Laboratory testing—Rationale and Tips for Reducing Door-to-Needle Times Without Compromising Patient Safety

Venous blood sampling with STAT assessment of critical laboratory values is a required part of the assessment for tPA. Provision of tPA would be unsafe in the setting of a known coagulopathy. AHA/ASA guidelines and the FDA package labelling all recommend against the use of tPA when there is a known coagulopathy, the patient is taking warfarin and the INR is greater than 1.7, the PTT is elevated, or platelets are less than 100,000. A brief focused history should be obtained to assess for the presence of medical conditions associated with coagulation disorders, including the presence of cancer, alcoholism, renal or liver failure or drug abuse. However, the most commonly encountered coagulopathy is due to the use of warfarin or other anticoagulants.

Waiting for the return of laboratory values, especially INR and PTT, can needlessly delay the initiation of tPA in patients with almost no risk of coagulopathy. Please consider these tips to avoid laboratory delays to improve your patient's door-to-needle times:

01 Patients with no history of warfarin or other anticoagulant use, active cancer, liver or renal disease, alcoholism or drug abuse are almost certain to have normal laboratory values for platelets, PT and PTT according to research studies.[1,2] In such patients, consider initiating tPA before the CBC and coagulation studies have been reported. In the exceedingly rare event that the coagulation studies return with an abnormality, immediately stop the tPA.

This approach is supported by AHA/ASA guidelines.[3] Specifically the guidelines state that "because time is critical, thrombolytic therapy should not be delayed while waiting for the results of the prothrombin time, activated partial thromboplastin time, or platelet count unless a bleeding abnormality or thrombocytopenia is suspected, the patient has been taking warfarin and heparin, or anticoagulation use is uncertain" (i.e., you cannot verify the absence of anticoagulants on the patient's medication list) (found on page 1665 of the 2007 guidelines).[3]

02 In centers that use of vascular imaging CT-angiography (CTA) or MR-angiography (MRA) as part of their initial neuroimaging assessment, a serum creatinine should be obtained prior to imaging to determine the safety of contrast injection. Do not allow the lack of reported creatinine to delay rapid non-contrast brain imaging. Immediately obtain the non-contrast CT or unenhanced MRI, interpret the image and provide IV tPA if indicated. The patient can then undergo contrast imaging either on the table if the results are now available, or be returned for CTA or MRA at a later time, after the creatinine value returns. At some centers, patients may undergo vascular imaging prior to an available creatinine value if the risk of harm from treatment delay is felt to outweigh the risk of harm from contrast injection.

03 Ancillary Testing

The need for pregnancy testing, chest x-ray, EKG, carotid ultrasound or other diagnostic tests prior to tPA administration should be based on clinical assessment in the context of the particular patient. Most patients do not require this testing prior to treatment, and the delays introduced will reduce the efficacy of tPA. The ASA guidelines state that "additional tests may be performed as indicated by the patient's history, symptoms, physical findings, or comorbidities" (page 1665 of the guidelines).[3]

1 Rost NS, Masrur S, Pervez MA, Viswanathan A, Schwamm LH. Unsuspected coagulopathy rarely prevents IV thrombolysis in acute ischemic stroke. Neurology 2009;73:1957-1962.

2 Cucchiara BL, Jackson B, Weiner M, Messe SR. Usefulness of checking platelet count before thrombolysis in acute ischemic stroke. Stroke 2007;38:1639-1640.

3 Adams HP, Jr., del Zoppo G, Alberts MJ, et al. Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council, Clinical Cardiology Council, Cardiovascular Radiology and Intervention Council, and the Atherosclerotic Peripheral Vascular Disease and Quality of Care Outcomes in Research Interdisciplinary Working Groups: the American Academy of Neurology affirms the value of this guideline as an educational tool for neurologists. Stroke 2007;38:1655-1711.

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