COMPARISON OF ELISA AND RAPID SCREENING TESTS FOR THE DIAGNOSIS OF HIV, HEPATITIS B AND HEPATITIS C AMONG HEALTHY BLOOD DONORS IN A TERTIARY CARE HOSPITAL IN MUMBAI

Dear editor,

Blood transfusion services is a vital part of modern health care system.\textsuperscript{[1]} With every unit of blood there is 1% chance of transfusion associated problems including transfusion transmitted diseases.\textsuperscript{[2]} Transfusing infected blood to unsuspected patients in need is a crime. It is mandatory to test each and every unit of donor blood for antibodies to HIV-1 and 2, Syphilis, Hepatitis C, Hepatitis B surface antigen and peripheral smear for malarial parasite.\textsuperscript{[3]} ELISA is recommended and preferred screening technique for blood banks. Many blood banks still do not have this facility. They prefer rapid, easy to perform and user friendly kits\textsuperscript{[4]} and their manufacturers strongly recommend their use. A preliminary study was therefore conducted to evaluate the efficacy of these rapid testing kits for screening blood donors.

Thirty blood samples reactive and non-reactive by the standard ELISA tests each for HIV, HBsAg and HCV were considered for processing by the rapid tests. The rapid test for HIV was done with Comb Aids - RS, HBsAg with Hepacard and HCV with Gold Spot HCV. A comparative evaluation of ELISA and rapid test results was done, considering ELISA as a standard test (Table).

The reactive samples had higher optical density (OD) values. Failure of the rapid kits to detect HIV, HBV and HCV reactive samples may be due to 1. Inadequate coating of the antigens, 2. Nature of the antigens used and 3. Genetic heterogeneity of the virus.

Most of these rapid assays use recombinant proteins from the prototype virus alone, specifically for HCV.

<table>
<thead>
<tr>
<th>Table: Comparative evaluation of ELISA and rapid tests</th>
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<tbody>
<tr>
<td><strong>HIV ELISA</strong></td>
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<tr>
<td>Reactive</td>
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<tr>
<td>$n = 30$</td>
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<tr>
<td>Rapid Reactive</td>
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<tr>
<td>Rapid Nonreactive</td>
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<td>Total</td>
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For HIV and HBV samples:

*Chi square: 14.14 (P < 0.001); Sensitivity: 43.33%, Specificity: 56.66%; % of false positive test: 0%; % of false negative test: 56.66%; Predictive value of positive test: 100%; Predictive value of negative test: 63.83%.

For HCV samples:

Sensitivity: 0%, Specificity: 100%; % of false positive test: 0%; % of false negative test: 100%; Predictive value of positive test: 0%; Predictive value of negative test: 100%; Chi square test is not applicable.
Variants of HCV may differ substantially in nucleotide sequence from one another and show varied geographical and epidemiological distributions.[4,5]

This shows that the rapid tests are inferior compared to ELISA. They have not shown any promising results in our study and hence should not be recommended in transfusion centre for screening blood donors.

Acknowledgements

1. F.P. Candes, Prof and Head of Department, Dr. Yasmin Khatib, Lecturer, Department of Pathology, Dr. R.N. Cooper Hospital, Mumbai.
2. Dr. Pandit, Prof and Head of Department, Dr. Jayshree Sharma, Incharge Blood Bank, Department of Pathology, K.E.M Hospital, Mumbai.

References


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Received: 03-12-07
Accepted: 24-12-07