KANSAS INITIATIVE FOR STROKE SURVIVAL

A PROJECT BY AND FOR KANSANS

Phone (913) 588-1554 • Fax (913) 945-8892

Blood Pressure Management in Acute Stroke

“First Tuesdays” Lecture Series

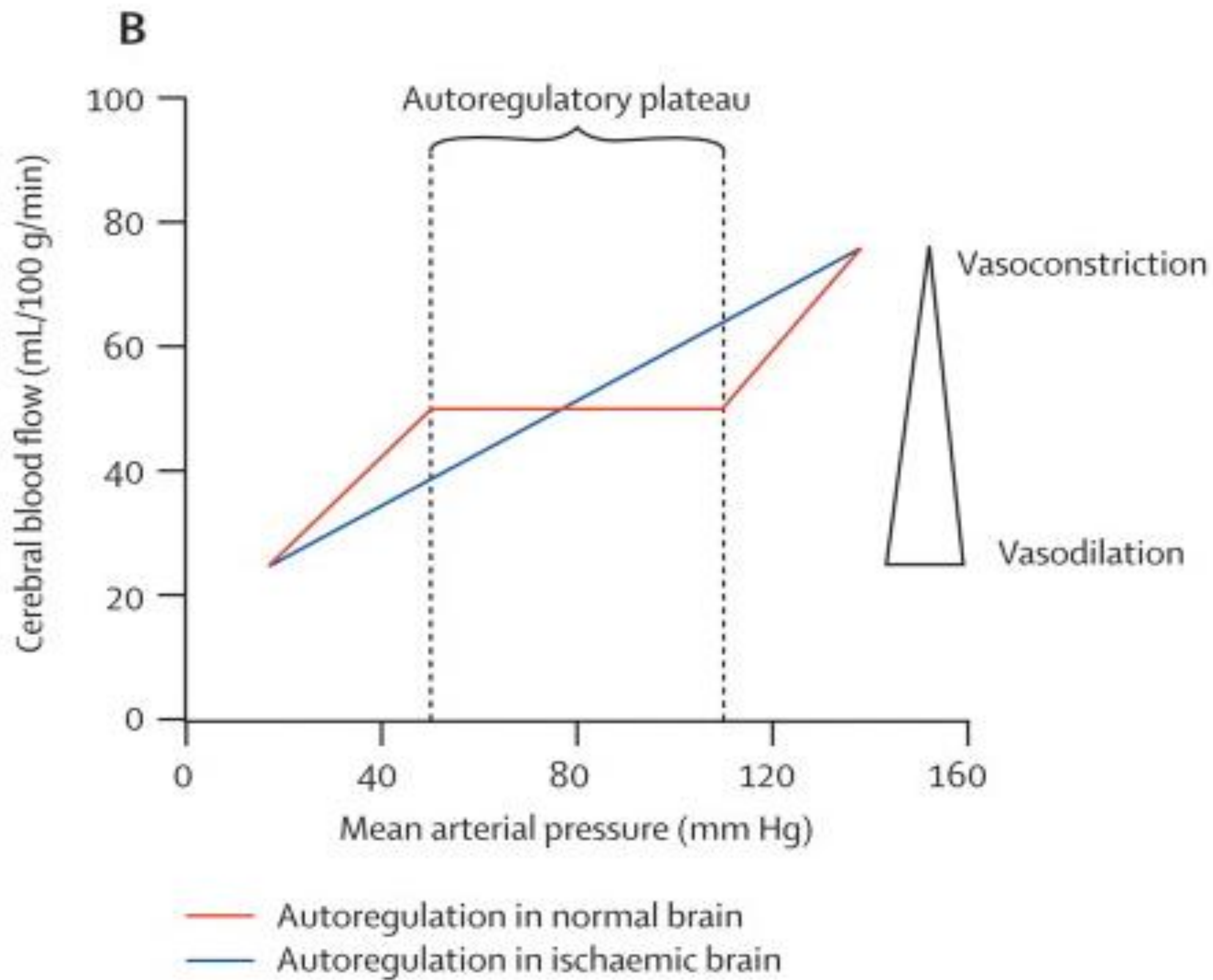
Introduction and Goal of "First Tuesdays"

- Sabreena Slavin MD – Vascular Neurologist and Neurohospitalist at KU School of Medicine
- Didactic lecture series as part of the Kansas Initiative for Stroke Survival
- Updates in Practice and FAQ's on Acute Stroke Care
- 20 minute didactic, 10 minutes for questions/discussion

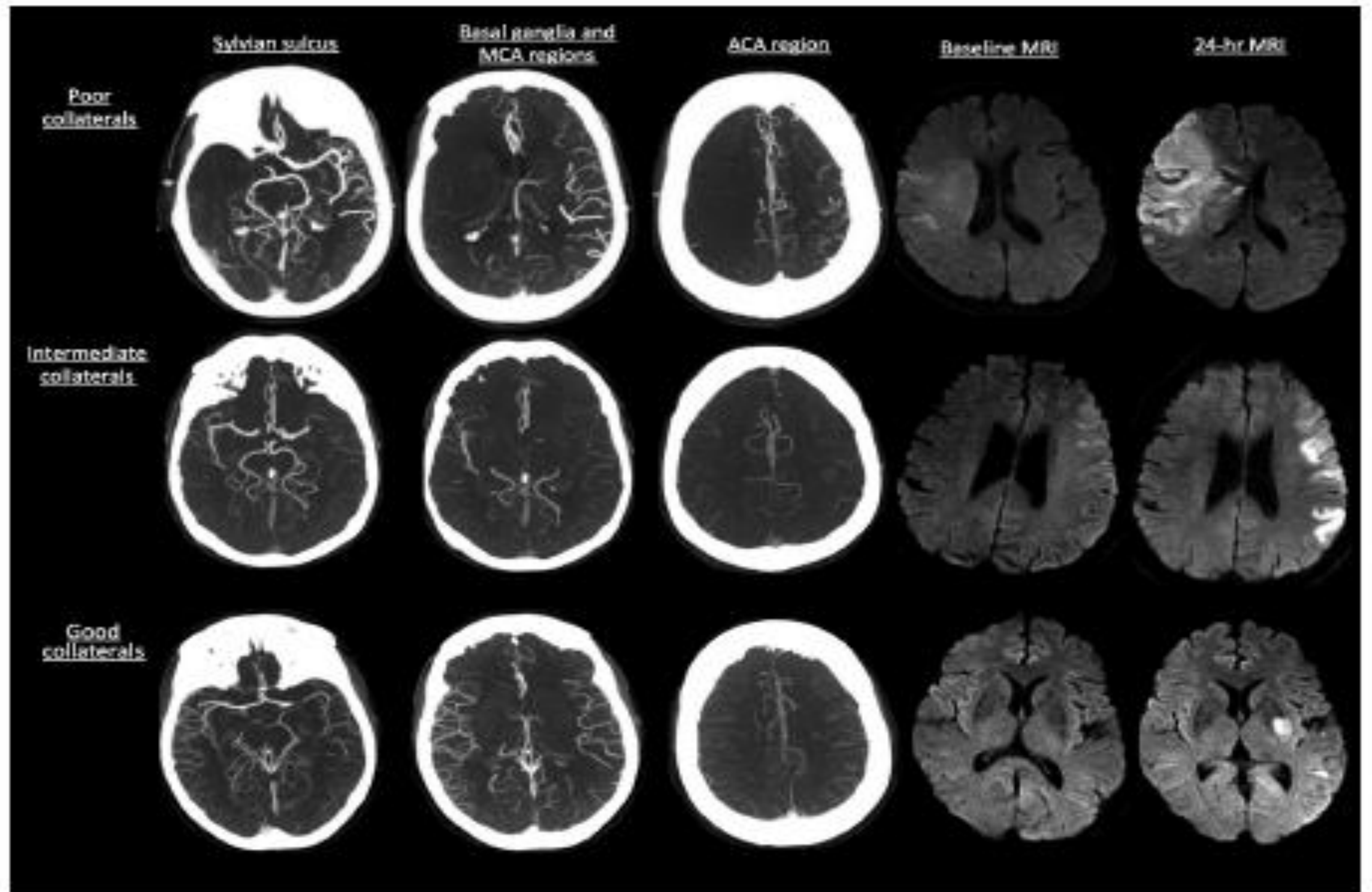
BP after stroke

- Elevated systemic BP occurs in 3/4 of patients after acute stroke.
  - impairment of cerebral autoregulation
  - edema ---> intracranial hypertension
  - neuro-endocrine response from stress

Georgianou et al, *J Human Hypertension* 2018



Tikhonoff et al, *Lancet* 2009



Nambiar et al, *Brain* 2013

Evidence for BP in ischemic stroke

- Majority of RCT’s in acute ischemic stroke shows either **harm or no benefit** associated with BP lowering in the first 24 hours.
  - Data from IMWEST in 2000: acute ischemic stroke patients received Nimodipine vs placebo for 5 days, starting within 24 hours post stroke. Lower diastolic BP by ≥ 20% was associated with higher risk of death/dependency at 21 days:
    - (OR 10.16, 95% CI 1.02-100.74)

Ahmed et al, *Stroke* 2000

AHA/ASA Guidelines

In early post-stroke period, do not treat unless

- BP greater than 220/120
- BP greater than 200/110 **+** evidence of acute end-organ damage (AKI, aortic dissection, MI, hypertensive encephalopathy, acute pulmonary edema)
- BP greater than 185/110 and eligible for tPA

No RCT's studies have addressed treatment of low BP. General guidelines are to avoid hypoperfusion.

Powers et al, *Stroke* 2018

BP management after treatment

After tPA:

- Do not treat unless BP greater than 180/105

After successful mechanical thrombectomy:

- Do not treat unless BP greater than 160/90
  - Study shows that achieving lower than this BP within the first 24 hours after successful MT had a lower likelihood of 3 month mortality (OR 0.08, 95% CI 0.01-0.54)

Powers et al, *Stroke* 2018; Goyal et al, *Neurology* 2017

What about in ICH?

- INTERACT2 (allowed various agents based on practitioner/institution choice)
  - 2829 patients with mild-moderate ICH showed early intensive lowering of SBP less than 140 (vs less than 180) showed trend of reduced risk of death/major disability at 3 months (OR 0.87, CI 95% 0.75-1.01)
  - Secondary analysis showed improved mRS and better physical/mental health related QOL on EQ-5D scale.
- ATACH-II (used Nicardipine only)
  - 1000 patients did not show any benefits of intensive BP lowering.

Anderson et al, *NEJM* 2013; Qureshi et al, *NEJM* 2016

AHA/ASA Guidelines

- In ICH, if SBP between 150-220, lowering SBP to 140 is safe (Class I, LOE A) and can improve functional outcome (Class II, LOE B)
- In ICH, if SBP > 220, can consider aggressive reduction of BP with IV infusion (Class IIb, LOE C)

Hemphill et al, *Stroke* 2015

BP management if you don't know

Meta-analysis of all stroke (ischemic or hemorrhagic) types also show either **harm or no benefit:**

- Meta-analysis of 17 RCT's showed controlling BP in acute stroke was associated with 34% higher risk of death within 30 days of stroke (RR 1.34, 95% CI 1.02-1.74).
- Cochrane meta-analysis of 26 RCT's showed acute BP lowering caused no difference in lowering death/dependency.
  - Consistent lack of benefit despite stroke subtype **(ischemic vs hemorrhagic)**

Wang et al, *PLoS ONE* 2014; Bath & Krishnan*, Cochrane Database Syst Rev* 2014

Hyperacute (EMS) treatment?

- There was a subgroup analysis in the Cochrane meta-analysis:
  – BP therapy in those who presented within 6 hours of stroke (both ischemic and hemorrhagic) onset, there ***was*** a significant lowering in risk of death/disability (OR 0.86, 95% CI 0.76-0.99).

Bath & Krishnan, *Cochrane Database Syst Rev* 2014.

In the pipeline…RIGHT-2 Study

- Rapid intervention with glyceryl trinitrate in hypertensive stroke trial-2 conducting in the UK
- Subjects with acute stroke within 4 hours and SBP ≥ 120
- Randomized to GTN patches vs placebo patches for 4 days
- Primary outcome is death/poor mRS at 90 days

http://www.isrctn.com/ISRCTN26986053

Questions?

- Call for help anytime!
- KU BAT phone: 913-588-3727
- http://www.kissnetwork.us/
- sslavin2@kumc.edu

AHA/ASA Guidelines

In early post-stroke period, do not treat unless

- BP greater than 220/120
- BP greater than 200/110 **+** evidence of acute end-organ damage (AKI, aortic dissection, MI, hypertensive encephalopathy, acute pulmonary edema)
- BP greater than 185/110 and eligible for tPA

No RCT's studies have addressed treatment of low BP. General guidelines are to avoid hypoperfusion.

Powers et al, *Stroke* 2018