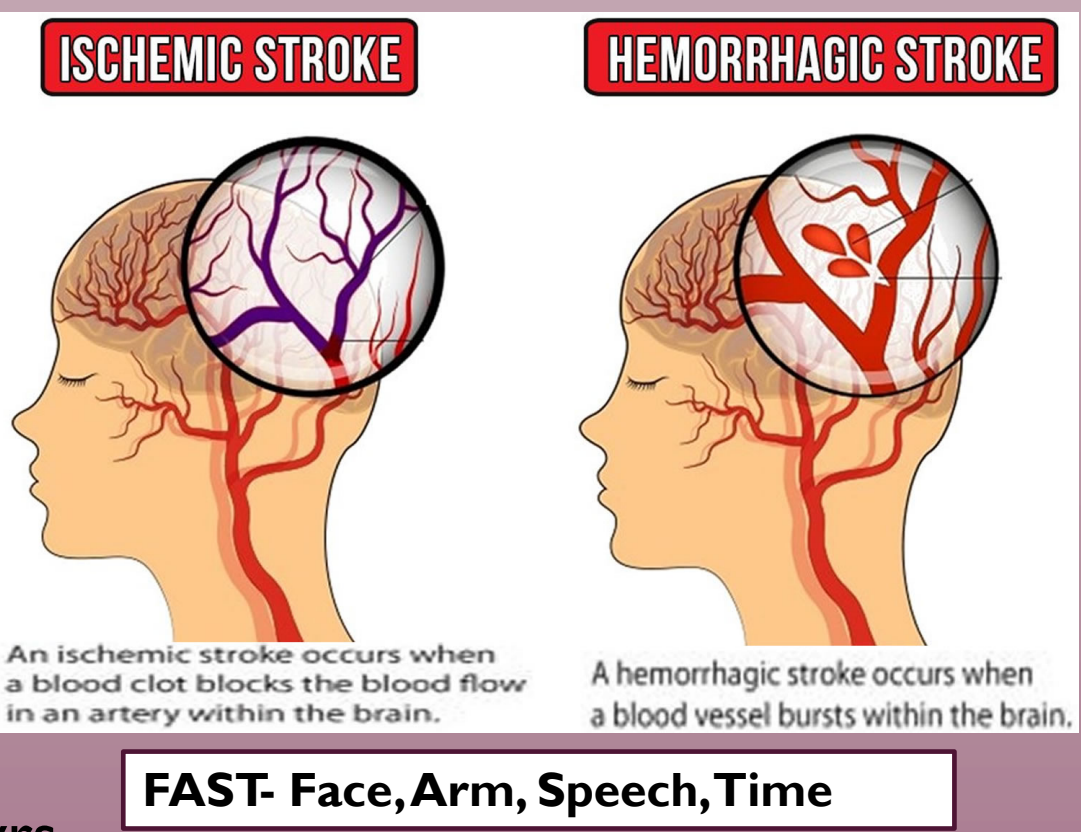


Acute Ischemic Stroke in mid-pregnancy& successful outcome- A Case Report

Vidyalekshmy Ranganayaki, Brinda Sabu, Dhanya R Shenoy, Asima Khan, Roshni Ambat, KIMSHEALTH, Trivandrum, India

INTRODUCTION

- Stroke is defined as a neurological deficit attributed to acute focal injury of the CNS by a vascular cause- cerebral infarction/ CVT/ ICH/ SAH
- No longer a disease of the old age
- 2nd leading cause of death & 3rd leading cause of adult disability
- Pregnancy-related stroke incidence → 30 in 100 000 pregnancies
- 3 times common among pregnant than nonpregnant individuals aged 15–44 yrs
- Most strokes (90%) occur peripartum/ in the 6 weeks following delivery



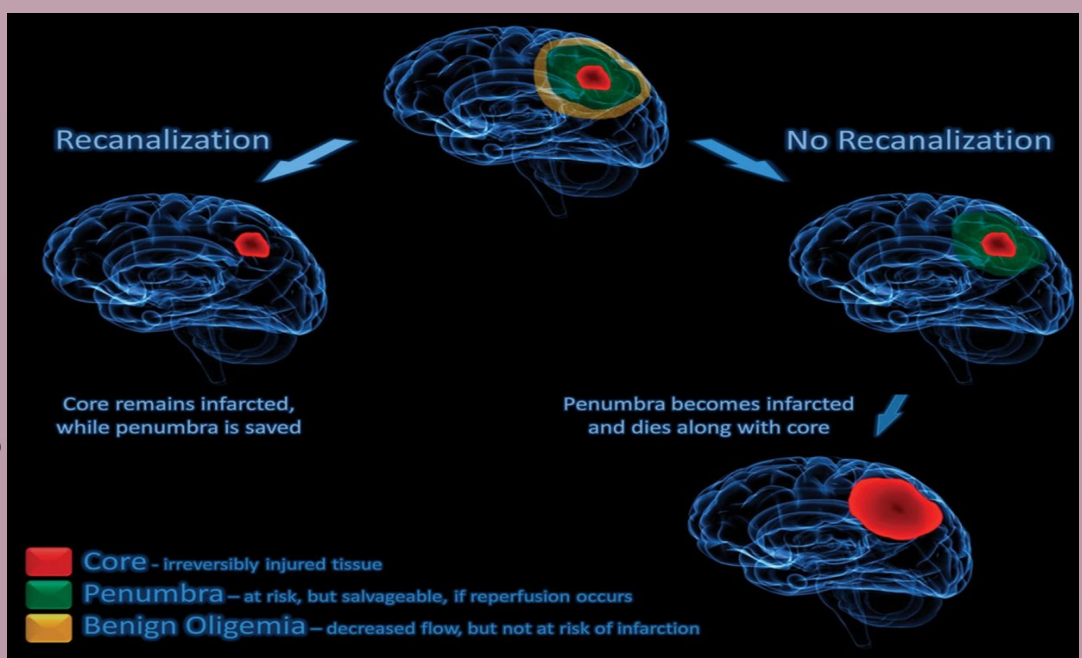
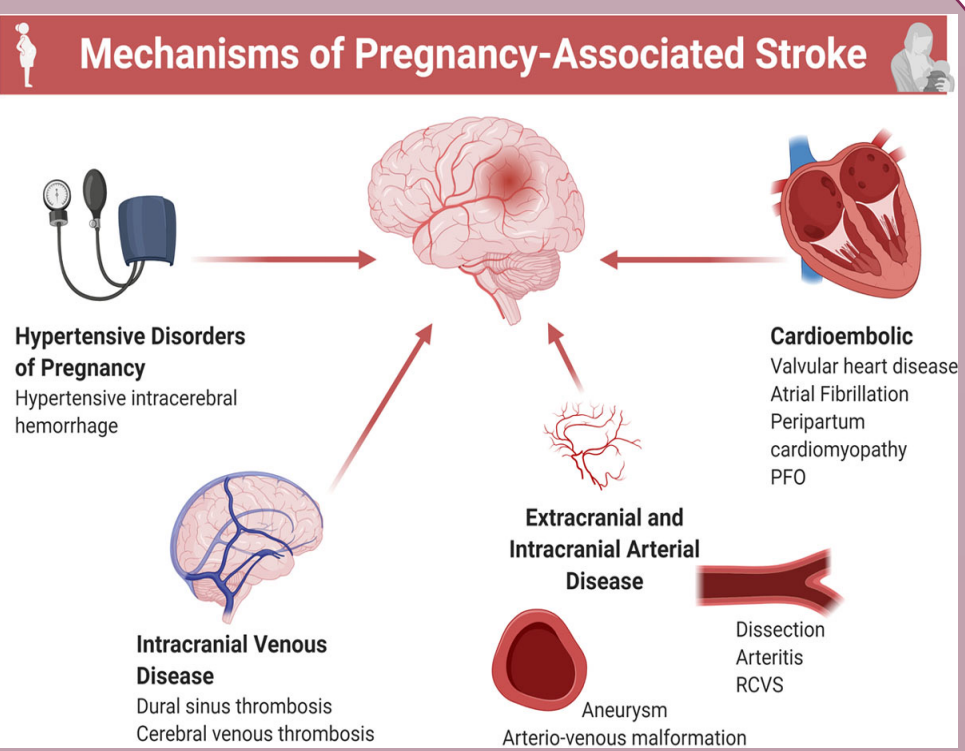
MC cause of stroke in young adults is Ischemic stroke

DISCUSSION

- MC cause of strokes in general population→ Ischemic (85%)
- In pregnancy→ Ischemia, Hemorrhage & Venous thrombosis have similar contribution

Initial Emergency Management

- Similar to non-pregnant patient
- Immediate access to a stroke center & timely Mx → key to good outcome
- Achieve & maintain SBP < 160mm Hg (33% of women who suffered from stroke had concomitant pre-eclampsia/ eclampsia)
- Fears of fetal risk associated with neuroimaging & ionizing radiation should be balanced with the potential hazardous consequences due to delay in Mx of stroke



Investigations

- **MRI(if available) is the preferred first-line imaging in pregnancy**
- **As CT access is easier, CT remains the investigation of choice for initial rapid diagnosis of stroke**

- **CT/ MR angiogram** → in suspected large vessel occlusion- to decide regarding mechanical thrombectomy

“Time is brain”

- **IV thrombolysis(rtPA) within 4.5 hrs of stroke onset (irrespective of age/ severity)**
- Significantly improves the stroke outcome

rtPA in pregnancy- Evidence?

- **IV rt-PA may be considered in pregnancy in moderate/ severe stroke when benefits outweigh the risk of uterine bleeding.**
- rt-PA does not cross the placenta, but there is a theoretical risk of placental bleeding & IUFD
- Safety & efficacy in early postpartum period (<14d) not established.
- H/o major Sx(CS/ difficult vaginal delivery) within 14d is a relative C/I for thrombolysis

AHA guidelines

Searching for the cause

Complete blood count, Urine routine, aPTT, INR

Liver/ renal function test, HBA1C

Lipid panel, Lipoprotein (a)

Cerebral arterial imaging- CT/ MRI/ Digital Subtraction angiography of head & neck

Brain perfusion imaging eg. CT/ MR perfusion

Transthoracic/ transesophageal echo

Holter monitoring

Hypercoagulability tests- Protein C/S,AT-3, PT gene/ Factor V Leiden mutation

Haematological panel test- S. electrophoresis, homocysteine, DCT

Rheumatological panel tests-

APLA- ACL,Antib2GP, LA
ANA,Antids DNA, RF,Anticentromere Ab,Anti Ro/La Ab, cANCA, pANCA, C3, C4

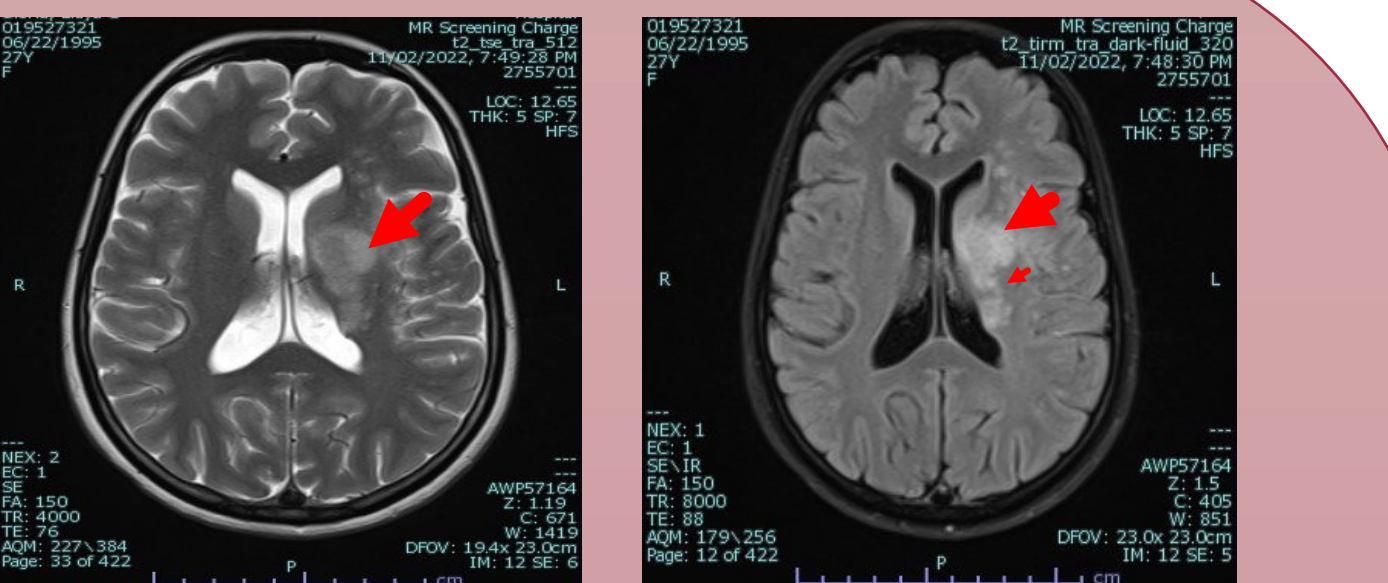
Selected tests- Serum & urine toxicology screen
B/L lower limb USS with Doppler
CSF examination
Ophthalmic-fluorescein retinal angiogram
Biopsy- skin/ temporal A

Post-thrombolysis care

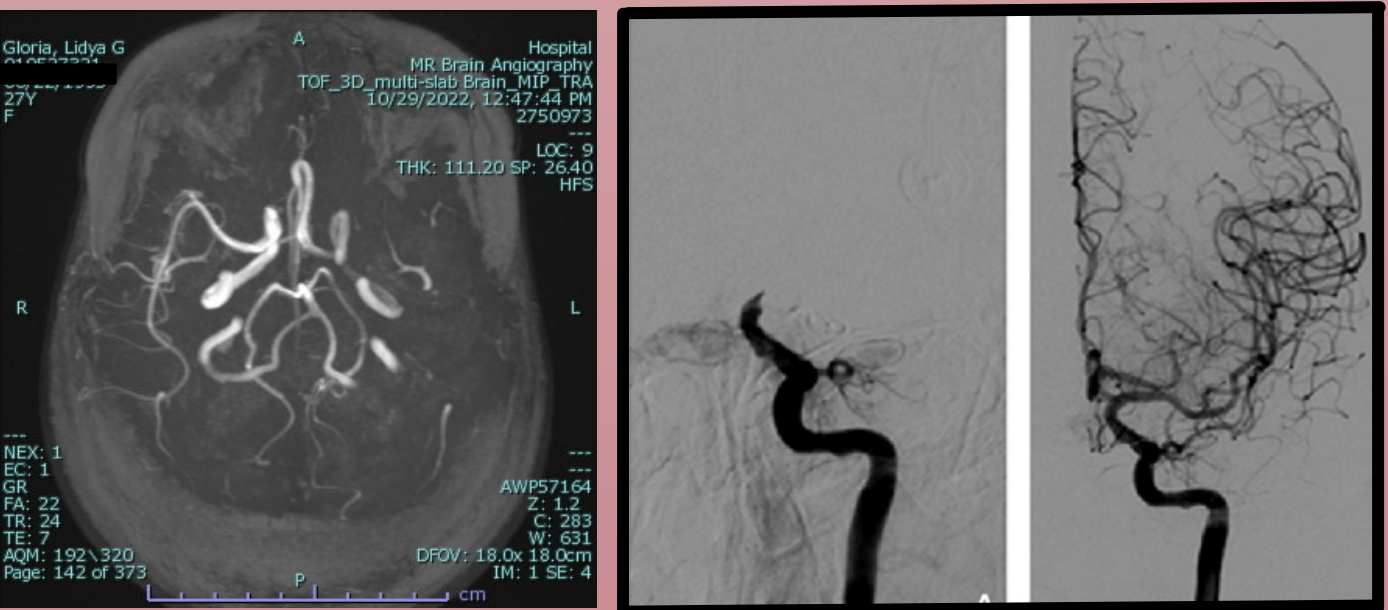
- Antenatal patients should be observed for vaginal/ intra-abdominal bleeding, pain& further neurological signs.
- Ultrasound to observe for retroplacental haematoma and to assess fetal wellbeing

CASE REPORT

- ❖ 27-year-old primi reported to the emergency with giddiness followed by brief unresponsiveness and slurring of speech, right sided weakness with multiple episodes of vomiting
- ❖ Her vitals were stable. Neurological examination showed left sided facial deviation and aphasia with a power of 3/5 in right upper and lower limb.
- ❖ MRI brain → Hyperacute left MCA infarct with large penumbra
- ❖ IV thrombolysis was done with alteplase
- ❖ But her weakness progressed. Re-screening MRI didn't show any bleed or increase in infarct size.
- ❖ Mechanical thrombectomy was done.
- ❖ Evaluation for young stroke done showed-
 - ❖ Anemia
 - ❖ Thrombophilia workup - Negative
 - ❖ ECG - Normal sinus rhythm, T inversion in II, III, AVF, V5& V
 - ❖ Cardiac markers- Negative
 - ❖ Echo → MVP, mild MR and trivial TR
 - ❖ Bubble contrast echo→ Normal
 - ❖ Holter → Monomorphic ventricular tachycardia
- ❖ Started on Flecainide& dual antiplatelets-Aspirin & Clopidogrel
- ❖ Her power & speech improved with physiotherapy
- ❖ Serial growth scans showed tailing of fetal growth & at 35 weeks showed Umbilical Artery Absent End diastolic flow.
- ❖ She was closely followed up. Aspirin & Clopidigrel were stopped and unfractionated heparin was started
- ❖ Elective LSCS was done at 36 weeks and delivered baby of weight 1.5 kg
- ❖ Postnatally Aspirin 150 mg was restarted. She is currently on Cardiology and Neurology followup



MRI brain T2 weighted image
MRI FLAIR sequence
Showing hyperintensity in the left gangliocapsular region & corona radiata suggestive of hyperacute Left MCA infarct



MR Angiogram showing absence of flow in the main stem of Left MCA
Carotid Angiogram pre & post thrombectomy

Investigations	
Hb-9.3 TC- 10500 Pit-N LFT-N RFT-N S.ferritin- low TIBC- increased Transferrin-N S iron- low PT/ APTT/ INR- N Urine analysis-N	Thrombophilia workup- APLA workup- Neg Protein C- 93.9 (N) Protein S- 88.4 (N) S. Homocysteine- 3.6 (N) Fac V Leiden mutation- Neg PT gene mutation- Neg MTHFR gene mutation- Neg
Lipid panel- N Lipoprotein a -N ANA profile – Neg cANCA, pANCA - Neg C3/ C4 - N	Echo- MVP, Mild MR Bubble Contrast Echo- N (To r/o patent F. ovale) DVT Doppler LL- N
Holter monitoring → s/o monomorphic ventricular tachycardia	

Role of Mechanical thrombectomy

All eligible patients with a large vessel occlusion on CT angiogram to be considered for clot retrieval
&urgently referred to a neurointerventional centre
Fetal radiation exposure is minimized by limiting the number of angiographic exposures, using low dose-pulsed fluoroscopy & radiation shields
Appropriate in only 10% cases

Secondary prevention strategies

Recurrent strokes account for 25–30% of all strokes.

- Gradual, sustained lowering of blood pressure - key element of secondary prevention.
- Dual antiplatelet therapy (Aspirin + Clopidogrel) within 24 hours & continued 21 days
- If atrial fibrillation → initiate oral anticoagulation within 4-14 days of onset of symptoms
- In all pts with clinical atherosclerotic disease→ high intensity statin therapy
- Smoking cessation
- In high risk Patent Foramen Ovale e.g. with Atrial Septal Aneurysm/ Substantial Shunt size→ consider PFO closure

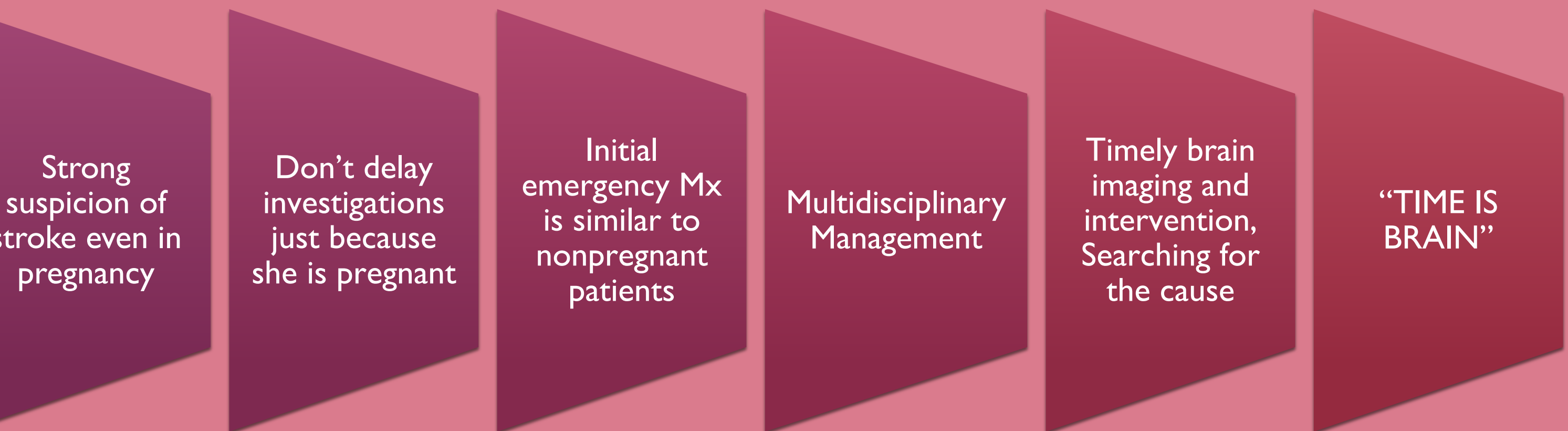
Mode of delivery

- Decision to the mode of delivery requires multidisciplinary input & should be individualised.
- Vaginal delivery maybe considered if there is no aneurysm/ neurosurgical intervention within 1 week of delivery.
- Early epidural to reduce fluctuation in maternal BP
- Shortened 2nd stage with elective operative vaginal delivery to prevent prolonged Valsalva and ↑ intracranial pressure seems prudent

Postpartum Management & Contraception

- Postpartum period is the highest risk period for VTE & stroke.
- Anticoagulation should be continued for at least 6 wks postpartum
- Complete thrombophilia screen at 6 wks postnatally to ensure optimal anticoagulation in future pregnancies.
- Combined hormonal contraception is C/I

To Summarise



References

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- Stroke and cerebrovascular disease in pregnancy: Incidence, temporal trends, and risk factors. Liu S, Chan W-S, Ray JG, Kramer MS, Canadian Perinatal Surveillance System 2019;50(1):13–20.