Incidence of Inflammatory Bowel Disease in Kaunas Region, Lithuania

Gediminas Kiudelis¹, Laimas Jonaitis¹, Kęstutis Adamonis¹, Aida Žvirblienė¹, Algimantas Tamelis², Rima Kregždytė³, Rūta Kučinskienė³, Jurgita Šventoraitytė³, Linas Kupčinskas¹

¹Department of Gastroenterology, Medical Academy, Lithuanian University of Health Sciences,
²Department of Surgery, Medical Academy, Lithuanian University of Health Sciences,
³Department of Preventive Medicine, Medical Academy, Lithuanian University of Health Sciences,
⁴Department of Children’s Diseases, Medical Academy, Lithuanian University of Health Sciences,
⁵Laboratory of Clinical and Molecular Gastroenterology, Institute for Digestive Research, Medical Academy, Lithuanian University of Health Sciences, Lithuania

Key Words: incidence; epidemiology; inflammatory bowel disease; ulcerative colitis; Crohn’s disease.

Summary. Objective. The aim of this study was to evaluate the incidence of inflammatory bowel disease in Kaunas and its region during a 3-year period.

Material and Methods. The study was conducted during the 3-year period (2007–2009) and enrolled the patients from Kaunas with its region, which has a population of 381,300 inhabitants. The data were collected from all practices in the area where the diagnosis of inflammatory bowel disease was made by practicing gastroenterologists and consulting pediatricians along with endoscopists. Only new cases of inflammatory bowel disease were included into analysis. The diagnosis of ulcerative colitis and Crohn’s disease was strictly made according to the Copenhagen criteria. Age- and sex-standardized incidence was calculated for each year of the study period.

Results. A total of 108 new inflammatory bowel disease cases were diagnosed during the study period: 87 had ulcerative colitis, 16 Crohn’s disease, and 5 indeterminate colitis. The incidence of ulcerative colitis, Crohn’s disease, and indeterminate colitis for each study year was 6.85, 0.95, 5.33, and 3.78 per 100,000; 0.95, 0.21, and 1.57 per 100,000; and 0.47, 0.21, and 0.42 per 100,000, respectively. The mean patients’ age at onset of ulcerative colitis, indeterminate colitis, and Crohn’s disease was 49.95 (SD, 17.03), 49.80 (SD, 17.71), and 34.94 years (SD, 17.71), respectively.

Conclusions. The average 3-year incidence of ulcerative colitis in Kaunas region was found to be lower as compared with that in many parts of Central and Western Europe. The incidence of Crohn’s disease was low and very similar to other countries of Eastern Europe. Age at onset of the diseases appeared to be older than that reported in the Western industrialized countries.

Introduction

Although the prevalence and incidence of inflammatory bowel disease (IBD) differs across the world and it is thought to be associated with a different genetic background as well as racial and environmental factors, no definite explanation for these differences has been drawn up till now (1). Most of the epidemiological studies have demonstrated the highest incidence of IBD in the developed countries of Western Europe and North America (2).

Medicina (Kaunas) 2012;48(8)
to compare it with the incidences in other countries of Central and Western Europe.

**Material and Methods**

The study was carried out during the 3-year period (2007–2009) and enrolled the patients from Kaunas and its region. The data were collected from all practices in the area where the diagnosis of IBD was made by practicing gastroenterologists and consulting pediatricians along with endoscopists. Only new cases of IBD were included into analysis. The diagnosis of ulcerative colitis and Crohn’s disease was made strictly according to the Copenhagen criteria and was confirmed if the case fulfilled all 3 diagnostic criteria (3, 4). Indeterminate colitis was diagnosed when there were difficulties in differentiation between 2 IBD entities, i.e., ulcerative colitis and Crohn’s disease. Data were gathered prospectively both from outpatient departments and hospitalized patients. The age- and sex-standardized incidence of IBD was calculated according to the direct standardization using the population of Lithuania divided into sex groups and age groups of 15–24, 25–34, 35–44, 45–54, 55–64, 65–74, and >74 years as of January 1 of each study year (2007, 2008, 2009). Annual standardized incidence rates were calculated using the number of events for each age-sex cohort as the numerator and the standard proportion of residents in that age-sex cohort as the denominator. The crude and standardized incidence rates were multiplied by 100 000 to express them as indices per 100 000 population.

The Student t test was employed to compare the mean age between groups. The chi-square or Fisher exact tests were used to compare proportions in the independent groups. In case, when the expected counts in more than 20% of cells in the contingency table were smaller than 5, the Fisher exact test was applied. Otherwise, the chi-square test was used. Differences between 2 proportions were tested by the z test. The statistical significance level was set at <0.05.

**Results**

During the 3-year period, 108 new IBD cases were diagnosed (Table 1). Five IBD cases could not be classified and were considered as indeterminate colitis. Table 1 shows the crude and standardized annual incidence rates. The patients with ulcerative colitis were significantly older than the patients with Crohn’s disease (Table 2). Male patients with ulcerative colitis were significantly younger than female patients (Table 2). None of the patients with ulcerative colitis had an initial diagnosis in childhood, i.e., before the age of 18 years (Fig.). Only 2 patients with Crohn’s disease were diagnosed with this disease before the age of 20 years; of them, only 1 patient was a 17-year-old male teenager (Fig.). The majority of patients with ulcerative colitis were diagnosed between 40 and 50 years of age, while the peak age of onset among patients with Crohn’s disease was between 30 and 40 years (Fig.). The sex distribution by disease shows a slight female predominance among patients with ulcerative colitis and Crohn’s disease. There were no significant differences in the appendectomy rates among the groups (Table 3). There were significantly more former smokers among patients with ulcerative colitis than those with Crohn’s disease. Left side colitis was most prevalent at the onset of ulcerative colitis (Table 4). The majority of patients with ulcerative colitis had a mild disease at the time of presentation, while the prevalence of severe ulcerative colitis was relatively rare (Table 3). Crohn’s disease presented with ileocolitis, terminal ileitis, and colitis (Table 4). Stricturing ileitis was diagnosed in 2 of the 4 patients with terminal ileitis, while other patients had a non-stricturing disease. One patient with colitis had peri-

---

**Table 1.** Crude and Standardized Incidence Rates of Inflammatory Bowel Disease per 100 000 Inhabitants, 2007–2009

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ulcerative colitis</td>
<td>87</td>
<td>6.70</td>
<td>6.85</td>
<td>5.43</td>
<td>5.33</td>
<td>7.48</td>
<td>7.38</td>
<td>6.56</td>
<td>6.52</td>
</tr>
<tr>
<td>Crohn’s disease</td>
<td>16</td>
<td>0.90</td>
<td>0.90</td>
<td>1.43</td>
<td>1.33</td>
<td>1.11</td>
<td>1.11</td>
<td>1.21</td>
<td>1.21</td>
</tr>
<tr>
<td>Indeterminate colitis</td>
<td>5</td>
<td>0.45</td>
<td>0.40</td>
<td>0.23</td>
<td>0.21</td>
<td>0.45</td>
<td>0.42</td>
<td>0.38</td>
<td>0.37</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>8.11</td>
<td>8.27</td>
<td>6.78</td>
<td>6.64</td>
<td>9.52</td>
<td>9.37</td>
<td>8.14</td>
<td>8.09</td>
</tr>
</tbody>
</table>

**Table 2.** Mean Age of Patients at Time of Initial Diagnosis

<table>
<thead>
<tr>
<th>Group</th>
<th>Ulcerative Colitis</th>
<th>Crohn’s Disease</th>
<th>Indeterminate Colitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD) [range], years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>43.5 (13.14) [22–74]†</td>
<td>31.67 (9.28) [17–53]</td>
<td>46.7 (18.8) [34–68]</td>
</tr>
<tr>
<td>Women</td>
<td>54.09 (18.04) [22–78] †</td>
<td>36.9 (10.94) [21–55]</td>
<td>48.53 (15.32) [36–73]</td>
</tr>
<tr>
<td>Total</td>
<td>49.95 (17.03) [22–78] †</td>
<td>34.94 (10.57) [17–55]</td>
<td>47.8 (16.9) [34–73]</td>
</tr>
</tbody>
</table>

*P<0.05 compared to women; †P<0.01 compared to Crohn’s disease.
Incidence of Inflammatory Bowel Disease in Lithuania

anal fistulas. No patients had a penetrating type of the disease at its initial presentation.

Discussion
Kaunas region has an excellent state-controlled medical care system with an easy universal access to the specialists. As a universal rule, general practitioners never make a primary diagnosis of IBD, and the patients are referred to the specialists; therefore, we assume that our study provides very precise data and estimates.

The results of our 3-year study demonstrated a lower incidence of ulcerative colitis and Crohn’s disease compared with many centers of Western Europe (3, 5). Fifteen years ago, a north-south gradient in the incidence of IBD was shown to exist in Europe (5) with the highest incidence of ulcerative colitis and Crohn’s disease being in northern centers (11.4 and 6.3 per 100 000) and significantly lower incidence in southern centers (8.0 and 3.6 per 100 000). Very limited data from the countries of Eastern Europe, such as Estonia, Romania, and Poland, demonstrated a low incidence of IBD ranging from 0.97 per 100 000 for ulcerative colitis and 0.5 per 100 000 for Crohn’s disease in Romania to 1.7 per 100 000 for ulcerative colitis and 1.4 per 100 000 for Crohn’s disease in Estonia (6–8). The lack of reliable data from previous decades does not allow us to establish the possible epidemiological trends of these diseases in our country. The incidence of IBD in Lithuania is still low and does not coincide with the epidemiological trends in Western European countries where the incidence of ulcerative colitis remains high and the incidence of Crohn’s disease is constantly increasing.

A study by Lakatos et al. showed that the incidence of ulcerative colitis and Crohn’s disease in Hungary increased from 1.66 and 0.41 per 100 000 persons in 1977 to 11.01 and 4.68 per 100 000 persons in 2001 (9). The data from Czech Republic

![Table 3. Demographic and Clinical Characteristics of Patients With Inflammatory Bowel Disease](image)

![Table 4. Disease Localization at Initial Diagnosis](image)

![Fig. The number of new ulcerative colitis (UC) and Crohn’s disease (CD) cases by different age groups](image)
and south Europe also demonstrated a significant increase in the number of new Crohn’s disease cases (10, 11). In this study, the patients with ulcerative colitis and Crohn’s disease mostly had a mild disease at their first presentation. The patients’ age was also more advanced compared with patients in Western European countries. Moreover, no increase in the incidence of IBD, particularly Crohn’s disease, in childhood was documented in our study, contrary to the situation reported in studies from Denmark and other Western countries (12). Though the incidence of ulcerative colitis is higher than that of Crohn’s disease and could precede a future increase of the latter, a low incidence of IBD could be probably explained by insufficient duration of lifestyle and dietary changes exposing the Lithuanian population during the last decades.

Our recent study that evaluated NOD2/CARD15 gene polymorphism in patients with IBD showed a higher prevalence of combined polymorphism variants in patients with Crohn’s disease than healthy controls (41.1% vs. 16.9%, \(P = 0.0004\)) (13). Interestingly, the relatively high carrier frequency of at least one NOD2 allele in the healthy controls (16.9%) is in contrast with a low incidence of Crohn’s disease in our study. We assume that Crohn’s disease in Lithuania has a strong genetic background that is partially related to NOD2 susceptibility variants. Therefore, environmental factors (e.g., diet, lifestyle) and especially a pattern of intestinal microbiota could be different from populations with a high incidence of Crohn’s disease and contribute to significantly lower disease development rates in our country. A study by Tsironi et al. has shown a rapid increase in the incidence of IBD in Canadian and British immigrants from Bangladesh (14), supporting the hypothesis that lifestyle and diet of the host country could rapidly change a personal susceptibility to IBD. A study investigating the intestinal microflora of infants from Estonia, a neighboring country in Eastern-Northern Europe with a low incidence of Crohn’s disease, demonstrated striking differences in the microflora compared with that of Swedish children and similarities in the microflora prevailing in the Western European infants in the 1960s (15). A recently conducted study that compared intestinal microbiota in the Lithuanian and German populations has shown the striking differences in its diversity (16). The overall richness of bacterial operational taxonomic units was significantly greater in the Lithuanian population in contrast to the German individuals. The investigation of bacterial phyla revealed that Firmicutes and Proteobacteria were more prevalent in the Lithuanian population, while Bacteroidetes were more common in the German population. These data support the hypothesis of dysbiosis with a loss of diversity and a shift of bacterial populations toward a more toxic profile (e.g., increase in the diversity of Bacteroides spp.) as a pathogenetic principle in the growing incidence of IBD.

Conclusions
The average 3-year incidence of ulcerative colitis in Kaunas and its region was found to be lower as compared with that in many parts of Central and Western Europe. The incidence of Crohn’s disease was low and very similar to other countries of Eastern Europe. Age at onset of the diseases appeared to be older than that reported in the Western industrialized countries.

Statement of Conflict of Interest
The authors state no conflict of interest.

References

Received 20 February 2012, accepted 27 August 2012