Intracranial Hemorrhage and ECG Changes

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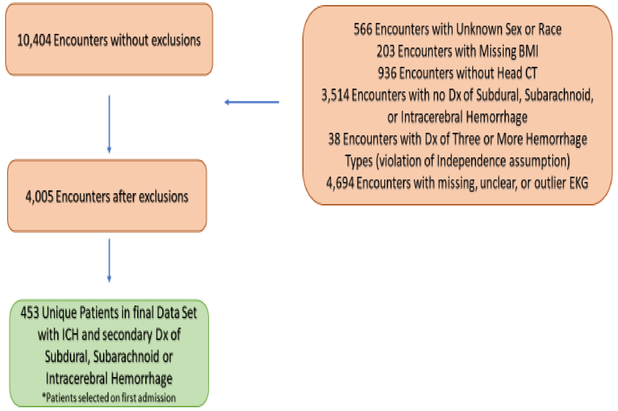
Background

- Electrocardiographic (ECG) abnormalities have been documented as far back as 1947 with QT prolongation, and abnormal T and U wave patterns (1).
- Mortality is increased with abnormal ECG (3). Physicians are required to interpret these changes as cerebral versus cardiac ischemia (4).
- In 2013, the most common ECG abnormalities associated with stroke were T-wave abnormalities, prolonged QTc interval, and arrhythmias.

Objective

- This analysis aims to further the claims of our predecessors with more power and population validity.

Methods



Results

Demographics	
Age, mean (SD)	67.91 ± 15.32
Race, n (%)	
White	320 (70.6%)
Black	73 (16.1%)
Other	60 (13.2%)
Sex, n (%)	
Male	234 (51.7%)
Female	219 (48.3%)
HTN, n (%)	388 (85.7%)
BMI, mean (SD)	27.94 ± 7.27
DM, n (%)	140 (30.9%)
Smoking Status, n (%)	
Never	198 (54.7%)
Current/Former	164 (45.3%)
Baseline Characteristics	
Intracerebral Hemorrhage, n (%)	352 (77.7%)
Subarachnoid Hemorrhage, n (%)	62 (13.7%)
Subdural Hemorrhage, n (%)	39 (8.6%)
QTC, mean (SD)	462.16 ± 41.15
QRS, mean (SD)	95.03 ± 22.71

Table 1: Demographics and baseline characteristics, N= 453

Variable	Mortality or Hospice	Survived	P-Value
Hemorrhage Type, n (%)			
Intracerebral	104 (74.3%)	248 (79.2%)	
Subarachnoid	21 (15.0%)	41 (13.1%)	
Subdural	15 (10.7%)	24 (7.7%)	
			0.449
QTC, mean (SD)	467.99 ± 43.77	459.59 ± 39.72	0.044*
QRS, mean (SD)	98.65 ± 25.30	93.42 ± 21.30	0.034*
AFIB, n (%)	41 (29.3%)	48 (15.3%)	<0.001*
LVH, n (%)	7 (5.0%)	23 (7.3%)	0.353
NSTWA, n (%)	27 (19.3%)	73 (23.3%)	0.338

Table 2:EKG changes, Mortality

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Discussion

- Our study shows that ECG abnormalities are common in patients with hemorrhagic CVA
- They are not independently associated with mortality or stroke characteristics.
- ECG changes in these patients should be interpreted cautiously and not be used as a sole indicator of prognosis or treatment decisions.
- There is a difference in average initial QTc (t = -2.023, p = 0.044), and the initial QRS (t = -2.133, p = 0.034) amongst patients that experienced mortality.
- A post-hoc analysis shows that QTc was an average of 8.437 units higher for patients
- that expired and QRS was 5.235 units higher for patients that expired.

Conclusion

- The results have demonstrated that ECG abnormalities are common in patients with hemorrhagic CVA, but they are not independently associated with mortality or stroke characteristics.
- Therefore, ECG changes in these patients should be interpreted cautiously and not be used as a sole indicator of prognosis or treatment decisions.

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