Impact of Initial Screening for Human T-Cell Lymphotropic Virus (HTLV) Antibodies on Efficiency of HTLV Western Blotting

The recommended algorithm for detection and characterization of serum human T-cell lymphotropic virus (HTLV) antibodies calls for first performing a screening enzyme immunoassay (EIA) and then further evaluating repeatedly reactive samples for antibodies recognizing specific HTLV glycoproteins (2, 3). A commercially available Western blot (WB) that includes both native and recombinant HTLV proteins offers a simplified approach for characterizing and typing HTLV infections (1, 4).

As an esoteric testing laboratory, our facility directly accepts sera for HTLV WB testing; this service is intended for samples that have already undergone EIA testing for HTLV antibodies in accordance with the recommended algorithm. We thus predicted that the efficiency (proportion of samples giving a positive or indeterminate result) of the HTLV WB assay would be high; however, this prediction was incorrect. Of 339 consecutive sera tested using the Genelabs Diagnostics (Singapore) HTLV-I blot 2.4 kit, 30 sera (9%) were positive, 86 sera (25%) were indeterminate, and 219 sera (65%) were negative, giving an efficiency of 34% (4 sera [1%] were uninterpretable due to high background staining).

To further test this unexpectedly low efficiency, 82 consecutive HTLV WB-negative sera were tested for HTLV antibodies by EIA (Abbott Laboratories, Abbott Park, Ill.); 61 of the 82 sera (74%) were nonreactive. Thus, it appeared that many HTLV WB-negative sera were not screened for HTLV antibodies prior to submission for HTLV WB testing.

To further test this hypothesis, we mailed physicians of 46 HTLV WB-negative patients a questionnaire asking for information regarding the HTLV antibody EIA performance history for the patient’s serum. Table 1 presents questionnaire responses (n = 31) as a function of HTLV EIA results obtained at our facility. Of the 24 WB-negative sera that were HTLV EIA nonreactive at our facility, 19 were not tested by EIA prior to submission for HTLV WB analysis and 2 were submitted for WB analysis even though a nonreactive EIA result was obtained. These findings were in sharp contrast to those obtained for seven HTLV WB-negative sera that were EIA reactive at our facility: six of the seven sera were tested by EIA prior to submission for WB analysis and five of the six were EIA reactive at the original testing laboratory. Of the 31 WB-negative serum samples for which a physician response was obtained, 22 (71%) either were not screened by EIA for HTLV antibodies or were submitted for WB despite an EIA nonreactive result. Assuming this percentage applies to all the WB-negative results we obtain, 46% of all samples submitted for HTLV WB analysis do not meet the criteria for WB testing set forth by the recommended testing algorithm. Had these sera not been submitted for HTLV WB testing, the HTLV WB testing efficiency would have increased from 34 to 63%.

These findings indicate that adherence to the recommended algorithm for HTLV antibody testing will dramatically improve HTLV WB testing efficiency. We encourage the development of a systematic plan to educate health care professionals regarding the recommended guidelines for HTLV antibody testing.

**TABLE 1. EIA performance history for WB-negative sera**

<table>
<thead>
<tr>
<th>Screening-EIA result</th>
<th>No. of samples with the following HTLV antibody EIA result at our facility:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nonreactive (n = 24)</td>
<td>Reactive (n = 7)</td>
</tr>
<tr>
<td>~</td>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>Nonreactive</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Reactive</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

* ~, samples not screened by EIA.

**REFERENCES**


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