Lab Focus

May 2003– periodic insert to 'Scope *from Fairview Clinical Laboratories*

Sound bites. . . .

LIS GOES LIVE AT FAIRVIEW NORTHLAND REGIONAL HOSPITAL

Effective May 6, the FlexiLab laboratory information system will go live at Fairview Northland Regional Hospital.

PLATELET FUNCTION TEST REPLACES BLEEDING TIME AT FAIRVIEW RIDGES HOSPITAL

Effective May 1, Platelet Function Testing will replace the bleeding time at Fairview Ridges Hospital. The platelet function test will be substituted on any orders received for bleeding time.

In addition to being a poor indicator of surgical bleeding risk, the bleeding time is operator dependent, has poor correlation to platelet function and can cause scarring.

The platelet function test is sensitive to platelet adhesion and aggregation abnormalities, thereby providing increased sensitivity for von Willebrand screening and aspirin-induced platelet dysfunction in comparison to the bleeding time.

The platelet function closure time uses two tests, collagen/ epinephrine (EPI) and collagen/ADP (ADP). EPI detects platelet dysfunction induced by any intrinsic platelet defects (vWD, aspirin, etc.). Abnormal samples (EPI >175) are also tested using ADP to enable discrimination of aspirin effects.

	EPI	ADP
Normal	normal	normal
Aspirin	abnormal	normal
vWD	abnormal	abnormal
Glanzmann's Thrombasthenia	abnormal	abnormal

Closure times may be prolonged with platelet counts <100,000/mm^3 or hematocrit <35%.

West Nile Virus Is Transmitted by Transfusion

Summary: Patients receiving blood transfusions this summer may be at risk of West Nile Virus (WNV) infections. WNV cases rose to a new high last year, reaching 4071 infections and 274 fatalities in the U.S. Experts anticipate another possible spike in cases this year, peaking in August through September. In 2002, the CDC confirmed 21 cases of infection transmitted by transfusion. The risk may be as high as 10-20 cases per 10,000 blood donations. More than 100,000 blood components are transfused at Fairview annually. Until a test is available to screen blood donors for the virus, physicians must watch post-transfusion patients for signs of WNV infection. For more information, visit: www.cdc.gov/ncidod/dvbid/westnile/conf/February_2003.htm

The year 2002 brought the largest documented arbovirus meningo-encephalitis epidemic in the Western hemisphere, and the largest epidemic of mosquito-borne West Nile meningo-encephalitis ever. In the U.S., 4071 infections, including 2907 cases of meningoencephalitis and 274 fatalities, were reported. In addition, case studies demonstrated transmission of West Nile Virus (WNV) infection by transplantation and transfusion (really a temporary transplant). While the true magnitude of transfusion transmission is unknown, CDC reported 61 possible cases and 21 cases were confirmed. Nineteen are not transfusion related, and 21 remain under investigation. **Red cells, platelet concentrates, and plasma were all implicated in transfusion transmission.**

Blood donation while a person is infected is feasible since about 80 percent of mosquito-acquired infections are asymptomatic. The remaining 20 percent of mosquito-acquired infections result in WNV fever (fever, headache, sore throat, myalgia, arthralgia, lymphadenopathy, etc.). Only about 1/150 (0.67 percent) develop meningoencephalitis where the fatality rate is about 9 percent. There are no chronic infectious carriers, but an infected person has a transient viremic period of one to eleven days, which is followed by development of antibody and resolution of infection. Blood donation during the viremic stage, prior to the development of symptoms, if any, is the cause of transfusion-related infection.

WNV infection in blood donors is a significant possibility when the epidemic has a chance to be amplified in mosquito-bird cycles and the involved mosquitoes shift feeding patterns from birds to include mammals (humans). In Minnesota the pattern shift is approximately July through October (human WNV cases in Minnesota last year were limited to August and September). The risk of transfusion transmission of WNV infection in the epidemic in Queens, New York in 1999, has been estimated as 1.8-2.7 infections per 10,000 donations. **The risk in the 2002 epidemic may have been as high as 10-20 infections per 10,000 donations**.

More than 100,000 blood components are transfused at Fairview yearly. Published infectious risks associated with transfusion are 1/150,000 for hepatitis B, 1/1,200,000 for hepatitis C, and 1/1,400,000 for human immunodeficiency virus making those risks for WNV seem relatively high.

The consequences of transfusion transmitted WNV infection can be important. In the 21 transfusion-transmitted cases, 12 developed meningoencephalitis, of which six died. Seven cases were asymptomatic. In the New York outbreak in 1999, nearly half of patients who developed meningoencephalitis still had memory loss, muscle weakness or difficulty walking one year later.

Thus, transmission of WNV infection by transfusion can be a relatively high-risk event in heavily endemic regions at times when mosquitoes feed on humans. It can be accompanied by serious consequences and steps to prevent it are needed.

What can we do about it?

We can test blood donors for WNV infection. FDA, test manufacturers, and blood collecting and testing agencies recognized the need for a donor test in Oct. 2002. July 1 is a generally agreed upon target date for test implementation. The successful implementation of a donor test, only eight months after the call for a test, is unprecedented. More commonly one might expect this to require about two years! The test will utilize technology for direct detection of the genetic material of the WNV using nucleic acid amplification testing (NAT). In order to implement WNV testing, the FDA will allow national deployment of investigational tests; a similar approach to that taken for NAT to detect HIV and HCV.

What if the test is not ready by July 1, 2003?

Fairview-University Medical Center, Minnesota Department of Health (MDH), Mayo Clinic, Memorial Blood Centers and Red Cross met in February to discuss the WNV epidemic, the plans for test implementation, and contingencies in the event that a test is not available for blood donors. A substantial list of contingent "ideas" was generated that included major modifications to transfusion practices during risk periods. Some initiatives such as stockpiling of frozen blood components like plasma are underway now. At Fairview University we have decided to follow up this issue by:

- Monitoring test implementation plans and achievement of mileposts. We have asked our blood suppliers to inform us of plans and progress on test implementation. Implementation of an effective donor test would mitigate many concerns.
- Monitoring the epidemic as it develops. While the epidemic in 2002 was unprecedented, predicting the epidemic this year is problematic. It will depend on weather (wet or dry favors various mosquito species), over-wintering success of virus, and other variables. MDH will begin monitoring birds, horses, and mosquitoes in May.
- Refining our contingency plans to minimize the impact on patient care while balancing safe transfusion practices. Our Transfusion Committees will be very helpful in this regard.
- Communicating results of the monitoring activities.

What can you do?

- Stay informed.
- Report cases of suspected post-transfusion WNV infection. Even if a test is implemented, we will still need to be vigilant and monitor patients for development of signs and symptoms of WNV infection. Physicians must report any case of WNV developing within four weeks of transfusion so donors are evaluated and quarantined, and recipients of other components from that donation are evaluated.

Additional Information:

The Internet contains a lot of information on WNV. The following sites will get you started:

- CDC 4th WNV National Meeting February 2003 Web site: http://www.cdc.gov/ncidod/dvbid/westnile/conf/February_2003.htm.
- The University of Minnesota, Environmental and Occupational Health Web site: http://www1.umn.edu/eoh/hazards/hazards%20site/west%20nile%20virus/wnintro.html
- The North Central Pest Management Center at Michigan State University Web site: http://www.ncpmc.org/NewsAlerts/westnilevirus.html

Robert J Bowman, M.D.
University of Minnesota
Laboratory Medicine &Pathology
Transfusion Medicine
Medical School