

A Retrospective Study on Decreased Blood Pressure in Post-CVA Patients with Hypertension Co-morbidity

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Background:

1. Cerebrovascular accidents (CVA) are the 4th leading cause of death annually affecting approximately 800,000 people in the United States [1].
2. Hypertension (HTN) is considered to be one of the most important risk factors for stroke [2].
3. Post-stroke, a patient's blood pressure (BP) may become difficult to manage. For example, some patients experience continuing HTN, some experience orthostatic *hypotension*, while others require a decrease in their anti-HTN medications [3].

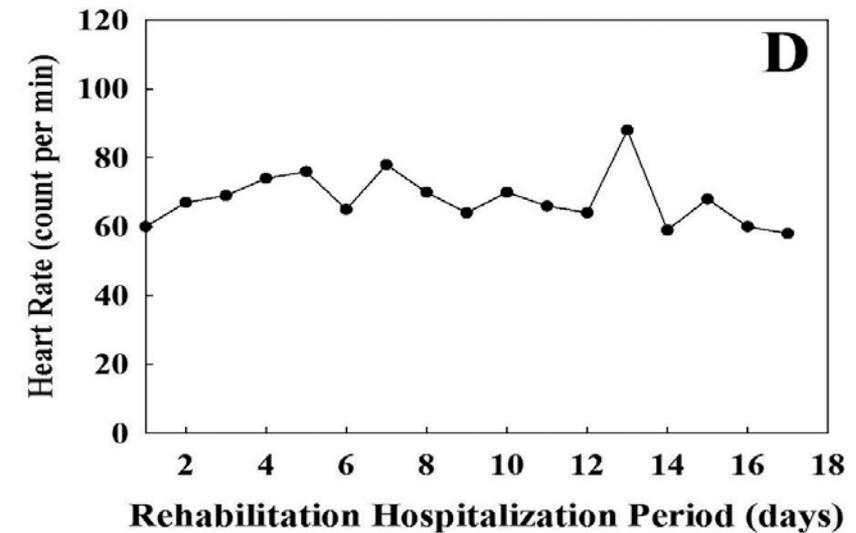
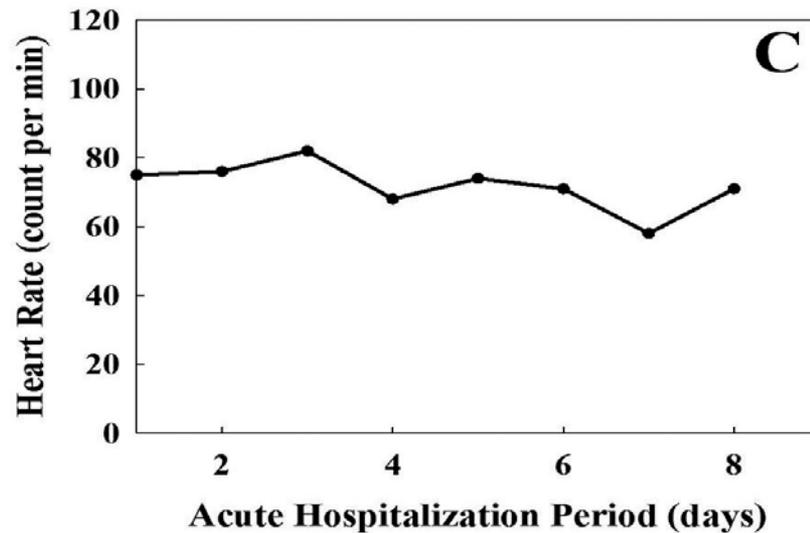
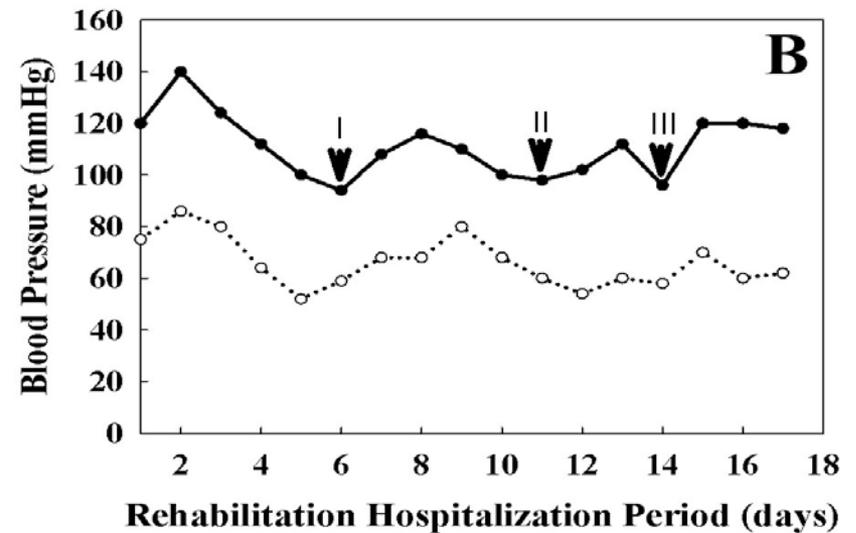
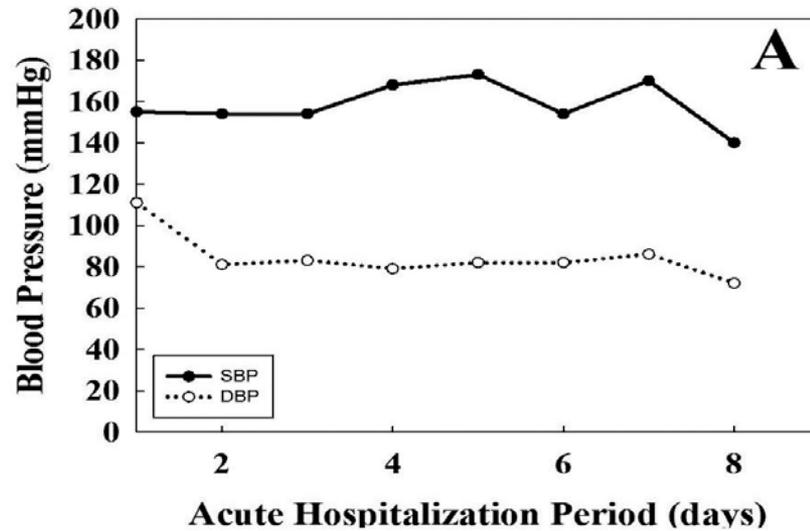
At the present time, there are no studies exploring conditions that contribute to alterations in HTN post-stroke, as well as the need to limit or reduce anti-HTN medications.

Preliminary data - Cases presentation:

Case 1: A 72 yo F with PMH of HTN, chronic LBP and depression who was transferred to CVA Unit d/t Rt PCA territory ischemic CVA. MRI: multiple acute infarction B/L @ PCA territory.

Home:	Metoprolol 100 mg BID Lisinopril 20 mg QD	BP not well controlled/documentated
At UK	75 mg Metoprolol BID, 20 mg Lisinopril daily, PRN: 10 mg Hydralazine 10 mg Labetalol.	BP: 140/78
Adm to rehab	75 mg Metoprolol BID 20 mg Lisinopril daily	BP : 120/80
Day 6	50 mg Metoprolol BID 10 mg Lisinopril daily	d/t SBP < 100
Day 11	25 mg Metoprolol BID 5 mg Lisinopril daily	d/t SBP < 100
Day 14	12.5 mg Metoprolol daily stopped Lisinopril	d/t SBP < 100
D/C home	12.5 mg Metoprolol	with acceptable BP

Preliminary data, cont'



Preliminary data, cont'

Case 2: A 64 yo F with PMH of HTN, T2 DM and obesity. She was admitted to our CVA Unit d/t Rt basal ganglia hemorrhagic stroke with Lt hemiparesis.

Home meds: HCTZ 50 mg bid, Coreg 3.125 mg bid, BP well controlled
amlodipine 10 mg bid

UK Hosp.: HCTZ 50 mg bid, coreg 3.125 mg bid, BP well controlled
amlodipine 10 mg bid, Plus PRN Med

Adm Rehab: HCTZ 50 mg bid, Coreg 3.125 mg bid, BP well controlled
amlodipine 10 mg bid,

Day 7: HCTZ 25 mg bid, Coreg 3.125 mg bid, d/t SBP < 100
amlodipine 10 mg bid

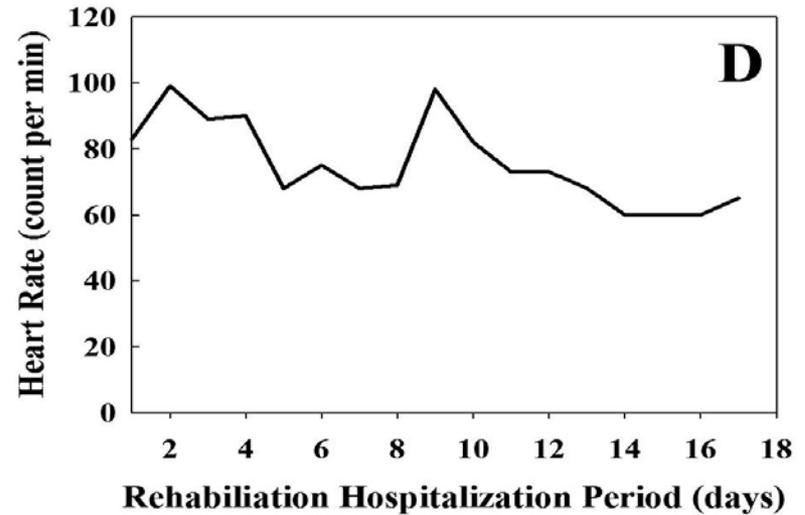
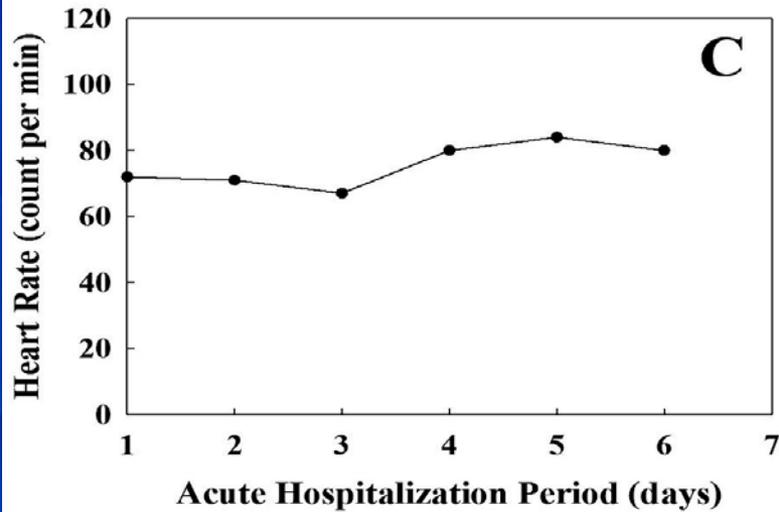
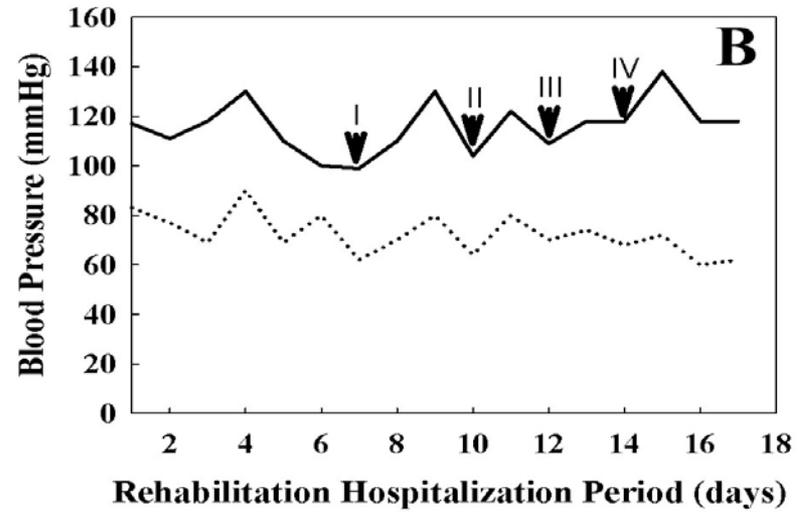
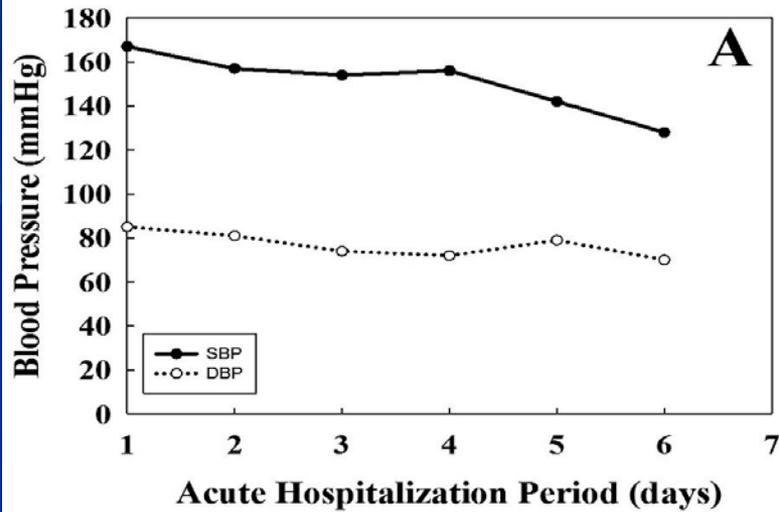
Day 10: HCTZ 25 mg bid, Coreg 3.125 mg bid, d/t SBP < 100
amlodipine 5 mg bid

Day 12: HCTZ 0 mg bid, Coreg 3.125 mg bid, d/t SBP < 100
amlodipine 5 mg QD

Day 14: Coreg 3.125 mg qd, d/t SBP < 100
amlodipine 0 mg QD

D/C home: Coreg 3.125 mg daily BP well controlled

Preliminary data, cont'



Preliminary data, cont' - Summary

Table . Doses of anti- HTN medications at home, acute care hospital, rehabilitation center and at discharge from rehabilitation center .

Case	home	at acute hospital	at admission rehab hospital	at discharge rehab hospital .
Patient #1.				
Metoprolol	100 mg bid	75 mg bid	75 mg bid	12.5 mg daily
Lisinopril	20 mg daily	20 mg daily	20 mg daily	d/c'd
Hydralazine	-	10 mg PRN 4 hrs	d/c'd	n/a
Labetalol	-	10 mg PRN 4 hrs	d/c'd	n/a
Patient #2				
HCTZ	50 mg daily	50 mg daily	50 mg daily	d/c'd
Coreg	3.125 mg bid	3.125 mg bid	3.125 mg bid	3.125 mg daily
Amlodipine	10 mg bid	10 mg, bid	10 mg bid	d/c'd
Hydralazine	-	10 mg PRN hrs	d/c'd	n/a
Labetalol	-	10 mg PRN hrs	d/c'd	n/a

What can we speculate from the preliminary data?

**In CVA patients with h/o HTN,
Some individuals need to wean down/off anti-HTN meds,
But not all patients, WHY?????.....**

**Is this (1) a normal variation, (2) universal phenomenon, or
(3) related to a specific stroke location/vascular territory?**

Aim:

**To explore the correlation between hypotension and
stroke lesion location in CVA patients with HTN**

Hypothesis:

Preliminary data indicate that some strokes may be associated with hypotension and the need to wean down/off anti-HTN medication. Otherwise, the patient may be over-medicated resulting in hypotension.

We hypothesize:

Stroke location is a primary determinant of subsequent normotensive and/or hypotensive conditions in stroke patients with HTN.

The hypothesis will be tested using the following study design:

~300-400 patients discharged from CHRH between 2007-2012, age (50-75 yo), gender, race matched and divided into 2 groups:

(1) HTN pts from GRU as a control (100 pts)

(2) CVA pts with HTN (200~300 pts)

Sub-group

(A): no significant changes of anti-HTN pre-post CVA

(B): significant decreased of anti-HTN pre-post CVA

Comparison of stroke lesion between group 2A and 2B:

- CT/MRI at acute care hospital**
- BP trending**

Inclusion criteria

1. **Stroke with h/o HTN**
2. **Receiving two or more anti-HTN meds**

Exclusion criteria

1. **Stroke with no h/o HTN**
2. **Less than 2 anti-HTN meds**
3. **Secondary HTN d/t renal artery stenosis/dz**

Experimental Design Strategy

HTN pt in GRU/CVA

Review their anti-HTN at acute care, adm & d/c meds at rehab



Sorting out pt by tapering down/off anti-HTN meds



No changes/increase

significant decreasing dose/meds

Review their BP trend
at rehab hospital stay

Review their BP trend
at rehab hospital stay

Review CT/MRI
at acute care hospital

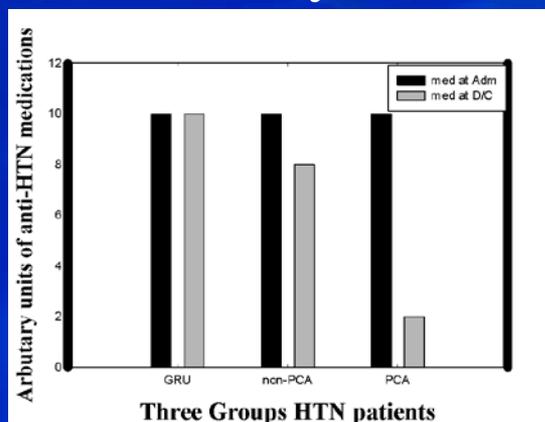
Review CT/MRI
at acute care hospital

Compare the pathological CVA lesion and determine any
co-relationship with tapering down/off anti-HTN meds

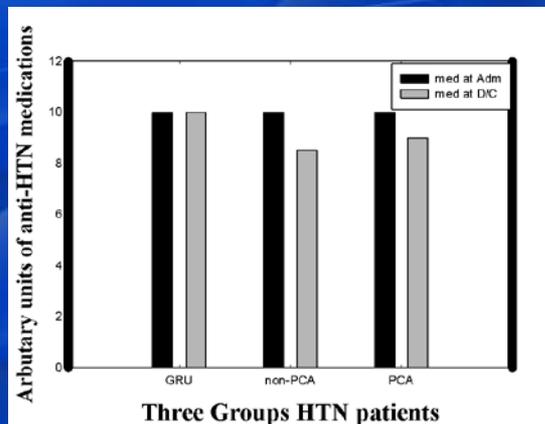
Possible mechanism(s) to explain observed changes

- 1. Specific stroke lesion may reset BP in the brain, pts do not need anti-HTN**
- 2. Overmedicated due to # 1**
- 3. Stress from CVA resolved, auto-regulation of brain perfusion is back to normal which is secondary to resolved cerebral edema**
- 4. Autonomic dysfunction? Peripheral vessel dilation, reduced total resistance**
- 5. Everything is possible prior to investigation 😊!**

If our hypothesis is correct, this suggests that in certain stroke patients anti-HTN should be decreased at appropriate times in the rehab unit, otherwise patients may become hypotensive, with decreased brain perfusion pressure and/or possible hinder recovery.



If our hypothesis is not correct, this suggests that stroke location does not predict hypotension. However, physiatrists still need to be cautious about weaning down/off anti HTN medications.



Clinical meaning/significance:

The outcome of this study will potentially direct physiatrists at a rehabilitation hospital/environment to taper down/off anti-HTN medications as patients become normotensive.

Otherwise, patients may become hypotensive, which may reduce cerebral perfusion pressure resulting in delayed recovery, possible exacerbation of stroke-related conditions, or even death.

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