NON-A, NON-B HEPATITIS: TESTING OF BLOOD FOR INFECTIVITY

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Test providing indirect evidence (ALT and anti HBc)

Since 1986 blood units in the United States are routinely tested for ALT and anti-HBc. The number of units with elevated ALT-values varies from 0.9 to 3.5%, and for increased anti-HBc-titres from 2 to 4%.

In Europe such surrogate testing for Non-A, Non-B hepatitis varies from country to country. In the Federal Republic of Germany all donors are screened for ALT since 1965. France and Luxemburg have decided in 1988 to make the testing of both ALT and anti-HBc obligatory for all blood units. In Belgium, Switzerland, Spain and Italy only part of the donor blood is presently screened with these tests. In the other European countries, surrogate testing for Non-A, Non-B hepatitis is (not yet) introduced.
The relevance, the advantages and draw-backs of this testing have been discussed previously in this Expert Committee.

Test providing direct evidence

Recently Choo et al (1) reported the successul isolation of a DNA-clone that encodes an antigen specifically associated with Non-A, Non-B hepatitis infections. They provided evidence that this clone is derived from the genome of the Non-A, Non-B hepatitis agent which was similar to the logaviridae. The authors have termed this virus, hepatitis C virus (HCV).
Using recombinant technology Kuo et al (2) have accomplished the expression of the continuous open reading frame of such a clone in yeast. In this way a polypeptide was synthetized which after solubilization and purification was used tc coat the wells of micro-titer plates so that circulating antibodies to HCV in blood samples could be captured and measured. Antibodies to HCV were detected in

six of seven human sera that previously were shown to transmit Non-A, Non-B hepatitis to chimpanzees. The only negative sample was obtained from an individual in the acute phase of post-transfusion Non-A, Non-B hepatitis.

Assays of matched blood donor and prospectively obtained recipient sera from 10 well-documented cases of post-transfusion Non-A, Non-B hepatitis revealed that there was at least one positive blood donor in nine of these cases. Each of the ten recipients seroconverted against HCV during the course of the disease although in one case this was not apparent until 12 months after transfusion while in the other cases antibodies were detected within 6 months. In contrast, in individuals infected with other viral hepatitis agents seroconversion against HCV was not observed.

Concerning the specificity of surrogate tests it is of interest to note that some of the anti-HCV-positive donors had no elevated ALT concentrations or increased antibody titres to HBc. Further support for a specific association between blood-borne Non-A, Non-B hepatitis and antibodies to HCV was obtained from assays of other cases of posttransfusion hepatitis.

About 80% of such patients from Japan, Italy and the United States had circulating antibodies to HCV whereas a lower frequency (15%) was observed in acute infections.

These data suggest that HCV is an important cause of chronic Non-A, Non-B hepatitis not only in the United States but also in other parts of the world. The specific and sensitive test for antibodies to HCV may lead to the improved safety of the blood supply once this test is available for large scale use and the initial results are confirmed by others. However, it is uncertain that testing of anti-HCV alone, will be sufficient to eradicate post-transfusion Non-A, Non-B hepatitis.

References

1. Choo, Q-L.,, Kuo, G., Weiner, A. et al.
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2. Kuo, G., Choo, Q-L., Alter et al.
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WGvA/hdw/1657/22/5/89