Clinical Significance of Splenic Tuberculosis in Patients Infected with Human Immunodeficiency Virus

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To assess the clinical significance of splenic tuberculosis in patients infected with human immunodeficiency virus (HIV) type 1, we compared 20 patients who had splenic tuberculosis with 20 randomly selected, HIV-infected patients with culture-proven tuberculosis for whom splenic involvement had been ruled out by ultrasonography. All of the patients were male prison inmates and intravenous drug users. Statistically significant differences (P < .05) were detected between patients with splenic involvement (median CD4+ cell count, 54/mm³) and those without splenic involvement (median CD4+ cell count, 92/mm³). No specific symptoms suggesting splenic involvement were detected in the patients with splenic tuberculosis. All patients received antituberculous drugs, and none of these patients required splenectomy. The median survival was similar in both groups. Splenic tuberculosis occurs in more-severely immunocompromised HIV-infected patients, the prognosis is generally good, the clinical response to therapy is usually favorable, and splenectomy is rarely necessary.

Splenic lesions have been infrequently described in the biomedical literature [1–3]. In immunocompromised patients with AIDS, splenic lesions are predominantly due to opportunistic infections [4–18], followed in frequency by Kaposi’s sarcoma and lymphomas [19]. Tuberculosis is a prevalent disease in Spain, and its prevalence in penitentiaries is alarming [20]. However, splenic lesions due to Mycobacterium tuberculosis are infrequent. To our knowledge, only 31 separate case reports of splenic abscesses due to M. tuberculosis have appeared in the worldwide literature [6–18]; 22 cases were included in a general series on abdominal tuberculosis [21], and seven other cases were reported by Murray et al. [22]. We conducted the present study to determine the clinical significance of splenic tuberculosis in a series of HIV-infected patients.

Patients and Methods

This study was performed at the Hospital General Penitenciario in Madrid, which was a 150-bed facility. Between 1 March 1991 and 31 March 1995, 7,673 patients were admitted to this hospital. We retrospectively reviewed the charts of all patients who were infected with HIV-1 and had culture-proven tuberculosis. Cases of splenic tuberculosis were defined as those in which patients had characteristic lesions in the spleen (i.e., multiple, small [≤1 cm], rounded, hypoechoic lesions) that were detected by ultrasonography (figure 1) at the time that tuberculosis was diagnosed (<30 days after diagnosis). Twenty control patients were selected randomly from a group of 68 HIV-infected patients with culture-proven tuberculosis for whom splenic involvement had been ruled out by ultrasonography. None of these patients had a concomitant condition that might also cause splenic lesions.

Ultrasoundographic examinations were performed by using electronic real-time scanners with 3.5-MHz and 5-MHz linear and curve-array transducers to investigate underlying clinical conditions (e.g., hepatosplenomegaly, fever of unknown origin, abnormal liver function test results, or chronic infection due to hepatitis B and/or hepatitis C viruses). Follow-up ultrasonographic examinations were performed between 20 days and 2 years after tuberculosis was diagnosed for 13 case patients and six control patients.

We used the χ² test and/or Fisher’s exact test to assess the association between categorical variables. We used a nonparametric test or Student’s t test for continuous variables; means (± SE) and median-interquartile ranges are reported. We calculated survival with a logrank test. P values of <.05 were considered statistically significant.

Results

During the study period, 88 of the 483 patients at the hospital who had culture-proven tuberculosis underwent abdominal ultrasonography. All of the patients with focal splenic lesions that were detected by ultrasonography (n = 20) were compared with an equivalent random group with no splenic involvement. All the patients were male intravenous drug users. The most
frequent symptoms, physical findings, and laboratory data are shown in table 1. The numbers of patients in each group, with a given diagnosis, based on microbiological criteria, were as follows: disseminated tuberculosis, 15 case patients vs. 14 control patients; pulmonary tuberculosis, 4 vs. 5; and nodal involvement, 1 vs. 1.

Among case patients, the mean size (± SE) of the spleen, as measured by ultrasonography, was 134 ± 5 mm. Ultrasonographic follow-up studies were done for 13 of these patients. The splenic focal lesions disappeared with medical treatment in 10 of these patients and decreased in size and number in one patient 2.5 months later. For another patient, a repeated ultrasonogram was obtained 20 days after the first ultrasonogram was obtained, and the findings were similar. For the last patient, a clear increase in the number of splenic lesions was detected after 32 days. No tuberculosis-related deaths occurred during the 3 months after the diagnosis.

For patients in the control group, the mean size (± SE) of the spleen was 136 ± 5 mm. Ultrasonographic follow-up studies were done for six of these patients; no focal splenic lesions were found. During the 3 months following diagnosis, only one death, which was not related to tuberculosis, occurred.

When we compared the study and control groups on the basis of the parameters shown in table 1, we did not find any significant differences. The clinical patterns for both groups were similar; the median survival was 21 months (25th and 75th percentiles, 9 months and 26 months, respectively) for case patients and 16 months (25th and 75th percentiles, 9 months and 17 months, respectively) for control patients ($P = .18$, logrank test). Statistically significant differences were detected only when the CD4$^+$ cell counts were compared: the median CD4$^+$ cell count for case patients was 54/mm$^3$ (25th and 75th percentiles, 14/mm$^3$ and 96/mm$^3$, respectively), and that for control patients was 92/mm$^3$ (25th and 75th percentiles, 64/mm$^3$ and 110/mm$^3$, respectively).

**Discussion**

The incidence of tuberculosis in Spanish penitentiaries was high (2,283 cases per 100,000 inmates) in 1993–1994 [23]; this incidence is ~40 times higher than that in the general Spanish population [24]. Despite the limitations inherent in our study (i.e., the retrospective design and the peculiar population, which consisted entirely of male prison inmates, all of whom were intravenous drug users), we found that splenic tuberculosis might be less uncommon than previously thought. The characteristic splenic lesions of mycobacteriosis are small, multiple, and rounded and appear hypoechoic on an ultrasonogram (figure 1) and hypodense on a CT scan [22, 25]. Other medical conditions that might cause splenic lesions should be ruled out.

In a review of the recent literature, we found that 31 HIV-infected patients with splenic tuberculosis have been described [6–18], and another 29 have been included in general series [21, 22]. The diagnosis was definite in only 10 cases (splenic biopsy was performed by means of percutaneous fine-needle aspiration or at necropsy or surgery); the diagnosis was highly probable in the remaining cases. The tuberculous splenic abscesses in these cases were present predominantly in the setting of disseminated tuberculosis diagnosed by strict microbiologi-
Table 1. Symptoms, physical findings, and laboratory data for patients with tuberculosis, with and without splenic involvement.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Splenic involvement (n = 20)</th>
<th>No splenic involvement (n = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms and physical findings*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fever, chills</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>Anorexia, weight loss</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Cough</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>Liver enlargement</td>
<td>18</td>
<td>16</td>
</tr>
<tr>
<td>Palpable lymph nodes</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Ascites</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Splenic enlargement</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Laboratory data(^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemoglobin concentration (g/dL)</td>
<td>10.1 ± 0.3</td>
<td>10.9 ± 0.5</td>
</tr>
<tr>
<td>WBC count (×10^3/mm^3)</td>
<td>3.564 ± 504</td>
<td>4.642 ± 662</td>
</tr>
<tr>
<td>Neutrophil count (×10^3/mm^3)</td>
<td>2.721 ± 495</td>
<td>3.464 ± 652</td>
</tr>
<tr>
<td>Lymphocyte count (×10^3/mm^3)</td>
<td>584 ± 55</td>
<td>797 ± 139</td>
</tr>
<tr>
<td>Median CD4(^+) lymphocyte count (×10^3/mm^3)</td>
<td>54(^a)</td>
<td>92(^a)</td>
</tr>
<tr>
<td>CD8(^+) lymphocyte count (×10^3/mm^3)</td>
<td>304 ± 61</td>
<td>372 ± 47</td>
</tr>
</tbody>
</table>
| Median lactate dehydrogenase level (U/L) | 231\(^b\) | 236\(^b\)

* Data are number of patients.
\(^a\) Data are mean ± SE unless otherwise indicated.
\(^b\) Twenty-fifth vs. 75th percentiles: 14/mm^3 vs. 96/mm^3 respectively, and 64/mm^3 vs. 110/mm^3 respectively.
\(^c\) P < .05.
\(^d\) Twenty-fifth vs. 75th percentiles: 164 U/L vs. 301 U/L, respectively, and 172 U/L vs. 304 U/L, respectively.

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References


