Paediatric Stroke – Emergency management in children - The 72hrs Post Alteplase

This document forms part of the statewide guideline for Paediatric Stroke – Emergency management in children

The 72hrs post Alteplase in Paediatric Ischaemic Stroke

MEDICAL CARE, CAUTIONS ABOUT ANTICOAGULANT AND ANTIPLATELET AGENTS AND NURSING CARE

ALERT

All Children who are receiving/have received an Alteplase Infusion for the treatment of Acute Arterial Ischaemic Stroke should already have Retrieval Services Queensland involved unless they are in a centre with appropriate definitive services. The child will be retrieved to a Paediatric Intensive Care Service.

Medical Management

Neurosurgical Consultation

As soon as possible after commencement of the Alteplase infusion the Neurologist (or delegate) should contact the Paediatric Neurosurgery Registrar at regarding patients who receive Alteplase for ischaemic stroke or have any large MCA and/or posterior circulation stroke regardless of eligibility for reperfusion therapy.

Medical Care and Investigations

A child who is receiving/has received Alteplase

- Should be nursed in a Critical Care Environment e.g. resuscitation area of ED or ICU (adult/paediatric) till retrieval has occurred.
- There should be medical staff who are immediately available to respond to any clinical deterioration in a child who has received IV Alteplase for Paediatric Acute Arterial Ischaemic Stroke.
- Provided with Neuroprotective Care.

Further details are outlined in:

- Neuroprotective Checklist
- Neuroprotective Care - Detailed information for the acute management of haemorrhagic or ischaemic stroke

In the event of significant deterioration:

- Cease the IV Alteplase infusion
- Provide resuscitative management
- Urgently escalate situation to Paediatric Neurologist, Critical Care Staff +/- RSQ - Deterioration is likely to result in a change in priority status for RSQ.
- Perform neuroimaging
- Notify the Neurosurgical team, Anaesthetist and the Operating Theatre if you are in a centre with these facilities.

Procedures

- Do not catheterise within 90 minutes of completion of the Alteplase (tPA) infusion. Catheterisation should be delayed, if safe, for as long as possible after completion of the infusion. Bladder ultrasound may be helpful in decision making. If IDC is required, use small gauge.
- Avoid NGT insertion until 8hrs post IV Alteplase (tPA) infusion.
- Avoid punctures of arteries or large veins within 24hrs after starting Alteplase (tPA), unless essential.
- Leave IV cannula in situ for repeated blood collection (as per below) where possible.
- Venepuncture will require at least 20mins of compression to halt bleeding.

Standard Investigations Post IV Alteplase Infusion for Paediatric Acute Arterial Ischaemic Stroke

For Centres that have ieMR use Paediatric Stroke Power Plan

Investigation	Due	Document Time Completed	Result Checked by Dr
Coagulation Profile and FBC	At completion of infusion		
	4hrs post infusion		
	10hrs post infusion		
	16hrs post infusion		
	22hrs post infusion		
	28hrs post infusion		
CT Head or MRI with SWI	Standard: 18-24hrs post infusion		
	ASAP after any sign of neurological deterioration		

Note: imaging needs to be completed at or before 24hrs (exclude haemorrhage) so commencement of anti-thrombotic treatment is not delayed.

Cautions about Anticoagulant and Antiplatelet Agents

There should not be any administration of any anticoagulant or antiplatelet agent until 24hrs after the Alteplase (tPA) infusion i.e. VKA/warfarin, LMWH, DOACs (direct oral anticoagulant), unfractionated heparin or anti-platelet agents (including oral aspirin).

Nursing Management

Nursing Care During and After Alteplase Infusion

- The patient must be nursed with a 1:1 ratio for at least the first 2 hours.
- Keep the patient nil by mouth till cleared by the medical team – requires an assessment of safe swallow.
- Standard age appropriate CEWT forms or the equivalent should be used to document observations and escalate care if vital signs fall outside normal age ranges.
    - iEMR or Clinical Information System: see Paediatric Stroke Power Plan
- See above notes in medical management about procedures (IDC, NGT, venous and arterial lines)

Documentation of the Alteplase Infusion

- Hourly rate
- Total volume of infusion delivered
- Volume infused at the completion

High Frequency Nursing Observations

Type of Observation	Frequency
• Vital signs – continuous ECG, HR, NIBP, RR, SaO2 • Neurological observations – GCS/AVPU, Pupil size and reaction, Extraocular movements, Fontanelle tension if present, Motor Response, Facial Symmetry and Signs of raised intracranial pressure or signs of brain herniation (this is an emergency)	• q15min for 2hrs then • q30min for 6hrs then • q1hr for 16hrs then • q2hr for 24hr then • q4hr for 24hr

Signs of raised intracranial pressure and progression to brain herniation
Features of raised intracranial pressure without brain herniation include: • Severe, persistent headache associated with vomiting • Altered conscious state **As raised intracranial pressure progresses to brain herniation, features include:** • Altered conscious state - unresponsive • Cushings triad – bradycardia, hypertension and irregular respirations • Widened pulse pressure • Decerebrate or decorticate posturing • Dilated or fixed, non-reactive pupil/s • Restricted eye movements - sixth nerve palsy

ALERT

Any deterioration in vital signs or neurological observations during or after the infusion are to be communicated to the senior medical team immediately.

If there is a significant neurological deterioration

- Provide resuscitation as appropriate
- Stop the IV Alteplase infusion if it is still running
- Arrange an urgent CT or MRI Brain
- Notify the Neurosurgical team, Anaesthetist and Operating Theatre if you are in a centre with these facilities OR urgently contact Retrieval Services Queensland

Continuously monitor for seizures and communicate to the senior medical team immediately.
In suspected or confirmed ischaemic stroke, the neurologist should be notified of seizures.
Prolonged or recurrent seizures may herald stroke extension or recurrence, malignant middle cerebral artery infarction or haemorrhagic transformation and should therefore prompt urgent neurological/neurosurgical review/discussion.

Additional Nursing Observations

Strict Fluid Balance
- Q6hr for 72hrs then
- Q12hr till advised to cease by medical staff

Review of punctured sites and wounds for bleeding
- q1hr for 24hrs
- If any signs of bleeding/bruising occur, apply direct pressure and seek urgent medical review.

Assessment for urinary and faecal bleeding
- All urine should be ward tested to assess for blood for q72hrs post administration of IV Alteplase, in the event of frank bleeding seek medical review.
- All stool samples should be tested for faecal occult blood for q72hrs post administration of Alteplase, in the event of frank bleeding seek urgent medical review.

Four limb neurovascular observations
- Q1hr for 24hr
- If any compromise to limb circulation is identified or suspected, then seek urgent medical review.
- Use standard age-appropriate neurovascular observation charts or the equivalent (iEMR or Clinical Information System) to document observations.

Mobility Post Administration of IV Alteplase

- The patient should rest in bed for 12-24hrs post completion of the Alteplase (tPA) infusion (a commode for toileting can be considered if appropriate assistance to prevent falls can be provided). After this period, mobilisation should be carefully initiated.

Low Stimulation Environment

- Patients with acute stroke are to be nursed in a low stimulation environment for the first 72 hours. This includes but is not limited to a single room (if clinically appropriate), grouping cares, limiting visitors/noise and maximising rest periods between observations.
- At 72 hours, medical and nursing review should determine if continuation of a low stimulation environment is required.