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Stroke in the elderly

Predictable, preventable and treatable

BILL O'BRIEN MB, MRCP, RICHARD LINDLEY MB BS, CHRISTOPHER R. LEVI MB BS

Stroke is the second most common cause of death worldwide, with most of the disease burden falling to the elderly and the very elderly. Effective treatments are available for acute management as well as for primary and secondary prevention of stroke. GPs are particularly well placed for identifying at-risk patients and for initiating 'triple therapy' of aspirin, a high-dose statin and blood pressure-lowering therapy.

Key points

- Stroke is the second most common cause of death worldwide and predominantly affects the elderly.
- Aspirin therapy, referral to a stroke unit and thrombolysis within 4.5 hours of onset are interventions that are of proven benefit for acute ischaemic stroke.
- A transient ischaemic attack (TIA) is a medical emergency and presents an urgent window of opportunity to prevent a completed stroke.
- Stroke prevention can be achieved by urgent diagnostic evaluation of a TIA and by starting 'triple therapy' with aspirin, a high-dose statin and blood pressure-lowering therapy.
- Treatment with an antiplatelet agent should be started immediately in patients who have experienced a transient focal neurological event.
- Anticoagulation therapy is vastly superior to treatment with antiplatelet agents for patients with atrial fibrillation.
- Carotid imaging is one of the most critical investigations in preventing stroke and should be performed urgently, followed by referral for surgery if a significant symptomatic stenosis is identified.

Stroke is a common cause of death and disability with most of the disease burden occurring in the elderly.[1] The definition of elderly varies widely but most publications refer to the elderly as those aged over 65 years with 'very elderly' defined generally as those aged over 80 years. Stroke is both predictable and preventable and, when it occurs, treatments exist that can significantly alter the natural history of the disease.[2] Although major strides have been made in terms of our understanding of the diseases responsible for stroke, and in the development of treatments to prevent and treat acute stroke, most of this information comes from studies carried out in a younger population. With our ageing population, stroke is predicted to increase in incidence, thus emphasising the need to optimise acute and preventive interventions.

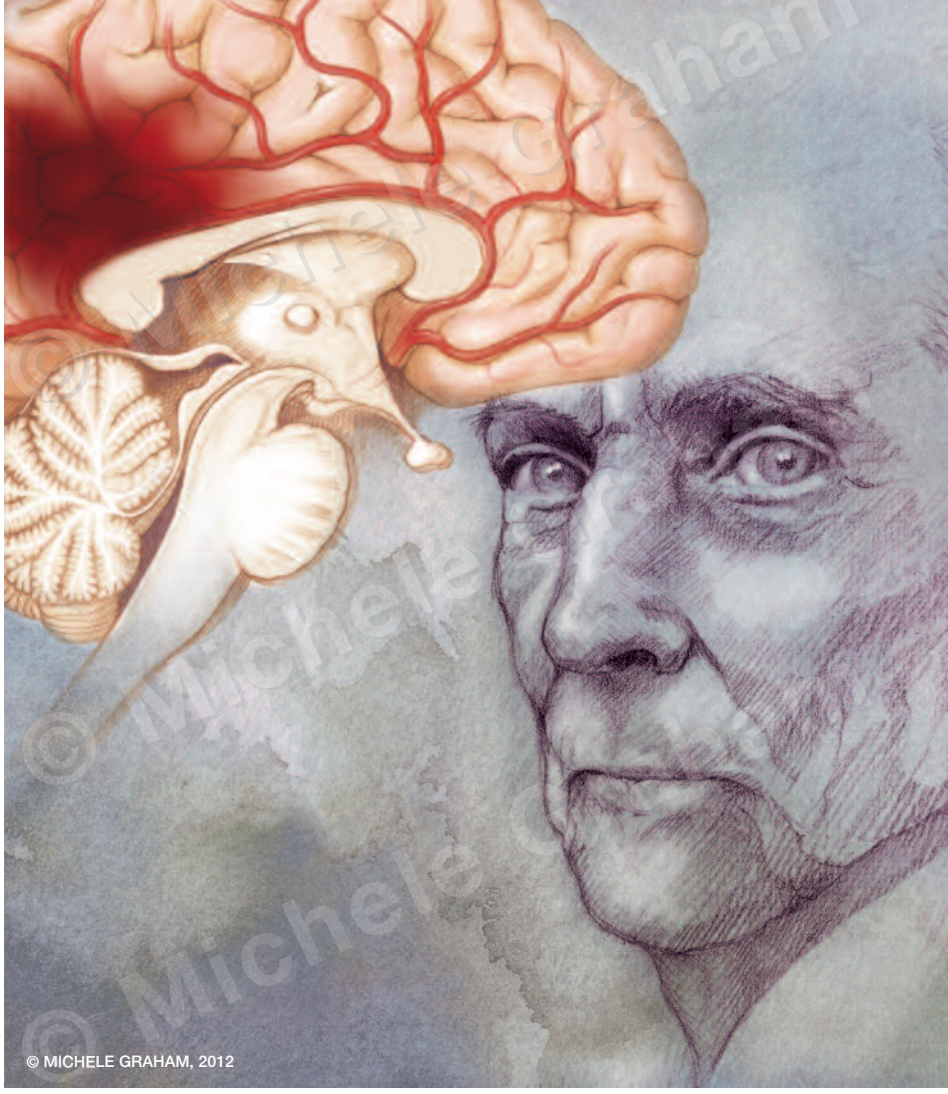
EPIDEMIOLOGY

Stroke is the second most common cause of death worldwide. Of those affected by stroke, some 80% are aged over 65 years and 25% are over 85 years. The incidence of stroke doubles every decade after the age of 55 years, and with increasing life expectancy the incidence of stroke within the population will increase. Indeed, stroke is predicted to be the leading

Dr O'Brien is a Neurologist at Gosford and Wyong Hospitals, Central Coast, NSW. Professor Lindley is Professor of Medicine at the Westmead Clinical School, Westmead Hospital, University of Sydney, NSW. Associate Professor Levi is Director of Acute Stroke Services at the John Hunter Hospital and Director of the Priority Research Centre for Brain and Mental Health at the University of Newcastle and Hunter Medical Research Institute, Newcastle, NSW.

cause of death in developed countries by 2030.[1] The cost of stroke to society is significant and is estimated at $1.3 billion per year in Australia alone.[2]

Hypertension, diabetes, smoking and atrial fibrillation have all been identified as modifiable risk factors for stroke, and account for about 60% of stroke cases. The remaining 40% of stroke cases are due to as yet unidentifiable causes, but may involve possible genetic mechanisms.[2] Age is the main unmodifiable risk factor for stroke and has a profound effect on both incidence and outcome. Age-associated risk factors, such as atrial fibrillation, congestive cardiac disease and carotid artery atherosclerosis, explain a large part of the increased incidence of stroke among the elderly, and comorbidities may explain the poorer outcome. However, even adjusting for these factors, mortality, length of hospital admission and final discharge destination are all poorer in the older patient who has had a stroke.



AETIOLOGY AND SUBTYPES

Over 80% of strokes are ischaemic in nature; the remaining causes are secondary to haemorrhage.[2] Three main stroke subtypes cause 75% of ischaemic strokes, with a roughly equal distribution. These subtypes have implications in terms of prognosis and treatment, and are listed below.

- **Large vessel atherosclerosis stroke.** These classically affect the origin of the internal carotid but may occur at any point both intra- and extracranially. This subtype may result in thrombosis at the site of disease or artery-to-artery distal embolisation. Antiplatelet and antithrombotic therapies are the best treatment options.
- **Cardioembolic stroke.** These are mainly due to atrial fibrillation, but are also caused by mural wall thrombosis following myocardial infarction, left ventricular failure or mitral valve disease. This subtype is an increasingly common cause of stroke in the elderly and anticoagulation is the treatment of choice.
- **Lacunar ischaemic stoke.** These are caused by small vessel disease. This subtype, in general, is associated with a significantly better outcome and much lower recurrence rate compared with other subtypes of ischaemic stroke. Treatment should include an antiplatelet agent.

Most strokes resulting from haemorrhage are caused by hypertensive small vessel lipohyalinotic disease, cerebral amyloid or aneurysm rupture, while a minority of cases are secondary to vascular malformations. Prognosis is poor in patients who have had a haemorrhagic stroke, with 50% mortality at one month.

ACUTE MANAGEMENT

Patients with acute stroke should be referred immediately to hospital and, as a rule, '000' should be called whenever stroke is suspected as treatments are critically time sensitive. There are three proven interventions for acute ischaemic stroke:

- aspirin given within 48 hours of symptom onset reduces both death rate and further stroke at one month

- stroke units have a large effect on reducing mortality and morbidity, as an intervention are applicable to the vast majority of patients, and are effective across all age groups[2]
- thrombolysis with alteplase is beneficial when given appropriately to those presenting within 4.5 hours of ischaemic stroke symptom onset.[3,4]

Most evidence for the benefit of these interventions comes from studies in younger patients. There is little evidence, to date, of benefit in those aged over 80 years because of their exclusion from the major trials. The Third International Stroke Trial (IST-3) will report results for thrombolysis for acute ischaemic stroke in those over 80 years of age in mid-2012.[5] Current practice for the acute management of stroke is that age alone is not an exclusion criterion. If premorbid physical and cognitive function are good then thrombolysis should be considered. The outcome is poor in elderly patients with a significant deficit at presentation, particularly when a vessel occlusion can be identified on imaging. The recommendation to provide thrombolysis in elderly patients with good physical and cognitive function is consistent with the current TGA approval of the thrombolytic agent alteplase in Australia. However, if the elderly patient is not independent prior to the event then alteplase is not generally offered because the aim of treatment is a return the patient to independent living.

TRANSIENT ISCHAEMIC ATTACKS

A transient ischaemic attack (TIA) presents an urgent window of opportunity to prevent a completed stroke. The early and intensive assessment and treatment of herald events such as a TIA is essential for stroke prevention. This can be achieved by urgent diagnostic evaluation of patients suspected of having a TIA and by starting 'triple therapy' with aspirin, a high-dose statin and blood pressure-lowering therapy.[6]

In a patient with a transient focal neurological event that has fully resolved and who is back to normal, immediate loading with aspirin is appropriate – waiting for a CT scan before initiation only raises risk while rarely changing management acutely. This is not the case if neurological signs persist or red flags are present, such as prior malignancy that may have metastasised or if the patient is currently on anticoagulation. A history of paroxysmal atrial fibrillation or identifying atrial fibrillation on an electrocardiogram should prompt immediate anticoagulation rather than antiplatelet therapy.

Urgent assessment of the extracranial carotid arteries is the other key step in the management algorithm of TIA because carotid stenosis is a particularly sinister and time-critical cause of transient symptoms. Indeed, a significant proportion of patients will have a completed stroke within days of a herald event if there is a significant carotid stenosis.

A recent focus of research has been identifying 'high-' and

'low-'risk TIAs based on clinical features, but the role of these scoring systems is as yet unproven and does little to direct treatment to alter the natural history of these events on an individual basis. Rapid assessment in specialised clinics where available are of proven benefit.

SECONDARY PREVENTION

Appropriate antithrombotic therapy is the first step of secondary prevention. The choice lies between antiplatelet treatment and anticoagulation. In the setting of a cardioembolic source such as atrial fibrillation, anticoagulation with warfarin is the treatment of choice. Strong evidence now exists that warfarin is superior to aspirin in the setting of atrial fibrillation, even in the very elderly, and while the risk of haemorrhage increases with age and comorbidities, so too does the risk of ischaemic stroke, with the risk–benefit balance in favour of anticoagulation.[7] The newer anticoagulant agents (e.g. dabigatran, apixaban and rivaroxaban) offer many advantages for secondary prevention of stroke once regulatory approval and subsidy issues are resolved. Caveats exist regarding the use of these newer agents in the elderly, with studies suggesting that adverse events are increased in the older age group. If a cardiac source of stroke cannot be identified then therapy with either aspirin plus slow-release dipyridamole or clopidogrel alone are the optimum treatments, and are equivalent to each other.[8] The combination of clopidogrel plus aspirin offers no additional benefit due to the increased haemorrhagic risk of this combination for those patients with prior stroke.[9]

Hypertension is a main risk factor for stroke and while early intensive treatment in the first week following a stroke may be harmful, controlling blood pressure in the long term is of major importance in preventing further cardiovascular events.[10] Furthermore, blood pressure-lowering treatment is appropriate for both ischaemic and haemorrhagic stroke. There are concerns regarding optimum blood pressure targets in the very elderly, for whom a balance is needed between treatment and over treatment; however, benefit has now been shown in primary prevention for those aged over 80 years, and for all ages in secondary prevention.[11]

Statin therapy reduces risk of cardiovascular events and is of proven effect in the secondary prevention of stroke, including in the very elderly, in whom atorvastatin has the most robust evidence.[12]

Carotid endarterectomy is one of the most powerful interventions in preventing stroke. In patients with symptomatic moderate (50 to 69%) or severe (greater than 70%) stenosis, early intervention (within two weeks of symptom onset) results in a major absolute risk reduction of further stroke. The benefit of carotid endarterectomy is even more substantial in the elderly; therefore, age alone should not be an exclusion criteria for this

intervention if the patient is otherwise well.[13] Carotid stenting is inferior to surgery and thus should only be performed if the patient is unsuitable for endarterectomy or because of patient preference.

The presence of other vascular risk factors should also be addressed, including smoking (stopping smoking can reduce future vascular risk by half), diabetes and lifestyle changes such as diet modification and increasing physical activity levels.

LIFE AFTER A STROKE

The sequelae of a stroke are extremely variable and depend, to a large degree, on the extent and location of the infarction or haemorrhage. Recovery is most dramatic in the weeks and months following the event but significant functional gains can be seen up to a year or more after the initial event, particularly with intensive rehabilitation and input from allied healthcare professionals.

Nonfocal symptoms such as fatigue and mood disturbance are very common and can be particularly troublesome, especially when on a superficial level all other signs have resolved. Typically, patients who have such symptoms launch back into their previous routine only to find that their physical and intellectual reserve is not what it was. Emphasising a graded return to duties and reassurance that these symptoms are to be expected and will gradually improve with time is helpful. These issues can persist for months and even years, and a low threshold for initiating an antidepressant is worthwhile (the best evidence is for SSRIs), especially when mood and irritability is a problem.

Driving can generally be resumed one month after the stroke event, provided deficits do not interfere with ability. Motor function and visual field assessment are important factors in determining this, but issues with judgement also have a significant impact on safety and can be best assessed on family reports of behaviour. If there are any doubts, an on-road driving test arranged via the local driver licensing authority can be helpful.

CONCLUSION

Stroke is a common cause of death and disability in the elderly, but good treatments now exist for both acute stroke and primary and secondary prevention. Primary care physicians are particularly well placed in identifying at-risk patients, such as those with a TIA and atrial fibrillation, and for commencing therapy. Treatment includes 'triple therapy' (aspirin, a high-dose statin and blood pressure-lowering therapy), warfarin for atrial fibrillation and urgent imaging of carotids with referral for surgery if a significant symptomatic stenosis is identified. In addition, rapid TIA assessment clinics are becoming more widespread and, where available, are an excellent resource. MT

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