

Clinical Features of Pediatric Patients with Hypertensive Urgency/Emergency in Critically Ill Patients

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Background

- ❖ In the pediatric population, hypertensive urgency/emergency is not well characterized nor staged.
- ❖ There is a paucity of data describing the epidemiology of hypertensive urgency/emergency especially with the increased prevalence of complex medical conditions.
- ❖ Systolic and diastolic blood pressure index (sBPI, dBPI) allows for comparison of blood pressure (BP) across a heterogeneous cohort as in the pediatric age group.

Objective

- ❖ Describe the clinical features and end organ dysfunction associated with hypertensive urgency/emergency in pediatric patients in a large quaternary center.

Methods

- ❖ Hypertensive urgency/emergency was defined as elevated BP requiring continuous intravenous (IV) antihypertensive medication (antiHTN).
- ❖ Systolic and diastolic BP index was defined as the ratio of absolute BP to stage 2 HTN for age, sex, and height (<13 yrs or 140/90 mmHg (≥13 yrs).
- ❖ Left ventricular hypertrophy (LVH) was defined as LVMI^{2.7} > 51gm^{2.7} for patients > 8 yrs.
- ❖ AKI was defined and staged by KDIGO criteria for creatinine at antiHTN initiation.

1219 ICU patients receiving continuous antiHTN from January 2017 – June 2018

Excluded: Patients receiving antiHTN in the cardiac ICU, Neonatal ICU, Operating Room

205 patients

Excluded: Patients on vasopressors <6 hrs prior, ECMO, neurosurgery, cardiac surgery, Age <2 or >21 years

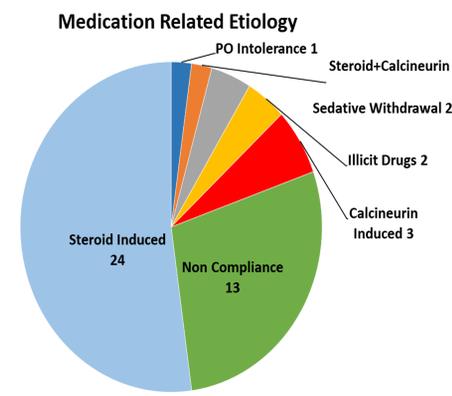
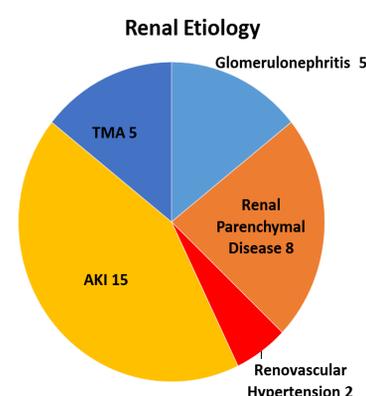
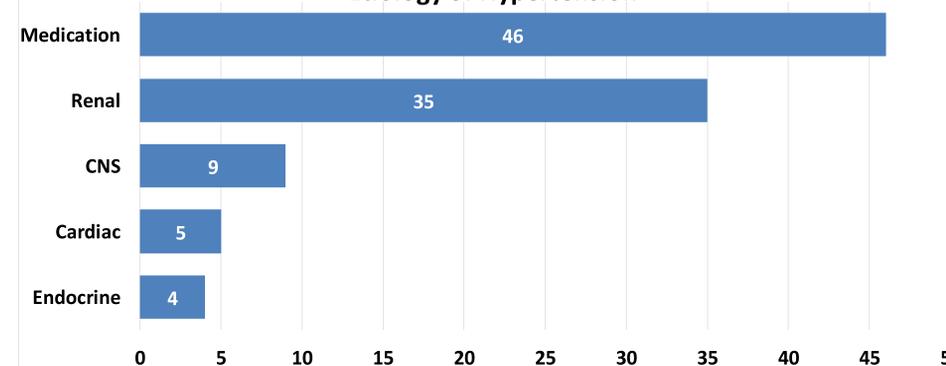
78 patients

Results

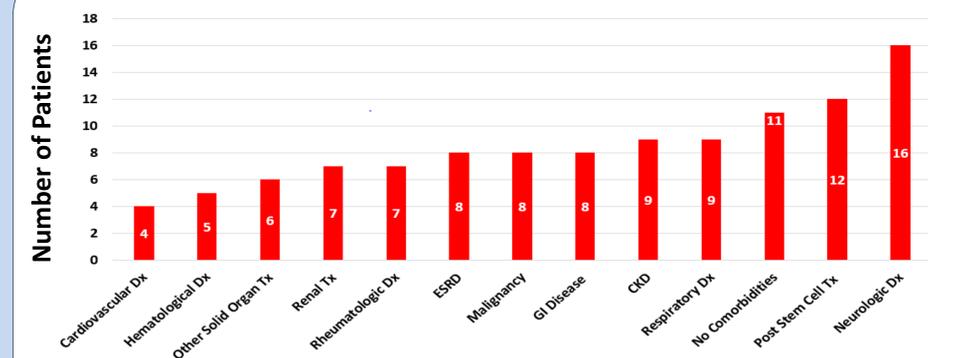
Clinical Characteristics of Cohort

Characteristics		Characteristics	
Age (years), mean ± SD	11.7 ± 5.3	AKI present n(%)	35/70 (50.0%)
Ethnicity, n (%)		Symptoms, n(%)	
Caucasian-Hispanic	29 (37.2%)	CNS	48 (61.5%)
Caucasian Non Hispanic	24 (30.8%)	GI	13 (16.7%)
Black	20 (25.6%)	Cardiac	7 (8.9%)
Asian	4 (5.1%)	Asymptomatic	6 (7.6%)
Unknown	1 (1.3%)	Unable to determine	18 (23.0%)
BMI Centile, median (IQR)	87.5 (40.6-98.4)	Abnormal neuroimaging, n (%)	33/49 (42.3%)
Male Sex, n (%)	44 (56.4%)	PRES, n (%)	14/49 (28.6%)
Prior HTN, n (%)	22 (29.1%)	LVH n (%)	20/41 (48.8%)
eGFR (Schwartz) at antiHTN start (ml/min/1.73m ²), median (IQR)	84.5 (31.7-98.4)	Hypertensive Retinopathy, n (%)	4/19 (21%)
Length of IV anti-HTN therapy(hrs), median (IQR)	57.7 (32.6-105.9)	Patients discharged on oral antiHTN n(%)	46 (58.9%)

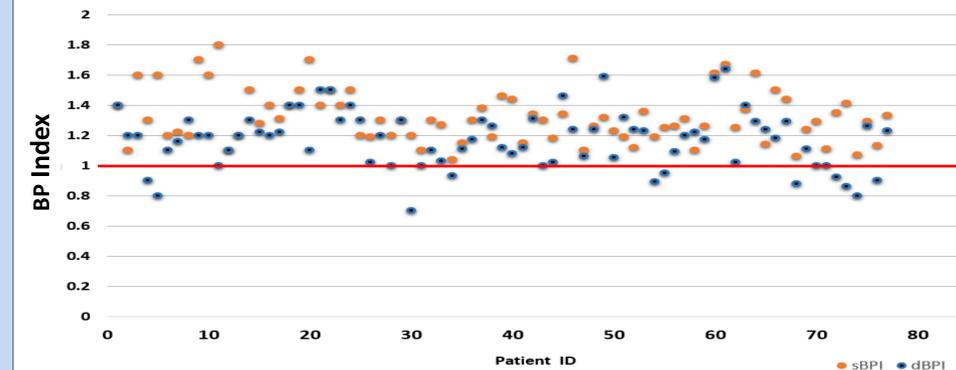
Etiology of Hypertension



Comorbidities



Blood Pressure Index at Anti-HTN Start



- ❖ Neurologic symptoms were common: headache (41%), altered mental status (26%), and seizures (24%)
- ❖ The most common co-morbidity was renal disease (30.7%: CKD, ESRD, Tx)
- ❖ Nicardipine was utilized in 70 patients (90%)
- ❖ Calcium channel blockers were frequently prescribed on hospital discharge (37.1%)
- ❖ BMI had a negative association with dBPI (β -0.01, 95% CI -.0027 to -.0001, p 0.03), and remained significant when controlled for age (p =0.02)
- ❖ There was no association between LVH and sBPI (95% CI 0.7 to 647, p 0.07) nor dBPI (95% CI 0.2 to 115.5, p 0.32)
- ❖ Patients with prior HTN had no significant higher odds of having LVH (p 0.08)

Conclusions

- ❖ Although renal disease was a prominent co-morbidity, medication related causes of hypertensive urgency/emergency were more likely
- ❖ Neurologic sx and abnormal neuroimaging were common
- ❖ Of those evaluated for end organ dysfunction, LVH was the most common finding
- ❖ BMI was significantly associated with diastolic BP, but not in the typical relationship described with primary hypertension.

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