Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Hepato-Gastroenterology

Epidemiological Profile of Inflammatory Bowel Diseases (IBD) in the Northern Region

S. Riffi Temsamani[1*], A. Akjay[1], L. El Aoufi[1], K. Attaqui[1], A. Zaoui[1], H. Ouaya[1], H. Meyiz[1], I. Mellouki[1]

[1]Department of Hepato-Gastroenterology, Tangier-Assilah-Tetouan, Al Houceima University Hospital Center, Tangier, Morocco

DOI: https://doi.org/10.36347/sjams.2025.v13i04.019 | **Received:** 03.03.2025 | **Accepted:** 08.04.2025 | **Published:** 22.04.2025

***Corresponding author:** S. Riffi Temsamani
Department of Hepato-Gastroenterology, Tangier-Assilah-Tetouan, Al Houceima University Hospital Center, Tangier, Morocco

Abstract **Original Research Article**

Inflammatory Bowel Diseases (IBD), including Crohn's disease and ulcerative colitis, are chronic inflammatory disorders of the gastrointestinal tract with increasing incidence worldwide. While traditionally more prevalent in Western countries, recent years have seen a notable rise in IBD cases across developing nations, including North African countries such as Morocco. In the northern region of Morocco, data on the epidemiological profile of IBD remain scarce. This study aims to characterize the demographic, clinical, and geographic distribution of IBD in this part of the country. Through the analysis of patient records and hospital data, we seek to identify patterns related to age, sex, disease type, diagnostic delay, and environmental or lifestyle factors potentially associated with disease onset and progression. Our findings provide the first comprehensive overview of IBD epidemiology in northern Morocco, highlighting local specificities and contributing to a better understanding of the disease in a Moroccan context. This work also underscores the need for improved data collection systems and targeted public health strategies to enhance early detection and disease management at the national level.

Keywords: Chronic Inflammatory Bowel Diseases (IBD), Crohn's Disease (CD), Ulcerative Colitis (UC), Epidemiology.

INTRODUCTION

Chronic inflammatory bowel diseases (IBD), including Crohn's disease and ulcerative colitis, represent a growing public health concern worldwide. Long considered diseases primarily affecting Western countries, they are now showing a significant rise in developing regions, particularly in North Africa.

In Morocco, managing IBD remains challenging due to the lack of reliable epidemiological data and the absence of a national registry. The clinical and diagnostic features of IBD are still poorly documented.

This study aims to provide an overview of the epidemiological profile of IBD in northern Morocco by analyzing their distribution across various factors and identifying current trends to better guide prevention and management strategies.

MATERIALS AND METHODS

This study includes 250 patients with IBD monitored in the hepatogastroenterology department over a 3-year period (2021-2024). The data were collected from the department's records, then compiled into a spreadsheet and analyzed using Microsoft Excel.

RESULTS

The incidence of IBD is increasing annually, with a relatively higher prevalence of Crohn's disease (82%) compared to ulcerative colitis (18%). The average age of patients is 37, with a peak between the ages of 25 and 45. The majority of patients (89%) resided in urban areas, and 43% were covered by CNSS-PIPC health insurance. The gender distribution is balanced for Crohn's disease, whereas men are more affected by ulcerative colitis. The prevalence of smoking in our cohort is relatively low at 13%, and 5% of the patients had a family history of IBD. Regarding lesion topography, ileocolic involvement is the most common in Crohn's disease, occurring in 60% of cases, especially in younger patients. For ulcerative colitis, pancolitis is the most common form, occurring in 65% of cases. Ano-perineal lesions are characteristic of Crohn's disease, occurring in 32% of cases. The phenotypes of Crohn's disease include inflammatory forms (44%), as well as fistulizing and stricturing forms (28%). Regarding

treatments, 23% of patients were receiving biologic therapy, 16% were on combination therapy, 13% were treated with immunosuppressants, and 15% had undergone surgical resection followed by maintenance therapy. Side effects were generally rare; however, 5% of patients experienced hematologic toxicity, 4% developed corticosteroid dependency, and two cases of acute pancreatitis were observed. Additionally, there were infectious complications, including 3 cases of tuberculosis reactivation. Our study revealed that 41% of patients followed a balanced diet, while 34% adhered to no specific diet.

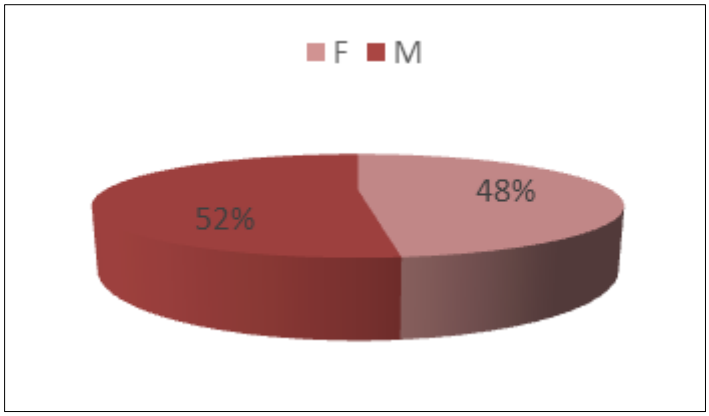

Figure 1: Distribution of subjects according to sex

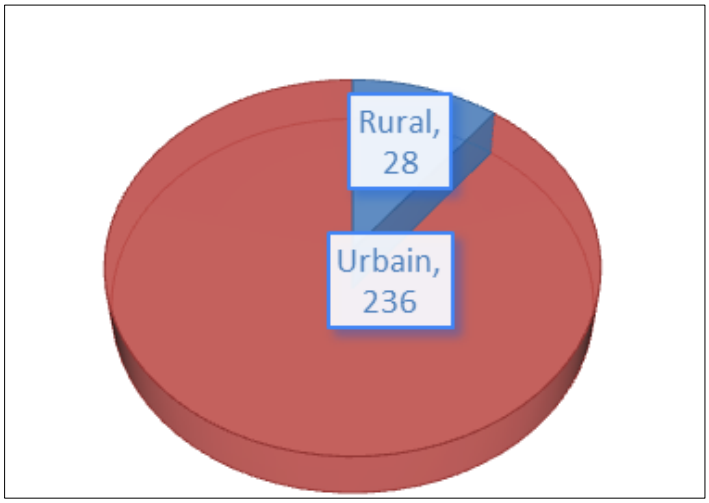

Figure 2: Distribution of subjects according to geographical origin

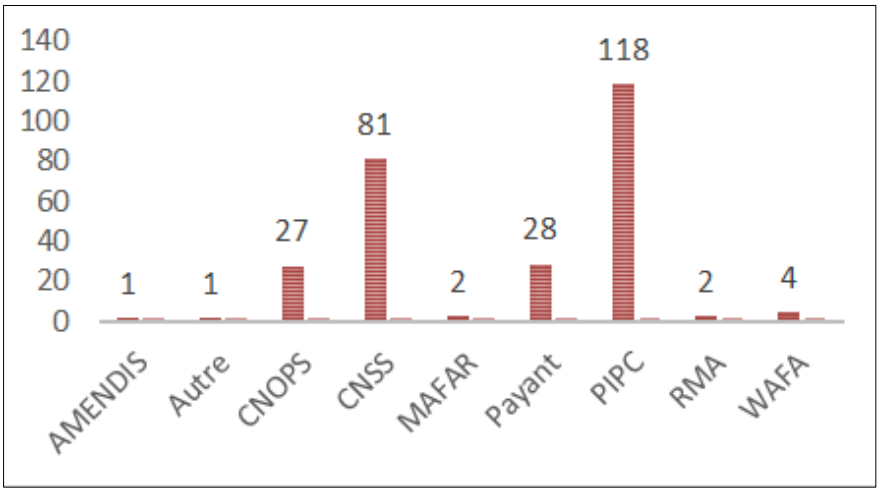

Figure 3: Distribution of patients according to medical coverage

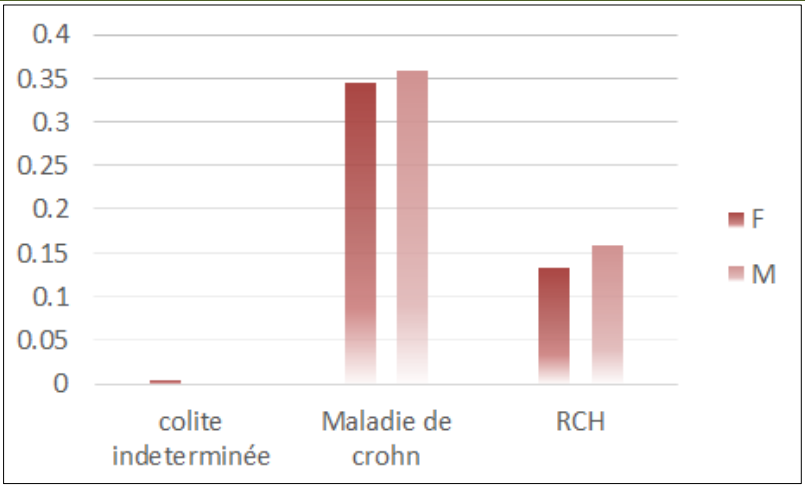

Figure 4: Distribution of IBD according to sex

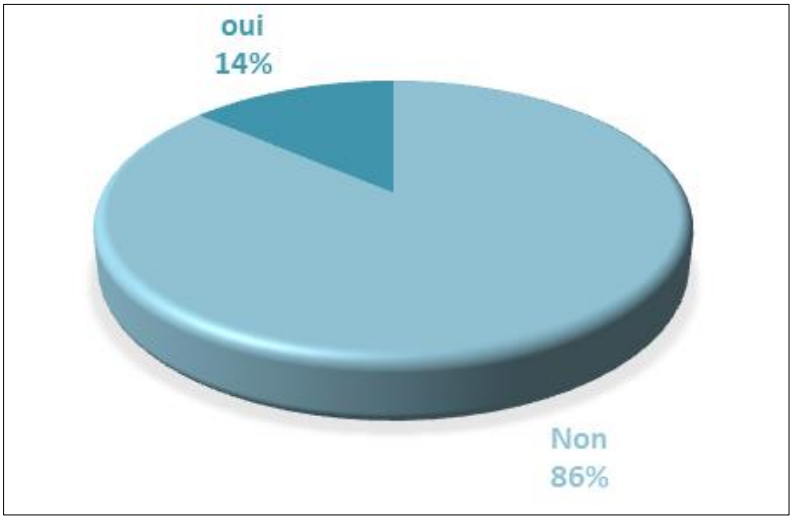

Figure 5: Distribution of IBD according to smoking status

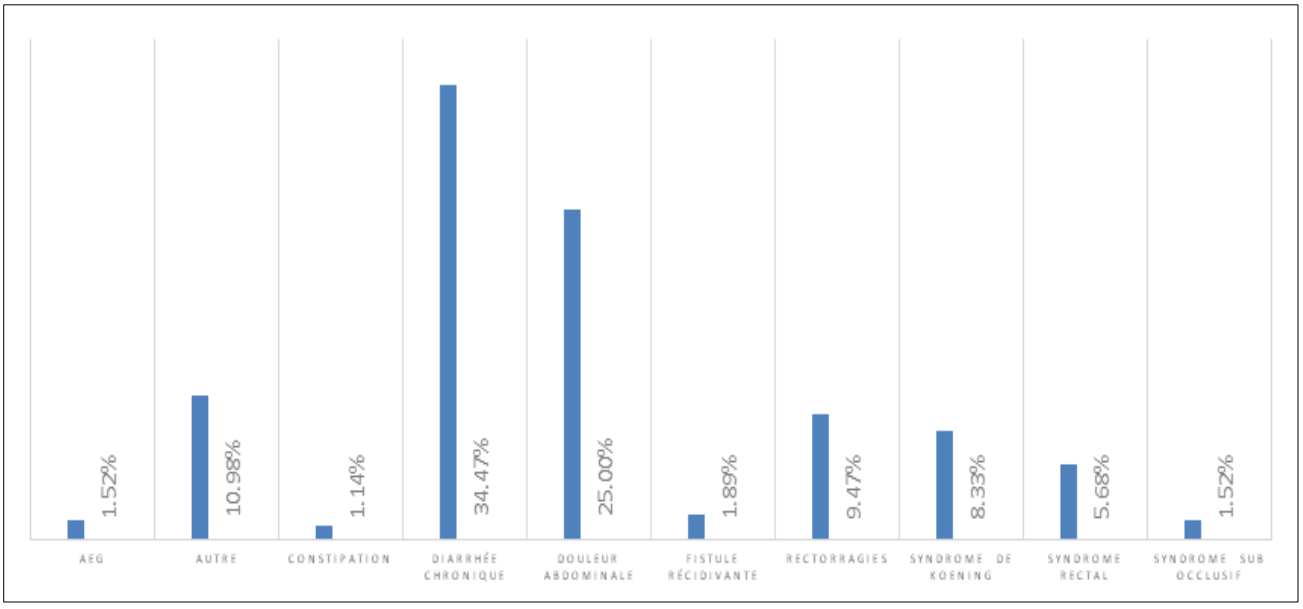

Figure 6: Distribution of patients according to initial symptoms

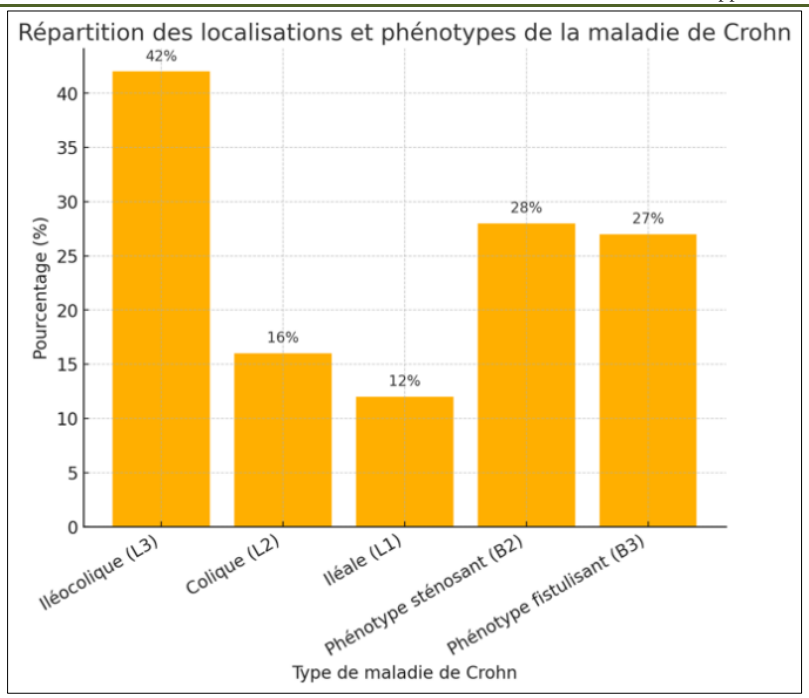

Figure 7: Distribution of Crohn's disease locations and phenotypes

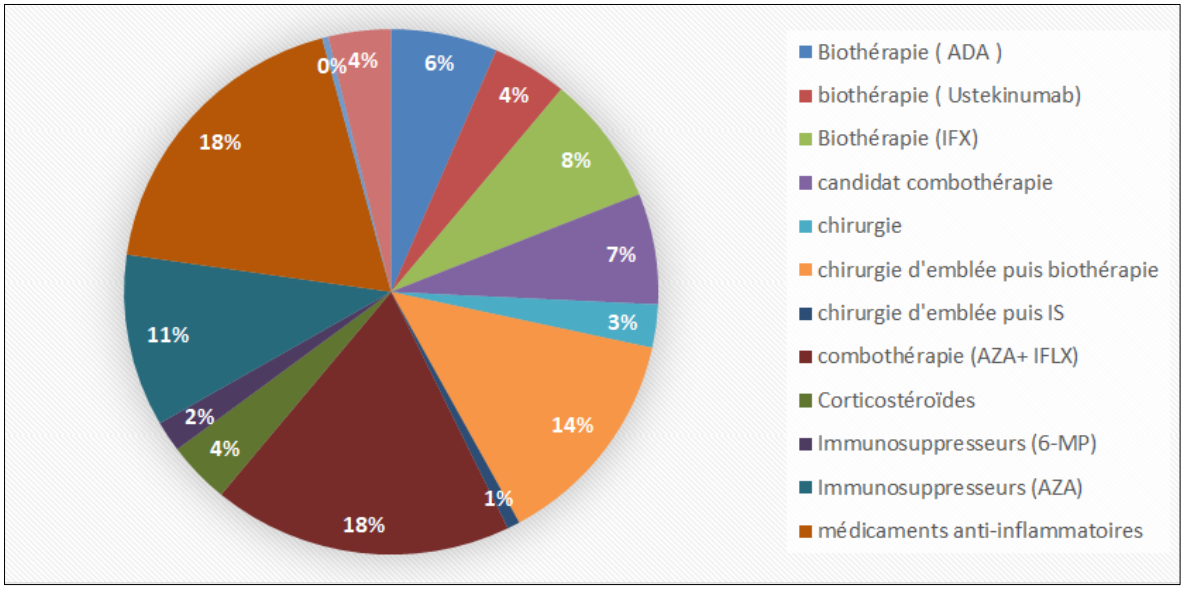

Figure 8: Distribution of patients according to maintenance therapy

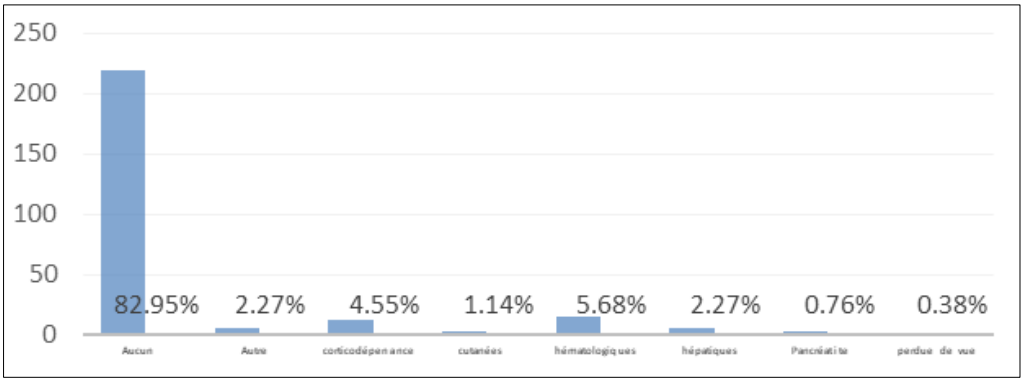

Figure 9: Distribution of side effects

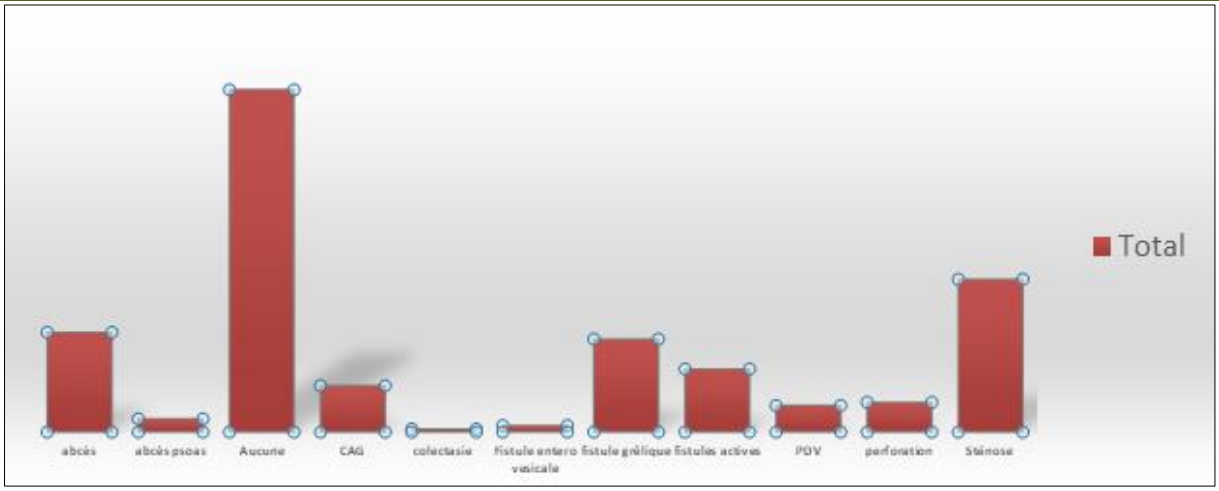

Figure 10: Distribution of IBD according to complications

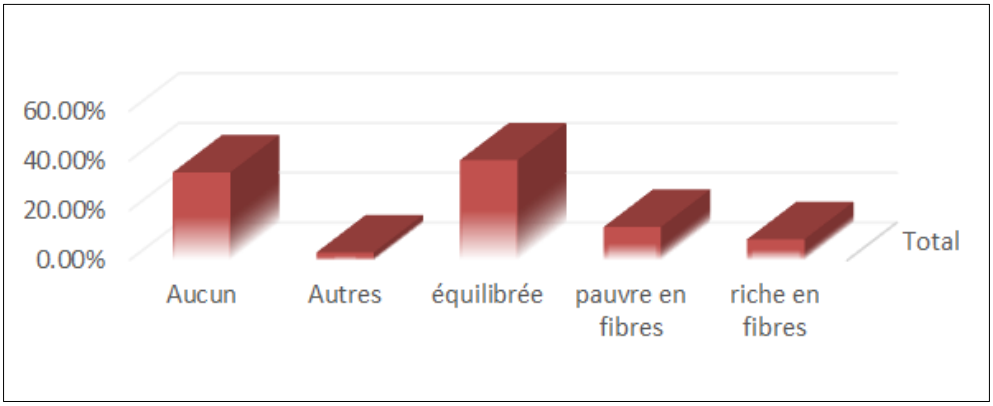

Figure 11: Distribution of IBD according to dietary patterns

DISCUSSION

The global distribution of inflammatory bowel diseases (IBD) has undergone significant changes in recent years. Once considered predominantly diseases of industrialized nations, recent epidemiological data highlight a growing incidence and emergence of IBD in low- and middle-income countries.

The average age of participants in our study was 37 years, with an age range from 11 to 85 years, which is consistent with findings from other recent studies. For instance, a study conducted at the University Hospital of Fès (Meyiz *et al*.,) [4], reported a mean age of 38 years (range: 17–70 years). Furthermore, several international studies have also reported comparable mean ages, ranging from 34 to 38 years [5-8]. In South Korea, one study found that nearly 70% of patients were under the age of 40 [7]. This trend toward a younger average age may be attributed to the increasing prevalence of IBD among young adults.

In our study, out of a total of 186 cases (70%), Crohn's disease was diagnosed, with a slight male predominance of 36%. Ulcerative colitis (UC) was identified in 77 patients (29%), with a stronger male predominance of 16%, while indeterminate colitis accounted for 0.76% of cases (n = 1).

These findings reveal a modest male predominance, although the difference remains marginal. This observation raises questions about the potential influence of biological, environmental, and genetic factors in the onset and progression of IBD.

Epidemiological studies conducted in Morocco have highlighted regional variations in the distribution of IBD according to sex and disease type. Several studies report a female predominance, particularly for Crohn's disease and ulcerative colitis.

For instance, a study conducted at the University Hospital of Fès reported a female-to-male sex ratio of 1.57 for Crohn's disease and 1.4 for ulcerative colitis [9]. Conversely, a study carried out at the University Hospital of Tangier in 2024 by Akjay *et al*., focusing on the characteristics of Moroccan patients with IBD, revealed a sex ratio of 1.1 in favor of males [11].

At the international level, trends also vary depending on the study and the type of IBD. For example, a study conducted in France by INSERM in 2023 reported a female predominance for Crohn's

disease with a sex ratio of 1.2, while ulcerative colitis showed an equal distribution between sexes [12].

In our study, an urban origin was observed in 89% of cases (n = 236), while rural origin accounted for 11% of cases (n = 28). These findings are consistent with those of other recent studies.

For example, a study conducted at the University Hospital of Tangier by Akjay *et al*., reported a higher incidence of IBD among the urban population compared to the rural population, with 70% of cases originating from urban areas versus 30% from rural regions [13].

Similarly, a study carried out at the University Hospital of Marrakech showed that the majority of patients came from urban settings (65%) compared to 35% from rural areas [14].

This predominance of urban cases may be explained by greater exposure to pollution, westernized dietary habits, and higher stress levels—factors that may contribute to the development of IBD. Moreover, urban populations generally have better access to healthcare services, which facilitates earlier diagnosis [10].

Our study highlights a smoking prevalence of 19%, with 14% (n = 37) among patients with Crohn's disease (CD) and 5% (n = 12) among those with ulcerative colitis (UC). These results are consistent with existing literature, which suggests a potentially protective role of smoking in UC [16], and a deleterious effect in CD, where the risk is reported to be twice as high in smokers compared to non-smokers. This increased risk is independent of the number of cigarettes smoked and decreases after smoking cessation, although it does not completely disappear until four years after quitting [15–17].

Smoking worsens the course of IBD by increasing the frequency and severity of flare-ups. Several mechanisms have been proposed to explain its divergent effects on UC and Crohn's disease. The influence of tobacco may vary depending on genetic background and could be modulated by the presence of specific susceptibility genes [18].

In ulcerative colitis (UC), a reduction in mucus glycoprotein production and an increase in colonic permeability are commonly observed. In contrast, tobacco use promotes mucus thickening and decreases colonic mucosal permeability, which may partially explain its potential protective effect in patients with UC or those at risk of developing the disease [19].

In our study, 4% of patients (n = 11) reported a first-degree family history of inflammatory bowel disease (IBD). These findings are comparable to those reported in several Moroccan studies. For instance, a study conducted at the Ibn Sina University Hospital in Rabat (Medicine Department C) on the epidemiological profile of IBD revealed a prevalence of family history of 5.5% [20].

Although our study and previous Moroccan research report relatively low rates of family history of IBD, these findings remain consistent with international data while also highlighting regional and genetic specificities. Identifying familial risk factors is essential to improving early screening and the management of at-risk patients, particularly in the Moroccan context, where awareness of IBD remains a major public health challenge [38].

The results of our study show that diarrhea is the most common clinical manifestation across all forms of IBD (34%), whether in Crohn's disease (CD) or ulcerative colitis (UC). It affects a significant proportion of patients, confirming its central role in the clinical presentation of IBD. Abdominal pain was reported in 25% of cases, while rectal bleeding was observed in 9.47% of patients with UC. Koenig's syndrome, which is typical of CD, was present in 8.33% of patients, and rectal syndrome—reflecting distal involvement frequently seen in IBD—was noted in 5.68% of cases. Less common manifestations, such as recurrent fistulas (1.89%) and subocclusive syndromes (1.52%), underscore the clinical complexity of these diseases.

The findings of our study are broadly consistent with international data. The high prevalence of ileocolic involvement (42%) in Crohn's disease (CD) aligns with the observations from the EPIMAD study conducted in France, where ileocolic disease accounted for approximately 45% of cases [21]. Anoperineal manifestations (23%) in our cohort are also in line with figures reported in a North American study, which estimated their prevalence between 20% and 30% among CD patients, particularly in those with the fistulizing phenotype (B3).

Regarding ulcerative colitis (UC), our study shows a predominance of pancolitis (18%), which is similar to international studies where pancolonic involvement generally ranges from 15% to 25%, particularly in Europe and North America [12]. The marked predominance of pancolitis in our study may be explained by a delayed diagnosis, allowing the inflammatory process to progress retrogradely from the rectum to involve the entire colon.

In our study, the stricturing phenotype of Crohn's disease (CD) was observed in 28% of cases, while the fistulizing phenotype was present in 27% of patients. These findings are similar to those reported by Aicha Akjay *et al*., in a study conducted at the University Hospital of Tangier, where the stricturing phenotype accounted for 30% of cases and the fistulizing phenotype for 23% [11].

In contrast, a study carried out at the Ibn Sina University Hospital in Rabat (Department of Medicine B) reported a predominance of the inflammatory phenotype (53.8%), with lower rates of fistulizing (34.2%) and stricturing (12%) phenotypes [9].

Additionally, data from the French EPIMAD registry also indicate a predominance of the inflammatory phenotype (60%), followed by stricturing (30%) and fistulizing (8%) phenotypes [22].

In our study, 29% of patients with ulcerative colitis (UC) received topical therapy, primarily for mild to moderate forms of the disease. Regarding maintenance treatment, 38% of patients were treated with biologic therapy, distributed as follows: 8% with Infliximab, 6% with Adalimumab, and 4% with Ustekinumab, with combination therapy applied in 18% of cases. Additionally, 19% of patients were on aminosalicylates, while 13% received immunosuppressants alone. Surgical intervention was necessary in 14% of patients, often followed by maintenance biologic therapy. Lastly, 7% of patients were candidates for biologics, while 4% were lost to follow-up.

In comparison, a study conducted at the University Hospital of Tangier reported a predominance of azathioprine (57%) as maintenance therapy, followed by 6-mercaptopurine (10%), methotrexate (4%), and aminosalicylates (26%). Although biologics were indicated in 66% of cases, only 10% of patients received them, mainly due to financial constraints. This marked difference from our study, in which 38% of patients were treated with biologics, may reflect better access to innovative therapies in our cohort or differences in national reimbursement policies for biologic agents [11].

Finally, international data also confirm these disparities in the management of IBD. For example, a study by Averhov *et al*., (2020) reported that immunosuppressants were the most commonly used treatment, prescribed in 52% of patients [25], while a study by Martins *et al*., (2021) indicated that aminosalicylates were the most frequently administered therapy, used in 88% of cases. This difference may be attributed to a distinct clinical profile of patients, with a predominance of mild to moderate forms of UC, for which aminosalicylates are particularly effective [26].

In our study, the overall tolerance to treatments for inflammatory bowel disease (IBD) was satisfactory, with 83% of patients experiencing no adverse effects during therapy. However, some notable side effects were reported: 6% of patients developed hematologic toxicity, and 4% showed signs of steroid dependence, indicating a prolonged need for corticosteroids to maintain clinical remission. Hepatotoxicity was observed in 2% of cases, requiring close biological monitoring. Gastrointestinal adverse effects were reported in 2% of patients, including two cases of acute pancreatitis.

In comparison, a study conducted in Lausanne reported a higher prevalence of acute pancreatitis associated with azathioprine, affecting 17.5% of patients with Crohn's disease and 17% of those with ulcerative colitis (UC). Additionally, 15% of patients experienced gastrointestinal intolerance, and hepatotoxicity was noted in 6% of both CD and UC patients [27]. These findings suggest a lower tolerance to azathioprine in that cohort, particularly regarding acute pancreatitis, when compared to the two cases observed in our study.

During our study, with an average follow-up period of two years, 39% of patients remained in remission, while several severe complications were observed. Among patients with Crohn's disease (CD), 18% developed a fistulizing form, and 13% presented with abscesses, including four cases involving the psoas muscle.

Other serious complications included stricturing forms in 17.42% of patients, severe acute colitis in 5% of cases, and intestinal perforations in 3.41% of patients. Additionally, a 3% loss to follow-up rate was recorded.

A Brazilian study conducted by Delmondes LM *et al*., reported a high prevalence of fistulizing complications in CD patients, with 67% of cases presenting with intestinal fistulas and abscesses. Among these patients, 13% had enterocutaneous fistulas, while 54% exhibited other types of fistulas, highlighting the clinical variability of fistulizing complications in Crohn's disease [30].

The study conducted at the University Hospital of Tangier also highlighted the severity of complicated forms of Crohn's disease (CD), with 7 patients presenting with active fistulizing CD and 5 patients with a stricturing phenotype, of whom 4 required surgical intervention. This study also emphasized the limited access to biologic therapies, which contributed to the development of severe complications and resulted in 2 deaths among patients with severe forms of CD [11].

These findings underscore the clinical complexity of fistulizing and stricturing forms of CD and highlight the importance of appropriate therapeutic management—particularly through improved access to innovative treatments such as biologic therapies—in order to prevent serious complications and improve patients' quality of life [39].

Our study revealed that 40% of patients followed a balanced diet, while 35% did not adhere to any specific dietary regimen. Additionally, 13% of patients followed a low-fiber diet, and 8% adopted a high-fiber diet. These findings highlight the diversity of dietary behaviors among patients with inflammatory bowel disease (IBD). However, it is important to emphasize that low-residue diets should not be

maintained over the long term, as they may lead to nutritional deficiencies and a deterioration in quality of life [31, 32].

According to ESPEN recommendations, dietary management should involve regular follow-up with a dietitian as part of a multidisciplinary approach to ensure optimal patient care. Experts agree that there is no universally recommended "IBD diet" to induce remission during the active phase. Therefore, an individualized nutritional strategy tailored to each patient's clinical condition is preferred. Furthermore, in patients with obesity, weight loss should only be considered during periods of stable remission [29-36].

CONCLUSION

At the end of this work, IBD are not uncommon in our context our research has contributed to a better understanding of their epidemiological, topographical, and phenotypic characteristics. The establishment of a regional registry for these conditions is essential and will not only help in understanding the epidemiological parameters but also facilitate their management in the future.

Abreviations:
UC: Ulcerative Colitis
CD: Crohn's Disease
CHU: University Hospital Center (*Centre Hospitalier Universitaire*)
IBD: Inflammatory Bowel Disease
WHO: World Health Organization (*Organisation Mondiale de la Santé*)
ECCO: European Crohn's and Colitis Organisation
AMO: Mandatory Health Insurance (*Assurance Maladie Obligatoire*)
RAMED: Medical Assistance Scheme (*Régime d'Assistance Médicale*)
CNSS: National Social Security Fund (*Caisse Nationale de Sécurité Sociale*)
ADA: Adalimumab
IFX: Infliximab
AZA: Azathioprine
6-MP: 6-Mercaptopurine

REFERENCES

1. Racine, A. (2015). *Maladies inflammatoires chroniques de l'intestin, facteurs d'environnement et expositions médicamenteuses : étude épidémiologique* [Thèse de doctorat, Université Paris-Saclay]. TEL Archives Ouvertes. https://tel.archives-ouvertes.fr/tel-01375170
2. Kirchgesner, J. (2023). *Épidémiologie des maladies inflammatoires chroniques intestinales (MICI)* [Support de cours, DIU MICI, année universitaire 2022–2023].10. Dr Antoine Meyer, DIU MICI, Facteurs d'environnement associés à la survenue des MICI et influençant le cours des MICI (hors facteurs alimentaires), 2022-2023
3. Windsor, J. W., & Kaplan, G. G. (2019). Evolving epidemiology of IBD. *Current Gastroenterology Reports, 21*(8), Article 40. https://doi.org/10.1007/s11894-019-0705-6
4. SNFGE. (n.d.). *État de connaissance des patients suivis pour MICI*. JFHOD | Société savante médicale française d'hépato-gastroentérologie et d'oncologie digestive. Consulté le 17 avril 2023, sur https://www.snfge.org/content/etat-de-connaissance-des-patients-suivis-pour-m
5. Danion, P., Buisson, A., Roblin, X., Mathieu, N., Charlois, A.-L., Borgerding, J. N., et al. (2018). IBD-INFO questionnaire: A multicenter French up-to-date survey of patient knowledge in inflammatory bowel disease. *Inflammatory Bowel Diseases, 24*(5), 943–952.
6. Ostromohov, G., Fibelman, M., Hirsch, A., Ron, Y., Cohen, N. A., Kariv, R., et al. (2021). Assessment of patients' understanding of inflammatory bowel diseases: Development and validation of a questionnaire. *United European Gastroenterology Journal, 10*(1), 104–114.
7. Yoo, Y.-S., Cho, O.-H., & Cha, K.-S. (2015). Disease-related knowledge and information needs among inflammatory bowel disease patients in Korea. *Gastroenterology Nursing, 38*(6), 455–463
8. Yoon, H., Yang, S.-K., So, H., Lee, K. E., Park, S. H., Jung, S.-A., et al. (2019). Development, validation, and application of a novel tool to measure disease-related knowledge in patients with inflammatory bowel disease. *Korean Journal of Internal Medicine, 34*(1), 81–89.
9. CHU Ibn-Sina. (s.d.). *Les aspects épidémiologiques des MICI dans une population marocaine : Expérience d'un service d'hépato-gastro-entérologie du CHU Ibn-Sina de Rabat "Clinique médicale B" (à propos de 300 cas)*.Mémoire de fin d'études
10. Akjay, A., Meyiz, H., Lakhdar, O., Ait Hmed, Y., Almaimouni, N., Elfassi, S., Ouaya, H., & Mellouki, I. (2024, May). Éducation thérapeutique chez les patients atteints de maladie inflammatoire chronique de l'intestin. *IOSR Journal of Humanities and Social Science (IOSR-JHSS), 29*(5, Series 11), 38–49.
11. https://www.inserm.fr/dossier/maladies-inflammatoires-chroniques-intestin-mici/
12. Akjay, A., Meyiz, H., Lakhdar, O., Ait Hmed, Y., Almaimouni, N., Elfassi, S., Ouaya, H., & Mellouki, I. (2024, May). [Epidemiological Profile of IBD in the Northern Region: "Pilot Study"]. *Scholars Journal of Applied Medical Sciences (Sch J App Med Sci), 12*(5), 619–626
13. Abakarim, O. (2019). *Profil immunoclinique des maladies inflammatoires chroniques de l'intestin (MICI)* [Thèse de doctorat en médecine, CHU Marrakech].
14. Nicolaides, S., Vasudevan, A., Long, T., & Van Langenberg, D. (2021). The impact of tobacco

smoking on treatment choice and efficacy in inflammatory bowel disease. *Intestinal Research, 19*(2), 158–170. https://doi.org/10.5217/ir.2020.00137

15. De Saussure, P., Clerson, P., Prost, P. L., Tan, N. T., & Bouhnik, Y. (2007). Appendectomy, smoking habits and the risk of developing ulcerative colitis: A case-control study in private practice setting. *Gastroentérologie Clinique et Biologique, 31*(5), 493–497.
16. Parkes, G. C., Whelan, K., & Lindsay, J. O. (2014). Smoking in inflammatory bowel disease: Impact on disease course and insights into the aetiology of its effect. *Journal of Crohn's and Colitis, 8*(8), 717–725. https://doi.org/10.1016/j.crohns.2014.01.001
17. Sigvardsson, I., et al. (2024). Exposition à la fumée de tabac pendant la petite enfance et risque ultérieur de maladie inflammatoire de l'intestin : Une étude de cohorte de naissance scandinave. *Journal of Crohn's and Colitis*. https://doi.org/10.1093/ecco-jcc/jjae020
18. Piovani, D., Danese, S., Peyrin-Biroulet, L., Nikolopoulos, G. K., Lytras, T., & Bonovas, S. (2019). Environmental risk factors for inflammatory bowel diseases: An umbrella review of meta-analyses. *Gastroenterology, 157*(3), 647–659. https://doi.org/10.1053/j.gastro.2019.04.041
19. Engoang, W. (2016). *Le profil épidémiologique des maladies inflammatoires chroniques de l'intestin : À propos d'une série universitaire de 982 cas, colligés au sein du service de gastroentérologie de médecine "C" du CHU Ibn-Sina* [Thèse de doctorat en médecine, CHU Rabat].
20. Gower-Rousseau, C. (2012). *Épidémiologie des maladies inflammatoires chroniques de l'intestin en France : Apport du registre EPIMAD* [Thèse de doctorat, Université du Droit et de la Santé – Lille II].
21. Épidémiologie et histoire naturelle des maladies inflammatoires chroniques intestinales : 30 ans de registre EPIMAD. (2018, février). *Hépato-Gastro & Oncologie Digestive, 25*(8/2),
22. Nicolaides, S., Vasudevan, A., Long, T., & Van Langenberg, D. (2021). The impact of tobacco smoking on treatment choice and efficacy in inflammatory bowel disease. *Intestinal Research, 19*(2), 158–170.
23. Boudour, M. (2022). *Étude épidémiologique et clinique de la maladie de Crohn* [Mémoire de master, Faculté des Sciences de la Nature et de la Vie, Alger].
24. Averhov, Å. H., Sachs, M. C., Ludvigsson, J. F., Khalili, H., Askling, J., Neovius, M., Myrelid, P., Halfvarson, J., Nordenvall, C., Söferling, J., Olén, O., & SWIBREG Study Group. (2020). Work loss in relation to pharmacological and surgical treatment for Crohn's disease: A population-based cohort study. *Clinical Epidemiology, 12*, 273–285. https://doi.org/10.2147/CLEP.S235686
25. Martins, K. R., Araújo, J. M., Cruz, Á. C., & Luiz-Ferreira, A. (2021). Epidemiologic aspects of inflammatory bowel disease in the western region of Minas Gerais State. *Arquivos de Gastroenterologia, 58*(3), 377–383. https://doi.org/10.1590/S0004-2803.202100000-61
26. Henchoz, S. (2011). *Caractéristiques cliniques, phénotypiques et thérapeutiques des patients atteints d'une maladie chronique inflammatoire de l'intestin (maladie de Crohn ou colite ulcéreuse) âgés de plus de 60 ans et/ou diagnostiqués après 60 ans, inclus dans la SWISSIBD cohort study* [Mémoire de maîtrise en médecine, Faculté de Biologie et Médecine, Université de Lausanne].
27. Ksouda, K. (2021, février). Description des effets indésirables des immunosuppresseurs chez un échantillon de patients tunisiens ayant une maladie inflammatoire chronique intestinale. *Journal de l'Institut de Médecine de Sfax (J.I.M. Sfax), 37*, 31–42.
28. Centre de Ressources et d'Informations Nutritionnelles. (2023, mars 20). *MICI : Les nouvelles recommandations nutritionnelles*. https://www.cerin.org
29. Delmondes, L. M. (2015). Clinical and sociodemographic aspects of inflammatory bowel disease patients. *Gastroenterology Research, 8*(3–4), 207–215. https://doi.org/10.14740/gr649w
30. FMC-HGE. (2023, avril 21). *Nutrition et MICI : quoi de neuf ?* Consulté le 21 avril 2023, sur https://www.fmcgastro.org/texte-postu/postu-2023/nutrition-et-mici-quoi-de-neuf/
31. El Maimouni, N. (2023). *État de connaissance des patients atteints de MICI* [Thèse de doctorat en médecine, CHU Tanger].
32. Académie Nationale de Médecine. (2024, octobre). Discussion à la suite de la présentation : « Nutrition et maladies inflammatoires chroniques de l'intestin : aspects physiopathologiques ». *Bulletin de l'Académie Nationale de Médecine, 208*(8), 1152–1153.
33. Agrawal, M. (2022). Implications of the changing epidemiology of inflammatory bowel disease in a changing world. *United European Gastroenterology Journal, 10*(10), 1113–1120. https://doi.org/10.1002/ueg2.12317
34. Wang, R., GBD 2019 IBD Collaborators. (2020). Global, regional and national burden of inflammatory bowel disease in 204 countries and territories from 1990 to 2019: A systematic analysis based on the Global Burden of Disease Study 2019. *The Lancet Gastroenterology & Hepatology*. https://doi.org/10.1016/S2468-1253(20)30229-7
35. Schreiner, P., Martinho-Grueber, M., Studerus, D., Vavricka, S. R., Tilg, H., & Biedermann, L. (2020). Nutrition in inflammatory bowel disease. *Digestion*, 1–16. https://doi.org/10.1159/000505368
36. Hu, L., Wu, S., et al. (2023). Impact du tabagisme maternel, du tabagisme chez la progéniture et de la susceptibilité génétique sur la maladie de Crohn et

la colite ulcéreuse. *Journal of Crohn's and Colitis*. https://doi.org/10.1093/ecco-jcc/jjad200

37. Cosnes, J. (2010). Tabagisme, activité physique, nutrition et mode de vie: Facteurs environnementaux et leur impact sur les MICI. Digestive Diseases, 28(3), 411-417. https://doi.org/10.1159/000320395
38. Viennot, S. (2020). *Diagnostic initial, suivi des MICI et détection des complications (Recommandations ECCO-ESGAR 2019)*. FMC Gastro – Post'U 2020. https://www.fmcgastro.org