Novel Approaches to Stroke Prevention in Atrial Fibrillation

Introduction

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Both the incidence and prevalence of atrial fibrillation increase with advancing age. Hence, the burden posed by stroke resulting from atrial fibrillation will continue to increase. Varying pharmacological methods to prevent such strokes have been tested over the preceding decades. Warfarin, warfarin plus dipyridamole, aspirin, warfarin plus aspirin, low-dose warfarin, and other regimens have been evaluated in clinical trials. The most rigorous trials have shown conventional dose warfarin, by itself, to be the most effective and safe means of stroke prevention for patients with heart disease and atrial fibrillation. New agents are in development or under evaluation in randomized clinical trials, but for now warfarin is the gold standard in clinical practice.

Yet treatment with warfarin carries its own burdens, the most severe being warfarin-related intracranial hemorrhage (ICH). Dose-effect for efficacy has been identified in clinical trials, and so adequate doses of warfarin are required to prevent stroke. Dose-effect for warfarin-related ICH is supported by case series, and so ICH is more likely to occur if doses are too high. Careful hematologic monitoring of patient-coagulation status is of paramount importance but has been difficult to achieve consistently. The elderly are at greater risk for warfarin-related ICH, but decreasing mobility, decreasing access to easy transportation, and decreasing financial capacity make compliance and adequate monitoring an unreachable goal. As a result, warfarin-related ICH is a familiar therapeutic challenge for all neurologists and neurosurgeons wherever warfarin is used.

Safe alternatives to warfarin must be developed. Warfarin-related ICH is more deadly than subarachnoid hemorrhage (SAH) from aneurysms and could become more frequent. For Greater Cincinnati, ICH occurring in the setting of heparin or warfarin treatment was identified by Flaherty et al1 for the years 1988, July 1993 to June 1994, and 1999. The proportion of these ICH of all ICH was 5%, 9%, and 17% (P<0.001). The annual incidence per 100 000 went from 0.8 to 1.9 to 4.4. Among those aged ≥80, the incidence went from 2.6 (95% CI, 0 to 7.8) in 1988 to 44.2 (24.8 to 63.6) in 1999. The investigators estimated that 15 000 anticoagulant ICH occur annually in the United States.

In this session, rapidly emerging alternatives to anticoagulation will be addressed. Pharmacological rate control in patients with atrial fibrillation is not the neurologist’s first thought with regard to stroke prevention, but rate control can offer major benefits for many patients.2 Endovascular treatments to prevent and treat stroke are in widespread use, spanning the heart, aortic arch, cervical and intracranial vessels. Endovascular bipolar radiofrequency ablation techniques provide an intracardiac method to eliminate atrial fibrillation in selected patients.3 Recurrence rates have been low. The left atrial appendage has been implicated as the favored location of thrombi in patients with atrial fibrillation. Occlusion of the left atrial appendage has become routine at some centers in the setting of mitral valve surgery. Less invasive, percutaneous techniques are evolving. Whether exclusion of the left atrial appendage from the circulation justifies its use as a primary or secondary method of stroke prevention is under active investigation.4

References

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