Stroke Prevention for Non-Valvular Atrial Fibrillation

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Abstract

Atrial Fibrillation (AF) is the most commonly-treated cardiac arrhythmia in the world. The major complication that stems from untreated AF is a thromboembolic stroke event. While Warfarin as been the long-standing treatment option in preventing stroke, there are several other available options that patients may consider. This review defines atrial fibrillation, explains different risk assessment tools in stroke prevention, and outlines the available prophylaxis options while weighing risks and benefits.

Defining Atrial Fibrillation

- **Cause:** Cardiac muscle cells, with the special property of automaticity, may produce unchecked action potentials. This may lead to unsynchronized contraction of the atrium. A person in AF may be assessed by electrocardiogram (Figure 1).
- **Classification:** Paroxysmal is <7 days; Persistent is >7 days; Long-standing persistent is >12 months; Permanent is >12 months with doctor/patient acknowledgement to forgo treatment.
- **Complication:** Sustained AF can cause formation of clots, most commonly within the left atrial appendage. These clots embolize and may cut off blood supply to the brain, leading to stroke (Figure 2).

Figure 1: ECG comparison between normal sinus rhythm (top) and atrial fibrillation (bottom). Illustration from https://www.chss.org.uk/heart-information-and-support/about-your-heart-condition/common-heart-conditions/heart-arrhythmias-2/medical-treatment-atrial-fibrillation/
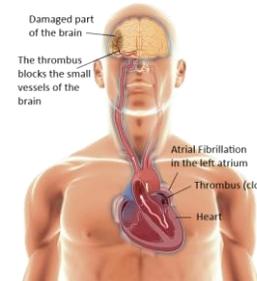
Figure 2: Anatomic significance of thromboembolism from left atrium to brain vessels. Illustration from https://medwell.hk/learn-about-afib

Assessing Need for Stroke Prevention

- **CHA₂DS₂-VASc (left table):** A score of 0 generally means no recommendation of antithrombotic therapy; A score of 1 suggests either anticoagulation or antiplatelet therapy; A Score of 2 or more recommends oral anticoagulation.
- **ATRIA score (right table):** A score of 5 or less is considered low risk; A score of 6 is moderate risk; a score of 7 or more is considered high risk.
- **Bleeding risk scores**: Scores such as HASBLED and HEMORR2HAGES provide potential caveats to long-term anticoagulation for individual patients, based on common factors such as age or history of hypertension, hemorrhage, stroke, or anemia.

CHA₂DS₂VASc Risk Score	
Risk Factor	Score point
CHF or LVEF ≤ 40%	1
Hypertension	1
Age ≥ 75	2
Diabetes	1
Stroke, TIA, or thromboembolism	2
Vascular disease	1
Age 65-74	1
Female	1

ATRIA Risk Score		
Risk factor	Points with prior stroke	Points without prior stroke
Age > 85	6	9
Age 75-84	5	7
Age 65-74	3	7
Age< 65	0	8
Female	1	1
Diabetes	1	1
CHF	1	1
Hypertension	1	1
Proteinuria	1	1
GFR < 40 or ESRD	1	1

Both tables constructed in Excel

Options for Stroke Prevention

- Warfarin (aka Coumadin)
  - Pros: Widely studied and longest used; not as expensive; bleeds are reversible
  - Cons: INR monitoring required; regimented
- Direct Oral Anticoagulants (DOACs) (ie Apixaban, Rivaroxaban, Edoxiban)
  - Pros: May outperform in stroke prevention; no INR monitoring
  - Cons: Expensive; regimented
- Left Atrial Appendage Occlusion (ie WATCHMAN)
  - Pros: No lifelong anticoagulation needed
  - Cons: Novel, not well-studied; expensive

Conclusion

Atrial fibrillation is a serious condition that can lead to devastating consequences. Thus, it is crucial to identify the severity of AF in each patient to determine the need for stroke prophylaxis. Currently, Warfarin and DOACs are the mainstay of treatment, and LAAO devices still need time and diligent research to be established as regular and viable alternatives. As with any other decision to treat or start prophylaxis, determining the choice for stroke prevention should always be discussed with the patient in a transparent exchange. In this, the needs of the patient should be weighed along with the different indications, benefits, and limitations of each option.