Guideline for Treatment of Head Injury in the Anticoagulated Patient

GUIDELINE: GUIDELINE FOR TREATMENT OF HEAD INJURY IN THE ANTICOAGULATED PATIENT

BACKGROUND:

Chronic anticoagulation therapy is used in the management of a variety of clinical conditions including prosthetic heart valves, chronic atrial fibrillation, pulmonary embolus, deep vein thrombosis, and pro-coagulant states. Warfarin is the most common oral anticoagulant used for chronic anticoagulation therapy, and an increasing number of elderly patients taking warfarin are being seen as trauma patients. Use of warfarin is a significant predictor of mortality in patients with traumatic intracranial hemorrhage. A significant number of patients initially present with no or minimal neurological symptoms and minor intracranial hemorrhage, which progresses to a moribund and ultimately fatal hemorrhage while awaiting diagnosis and initiation of treatment. Rapid confirmation of intracranial hemorrhage with expedited head CT scan combined with prompt reversal of warfarin anticoagulation may decrease progression of intracranial hemorrhage and reduce mortality

PURPOSE:

To rapidly identify intracranial hemorrhage in anticoagulated patients and reduce the time from presentation to reversal of anticoagulation.

Evidence Base Guidelines are intended to serve as a general statement regarding appropriate patient care practices based upon the available medical literature and clinical expertise at the time of development. They should not be considered to be accepted protocol or policy, nor are intended to replace clinical judgment or dictate care of individual patients.

GUIDELINE:

Inclusion criteria:

The protocol applies to all adult (18 or older) Warfarin anticoagulated trauma patients, deemed at risk for intracranial injury. This includes all Warfarin anticoagulated patients with blunt or penetrating mechanisms of trauma, including falls from same level (ground level fall), which have one of the following:

1. Any loss of consciousness after trauma
2. Any mental status changes after trauma
3. History of direct or indirect impact to the head or neck
4. Any signs of external injury to head or neck such as abrasion or ecchymosis
5. Falls from one level to another level

Exclusion Criteria:

1. Hospice patients
2. Patients that are part of the trauma code, hemodynamically unstable, or displaying signs of shock that may need other life-sustaining procedures. As part of their resuscitation, these patients

may need reversal of anticoagulation and may also benefit from prothrombin complex concentrate (PCC), at the direction of the treating physician (for dosing please refer to KCentra table below)

Diagnosis:

1. Rapid triage directly to a treatment area.
    a. Patient is brought immediately from waiting room to treatment area
2. Emergent ordering of head computed tomography (CT) scan. This may be prepared by the triage nurse with the signature of a physician. CT tech is notified of need to prioritize this study.
3. An initial emergent evaluation by Emergency Physician, Trauma Surgeon, Neurointensivist or Neurosurgeon.
4. Stat labs with Emergency Hemorrhage Panel (EHP) including prothrombin time and international normalized ratio (INR), and Type and Screen done within 10 minutes of arrival.
5. The on-call radiologist (staff or resident) provides immediate interpretation of the Head CT scan and relays the results back to the treating physician and adds the documentation of "initial read" in chart.

Treatment:

Patients without any signs of intracranial hemorrhage on the initial head CT scan are managed based on the hospital specific guidelines and/or treating physician discretion, which may include admission for observation or repeat head CT.

Patients with CT scan confirmation of intracranial hemorrhage and INR>1.5 please give 10 mg of Vitamin K given IV piggyback (Patients with history of allergic reaction to vitamin K will not receive it).

Prothrombin complex concentrate (PCC) pathway

1. KCentra is a 4-factor PCC and the preferred treatment/reversal agent in treatment of patients who are anticoagulated with Warfarin and have intracranial hemorrhage. Relative contraindications to Kcentra use include:
    a. History of thrombotic or thromboembolic event in past 6 weeks (DVT, PE, ischemic stroke, acute coronary syndrome, acute venous/arterial ischemia etc.);
    b. Known prothrombotic condition (malignancy, DIC, hypercoagulable condition, hepatic disease, polytrauma, HIT, etc.)
    c. If any of the above criteria is met or the patient has mechanical heart valve such as aortic or mitral valve replacement, please discuss with ER,
    d. Trauma Surgery, Neurointensivist, or Neurosurgery attending the possibility of giving KCentra.
2. If decision is made to use KCentra, please infuse immediately. Please use the following guideline table for dosing. For patients over 100 kg body weight, use:

INR	KCentra Dose	Maximum Dose
1.6-1.9 on warfarin	May consider FFP pathway or Kcentra 25 units/kg	2500 units
2.0 -3.9 on warfarin	25 units /kg	2500 units
4.0-6.0 on warfarin	35 units /kg	3500 units

> 6.0 on warfarin	50 units /kg	5000 units

3. KCentra is a 4 factor PCC and should be able to reverse Warfarin anticoagulation without FFP administration; therefore, side effects of FFP administration, such as risk for volume overload, may be avoided. In general, use of KCentra should be avoided in combination with FFP. However, trauma patients **who require hemostatic resuscitation** may benefit from the combined treatment of KCentra with administration of 2-4 units of FFP as the initial treatment. Combined initial treatment (KCentra with FFP) can be initiated at the discretion of the treating physician.
4. If INR 1.6-1.9, KCentra may be considered as described above. Given the scarce evidence and the potential prothrombotic risk of KCentra, FFP may be considered as an alternative (see FFP pathway below).
5. Check PT/INR (or EHP) at 1 hour, 6 hours and 24 hours after KCentra administration.
6. If PT/INR is still >1.5 after appropriate dosing of KCentra in one hour, consider other possible causes such as a low fibrinogen. For patients whose INR does not correct after KCentra, please switch to FFP pathway with the empiric administration of 2-4 units of thawed FFP.

FFP only Pathway (If PCC not available or decision was made not to use it)

1. Immediately transfuse 4 Units universal-donor FFP and request 4 U of type-specific FFP to be sent as soon as possible.
2. Check INR after the first 4 units of FFP have been infused and follow your hospital guidelines or treating physician discretion for repeat FFP dosing as needed.

Idarucizumab (Praxbind) Pathway only for Dabigatran (Pradaxa)

1. Thromboembolic Risk: Reversing dabigatran therapy exposes patients to the thrombotic risk of their underlying disease. Resume anticoagulant therapy as soon as medically appropriate.
2. Re-elevation of Coagulation Parameters: In patients with elevated coagulation parameters and reappearance of clinically relevant bleeding or requiring a second emergency surgery/urgent procedure, an additional 5 g dose of PRAXBIND may be considered.
3. Hypersensitivity reactions: Discontinue administration and evaluate.
4. Risks of Serious Adverse Reactions in Patients with Hereditary Fructose Intolerance due to Sorbitol Excipient: Patients with hereditary fructose intolerance may be at risk of adverse reactions.
5. ADVERSE REACTIONS
    a. In healthy volunteers, the most frequently reported adverse reactions in greater than or equal to 5% of subjects treated with idarucizumab was headache.
    b. In patients, the most frequently reported adverse reactions in greater than or equal to 5% of patients treated with idarucizumab were hypokalemia, delirium, constipation, pyrexia, and pneumonia.
6. The recommended dose of idarucizumab is 5 g, provided as two separate vials each containing 2.5 g/50 mL idarucizumab.

7. There is limited data to support administration of an additional 5 g of idarucizumab.

FEIBA (aPCC) Pathway for Factor Xa Inhibitor – Rivaroxaban (Xarelto®) / Apixaban (Eliquis®)

1. FEIBA can cause thromboembolic events following doses above 200 units per kg per day and in patients with thrombotic risk factors.
2. Monitor patients receiving FEIBA for signs and symptoms of thromboembolic events.
3. Anaphylaxis and severe hypersensitivity reactions may occur. Should symptoms occur, discontinue treatment with FEIBA and administer appropriate treatment.
4. FEIBA is made from human plasma and may contain infectious agents, e.g., viruses, the variant Creutzfeldt-Jacob disease (vCJD) and theoretically, Creutzfeldt-Jacob disease (CJD) agent.
5. ADVERSE REACTIONS
    a. The most common adverse reactions observed in >5% of subjects were anemia, diarrhea, hemarthrosis, hepatitis B surface antibody positive, nausea, and vomiting.
    b. The serious adverse drug reactions are hypersensitivity and thromboembolic events, including stroke, pulmonary embolism, and deep vein thrombosis. Request Pharmacy consultation for dosing.
6. Dosing – Consult Pharmacist
    a. Minor bleeding, monitor and re-check labs
    b. Major bleeding: FEIBA™ low dose (approximately 8-12 units/kg); Second Option: may consider KCentra™ if clinically necessary
    c. Emergent life threatening bleed: FEIBA™ 8units/kg to 25-50 units/kg. Second Option: KCentra™ 25-50 units/kg
7. Antidote Drug AndexXa rejected By FDA In August 2016, reapplied for

Please also note:

1. Appropriate surgical consultation, including neurosurgical consultation, should be obtained emergently.
2. This protocol focuses on the initial rapid process to correct the Warfarin associated anticoagulation in patients with head injury. Any additional blood product transfusion or patient monitoring is based on hospital guidelines and treating physician discretion.
3. The appropriate treatment of trauma patients based on trauma guidelines and ATLS supersedes this protocol. As such, at the discretion of the treating physicians, lifesaving maneuvers, such as endotracheal intubation, and other required treatments, including transfer to a definitive-care site, should not be delayed.

References:

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