



Saint Luke's Regional Laboratories Clinical Laboratory Letter



May 2009

Lab Testing for H1N1

According to the Centers for Disease Control (CDC), rapid influenza testing may be used in the initial evaluation of patients with influenza symptoms, however results should be interpreted with caution when H1N1 (swine flu) infection is suspected. Across the nation, some of the confirmed cases of H1N1 infection have tested positive for influenza A by rapid antigen, while some have been negative. Locally, during the recent outbreak, both seasonal influenza A and the H1N1 strain have initially been detected by rapid antigen tests.

Rapid influenza antigen testing has been offered by Saint Luke's Regional Laboratories since 2001. The overall sensitivity of the rapid influenza test used by Saint Luke's Regional Laboratories is 70-80% for seasonal influenza A & B, with a specificity of 90-95%. Optimal sensitivity is dependent upon adequate specimen collection and collection within the first 4-5 days of illness. Nasopharyngeal swabs or nasal wash specimens are acceptable for rapid influenza testing. Synthetic swabs with aluminum or plastic shafts, should be used for collection. Upon collection, specimens should be placed in M4 viral transport media, and transported to the laboratory immediately or refrigerated. Cotton and calcium alginate swabs or any swab with a wooden shaft are unacceptable for testing. Do not submit respiratory specimens for virus culture for swine flu.

It is currently unknown how well rapid influenza tests detect the H1N1 strain and they are not recommended as the only testing measure in the setting of a serious infection. At this time, the only definitive testing for H1N1 is PCR testing available only through state public health laboratories or the CDC.

State health departments in both Kansas & Missouri are updating their approach to H1N1 diagnostic testing frequently. Clinicians with a suspect case should consult Saint Luke's Regional

Laboratory Microbiology, or the state health department websites (www.dhss.mo.gov & www.kdheks.gov) for testing recommendations.

Transfusion Safety Initiative Revisited

The College of American Pathologists recently undertook a study to determine how frequently specimens submitted for type and crossmatch were mislabeled. Among 112,112 specimens from 122 participating institutions, the mislabeled specimen rate was 1.12 percent. Even more alarming, 1 in 2,500 samples had the wrong patient's blood in the mislabeled tube!

In order to eliminate these errors a transfusion safety initiative was introduced at Saint Luke's Hospital on January 3, 2006. This policy required that a patient have two blood types on file before ABO specific blood components would be issued. During the first year of its existence, this new policy identified 16 cases of wrong blood in tube at Saint Luke's Hospital. Following this successful pilot program, the transfusion safety initiative rolled out to all of the other hospital laboratories within the Saint Luke's Health System. Review of the past year's data revealed that the requirement for two blood types caught 14 mislabeled specimens with the wrong blood in tube. Interestingly, only 2 cases were identified at Saint Luke's Hospital, suggesting that the requirement for two blood types during the past two years has decreased the mislabel rate and significantly improved transfusion safety. Hopefully, the entire health system will experience the same rate of improvement next year.

Mislabeled specimens is the most frequent cause of ABO hemolytic transfusion reactions. Approximately 10% of ABO-incompatible transfusions are fatal. An additional risk of mislabeling is the failure to administer Rh immune globulin to an Rh negative woman resulting in hemolytic disease of the newborn.

Medicare Says No to Warfarin Pharmacogenomics

In August 2007, the Food and Drug Administration (FDA) introduced new labeling to the warfarin and Coumadin package insert to inform physicians that gene variations may influence how patients respond to warfarin therapy. However, FDA did not recommend or require that genotyping be performed before initiation of warfarin therapy. Since that time many pundits have predicted that warfarin pharmacogenomics would become the first major success story for personalized medicine. It was reasonable to expect that more accurate, pharmacogenetic-based initial dosing of warfarin would reduce the risk of serious bleeding and thrombotic complications. However, to date, only 3 small prospective randomized control trials have compared pharmacogenetic-based initiation of warfarin to empiric dosing and none of these studies have convincingly demonstrated that pharmacogenetic-based dosing is more efficacious than empiric dosing. Because of this paucity of data, the Centers for Medicare and Medicaid Services has announced that it will not pay for warfarin pharmacogenetic tests.

Consistent calls for additional trials to evaluate the clinical utility of pharmacogenetic-based warfarin dosing have been heard by the National Heart Lung and Blood Institute. The COAG (Clarification of Optimal Anticoagulation through Genetics) trial which is funding a prospective multicenter randomized controlled study is scheduled to begin in 2009. However, sufficient outcomes data will probably not be available for several years.

Chylous Pleural Effusions

Chylous pleural effusions usually result from disruption or obstruction of the thoracic duct and are typically described as exudative lymphocytic pleural effusions with a milky appearance. Identifying chylothorax is important in determining the etiology of pleural effusion, but the biochemical parameters of chylous effusions have never been thoroughly analyzed. The criteria published in most medical textbooks were based on a small study published more than 30 years ago. Recently, investigators from the Mayo Clinic published their biochemical analysis of the pleural fluid obtained from 74 adults with a diagnosis of chylothorax (Mayo Clin Proc. Feb 2009;84(2)129-33).

Gross appearance of the fluid was not a sensitive diagnostic criterion in identifying chylothorax. Only 44% of cases had the classic milky appearance attributed to chylothorax. A nonmilky appearance should not be used as a criterion to rule out a chylous effusion.

Most chylous effusions (86%) were classified as exudative effusions.

- Pleural effusions were classified as exudative if one of the following conditions were met:
- Pleural fluid total protein level greater than 2.9 g/dL
- Pleural fluid lactate dehydrogenase level more than two-thirds of the upper limit of the normal serum value or
- Pleural fluid cholesterol level greater than 45 mg/dL

Only 10% of the chylous effusions had lactate dehydrogenase levels in the exudative range.

The traditional biochemical criterion for chylothorax is a pleural fluid triglyceride level greater than 110 mg/dL. For the most part, the Mayo study validated this criterion. The mean \pm -SD triglyceride value for transudative chylothoraces was 192 \pm -105 with a median of 195 mg/dL while the mean \pm -SD triglyceride value for exudative chylothoraces was 855 \pm -816 with a median of 601 mg/dL. However, 14% of patients had triglyceride values less than 110 mg/dL primarily due to perioperative fasting and malnourishment.

In cases of suspected chylous effusion with triglycerides less than 110 mg/dL, the specimen can be sent to a reference laboratory for lipoprotein electrophoresis. The presence of chylomicrons in the fluid supports the diagnosis of chylothorax.

Platelet Orders

Platelets for transfusion can be prepared either by separation of platelet concentrates from whole blood or by apheresis from single donors. The former are often referred to as random donor platelet concentrates. Saint Luke's Health System only provides apheresis single donor platelets. A single donor platelet concentrate is the equivalent of 8 random donor platelet concentrates. The usual adult dose is one single donor platelet concentrate, which should increase the platelet count by 30,000 to 40,000/uL. Orders for a 10 pack of platelets are no longer appropriate.