Table 1. Results of voluntary HIV testing in 2 Italian infectious diseases units, 2002–2007.

<table>
<thead>
<tr>
<th>Variable</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of patients tested</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>419</td>
<td>56</td>
<td>340</td>
<td>54</td>
<td>417</td>
<td>70</td>
</tr>
<tr>
<td>Male sex</td>
<td>348</td>
<td>41</td>
<td>199</td>
<td>40</td>
<td>257</td>
<td>53</td>
</tr>
<tr>
<td>Female sex</td>
<td>71</td>
<td>15</td>
<td>141</td>
<td>14</td>
<td>160</td>
<td>17</td>
</tr>
<tr>
<td>Positive results, no. (%)</td>
<td>5 (1.2%)</td>
<td>0</td>
<td>3 (0.9%)</td>
<td>1 (1.9%)</td>
<td>8 (1.9%)</td>
<td>0</td>
</tr>
</tbody>
</table>

**NOTE.** Data are for the Section of Infectious Diseases, Department of Pathology, G.B. Rossi University Hospital, Verona, Italy (Verona) and the Infectious Diseases Unit, Annunziata Hospital, Cosenza, Italy (Cosenza).

* January through September.

in the United States and favor the proposal of universal HIV testing in health care settings [3]. In Italy (and in other European countries), anonymous, voluntary HIV testing has long been offered free of charge in infectious diseases units in an effort to attract at-risk individuals and to diagnose the infection early. To determine whether voluntary testing is indeed sought by at-risk individuals, we reviewed and compared data on the use and results of voluntary HIV testing from January 2002 through September 2007 in 2 infectious diseases units, one (G.B. Rossi University Hospital; Verona, Italy) located in northeastern Italy, in the Veneto region, and the other (Annunziata Hospital; Cosenza, Italy) located in southern Italy, in the Calabria region.

A total of 2223 tests were performed at the infectious diseases unit in Verona, and 383 tests were performed at the unit in Cosenza (table 1). Positive results were obtained in only 1.8% of tests performed in Verona and 0.26% of tests performed in Cosenza. Importantly, 8 of the 40 tests with positive results in Verona and the only test with positive results in Cosenza were performed for sexual partners of HIV-infected patients. During the same period, 59 cases of AIDS were diagnosed at the infectious diseases unit in Verona and 13 cases of AIDS were diagnosed at the infectious diseases unit in Cosenza in people who had never undergone HIV testing. Our results prompt a number of considerations. First, many more people undergo voluntary HIV testing in Verona (where the infectious diseases unit serves a population of 826,000 and where anonymous HIV testing is also offered by another dedicated HIV testing center) than in Cosenza (where the infectious diseases unit is the only HIV testing center and serves a population of 734,000). This finding may partly be the result of a greater fear of AIDS in Verona, because a far higher number of AIDS cases have been observed in the Verona area than in the Cosenza area since the beginning of the epidemic (613 cases vs. 126 cases) [4]. Second, because the number of positive results was low in Verona and was virtually zero in Cosenza, it is evident that few individuals who are truly at high risk of acquiring HIV infection seek testing. Third, the above data contrast with the still considerable number of individuals presenting at late stages of infection without previous knowledge of their HIV infection status.

In conclusion, an analysis of the use and results of voluntary HIV testing in 2 Italian infectious diseases units showed that few people who seek HIV testing have acquired the infection—whereas many individuals discover their HIV infection status only after manifesting symptoms of AIDS—and that voluntary HIV testing is underused (particularly in the infectious diseases unit in southern Italy). More targeted information campaigns need to be planned and performed in Italy (especially in the less developed southern regions) if more cases of HIV infection are to be identified at early stages through voluntary testing. Alternatively, universal HIV testing in health care settings should also be considered in Italy.

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Liposomal Amphotericin B as a Cause of Pseudohyperphosphatemia

To the Editor—We report an interference in the Synchron LX-20 phosphorus assay (Beckman Coulter) that is caused by liposomal amphotericin B. A patient infected with HIV was admitted to the National Institutes of Health Clinical Center...
(Bethesda, MD) for treatment of cryptococcal meningitis. His baseline serum phosphorus level was 4.2 mg/dL (within the normal range; measured by Synchron LX-20 assay). The patient began treatment with liposomal amphotericin B at hospital admission. His serum phosphorus level was 5.5 mg/dL on day 2 of hospitalization and increased to 6.5 mg/dL on day 6. The next day, the patient’s serum phosphorus level was found to be 7 mg/dL. His serum creatinine level had been stable at 0.7–0.8 mg/dL during this period. The patient did not develop signs of hyperphosphatemia. His serum calcium, parathyroid, and vitamin D levels were normal. Because there was not an evident cause of hyperphosphatemia, a possible interference in the phosphorus assay was suspected. The patient did not start receiving treatment for hyperphosphatemia, and the clinical laboratory was contacted.

In contrast to the elevated serum phosphorus values detected by the Synchron LX-20 assay, normal values were found after removing liposomal amphotericin B from the samples by ultrafiltration (25 min at 10,000 rpm; Minicon 30 filter) (figure 1). The patient’s serum creatinine level increased on day 9, and the Synchron LX-20 assay revealed phosphorus values as high as 8.1 mg/dL on day 10. The patient developed true hyperphosphatemia attributable to renal failure, but the ultrafiltration procedure showed phosphorus values that were 1.5–2.5 mg/dL lower than the values determined using the Synchron LX-20 assay (figure 1). Liposomal amphotericin B therapy was discontinued on day 16 of hospitalization, and the difference in phosphorus levels between the assays decreased to 1 mg/dL 5 days later and to 0.9 mg/dL 12 days after discontinuation of therapy.

The differential diagnosis of pseudo-hyperphosphatemia includes hyperlipidemia, paraproteinemla, hyperbilirubinemia, and hemolyzed samples [1]. None of these factors were present in this case. Nafcillin and rifampin can also produce interference with the Synchron LX-20 assay, but the patient did not receive these medications [2].

Liposomal amphotericin B has recently been reported as a cause of interference in the Synchron LX-20 phosphorus assay [3, 4]. This drug consists of amphotericin B intercalated into a unilamellar bilayer vesicle containing phospholipids and cholesterol. It has been postulated that biodegradation of the liposomal vehicle may result in interference because of light scatter or precipitation, affecting the absorbance measurements [3]. In contrast, Lane et al. [4] postulate that phosphate is released from the phospholipids and measured in the Synchron LX-20 assay.

Clinicians should be aware of this important interaction to avoid unnecessary and potentially harmful treatments to lower serum phosphorus levels. According to the findings of this case, clinicians might find falsely elevated readings of phosphorus levels (as high as 2.5 mg/dL above the normal value) after ~7 days of therapy with liposomal amphotericin B. There is expected to be a loss of interference in the phosphorus assay 5–6 days after stopping liposomal amphotericin B therapy, which corresponds to the elimination half-life of the drug. Longer periods of residual interference might occur in the presence of renal failure, because this drug is renally cleared.

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