**Suspicion of acute stroke in pregnancy: FAST positive in a pregnant patient**

**URGENT ASSESSMENT**

* + **Start** with p.1 acute stroke pathway (symptoms, onset, anticoagulation, BP, BM, NIHSS, swallow and obtain IV access ([Slide 1 (scot.nhs.uk)](http://intranet.lothian.scot.nhs.uk/Directory/emergencydepartment-rie/DepartmentalProtocols/NEW%20EM%20Guidelines/Stroke%20-%20Acute%20Stroke%20Pathway.pdf))
  + **Request neuroimaging** – ***urgent non contrast CT head is safe in pregnancy****.* CT angiogram and CT perfusion can be done in pregnancy if indicated – the foetus is not at any definitive risk from any IV iodine contrast administration
  + **Review brain imaging** and report ± discuss with a radiologist to determine if:

**N**

**Y**

Intracranial haemorrhage present (*if yes, consider secondary causes of ICH*

*and refer to ICH ACT guidance - \sich)*

Imaging feature(s) of ischaemia in keeping with acute arterial stroke

**Y**

**N**

Are there any features of venous sinus thrombosis such as venous infarct?

**Y**

**N**

CTA/CTP fulfil criteria for thrombolysis or thrombectomy (if applicable)

**N**

**Y**

**CONSULTATION** (guided by your assessments above)

# \*Stroke\*

|  |  |  |  |
| --- | --- | --- | --- |
| **Y** |  | **N** |  |

*All patients with a suspected stroke should be discussed with the stroke consultant to guide referral, treatment and placement decisions.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Y** |  | **N** |  |

* + **Interventional neuroradiology**

*If considering CTA/CTP, if thrombectomy considered – thrombectomy may be preferred to thrombolysis in women where obstetric haemorrhage is a concern*

**N**

**Y**

* + **Obstetrics**

*The obstetric team (registrar bleep RIE: 1616; SJH: 3558 /consultant RIE: bleep 1617; SJH: 3898) and obstetric anaesthetic team should be made aware of all patients with a suspected stroke in pregnancy.*

* + **Critical care**

|  |  |  |  |
| --- | --- | --- | --- |
| **Y** |  | **N** |  |

*If patient judged to have or be at risk of raised ICP, GCS falling or neurosurgery is needed or any acute deterioration in which a senior doctor feels critical care review or admission may be beneficial.*

* + **Neurosurgery**

|  |  |  |  |
| --- | --- | --- | --- |
| **Y** |  | **N** |  |

*If at risk of malignant middle cerebral artery syndrome / swelling from a cerebellar infarct*

**ACUTE TREATMENT**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| * **IV thrombolysis:** pregnancy and the post partum period are **not** an absolute | **Y** |  | **N** |  |
| contraindication to thrombolysis but a multidisciplinary discussion is recommended with obstetric on call team. |  |  |  |  |
| * **Thrombectomy:** refer to thrombectomy guideline: [Slide 1 (scot.nhs.uk)](http://intranet.lothian.scot.nhs.uk/Directory/emergencydepartment-rie/DepartmentalProtocols/NEW%20EM%20Guidelines/Stroke%20-%20Acute%20Stroke%20Pathway.pdf) | **Y** |  | **N** |  |
|  | | | | |
| * **Acute blood pressure lowering:** target BP <160/100 if thrombolysis used for | **Y** |  | **N** |  |
| ischaemic stroke. Consider target BP <140/90 if stroke due to pre-eclampsia as per eclampsia guideline. ([Microsoft Word - Eclampsia Severe Pre-eclampsia (scot.nhs.uk)](https://eur01.safelinks.protection.outlook.com/?url=http%3A%2F%2Fintranet.lothian.scot.nhs.uk%2FDirectory%2FReproductiveMedicine%2FPoliciesAndGuidelines%2FDocuments%2FMaternity%2520Pan%2520Lothian%2FAntenatal%2FEclampsia%2520Severe%2520Pre-eclampsia.pdf&data=05%7C01%7CMireia.Moragas%40nhslothian.scot.nhs.uk%7C08890bee525445bc673308dad6caafc5%7C10efe0bda0304bca809cb5e6745e499a%7C0%7C0%7C638058463563763517%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=fk5qXBsfrld%2FIj9nSECu8OB7FJVcfejzTelC%2FnnDfrw%3D&reserved=0))  1st line: Labetalol 200 mg po stat.  Alternatives: Nifedipine 10mg po (not sublingual) or IV hydralazine (if hypertension is severe and labetalol contraindicated) |  |  |  |  |
| * **Analgesia if in pain:** paracetamol; avoid opiates | **Y** |  | **N** |  |
|  |  |  |  |  |
| * **If there is risk of airway compromise:** omeprazole 20mg po 24 hrly | **Y** |  | **N** |  |
| * **Anti-emetic if nauseated or vomiting:** | **Y** |  | **N** |  |

1st line: cyclizine 50mg po/IM prn/tds

2nd line prochlorperazine 12.5mg IM tds or 10mg po tds

**PLACEMENT**

Admission to be discussed between stroke and obstetrics team depending on the most pressing problem.

If >20 weeks pregnant, aortocaval compression should be relieved at all times with 15-30 degrees of left lateral tilt or manual uterine displacement to enable venous return from the legs and avoid hypotension.

**SECONDARY PREVENTION**

**BP lowering:** If long term BP lowering needed consider Nifedipine po or Labetalol po.

ACE inhibitors and Angiotensin-2 receptor blockers are contraindicated.

**Hypercholesterolaemia:**

Cholesterol and triglycerides are elevated in pregnancy and should not be measured.

Statins are contraindicated in pregnancy, and should be stopped if taken previously.

**Antiplatelet therapy:**

Aspirin 75mg od can be started or continued during pregnancy and breastfeeding.

Clopidogrel for special indications can be continued during pregnancy but should be withdrawn 7 days prior delivery to allow regional analgesia and anaesthesia.

**Anticoagulation:**

Low molecular weight heparin is the preferred anticoagulant agent. Unfractionated heparin is also safe during pregnancy.

Warfarin: risk of skeletal defects and intracranial haemorrhage in the 1st trimester.

Direct oral anticoagulants: not recommended due to lack of data.

Planned delivery is necessary.

**SPECIAL CONSIDERATIONS**

1. **Mode of delivery:**

Vaginal delivery can be encouraged provided there are no obstetric contraindications.

Epidural anaesthesia and shortened second stage may reduce fluctuations in maternal blood pressure.

1. **Risk of recurrent stroke in future pregnancies:**

The overall rate of recurrence of stroke associated with a subsequent pregnancy is small.

Women who are taking aspirin following an initial stroke can be reassured that they may continue taking this in any future pregnancy.

1. **Further secondary prevention will depend on the cause.**

Hypertensive disorders will likely need long term antiplatelet treatment

Remember to advise on modifiable risk factors

Future pregnancies are possible but will need antiplatelet treatment

1. **Risk factors for ischaemic stroke in pregnancy:**

-Older age (>35)

-African American race

-Heart disease

-Thrombophilias

-Rheumatological disorders

-Sickle cell disease

-Pregnancy specific factors (endothelial dysfunction, impaired autoregulation, gestational diabetes, severe postpartum haemorrhage, caesarean section)

1. **Ischaemic stroke in Pregnancy and the post partum period – causes to consider**

-Less commonly associated with traditional vascular risk factors (AF, large vessel arteriosclerosis, cerebral small vessel disease)

-Carotid/Vertebral dissection

-Paradoxical embolism and PFO

-Reversible cerebral vasoconstriction syndrome

-Pre-existing heart disease (due to cardiac remodelling)

-Pre-eclampsia and eclampsia

-Pregnancy associated cardiac dysfunction worse in preeclampsia

-Active migraine with aura (risk factor)

-Endothelial dysfunction (Thrombotic thrombocytopenic purpura/haemolytic uraemic syndrome)

**Evidence informing this guideline**

Cauldwell M, Rudd A, Nelson-Piercy C. Management of stroke and pregnancy. *European Stroke Journal*2018;3(3):227-236.

Wiles R, Hankinson B, Benbow E, Sharp A. Making decisions about radiological imaging in pregnancy. *BMJ* 2022 377:e070486

Brown MA, Magee LA, Kenny LC, et al.; International Society for the Study of Hypertension in Pregnancy (ISSHP). Hypertensive disorders of pregnancy: classification, diagnosis and management recommendations for international practice. *Hypertension* 2018; 72: 24-43.

Consensus with colleagues in NHS Lothian including Stroke physicians, Obstetrics (Lead clinician: Dr Mary), Obstetric anaesthesia (Dr Rosamunde Burns) Interventional neuroradiology (Dr Nania), Critical Care (Dr Kefala, Dr Service) and Neurosurgery (Mr P Brennan).

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