

# The Newcastle upon Tyne Hospitals NHS Foundation Trust

## Management of Spontaneous Intracerebral Haemorrhage in NICU

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### 1 Introduction

Spontaneous (non-traumatic) intracerebral hemorrhage (SICH) is a significant cause of morbidity and mortality throughout the world. It accounts for 10% of all “strokes” but carries a significantly greater risk of morbidity and mortality with only 20% of patients being independent at six months. is a medical emergency. Rapid diagnosis and attentive management of patients with ICH is crucial because early deterioration is common in the first few hours after ICH onset. Recent population-based studies suggest that most patients present with small ICHs that are readily survivable with good medical care. This suggests that excellent medical care likely has a potent, direct impact on ICH morbidity and mortality now, even before a specific therapy is found.

### 2 Guideline scope

This guideline applies to patients who have suffered haemorrhage into the brain parenchyma not due to trauma being managed in neurocritical care. This is distinct from subarachnoid haemorrhage (SAH) or isolated intraventricular haemorrhage (IVH.)

### 3 Evidence Review and Evaluation

### 4 Guideline

Within the first hour of presentation to a hospital, 15% of patients demonstrate a decrease in the GCS score of >2 points. The risk for early neurological deterioration and the high rate of poor long-term outcomes underscores the need for aggressive early management.

#### 4.1 Initial Assessment & resuscitation

4.1.1 ABCD approach.

4.1.2. Obtain a focused history regarding the timing of symptom onset (or the time the patient was last normal) and information about medical history (alcohol, liver disease), medication (in particular anticoagulants/antiplatelet agents), and drug use. Urgent blood sugar (BM) and bloods including FBC, Coagulation studies, biochemistry profile. Patients with ICH are frequently medically and neurologically unstable, particularly within the first few days after onset.

4.1.3 Care of ICH patients in a dedicated neuroscience intensive care unit is associated with a lower mortality rate.

#### **4.2 Make the diagnosis**

The abrupt onset of focal neurological symptoms is presumed to be vascular in origin until proven otherwise. Identification of patients with suspected intracranial hemorrhage requires urgent brain imaging CT is very sensitive for identifying acute hemorrhage and is considered the gold standard.

#### **4.3 Consider the cause**

Hypertension accounts for the majority of cases (60-70%) which have a characteristic distribution. Anticoagulation, sympathomimetic drugs should also be considered. Secondary causes include congenital amyloid angiopathy (CAA), vascular malformations, haemorrhagic transformation of infarct (arterial/venous) or tumour and vasculitides.

CT angiography, CT venography, contrast-enhanced CT, contrast-enhanced MRI, magnetic resonance angiography, and magnetic resonance venography can be useful to evaluate for underlying structural lesions, including vascular malformations and tumors when there is clinical or radiological suspicion

#### **4.4 Medical management**

Patients who do not require surgical intervention benefit from being managed by a multidisciplinary stroke team. They should be referred to the on call stroke consultant within 24 hours of admission.

#### **4.5 Interventions to prevent further bleeding**

##### **4.5.1 Correct any coagulopathy urgently**

Warfarin should be reversed urgently with beriplex and vitamin K. Patients with a severe coagulation factor deficiency or severe thrombocytopenia should receive appropriate factor replacement therapy.

Platelets should be administered to keep > 100,000. The usefulness of platelet transfusions in ICH patients with a history of antiplatelet use is unclear but may be considered

##### **4.5.2 Blood pressure control**

Blood pressure (BP) is frequently, and often markedly, elevated in patients with acute ICH; these elevations in BP are greater than that seen in patients with ischemic stroke. Although BP generally falls spontaneously within several days after ICH, high BP persists in a substantial proportion of patients. This is an area of ongoing research and until ongoing clinical trials of BP intervention for ICH are completed, physicians must manage BP on the basis of the present incomplete efficacy evidence.

4.5.2.1 In conscious patients presenting with a systolic BP of 150 -220mmHg acute lowering of systolic BP to 140mmHg is probably safe.

4.5.2.2 After the acute period BP should be managed as per NICE Hypertension Guidelines (<http://pathways.nice.org.uk/pathways/hypertension>)

#### **2010 AHA/ASA Recommendations for Treating Elevated BP in ICH**

1. If SBP is >200 mm Hg or MAP is >150 mm Hg, then consider aggressive reduction of BP with continuous intravenous infusion, with frequent BP monitoring every 5 min.
2. If SBP is >180 mm Hg or MAP is >130 mm Hg and there is the possibility of elevated ICP, then consider monitoring ICP and reducing BP using intermittent or continuous intravenous medications while maintaining a cerebral perfusion pressure >60 mm Hg.
3. If SBP is >180 mm Hg or MAP is >130 mm Hg and there is not evidence of elevated ICP, then consider a modest reduction of BP (eg, **MAP of  $\leq$  110 mm Hg or target BP of 160/90 mm Hg**) using intermittent or continuous intravenous medications to control BP and clinically re-examine the patient every 15 min.

#### **4.6 ICP/ CPP management**

Current guidelines for ICP monitoring in ICH follow the approach in severe TBI with ICP monitoring recommended in patients with GCS  $\leq$  8, large hematomas with mass effect suggestive of elevated ICP or hydrocephalus. As a goal, an ICP <20 mmHg should be maintained, with a minimal CPP of 60 mmHg, adjusted based on an individual patient's cerebral autoregulation status.

ICP treatment should be directed at the underlying cause, especially if due to hydrocephalus or mass effect from the haematoma.

#### **4.7 Indications for Surgery**

For most patients with ICH the usefulness of surgery is uncertain, but may be lifesaving.

4.7.1 Ventricular drainage as treatment for hydrocephalus is reasonable in patients with decreased level of consciousness.

4.7.2 Patients with cerebellar hemorrhage who are deteriorating neurologically or who have brainstem compression and/or hydrocephalus from ventricular obstruction should undergo surgical removal of the hemorrhage as soon as possible. Initial treatment of these patients with ventricular drainage alone rather than surgical evacuation is not recommended.

4.7.3 For patients presenting with lobar clots >30 mL and within 1 cm of the surface, evacuation of supratentorial ICH by standard craniotomy might be considered.

#### **4.8 Supportive Care**

##### **4.8.1 Glycaemic Control**

Keep blood glucose 6-10mmol/L. Avoid hypoglycaemia.

#### **4.8.2 DVT prophylaxis**

TEDS & SCDs from hospital admission, initiate low molecular weight heparin within 1–4 days (normally after 72hours) following onset (assuming cessation of bleeding.)

#### **4.8.3 Fever Management**

Fever should be evaluated and managed along standard lines. The incidence of fever after basal ganglionic and lobar ICH is high, especially in patients with IVH. In patients surviving the first 72 hours after hospital admission, the duration of fever is related to outcome and appears to be an independent prognostic factor in these patients.

#### **4.8.4 Seizure Management**

The incidence of clinical seizures within the first 2 weeks after ICH has been reported to range from 2.7% to 17%, with the majority occurring at or near onset. Prophylactic anticonvulsant medication should not be used. Clinical seizures should be treated with antiepileptic drugs. Non convulsive seizures are common and EEG monitoring should be performed in patients with inadequately explained decreased level of consciousness.

#### **4.8.6 Swallow Assessment**

Patients should have a swallow assessment before being given any oral food, fluid or medication.

#### **4.8.6 Nursing care**

Prevention of complications of immobility through positioning, airway maintenance, and mobilization within physiological tolerance.

#### **4.8.7 Rehabilitation**

Patients with stroke are assessed and managed by stroke nursing staff and at least one member of the specialist rehabilitation team within 24 hours of admission to hospital, and by all relevant members of the specialist rehabilitation team within 72 hours, with documented multidisciplinary goals agreed within 5 days

### **4.9 Outcome Prediction**

Many observational and epidemiological studies have identified a wide range of factors that are predictive of outcome after acute ICH. From these studies numerous outcome prediction models have been developed for mortality and functional outcome.

#### **Mortality (ICH Score)**

<http://www.mdcalc.com/intracerebral-hemorrhage-ich-score/>

#### **Functional outcome (FUNC Score)**

<http://www2.massgeneral.org/stopstroke/protocolAdultHemorrhage.aspx>

Although prognostication early after ICH may be desired by physicians, patients, and families, it is currently based on uncertain ground. Given this uncertainty and the potential for self-fulfilling prophecies of poor outcome, great caution should be undertaken in attempting precise prognostication early after ICH, especially if the purpose is to consider withdrawal of support or DNR orders. Aggressive full care early after ICH onset and postponement of new DNR orders until at least the second full day of hospitalization.

## 5 Training, Implementation, Resource Implications

## 6 Monitoring Section

Where appropriate, this should include what will be monitored i.e. the content of the audit, who will gather this information, which group it will be presented to and the frequency at which this will occur e.g.

Compliance with this guideline will be monitored by periodic audit using the audit tool attached as appendix 1 by (staff role). The audit data will be reported monthly to the (identified) group which will review the report, identify any actions required to improve compliance and monitor these actions through to completion.

The audit tool should be included as an appendix to the guideline.

## References

Morgenstern LB, Hemphill JC 3rd, Anderson C, et al. Guidelines for the management of spontaneous intracerebral hemorrhage: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. (2010) 41: 2108–29.

Andrews C.M., Jauch E., Claude Hemphill III J. et al. Emergency Neurological Life Support: Intracerebral Haemorrhage. *Neurocrit Care* (2012) 17:S37–S46

NICE clinical guideline 68 (2008) Stroke: diagnosis and initial management of acute stroke and transient ischaemic attack (TIA).

<http://www.nice.org.uk/nicemedia/pdf/CG68NICEGuideline.pdf>

(Accessed online 29 November 2012)

NICE Quality Standard for Stroke (2011)

<http://www.nice.org.uk/media/7EC/67/StrokeQualityStandard.pdf>

(Accessed online 05 December 2012)

All guidelines must consider any new or revised external reports or guidance and reference must be made to NICE guidance in particular where this is applicable.