Emigration to western industrialized countries: A risk factor for developing inflammatory bowel disease

M. Barreiro-de Acosta a, b,⁎, A. Alvarez Castro a, b, R. Souto a, b, M. Iglesias b, A. Lorenzo a, J.E. Dominguez-Muñoz a, b

a Department of Gastroenterology, University Hospital of Santiago de Compostela, Spain
b Foundation for Research in Digestive Diseases (FIENAD), Santiago de Compostela, Spain

Received 19 April 2011; received in revised form 16 May 2011; accepted 24 May 2011

Abstract

Background: A higher incidence of inflammatory bowel disease (IBD) in industrialized areas has been previously reported, but the effect of emigrating to western industrialized countries for a period of time and returning to the country of origin is unknown. Aim of the study was to evaluate the effect of emigrating to another country and returning to the place of origin on the risk of IBD.

Methods: A prospective case-control study was performed. Inclusion criteria were all patients >18 years diagnosed with Crohn’s disease (CD) or ulcerative colitis (UC) in the last 10 years. Healthy, unrelated controls, matched by sex, age and smoking habits, with no family history of IBD were included. All patients and controls were interviewed and emigration was defined as living for at least one year in another country.

Results: 242 consecutive patients with IBD (105 CD and 137 UC) and 242 controls were included. Patients who had previously emigrated developed more frequently IBD than controls (OR 1.93, 95%CI 1.19–3.15, p<0.01). Patients who emigrated to European countries developed more frequently IBD than controls (OR 1.91, 95%CI 1.07–3.47, p=0.02), but not those who had emigrated to Latin America (OR 1.48, 95%CI 0.67–3.27, p=0.32). Emigration plays a significant role in the development of UC (OR 2.24, 95%CI:1.29–3.88, p<0.01), but not in CD (OR 1.56, 95%CI:0.83–2.92, p=0.15).

Conclusions: People who emigrate to westernised countries have a higher risk for developing IBD, especially UC. Environmental factors related with industrialization seem to play an important role in the pathogenesis of these diseases.

© 2011 European Crohn’s and Colitis Organisation. Published by Elsevier B.V. All rights reserved.

⁎ Corresponding author at: Department of Gastroenterology, University Hospital of Santiago de Compostela, C/Choupana, s/n, E-15706-Santiago de Compostela, Spain. Tel.: +34 696 990188; fax: +34 981 955100.
E-mail address: manubarreiro@hotmail.com (M. Barreiro-de Acosta).

1873-9946/$ - see front matter © 2011 European Crohn’s and Colitis Organisation. Published by Elsevier B.V. All rights reserved.
doi:10.1016/j.crohns.2011.05.009
1. Introduction

Epidemiological studies have suggested that the incidence of inflammatory bowel diseases (IBD), including Crohn’s disease (CD) and ulcerative colitis (UC), may vary markedly across Europe and other regions. Although the aetiology of CD and UC is largely unknown, environmental factors, together with genetics, are well known to influence the risk of IBD. Environmental changes and, more specifically, industrialization and improved socioeconomic status, appear to play a role in the development of these diseases.

IBD incidence in Spain has increased in recent years, from an incidence of 11/100,000 per year in the nineties to figures close to Northern European countries today. 

Emigration is the act of leaving one’s country or region to settle in another. Galicia is an area in North-West Spain where people had emigrated for years to work in foreign countries of Europe and Latin America. One of the characteristics of Galician emigration is that after working abroad for some months or years, most people returned to Galicia.

To exclude the role of genetics, we hypothesized that people who emigrate to more industrialized countries as compared with the North-West of Spain, despite returning later to the original country, have a higher risk of developing IBD. The aim of the study was to evaluate the risk of IBD in subjects who returned to the North-West of Spain after having emigrated years before to other countries with different degrees of development and industrialization.

2. Methods

A prospective case-control study was performed. Inclusion criteria were all patients older than 18 years diagnosed with CD or UC in our hospital over the last 10 years. Patients diagnosed with IBD in the emigration country, before returning to Spain, were excluded. Healthy, unrelated individuals matched by ethnicity, sex, age and smoking habits, family size, study levels and with no family history of IBD were included as controls.

All patients and controls were interviewed by the same interviewer about all the places where they had lived before being diagnosed with IBD and for how long they had stayed there. Emigration to another country was defined as staying for at least one year in that country. Patients were categorized into separate groups according to emigration to Western Europe or Latin America. The study was approved by the local ethic committee.

Results are shown as OR 95%CI and analyzed by the Chi-Square test and Fisher’s exact test as appropriate.

3. Results

In total, 242 consecutive patients with IBD (105 with CD (43.3%) and 137 with UC (36.7%)) 123 female (50.8%) and 119 (49.2%) male, mean age 38 years, age range 18–76 years, and 242 gender and age matched healthy controls were included. Fifty-two (21.4%) patients and 29 (11.9%) controls had previously lived in another country. Thirty-four (14%) cases had emigrated to Western European countries and 12 (4.9%) to Latin America. Table 1 shows the countries where patients and controls had emigrated to.

![Table 1](List of countries where patients and controls had emigrated to.)

<table>
<thead>
<tr>
<th>Table 1</th>
<th>List of countries where patients and controls had emigrated to.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients (n)</td>
<td>Controls (n)</td>
</tr>
<tr>
<td>Europe</td>
<td>34</td>
</tr>
<tr>
<td>Switzerland</td>
<td>15</td>
</tr>
<tr>
<td>Germany</td>
<td>7</td>
</tr>
<tr>
<td>Great Britain</td>
<td>4</td>
</tr>
<tr>
<td>France</td>
<td>4</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>2</td>
</tr>
<tr>
<td>Belgium</td>
<td>2</td>
</tr>
<tr>
<td>Latin America</td>
<td>16</td>
</tr>
<tr>
<td>Venezuela</td>
<td>6</td>
</tr>
<tr>
<td>Argentina</td>
<td>6</td>
</tr>
<tr>
<td>Brazil</td>
<td>1</td>
</tr>
<tr>
<td>Cuba</td>
<td>1</td>
</tr>
<tr>
<td>Panama</td>
<td>1</td>
</tr>
<tr>
<td>Uruguay</td>
<td>1</td>
</tr>
<tr>
<td>Mexico</td>
<td>0</td>
</tr>
</tbody>
</table>

4. Discussion

The main finding of this study is that people who had been living for more than a year in more westernised countries as
compared with North-West of Spain had a higher risk of developing IBD. Previous studies have shown that IBD is more common among the most industrialized areas and socially advanced groups,6 but there is no strong evidence to support that IBD is more common in urban than in rural settings and migration towards more accessible health care has not been adequately addressed.7 However the higher frequency of IBD in this subgroup of population may be secondary to other factors such as genetic predisposition, physical exercise, sunlight exposure and domestic hygiene. Regarding this last point, a previous study revealed a more frequent hot water supply among patients presenting CD than among controls.8 A direct relationship between industrialization and IBD is hard to be demonstrated, and reported data on this specific topic are scarce. A recent case-control study with a significant number of IBD patients have shown that air pollution exposure was not associated with the incidence of IBD, but residential exposures to SO2 and NO2 may increase the risk of early-onset UC and CD, respectively.9

Our findings are the first showing the association of IBD and emigration between European countries. This relation had been previously described in migrants from Asia to Europe. In a study of Bangladeshi immigrants settled in East London, CD rates were significantly higher in Bangladeshis under 20 years of age compared with relatives that had remained in Bangladesh.10 A Canadian study observed a significantly higher incidence of IBD in the South-Asian paediatric population, probably second generation migrants, compared with the rest of the paediatric population.11 Also in Canada, a high incidence of new cases of CD patients who had emigrated from India has been reported.12 In a 3-year prospective study among Europeans and first and second-generation South Asians in Leicester from the years 1991–1994 it was documented that extensive UC was more common in the second-generation migrants than in the first generation and was comparable to that of the European community.13 However, in a recent Swedish study, no increased risks for CD and UC were found among first-generation immigrants.14 Other migration studies showed that in Israel the incidence of IBD among European and American immigrants differs from those who immigrated from Asia and Africa.15

In the present study, it has been observed that emigrating to Latin America, typically less developed and industrialized countries than Spain, does not increase the risk for developing IBD. This data strengthens the idea that what is important is not the fact of emigration but the emigration country, in this case, Western European countries.16

A relevant finding of the present study is that the risk for people that had emigrated to westernised countries is limited to UC, but a high trend in the risk of developing CD was also observed and perhaps a study with a higher number of subjects could have found statistically significant differences for CD.

Once again, aetiology of CD and UC seems to be different, with genetic factors being more important in CD and possibly environmental factors being more important in the risk of UC. In the same population included in this study, we had previously observed that genetic factors like CARD15 mutations play a role in the risk of developing CD.17 No other study has previously associated emigration exclusively with UC, and not with CD, but in the Canadian study performed in paediatric population, most of the new IBD patients had a colonic disease location.11

The present study has some limitations. Data from the countries of emigration about specific local risk factors for IBD are lacking. Another limitation is that we do not have data about if patients had any abdominal symptoms before leaving Spain or if they visited any gastroenterologist in the country of immigration. In addition, there is not a universal definition of emigration; we have chosen living at least one year in the same place, but most of our patients had lived there much longer than a year. The strongest point of the present study is the inclusion of a very well defined control group with similar age, gender and smoking habits compared with patients, but without family history of IBD.

We conclude that people emigrating to more industrialized countries develop more frequently IBD. Environmental factors related with industrialization seem to play an important role in the pathogenesis of these diseases.

References

