Further Section

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Concluding Remarks

H.P.	Harold P.	Adams Jr.

Iowa City, Iowa, USA

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This symposium provides an update about new developments in the prevention of ischemic stroke. In comparison to the past discords about the management of persons at risk of stroke when no medical or surgical treatments had been proven to be effective, our disagreements now focus on what may be the best interventions to forestall stroke. The new controversies reflect our tremendous progress in the management of stroke-prone patients.

While arteriography is still a prerequisite diagnostic study before the decision for carotid endarterectomy is made at many medical centers, Hennerici and Dafferts-Joffer challenge this dogma. Recent technological advances have greatly improved ultrasound studies and magnetic resonance angiography. Their contention that the combination of these tests is superior to arteriography when making treatment decisions, such as the selection of cases for carotid endarterectomy, needs to be confirmed by additional well-designed studies. If prospective studies confirm that these noninvasive studies are equal to or superior to arteriography, there will probably be a major shift in medical practice. Similarly, further clinical research, as recommended by Dr. Touboul, is needed to define the subtypes of atherosclerotic plaques, as delineated by ultrasonography, that are most likely to be associated with stroke or other vascular events. Such differentiation will probably influence recommendations for carotid endarterectomy and possibly the selection of medical therapies.

While carotid endarterectomy is of proven value in preventing stroke in patients with severe ($>70\%$) stenosis of the internal carotid artery who have had recent ischemic symptoms, the benefit of the operation for other indications has not been established. Although stenosis of the internal carotid artery is often detected in asymptomatic persons, the usefulness of carotid endarterectomy in asymptomatic patients is still not established. The Asymptomatic Carotid Atherosclerosis Study, which is being directed by Dr. James Toole, is likely to provide a definitive answer about the efficacy of this operation.

Chronic administration of oral anticoagulants has proven to be highly effective in preventing stroke among

persons with atrial fibrillation. Anticoagulants are particularly beneficial when a patient with atrial fibrillation has had a transient ischemic attack or stroke. Dr. Boysen has evaluated the several recently completed studies and concludes that some subgroups of patients are most likely to benefit from oral anticoagulants. The 'best' level of anticoagulation needs to be defined. Several combinations of drugs (such as warfarin and aspirin), in different doses, need to be tested. Transesophageal echocardiography may also permit further definition of high-risk and low-risk groups.

A recent meta-analysis of antiplatelet therapy confirms the value of this form of therapy in preventing ischemic stroke, myocardial infarction, and vascular death. Still, controversies persist. The relative indications for ticlopidine or aspirin, the best dose of aspirin, the efficacy of combinations of antiplatelet agents, and the usefulness of the oral anticoagulants in adjunct to antiplatelet agents are still unsettled. Dr. Harbison has reviewed some of these issues and provides guidance based on currently available data.

Dr. Fisher proposes that prophylactic administration of drugs with neuroprotective effects might be very useful in patients who are at very high risk for ischemic stroke. While this approach may be unconventional, it has considerable merit. The benefit of nimodipine in preventing brain ischemia in patients with vasospasm after subarachnoid hemorrhage may be the result of its being used before ischemic symptoms appear. Dispensing nimodipine or another neuroprotective agent in high-risk patients (carotid endarterectomy, coronary artery bypass grafting, recent transient ischemic attacks) may lessen the frequency or severity of brain ischemia. Combining such therapies with interventions such as antiplatelet aggregating drugs should be tested.

These presentations provide as many questions as answers; they can serve as the springboard for future research that can advance our care of persons at risk for ischemic stroke. Hopefully, this symposium will stimulate several groups of researchers to test some of these hypotheses.