

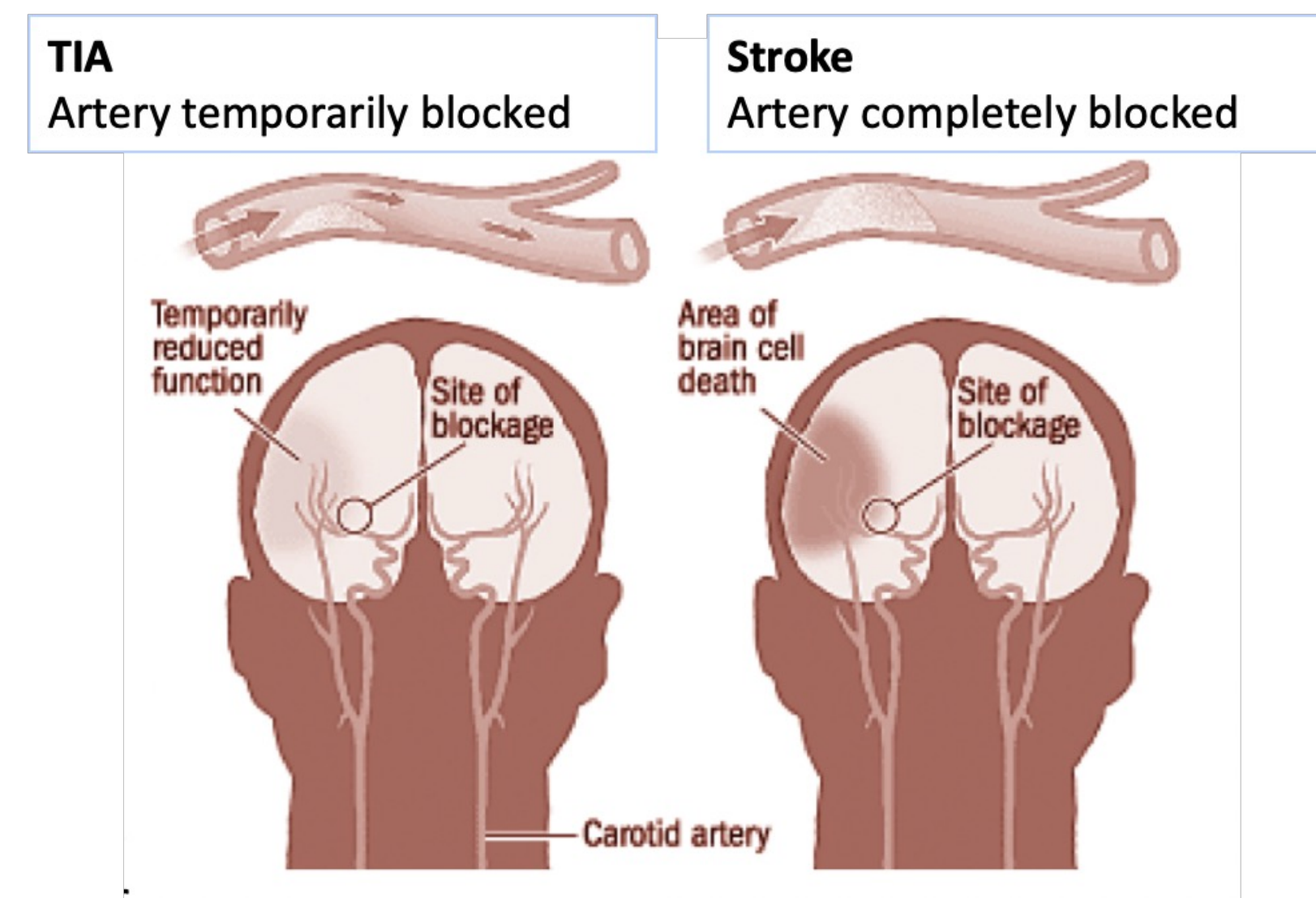
Stroke Risk After Lowering Elevated Blood Pressure in Transient Ischemic Attack

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Introduction



- There is a relationship between the diagnosis of TIA and the subsequent development of a stroke¹⁻⁴
- The risk of developing a stroke within 90 days of a TIA is approximately 10.5% with about half of these occurring in the first **1-2 days** of the TIA³

Risk factors that may increase the likelihood of developing a stroke following a TIA include:

- Having age over 60
- A blood pressure of 140/90 or greater**
- Diabetes
- Increased TIA duration
- Increased symptomatology at the time of presentation⁵⁻⁸.

Gap: It is unknown whether **acute treatment** of elevated blood pressure (BP) in TIA patients in the ED alters stroke risk in the subsequent hospital stay

Specific Aims

Aim I: To evaluate the effect of lowering blood pressure on stroke risk in ED patients with TIA and elevated blood pressure

Aim II: Determine the effects of lowering BP in ED patients with TIA and a hypertensive BP on length of hospital stay (LOS), ICU admission and discharge disposition setting

Method: A retrospective cohort study using a sample of adult patients who were seen at a Beaumont Hospital Emergency Department (8 hospital system)

Inclusion Criteria:

- Diagnosis in ED of **TIA**
- Age ≥ 18
- BP: systolic ≥ 140 mmHg or systolic ≥ 90 mmHg

Study Population: 3,095 patients

Study Design

Antihypertensive Administered in ED	No Antihypertensive Administered in ED
Patient outcome: stroke (ischemic/hemorrhagic), hospital LOS, discharge disposition, ICU admission	Patient outcome: stroke (ischemic/hemorrhagic), hospital LOS, discharge disposition, ICU admission

Results

Table 1. Patient and clinical characteristics

Variables	Antihypertensive Administered in ED			p value
	All	Yes	No	
n (%)	3095	649 (21%)	2446 (79%)	
Median age (IQR)	73.0 (62.0, 82.0)	75.0 (65.0, 83.0)	73.0 (62.0, 82.0)	<.0001 ¹
Sex, n (%)				0.0403 ²
Female	1726 (55.8%)	385 (22.3%)	1341 (77.7%)	
Male	1369 (44.2%)	264 (19.3%)	1105 (80.7%)	
Race, n (%)				<.0001 ²
White or Caucasian	2322 (75.1%)	440 (18.9%)	1882 (81.1%)	
Black or African American	627 (20.3%)	172 (27.4%)	455 (72.6%)	
Other	142 (4.6%)	37 (26.1%)	105 (73.9%)	
Missing	4	0	4	
Stage of hypertension, n (%)				<.0001 ²
Stage 1	1074 (34.7%)	79 (7.4%)	995 (92.6%)	
Stage 2	2021 (65.3%)	570 (28.2%)	1451 (71.8%)	

¹Unequal variance two sample t-test; ²Chi-Square p-value

Table 2. Effect of administration of antihypertensive medication on stroke risk in ED patients presenting with TIA and elevated blood pressure

Variables	Antihypertensive Administered in ED			Unadjusted OR [yes vs no]	p value	Adjusted OR [yes vs no]	p value
	All	Yes	No				
n (%)	3095	649 (21%)	2446 (79%)				
Total stroke	429 (13.9%)	98 (22.8%)	331 (77.2%)	1.14 (0.89 - 1.45)	0.304	1.12 (0.87 - 1.43)	0.371
Ischemic stroke only	419 (13.5%)	95 (22.7%)	324 (77.3%)	1.12 (0.88 - 1.44)	0.357	1.11 (0.87 - 1.43)	0.399
Stage 1 hypertension	122 (29.1%)	8 (6.6%)	114 (93.4%)	0.87 (0.41 - 1.86)	0.720	0.79 (0.36 - 1.71)	0.548
Stage 2 hypertension	297 (70.9%)	87 (29.3%)	210 (70.7%)	1.06 (0.81 - 1.40)	0.652	1.05 (0.80 - 1.38)	0.731
Hemorrhagic stroke only	9 (0.29%)	3 (33.3%)	6 (66.7%)	1.89 (0.47 - 7.57)	0.369		
Ischemic/hemorrhagic stroke	1 (0.03%)	0 (0%)	1 (100%)				

Adjusted odds ratio (OR) were estimated by multivariable logistic regression, adjusting for age, sex, and race

Table 3. Effect of administration of antihypertensive medication on secondary outcomes in ED patients presenting with TIA and elevated blood pressure

Outcomes	Antihypertensive Administered in ED			p value
	All	Yes	No	
Discharge disposition, n (%)				0.1371 ¹
Home discharge	2695 (88.4%)	548 (86.0%)	2147 (89.0%)	
Rehab/intermediate care/skilled nursing facility	299 (9.8%)	76 (11.9%)	223 (9.2%)	
Deceased	3 (0.1%)	1 (0.2%)	2 (0.1%)	
Left AMA/discontinued care	48 (1.6%)	10 (1.6%)	38 (1.6%)	
Not applicable/other	5 (0.2%)	2 (0.3%)	3 (0.1%)	
Missing	45	12	33	
Hospital length of stay (Days), median (IQR)	2.0 (1.2, 3.1)	2.1 (1.5, 3.8)	1.9 (1.2, 3.0)	<.0001 ²
Intensive care unit admission, n (%)				0.3587 ³
Yes	71 (2.3%)	18 (2.8%)	53 (2.2%)	
No	3024 (97.7%)	631 (97.2%)	2393 (97.8%)	

¹Fisher Exact p-value

²Unequal variance two sample t-test

³Chi-Square p-value

Abbreviations: ED = emergency department; AMA = against medical advice

Conclusions

Challenges and Limitations

- This is an observational study, so no causality can be concluded
- The patient data collected from EPIC EMR is based on the accuracy of documentation and coding of patient encounters
- Accuracy of the emergency physician in diagnosing a TIA must also be taken into account

Discussion

- Treatment of elevated BP in ED patients experiencing TIA is not associated with a decreased stroke rate during the subsequent hospital admission
- Future directions may include conducting a prospective trial on BP control in this population

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