

Pharmacotherapy Management of Cardioembolic Stroke and Outcomes: A Retrospective Review (PROCESS Study)

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Background

- Stroke is the 3rd leading cause of death in Canada.
 - 80% of all strokes are ischemic.
 - 20% of ischemic strokes are cardioembolic.
- Cardioembolic strokes are larger and associated with poorer outcomes, including mortality rates of about 27-31%.
- There is limited evidence for the optimal management of cardioembolic stroke:
 - Anticoagulation (re)-initiation begins 2 to 14 days after minor strokes, and up to 3 to 6 weeks after major strokes.
 - 2^o prevention after stroking while on therapeutic anticoagulation is unclear.
 - The role and efficacy of statins is unclear.

Objectives

Primary:

- To characterize demographics and risk factors of patients admitted to Surrey Memorial Hospital with cardioembolic stroke.
- To review the pharmacotherapy management after acute cardioembolic stroke and related outcomes.

Secondary:

- To review the pharmacotherapy management before acute cardioembolic stroke and related outcomes.

Methods

- A retrospective chart review was conducted using the Electronic Medical Records (EMR) at Surrey Memorial Hospital.
- Inclusion criteria: patients ≥ 19 years old diagnosed with cardioembolic stroke (i.e. ICD code "434.1 Cerebral embolism" or "434 Occlusion of cerebral arteries" AND "425 Cardiomyopathy" or "427.3 Atrial fibrillation and flutter")
- Exclusion criteria: Palliative patients with expected death within 30 days due to underlying disease as documented in chart.
- Sample size of convenience starting May 24th 2012 until May 24th 2011 or 50 charts pulled (ie. 25% of annual number of patients admitted with ischemic stroke), whichever came first to reflect most current practice.

	n/N	%/(range)
Males	22/48	46%
Age – median (yrs)	77	(48-95)
Atrial Fibrillation (Afib)	48/48	100%
• Afib known prior to admission (PTA)	26/48	54%
History Stroke/Transient Ischemic Attack	24/48	50%
• History of previous stroke	21/48	44%
• History of previous TIA	11/48	23%

Table 1: Patient Demographics.

	n/N	%/(range)
On AC/AP PTA		
• Known History Stroke/TIA	16/24	67%
• Known Afib	18/25	72%
• Known Afib + History Stroke/TIA	12/14	86%
Warfarin use PTA	8/25	17%
• INR on admission – median	1.7	(1.3-2)
• Below therapeutic target <2	7/8	88%

Table 2: Patient Risk Factors.

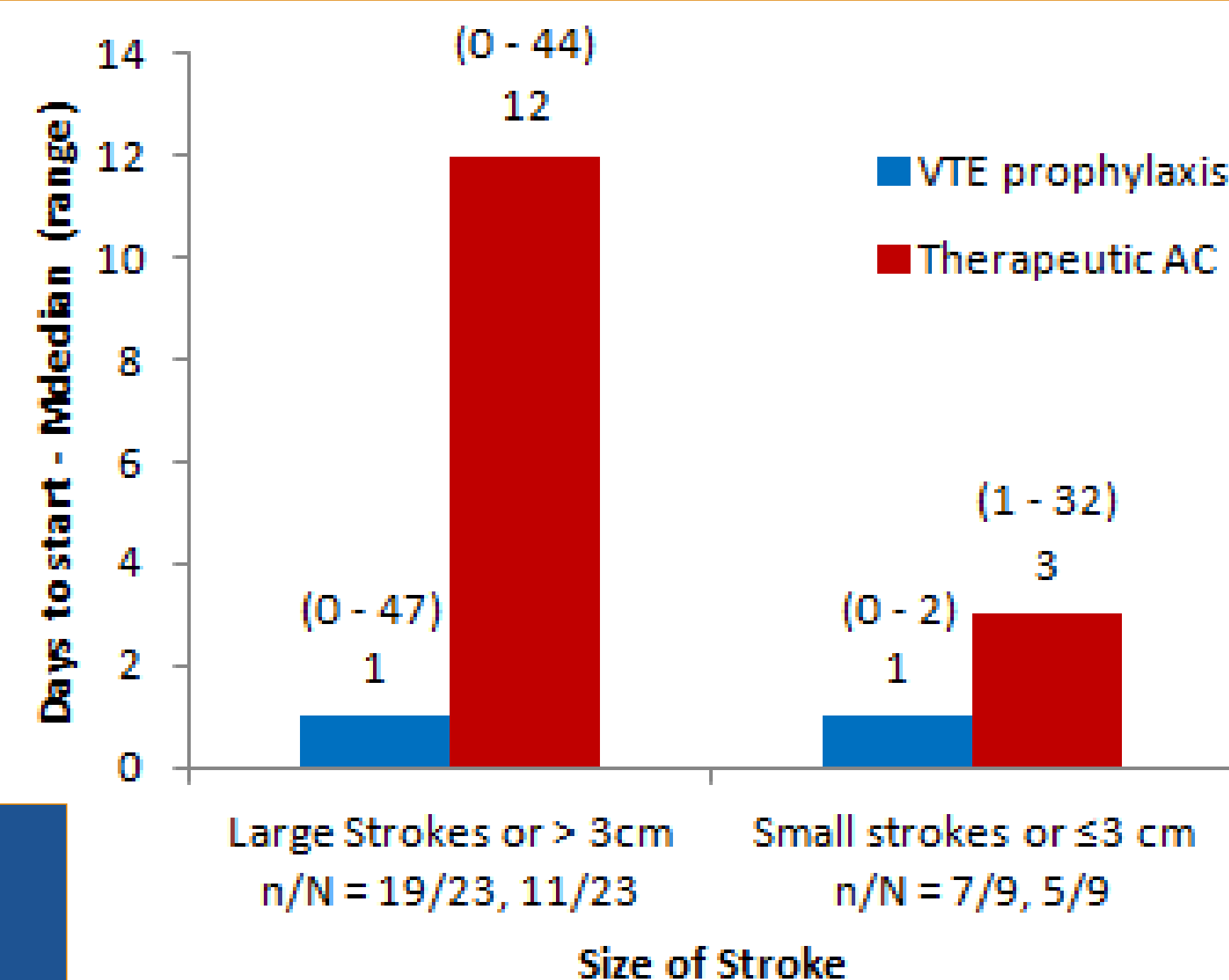


Figure 1: Time to anticoagulation.

	n/N	%/(range)
LDL on admission – median (mmol/L)	2.0	(0.9-4.7)
LDL <2 mmol/L on admission	17/34	50%
• On statin PTA	10/16	63%
Discharged with statin	28/34	82%
• Newly started on statin	14/34	38%
○ Framingham risk low	3/13	
○ Framingham risk mod	3/13	
○ Framingham risk high	7/13	

Table 3: HMG-CoA Reductase Inhibitor (statin) usage.

Results

- 5/34 discharged patients (15%) were not started on any therapeutic anticoagulation (AC); however all were on antiplatelet (AP) therapy, and median length of stay in hospital was 16 days (range 2 - 46).
- 9 patients with large strokes had intracranial hemorrhages, and had initiation of therapeutic AC held for ≥ 14 days without re-stroking.
- No patients had intracranial hemorrhage 2^o to therapeutic AC.

	n/N	%/(range)
Death	14/48	29%
• Large or >3cm stroke	10/11	91%
• Small or ≤ 3 cm stroke	1/11	9%
Discharged home without supports	11/48	23%
Survived pts & Modified Rankin Score ≥ 3	23/48	48%
Length of stay – median (days)	22	(2-121)

Table 4: Discharge outcomes.

Limitations

- Retrospective chart review
- Incomplete chart documentation
- Does not reflect usage of newer oral anticoagulants

Conclusions

- Most patients were appropriately on AC/AP prior to admission; however patients taking warfarin PTA had subtherapeutic INRs which may have resulted in stroke.
- A significant number of new Afib cases (46%) coincided with stroke onset, which reflects an opportunity for prevention awareness.
- VTE prophylaxis was started ~ 1 day regardless of stroke size; timing did not correlate with bleeds, however unable to conclude risk due to small amount of charts reviewed.
- Therapeutic AC was started in larger strokes ~ 12 days, and in smaller strokes ~ 3 days; no ICH occurred due to therapeutic AC and no recurrent ischemic strokes occurred while anticoagulation was held.
- As 15% of discharged patients were not started on anticoagulation, patients may benefit from further follow-up in a stroke prevention clinic.
- Patients with low-moderate Framingham Risk Scores were newly initiated on statin therapy, an area which requires further study.
- New initiatives such as the use of newer oral anticoagulants for preventing unfavourable cardioembolic stroke outcomes requires further study.

