavior at diagnosis (non-stricturing non-penetrating 30%–37% vs. penetrating 45%–46%) [29, 30]. However, recent studies have reported a drastically increasing IBD incidence together with the opposite trend in CD behavior (non-stricturing non-penetrating 59%–68% vs. penetrating 11%–13%) probably due to early IBD identification resulting from high awareness in
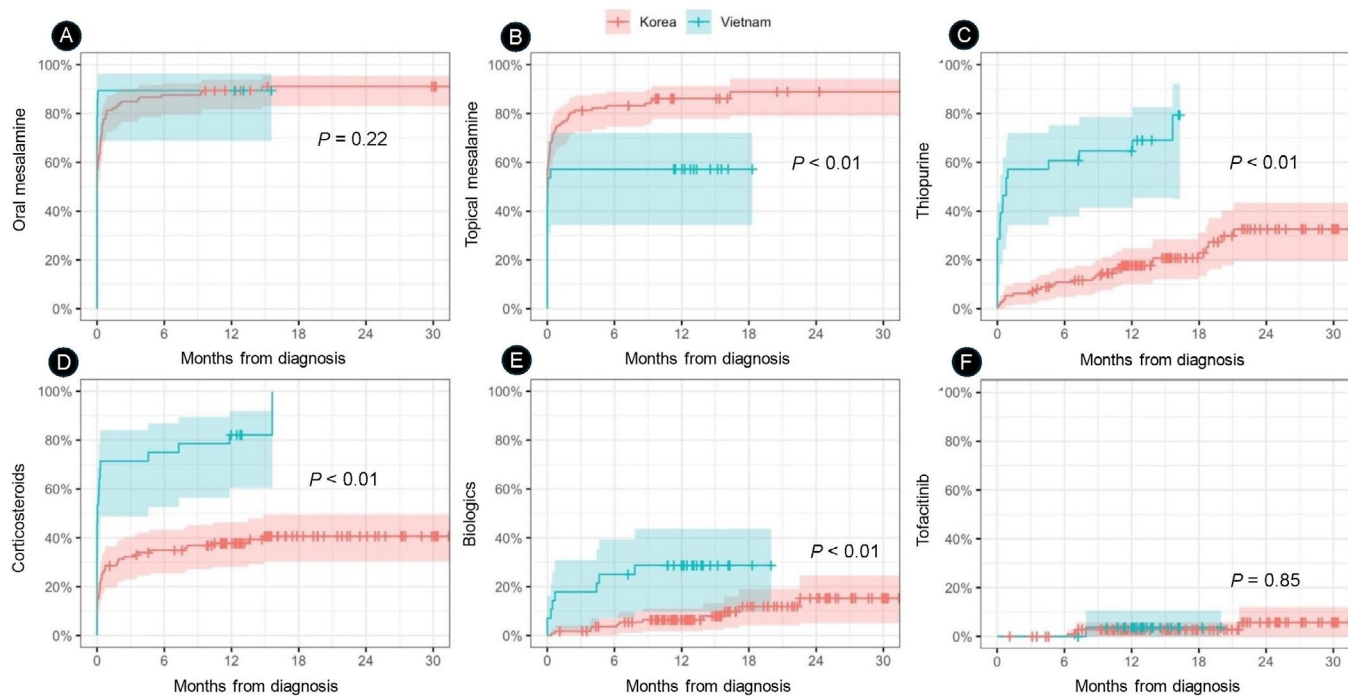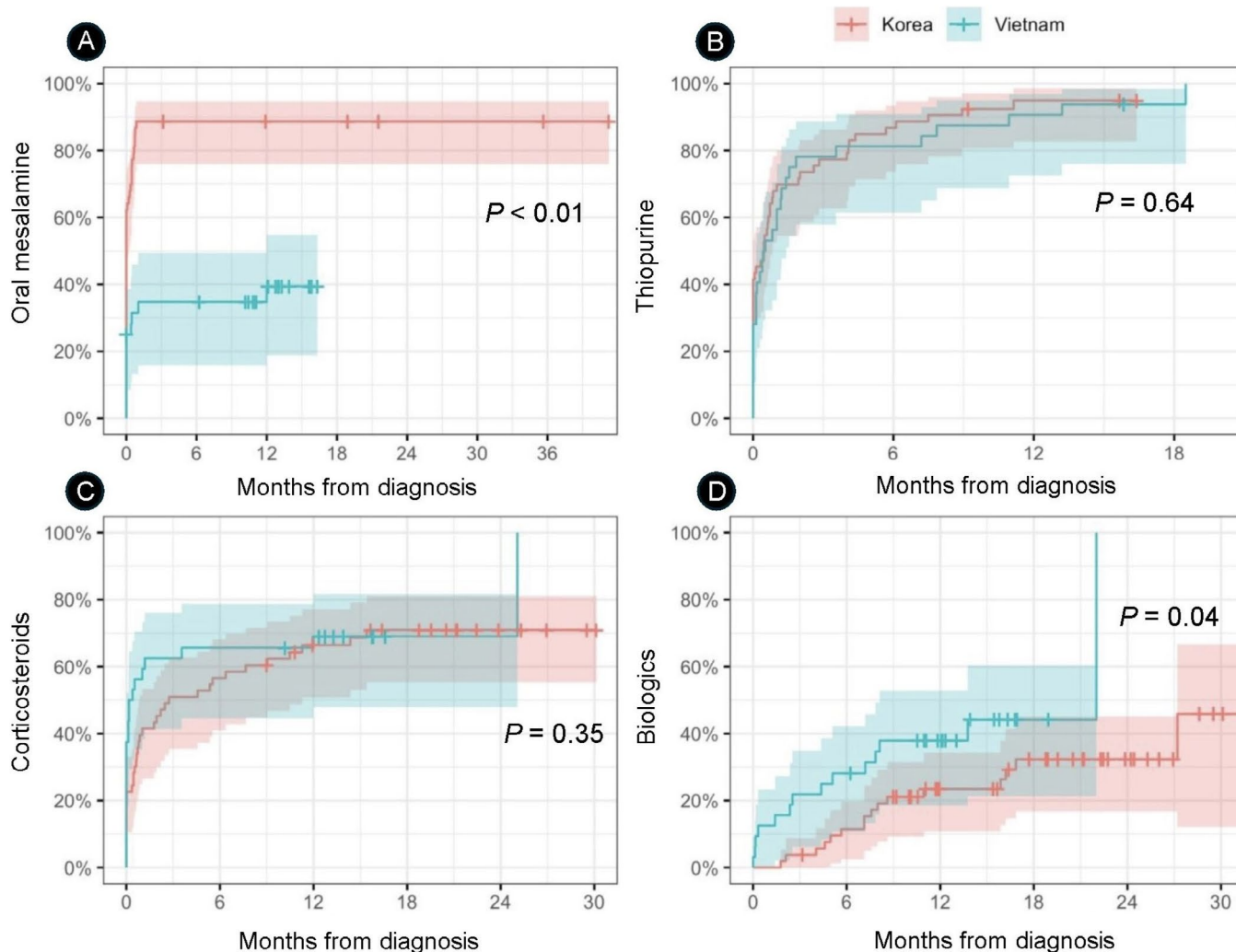
FIGURE 2 | Kaplan–Meier curves for time to treatment of ulcerative colitis with oral mesalamine (A), topical mesalamine (B), thiopurine (C), corticosteroids (D), biologics (E), and tofacitinib (F) between Vietnamese and Korean patients.

China these days [18]. Likewise, a previous Korean study conducted in 1996 showed a high proportion of severe UC activity (34.8%) and no cases of remission at diagnosis, which was similar to those of Vietnamese patients in the present study [31]. In a recent Korean study, disease activity at diagnosis has changed: mild in 49% of cases, moderate in 41.1% of cases, and severe in 8.6% of cases. Additionally, 1.3% of patients had clinical remission (asymptomatic) at diagnosis [32]. In our study, we also found that 5.4% of Korean patients with UC were in remission at diagnosis. Regarding the perianal disease in CD, we found a higher proportion of this complication in the Korean cohort than in the Vietnamese one (39.6% vs. 12.5%), which is in line with a longitudinal study in Korea showing up to 43.3% of perianal fistula in CD [19]. In contrast, two studies conducted in Thailand and Taiwan showed that only 10.9%–14.8% of CD patients developed perianal disease [24, 33]. Despite the unknown cause of this difference among Asian countries, unstudied factors such as genetic or microbial differences may contribute to the disparity in the burden of perianal disease between the two countries in our study, as those factors are implicated in the development of perianal fistula inflammation in CD [34]. Additionally, perianal disease has a wide range of symptoms; hence, detecting them requires a high level of suspicion [35]. Since IBD is an emerging health issue in Vietnam, both clinicians and patients may have low disease awareness, possibly causing a low probability of detection of perianal disease. Considering this, IBD education programs with a special focus on early signs, symptoms, and complications customized for community and healthcare workers would help improve the diagnosis and management of this disease in Vietnam and comparable countries. Intestinal ultrasound (IUS) has been increasingly recognized as part of the diagnostic and monitoring tools for IBD, as it is a non-invasive, simple, and cost-effective method for assessing disease activity of IBD [36–39]. The adoption of IUS could be clinically relevant,

particularly for resource-constrained settings in Asia, where early diagnosis and monitoring of disease progression could benefit from such accessible imaging techniques. Unfortunately, IUS was not used during this study period. Future prospective studies with IUS are warranted to evaluate its feasibility and effectiveness in Asia and to assess its potential impact on improving early diagnosis and disease management.

Given that mesalamine is the firstline treatment of mild-to-moderate UC [40], oral mesalamine was commonly used in UC patients in both countries in our study. However, we found that topical mesalamine was used more frequently in the Korean cohort. This could be attributed to the fact that topical mesalamine is not typically covered by the insurance reimbursement system in Vietnam [41]. Additionally, the relatively low percentage of proctitis in Vietnamese patients might also contribute to the insufficient use of topical 5-ASA in these patients. Indeed, underuse of topical 5-ASA therapy in UC is among the common missteps in the management of IBD in Asia [42]. Mesalamine is commonly used in Asian countries as a CD treatment despite its limited efficacy [43]. Two recent studies in Asia have shown that 75.8%–99.4% of CD patients were prescribed mesalamine [24, 44]. We similarly found that mesalamine was used in 88.7% of Korean patients with CD and only in 37.5% of Vietnamese patients with CD. This may be due to a more severe and complicated disease course in Vietnamese patients with CD, warranting more potent medications. We found that Vietnamese patients with CD started using biologics sooner after diagnosis than Korean patients. In contrast, we found no statistically significant difference in the period from diagnosis to the initiation of corticosteroids and immunomodulators in patients in both countries because these medications are frequently used as the initial treatment of CD [45–47]. Two studies conducted in Asia showed that biologics were only prescribed in 0.5%–4% of UC

FIGURE 3 | Kaplan–Meier curves for time to treatment of Crohn's disease with oral mesalamine (A), thiopurine (B), corticosteroids (C), and biologics (D) between Vietnamese and Korean patients.

TABLE 3 | Clinical outcomes at 1 year after diagnosis among 225 study participants.

Characteristics[a]	Total population (n = 225)	Ulcerative colitis				Crohn's disease			
		Total (n = 140)	Korea (n = 112)	Vietnam (n = 28)	p[b]	Total (n = 85)	Korea (n = 53)	Vietnam (n = 32)	p[b]
Mucosal healing	88 (39.1)	59 (41.1)	41 (47.1)	18 (63.4)	0.561	29 (34.1)	14 (32.6)	15 (48.4)	0.228
Serious infection	26 (11.6)	12 (8.6)	9 (8.0)	3 (10.7)	0.706	14 (16.5)	8 (15.4)	6 (18.8)	0.767
Tuberculosis	16 (7.1)	12 (8.6)	11 (9.8)	1 (3.6)	0.459	4 (4.7)	4 (8.2)	0 (0.0)	0.149
IBD related hospitalization	54 (24)	23 (16.4)	18 (16.1)	5 (17.9)	0.781	31 (36.5)	23 (43.4)	8 (25)	0.107
IBD related surgery	6 (2.7)	0 (0)	(0)	0 (0)		6 (7.1)	4 (7.5)	2 (6.2)	1

Abbreviation: IBD, inflammatory bowel disease.
[a]Data are presented as No. (%).
[b]Fisher's exact test.

patients and 11.6%–13% of CD patients [18, 25]. We found a significantly higher proportion of Vietnamese patients, particularly those with CD, receiving biologic therapy. Biologics demonstrate efficacy in the management of CD and tend to be used in the early treatment of patients exhibiting poor prognostic factors, including stricturing or penetrating complications [4–7, 45]. In our study, the number of CD patients with poor prognostic factors in Vietnam was high. This could influence the decision to administer biologics early in such patients. While the higher baseline disease severity in the Vietnamese cohort likely

contributes, other factors necessitate consideration. Vietnam's status as a lower-middle-income country with limited resources [48] and restricted insurance reimbursement for biologics to only tertiary referral hospitals (including our four study sites) may influence treatment patterns. This limited access may result in earlier biologic prescriptions for patients meeting stringent criteria at these specialized centers, prioritizing those with more severe disease or poor prognostic factors, such as stricturing or penetrating CD, which were prevalent in our Vietnamese cohort. Finally, a recent shift towards increased biologic use in Asian IBD patients, documented in a 2020 study of 384 Asian physicians, may also be at play [47]. These factors suggest that healthcare system constraints in Vietnam, coupled with potentially evolving treatment paradigms in Asia, may contribute to earlier biologic initiation, irrespective of disease severity alone.

In our study, 39.1% of participants achieved endoscopic healing at 1 year post-diagnosis. Within the first year after diagnosis, 16.4% of UC patients and 36.5% of CD patients were admitted to hospitals. Two large IBD studies conducted in Korea similarly found that the cumulative risks of hospitalization 1 year after UD and CD diagnosis were 10.6% and 31.2%, respectively [49, 50], which were comparable to the results of our study. Regarding colectomy, other studies found that the cumulative risk 1 year after diagnosis among Asian patients with UC was only 1%–1.8%, while that of patients with CD was 8%–20.3% [18, 50]. Concurring with this, we found that no patients with UC required surgery, while 7.1% of CD patients underwent surgery during the first year post-diagnosis. Additionally, we found that the rates of TB reactivation and serious infection were 7.1% and 11.6%, respectively, among our whole patient cohort. Tuberculosis reactivation following anti-TNF-α therapy is substantially more common in Asian countries than in Western Europe and North America [10, 11, 51]. Furthermore, serious infection after using biologics has been an increasing concern worldwide [9–11]. Interestingly, the clinical outcomes at 1 year post-diagnosis were not significantly different between the two countries, although Vietnamese patients had more severe IBD and complicated CD. This unexpected finding likely reflects the interplay of several factors beyond the initial disease severity and treatment timing. While the earlier and more frequent use of biologics in Vietnam might have mitigated some of the increased risks associated with a more severe disease [3–7, 52], this effect may be confounded by other variables. The variability in response to biological therapies among Vietnamese and Korean patients, which is attributed to distinct genetic factors, environmental influences, or different pathogenic mechanisms associated with IBD [53–55], may also provide a partial explanation for this finding. Based on the study results, we suggest that educational activities or campaigns should be implemented in Vietnam to improve IBD awareness with the aim of promoting early diagnosis and effective disease management. The application of IUS could serve as a potential starting point for these initiatives. Our results also emphasize the need for improved access to effective therapies, particularly advanced therapies, in under-resourced environments. In Korea, due to the national reimbursement system, it is often delayed in prescribing advanced therapies in IBD after several rounds of corticosteroids and a quite long period of immunomodulator use. Earlier use of biologic therapies in Korean IBD patients might have resulted in better clinical outcomes in the present study. While timely access to biologics is crucial for optimal IBD management, a comprehensive understanding of the diverse factors influencing outcomes is needed. Future research should explore genetic, environmental, infrastructural, and socio-economic influences on IBD prognosis to develop effective and sustainable care strategies.

This retrospective, multi-national study has several methodological limitations. Firstly, the smaller sample size in Vietnam ($n = 60$) compared to Korea ($n = 165$) reduces statistical power, particularly for less common outcomes, and may limit the generalizability of our findings to the Vietnamese population. However, this difference in IBD sample size between countries may reflect well the real-world situation of IBD in Asia. We collected consecutive new IBD patients from 3rd referral hospitals in Daegu City and Ho Chi Minh City, which are metropolitan cities of each country, during the same study period. Given that the population of Ho Chi Minh City (8.9 million) is much higher than Daegu City (2.3 million), the IBD prevalence of Vietnam appears to be much lower than that of Korea. Secondly, confounding variables potentially influencing clinical outcomes of patients such as laboratory tests or results of cross-sectional image (for CD) were not collected in the study. Thirdly, while a MES of 0 or a UCEIS score of 1 or lower are both recommended for confirming endoscopic healing, differences in endoscopic scoring systems may also affect cross-country comparisons of endoscopic healing. Finally, the restriction to tertiary teaching hospitals in large cities may limit the generalizability of our findings to all IBD patients in both countries. These limitations should be considered when interpreting our results. Despite the limitations of this study, to the best of our knowledge, it provides valuable insights into the management and short-term outcomes of IBD in a resource-limited (Vietnam) and a high-income (Korea) Asian setting.

In conclusion, severe IBD is more common, while biologics administration is earlier, in Vietnamese patients compared with Korean patients at 1 year post-diagnosis. However, 1-year outcomes did not differ among patients in the two countries. Country-based IBD education programs with a special focus on early signs, symptoms, complications, and treatment strategies customized for the community and healthcare workers would improve early diagnosis and management.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.