
André EDOUARD (1), Michel PAILLAUD (2), Sylvie MERLE (3), Catherine ORHAN (2), Monique CHENAYER-PANELATTI (4) and le COGEAG (5)

(1) Service d’Hépato-Gastroentérologie, C.H.U de Fort-de-France, Martinique ; (2) Centre médico-social, 64, rue du Dr J.Pitat, 97100 Basse-Terre, Guadeloupe; (3) Observatoire Régional de la Santé de Martinique ; (4) Service de Médecine interne, C.H.U de Fort-de-France, Martinique; (5) Collège de Gastroentérologie des Antilles et de la Guyane françaises.

SUMMARY

Objectives — To investigate the incidence of inflammatory bowel disease in the French West Indies.

Methods — From January 1st 1997 to December 31st 1999 all patients observed with clinical symptoms suggestive of inflammatory bowel disease attending gastroenterologists practicing in Guadeloupe and Martinique were included. Patients were interviewed with a standard questionnaire to record data used by an expert to establish the final diagnosis of definite, probable or possible Crohn’s disease, ulcerative colitis, unclassifiable chronic colitis or acute colitis, according to the EPIMAD registry.

Results — Sixty-six cases of ulcerative colitis (47.48%) including 12 cases of ulcerative proctitis (18.18% of the ulcerative colitis cohort), 55 of Crohn’s disease (39.57%), 11 of unclassifiable chronic colitis (7.91%), and 7 of acute colitis (5.04%) were recorded. The crude annual incidence (per 100,000 inhabitants) based on definite and probable cases only was 2.44 for ulcerative colitis and 1.94 for Crohn’s disease. The female/male ratio is 1.079.

Conclusions — The observed incidence of inflammatory bowel disease in the French West Indies is lower than in metropolitan France. These data will serve as a basis to assess disease evolution.

INTRODUCTION

Inflammatory bowel diseases (IBD) are generally observed in young patients. Crohn’s disease (CD) and ulcerative colitis (UC) predominated. Although IBD have long been considered to be a particular condition observed in Northern Europe, they also occur in other countries where the incidence is rising. Several reports have demonstrated the role of environmental factors, abnormal immune response and genetic factors, especially for CD [1-5]. We conducted an incidence study using the EPIMAD register methodology [6] in order to determine the incidence of IBD in the French West Indies (islands of Guadeloupe and Martinique) and compare our findings with those from other geographical regions.

Reprints: A. EDOUARD, Service d’Hépato-Gastroentérologie du CHU de Fort-de-France, BP 632, 97261 Fort-de-France Cedex.
E-mail: hepato.gastro@chu-fortdefrance.fr

RÉSUMÉ

Incidence des maladies inflammatoires chroniques intestinales aux Antilles françaises (1997-1999)

André EDOUARD, Michel PAILLAUD, Sylvie MERLE, Catherine ORHAN, Monique CHENAYER-PANELATTI et le COGEAG

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Objectifs — Evaluer l’incidence des maladies inflammatoires chroniques intestinales aux Antilles françaises.

Méthodes — Du 1er janvier 1997 au 31 décembre 1999, les gastro-entérologues des Antilles françaises ont répertorié les cas inci-dents de maladies inflammatoires chroniques intestinales. Un référent classa ensuite chaque dossier en maladie de Crohn ou recto-colite hémorragique certaine, probable ou possible, colite chronique inclassable ou colite aiguë selon la méthodologie du registre EPIMAD.

Résultats — Soixante-six recto-colites hémorragiques (47,48 %) dont 12 proctites (18,18 % des recto-colites), 55 maladies de Crohn (39,57 %), 11 colites inclassables (7,91 %) et 7 colites aiguës (5,04 %) furent enregistrées. L’incidence brute annuelle pour les cas certains et probables était de 2,44/100 000 pour la recto-colite hémorragique et de 1,94/100 000 pour la maladie de Crohn. Pour la recto-colite hémorragique, le sex-ratio F/H était de 1,46 et l’âge médian au moment du diagnostic de 34 ans contre respectivement 1,61 et 29 ans pour la maladie de Crohn. Un délai moyen de 2 mois fut nécessaire au diagnostic des 2 affections.

Conclusions — Aux Antilles françaises, l’incidence des maladies inflammatoires chroniques intestinales est inférieure à celle observée en France métropolitaine. Cette étude initiale permettra d’apprécier son évolution.

PATIENTS AND METHODS

Study population

Guadeloupe and Martinique, two islands in the West Indies are two administrative districts of France. With French Guyana they constitute the French Departments of America. According to the 1999 census, Guade-loupe has 422,222 inhabitants with a density of 248/km², 82.5% of the population lives in urban areas; the migratory balance is close to zero (-0.33%). This population is relatively young since 38.2% of the inhabitants are aged less than 25 years and 14% are over 60 years. The female/male ratio is 1.079.

Martinique has 381,325 inhabitants (1999 census) with a density of 347/km²; 97% of the population lives in urban areas and the migratory balance is close to zero (-0.33%). This is also a young population:

This work was financed by a grant from the Institut de Recherche des Maladies de l’Appareil Digestif (IRMAD).
35.5% under 25 years and 16.6% over 60 years. The female/male ratio is 1.107.
This population-based study thus concemed 803,547 inhabitants.

Methods
This prospective multicentric survey was conducted using the methodology of the EPIMAD registry [6]. All gastroenterologists practicing in a private or hospital setting in Guadeloupe (N = 14) and Martinique (N = 9) attended a meeting held in the French West Indies where an expert from the EPIMAD (registry of inflammatory bowel disease in Northwestern France) delivered a document describing the purpose of the study and the study protocol. The gastroenterologists were invited to identify all incident patients consulting between January 1, 1997 and December 31, 1999 presenting symptoms compatible with a diagnosis of inflammatory bowel disease. A questionnaire was completed for each patient consulting a private clinic or a hospital unit and forwarded to the physician-investigator for Guadeloupe or Martinique. Data collected included patient age, sex, duration of residence on the island, time between symptom onset and diagnosis, and clinical, radiological, endoscopic, and histological data at the time of diagnosis. Using previously published criteria [6, 7], an expert investigator determined the final diagnosis for each patient: definite, probable or possible Crohn's disease or ulcerative colitis, unclassifiable chronic colitis, or acute colitis (when symptom duration was less than six weeks). When the diagnosis of unclassifiable chronic colitis or acute colitis was retained, the patient was followed for two years to obtain further information (persistent symptoms, significant new clinical events, new histological data) necessary to establish the final diagnosis.

All gastroenterologists practicing in the French West Indies participated in the survey. The pathology laboratories operating in the region participated in a complementary survey to collect data on biopsy and surgical material and confirm exhaustive data collection.

Statistical analysis
Incidence is presented as population-based crude and standardized data using the age groups of the world population. Data were processed with EPI-INFO version 6 and compared with the chi-square test. Students' t test was applied to compare means.

Results
From January 1, 1997 to December 31, 1999, 139 cases of CIBD were recorded (table I): UC (N = 66, 47.8%) including 12 cases of ulcerated proctitis (18.8% of all cases of ulcerative colitis), CD (N = 55, 39.57%), unclassifiable chronic colitis (N = 11, 7.91%) and acute colitis (N = 7, 5.04%).
We retained for analysis certain and probable IBD, i.e. 106 cases (table II). Among the 59 cases of UC retained for analysis, diagnosis was certain for 41 (69.49%) and probable for 18 (30.51%). Among the 47 cases of CD retained for analysis, diagnosis was certain for 15 (31.91%) and probable for 32 (68.09%).

Mean crude annual incidence per 100,000 inhabitants was 2.44 for UC and 1.95 for CD. The sex-ratio was 1.46 for UC and 1.61 for CD.

During the three years of the study, there was no significant difference in crude annual incidence between men and women, between Guadeloupe and Martinique, or between CD and UC. The crude annual incidence of IBD was highest in the 20-29 year age group in both men and women. For UC, the highest incidence was 3.91/100,000 in men aged 40-49 years and 5.80/100,000 for women aged 20-29 years. For CD, the highest crude annual incidence was 3.64/100,000 for men aged 30-39 years and 5.80/100,000 for women aged 20-29 years. There was a significant peak in incidence during the seventh decade of life for both diseases (figure 1).

The mean standardized annual incidence rates were 2.23 per 100,000 inhabitants for UC and 1.85 per 100,000 inhabitants for CD. There was no significant difference between the two islands (table III).

Ninety-six patients (81.13%) were born in the French West Indies, 17 (16.03%) in metropolitan France, and the three others in England, Cameroon and Haiti.

Age at diagnosis was significantly higher (P < 0.05) for patients with UC (mean 34 years, range: 8-77 years) than CD (mean 29 years, range: 10-70 years).

Mean time from symptom onset to diagnosis was two months for both diseases (range: 1-180 months for CD and 1-96 months for UC). Diagnosis was established by a private practitioner gastroenterologist for 81.13% of patients with IBD (72.34% of CD and 88.13% of UC).

For CD, 25 patients (53.19%) presented small bowel involvement, isolated in two patients and associated with colonic involvement in the others. Isolated colonic disease was reported in 11 patients (18.18%) and perineal lesions in 9 (19.14%). For UC, 11 patients (18.18%) presented isolated rectal involvement (ulcerated proctitis), 15 (25.42%) left colonic involvement not extending beyond the splenic flexure at endoscopy, 15 (25.42%) involvement extending to the right transverse colon, 9 (15.42%) involvement extending to the right colon but not the cecum, and 6 patients (20.33%) had pancolitis. Three patients had spotty lesions despite a highly suggestive endoscopic and histological aspect. The time from symptom onset to diagnosis was similar irrespective of the localization of the disease.

Table I. – Incident cases of Crohn’s disease (CD), ulcerative colitis (UC), ulcerative proctitis (UP), unclassifiable chronic colitis (UCC) and acute colitis (AC) observed in 1997-1999. Total number in the French West Indies and in each island.

<table>
<thead>
<tr>
<th></th>
<th>UC*</th>
<th>UP</th>
<th>CD</th>
<th>UCC</th>
<th>AC</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guadeloupe</td>
<td>56</td>
<td>17</td>
<td>30</td>
<td>6</td>
<td>3</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>(49.18%)</td>
<td>(34.42%)</td>
<td>(9.83%)</td>
<td>(6.55%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Martinique</td>
<td>30</td>
<td>6</td>
<td>36</td>
<td>7</td>
<td>3</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>(46.15%)</td>
<td>(43.58%)</td>
<td>(6.41%)</td>
<td>(3.84%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>23</td>
<td>66</td>
<td>13</td>
<td>5</td>
<td>139</td>
</tr>
<tr>
<td></td>
<td>(47.48%)</td>
<td>(39.57%)</td>
<td>(7.91%)</td>
<td>(5.04%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* total UC including UP; % in parentheses
**Inflammatory bowel disease in the French West Indies**

Comparisons of data in the different registries from metropolitan France with our results (table IV) show that the incidence of IBD is lower in the French West Indies than in other regions of France and that the sex ratios for CD and UC are not significantly different. UC is more frequent than CD in the French West Indies, the standardized incidence of UC being closer to that observed in Brittany and the standardized incidence of CD being much lower than reported for other regions of France. The female predominance of both diseases is remarkable in the French West Indies, while in France CD is more frequent in women and UC more frequent in men.

Age at diagnosis of CD in our study (29 years) was close to that observed in northwestern France, Midi-Pyrénées, and Brittany but much different than observed in Puy-de-Dôme (42.6 years).

For UC, our study was the only one demonstrating female predominance, with a median age (34 years) close to that in other regions but lower than in Midi-Pyrénées (44 years).

Further studies in population will be needed to determine whether the trend towards an increased incidence of CD and decreased incidence of UC, as observed in other western countries with a high disease incidence such as northwestern France, the United States, and Denmark [5].

There is little epidemiological data on IBD in other islands of the West Indies. Available data come from old reports from Jamaica, Puerto Rico, and Trinidad. Most of these studies were retrospective prevalence reports on data collected 17 to 30 years before our incidence survey. Comparisons would not be pertinent because of this methodological bias. Lee et al. [10] reported 20 cases of CD in Jamaica diagnosed in 19 black patients and one Caucasian patient between 1967 and 1987. Jamaica had 1,813,594 inhabitants in 1970 and 2,206,507 in 1992. Moreno et al. [11] reported 70 cases of IBD observed in Puerto Rico between 1980 and 1987 with 5.36 UC for 1 CD. The 1987 census in Puerto Rico recorded 3.2 million inhabitants. In 1979, Bartholomew et al. [12] collected data on 34 cases of UC and 14 cases of CD observed over a ten-year period in Trinidad which had a population of 940,719 inhabitants in 1970. Regarding the ethnic background of these patients (1 Caucasian, 26 blacks, 18 Indians, 3 diverse mixed background), the authors suggested that the hypothesized lower incidence of IBD in West Indies, African or Indian populations is unfounded.

Contradictory results have been published concerning black people living in England and the United States. In 1986, Benfield et al. [13] reported six cases of UC observed over a 15-year period in black patients coming from the West Indies and living in England. These patients had severe disease highly sensitive to sulphasalazine. In a study conducted in Derby, England, in 1976-1985, there was no significant difference in the incidence of CD between the Caucasian and West Indian populations [14]. Simsek et al. [15] reported 38 cases of CD and 26 cases of UC in black patients living in Georgia, USA, during the period 1960-1987. These authors noted an elevated rate of reoperation for the CD patients and a higher incidence of primary sclerosing cholangitis for the UC patients. Paul et al. [16] found that the incidence of CD was higher among white people living in the Washington area and that the 43 cases of CD observed between 1965 and 1987 in the black population presented higher morbidity and longer delay to diagnosis.

Data from sub-Saharan Africa other than South Africa are rare. The first case of UC was reported in 1964 and a study conducted in 1981 in 24 African countries including over one million outpatients and 190,000 inpatients identified 22 cases of IBD [17].

The prevalence of these diseases may be underestimated because of the difficult differential diagnosis with schistosomiasis-

**Discussion**

This population-based study was facilitated by the relative geographical isolation of the study population (islands with almost zero migration balance) and the similar ethnic background of the two island populations (mixed population with African, Caucasian and Hindu ancestors completed by colonies from Asia and the Middle-East which immigrated during the early part of the 20th century). The tropical climate, the low rate of tobacco smoking, and eating habits (which are becoming less specific) created a particular environment.

In Northwestern France [6], the mean standardized annual incidence per 100,000 inhabitants is 5.6 for CD and 3.7 for UC. The sex-ratio is different, CD being more frequent in women (4.3/100,000) than in women (3.2/100,000). Incidence per 100,000 inhabitants is 5.6 for CD and 3.7 for UC.

In southeastern France [9], the reported incidence is higher for UC (4.5/100,000) and lower for CD (3.3/100,000).

In northwestern France [6,7], the mean standardized annual incidence per 100,000 inhabitants is 5.6 for CD and 3.7 for UC. The sex-ratio is different, CD being more frequent in women (6.2/100,000) than in men (5.1/100,000) and UC being more frequent in men (4.3/100,000) than in women (3.2/100,000).

Reports from metropolitan France note that in western areas (Brittany) [7], the incidence of UC (2.7/100,000) is similar to that in northern areas, while the incidence of CD (2.8/100,000) is lower (although a large number of cases of acute colitis and possible CD were not taken into account). The results of a survey conducted in an administrative district in central France (Puy-de-Dôme) [8] reported that the mean standardized annual incidences per 100,000 were 5.7 for CD and 1.9 for UC (again with a large number of cases of acute colitis and possible CD not taken into account). In southwestern (Midi-Pyrénées) and southeastern France [9], the reported incidence is higher for UC (4.5/100,000) and lower for CD (3.3/100,000).

**Table II. –** Definite, probable and possible diagnosis of Crohn’s disease (CD), ulcerative colitis (UC) and ulcerative proctitis (UP).

<table>
<thead>
<tr>
<th></th>
<th>UC [N]</th>
<th>UP [N]</th>
<th>CD [N]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definite</td>
<td>41</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Probable</td>
<td>18</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>Possible</td>
<td>7</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>66</td>
<td>12</td>
<td>55</td>
</tr>
</tbody>
</table>

Fig. 1 – Incidence of inflammatory bowel disease in the French West Indies according to age.

**Incidences des M.I.C.I aux Antilles selon les classes d’âge.**

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Table III. – Crude and age-adjusted mean annual incidence, female/male ratio and median age of patients with Crohn’s disease and ulcerative colitis in the two administrative districts in the French West Indies in 1997-1999 (certain and probable diagnosis).

<table>
<thead>
<tr>
<th>Registry and region</th>
<th>Year</th>
<th>CI BD</th>
<th>CD</th>
<th>UC</th>
<th>ICC</th>
<th>AC</th>
<th>Standardized incidence UC</th>
<th>Standardized incidence CD</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPIMAD Nord-Pas-de-Calais</td>
<td>1988</td>
<td>576</td>
<td>281</td>
<td>207</td>
<td>88</td>
<td>104</td>
<td>4.4</td>
<td>6.0</td>
</tr>
<tr>
<td>EPIMAD Nord-Pas-de-Calais</td>
<td>88-90</td>
<td>1291</td>
<td>674</td>
<td>456</td>
<td>151</td>
<td>3.2</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>EPIMICI Puy-de-Dôme</td>
<td>93-94</td>
<td>167</td>
<td>79</td>
<td>29</td>
<td>4</td>
<td>55</td>
<td>1.9</td>
<td>5.7</td>
</tr>
<tr>
<td>ABERMAD Bretagne</td>
<td>94-95</td>
<td>657</td>
<td>205</td>
<td>165</td>
<td>42</td>
<td>245</td>
<td>2.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Midi-Pyrénées</td>
<td>97-98</td>
<td>473</td>
<td>171</td>
<td>265</td>
<td>37</td>
<td>4.31</td>
<td>3.25</td>
<td></td>
</tr>
<tr>
<td>REMICIA French West Indies</td>
<td>97-99</td>
<td>139</td>
<td>55</td>
<td>66</td>
<td>11</td>
<td>7</td>
<td>2.23</td>
<td>1.85</td>
</tr>
</tbody>
</table>

F/M = female/male; I = Incidence; I std = standardized incidence; m age = median age

A subsequent study [21] conducted by the same authors for the period 1980-1984 and published in 1986 reported 134 cases of CD, 197 cases of UC and 16 cases of undetermined colitis. The mean crude annual incidence of UC was 1.9 per 100,000 inhabitants among the mixed ethnic background population, 5.0 among whites and 0.6 among blacks. For CD, the incidence rates were 1.8, 2.6 and 0.3, respectively.

For Mwantembe et al. [22], this particular pattern of disease incidence results from significantly different distributions in the white and black populations of South Africa of allelic associations of the genes coding for interleukin (IL) 1b, IL-1 receptor, and its antagonist.

Comparing the results of our study with data in the literature, we observed that the incidence of IBD is higher in the French West Indies than reported for sub-Sahara Africa and for black people living in South Africa, but lower than rates reported for western countries and close to those found in low incidence areas of metropolitan France. The French West Indies is thus in an intermediary situation, but close to Western Europe.

Further studies should be conducted to evaluate the frequency of NOD2/CARD15 gene mutations, a major CD susceptibility gene situated on chromosome 16q, and other IBD susceptibility genes [23] among French West Indies populations with IBD.

Increased density of medical practitioners, improved living conditions, and better access to health care do not appear to have played a determining role in the epidemiology of IBD.
because diagnostic practices have not changed greatly over the last twenty years. Conversely, environmental factors such as international travel and tourism, population mixing, and the regression of intestinal parasite diseases appear to have played an important role in the epidemiology of IBD.

In Martinique, the overall rate of intestinal parasitic infestation has declined from 53% of the population in 1978 to 6.14% in 1995, with a prevalence of intestinal parasites observed in public hospital laboratories declining from 9.68% in 1988 to 6.14% in 1994 [24]. Strongyloides stercolalis infection is still considerable (half of the reported parasite infections) but schistosomiasis is no longer a major public health problem as seen in the sixties. At the same time, new parasitic diseases have developed in relation to the human immune deficiency virus (HIV) epidemic. Bach [25] hypothesized that regression of childhood parasite diseases favors the emergence of CD and certain autoimmune diseases such as multiple sclerosis. More recently, Hunter et al. reviewed results of treatments of experimental colitis in animal models and CIBD in humans using worm extracts and found that these treatments have an immunomodulatory effect on cytokines produced by T helper (Th) lymphocytes, favoring a Th2 reaction [26].

Smoking habits and their possible protective (anti-UC) or deleterious (pro-CD) effects constitute another element which should be studied in further work in our populations [5]. Fewer youth and adults smoke in the French West Indies than in metropolitan France. According to the 2002 ESCAPAD survey, 10% of young girls and 12% of young boys aged 17-19 years smoke daily versus 42% in the same age group in metropolitan France [27]. Another survey conducted in 2000 among persons aged 16-64 years consulting a general practitioner in Martinique [28] found that 23% of men and 7% of women were regular smokers. The lower percentage of smokers in the Martinique population could explain the predominance of UC and the relatively low rate of CD in Martinique and in the French West Indies in general.

The present findings provide a basis for future work to monitor changes in the incidence of IBD in the French West Indies and to search for causal environmental and/or genetic factors.

In conclusion, using the same methodology as applied in other regions of France, we found that the incidence of IBD in the French West Indies is lower than in metropolitan France and that it is higher than available rates reported for black populations. In light of the present findings, it would be useful to create a registry to monitor changes in the incidence of IBD and conduct analytical studies designed to better ascertain the roles of environmental and genetic factors and thus develop etiological hypotheses.

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