

Issues in the long-term management of stroke

Stroke is a common medical problem in South Africa and one that often needs long-term management.

BRENT TIPPING, MB ChB, FCP (SA), Cert Geriatrics (SA), MPhil
Specialist Geriatrician, University of the Witwatersrand Donald Gordon Medical Centre, Johannesburg

Brent Tipping is a geriatrician in full-time private academic practice at the University of the Witwatersrand Donald Gordon Medical Centre. His interests include vascular-related cognitive impairment, executive impairment, stroke, and acute geriatric medicine.

In South Africa stroke is the fourth most common cause of death in the general population and the most common cause of death in persons older than 65 years. For each 1 person dying of stroke 3 will survive. At present only 1 of these will return to independent functioning. This article aims to address common issues pertaining to the long-term management of the over 50 000 stroke survivors who currently live in South Africa.

Stroke is a vascular-mediated injury that results in neurological damage. Neurological reorganisation occurs in the human brain after stroke. The specific molecular and cellular changes that occur in the brain soon after stroke suggest that the brain is more amenable to activity-driven reorganisation. This important concept underlies the principles of rehabilitation.

Rehabilitation begins as soon as the diagnosis of stroke is established. Early organised multidisciplinary stroke care in the setting of a dedicated stroke unit allows 5 more patients to achieve independence at home, prevents 4 further deaths and 2 fewer patients requiring institutionalisation per 100 stroke patients managed. Stroke care outside a stroke unit (available in most cities in South Africa) in the year 2008 may be considered substandard care.

In stroke survivors specific impairments are common, and they contribute to both morbidity and mortality (Table I). To minimise the effects of these impairments early identification is paramount. This facilitates the implementation of management aimed at maximising rehabilitation and preventing complications. The stroke unit model of care aims to identify and manage these impairments through an organised and protocol-driven approach.

Table I. Common stroke-related impairments

- Dysphagia
- Communication disorders
- Bowel and bladder dysfunction
- Spasticity
- Falls
- Shoulder pain
- Depression
- Cognitive impairment
- Difficulties with community and social reintegration

The specific molecular and cellular changes that occur in the brain soon after stroke suggest that the brain is more amenable to activity-driven reorganisation.

Dysphagia

Stroke-related dysphagia is best defined as the disruption of bolus flow through the mouth and pharynx. Aspiration, malnutrition and dehydration are the most important consequences of dysphagia. Stroke patients with dysphagia have a 3-fold increase in mortality and a 6 - 7-fold increased risk of aspiration pneumonia. The incidence of stroke-related dysphagia ranges from 23% to 50%. The muscles of swallowing are represented asymmetrically in the motor cortices. This asymmetrical bilateral distribution may explain why up to half of stroke patients have dysphagia and why most will regain a safe swallow within a month.

Beside testing of swallowing involves presenting small volumes of water or food and observing for signs of dysphagia or aspiration. Signs of an unsafe swallow include: loss of fluid from the mouth, poor co-ordination of the muscles (or dyspraxia), facial weakness, delayed pharyngeal/laryngeal elevation, coughing, throat clearing, breathlessness and changes in voice quality after swallowing. A fall in oxygen saturation of 2% after drinking 10 ml of water or more may predict aspiration.

All patients with stroke should be screened for dysphagia, preferably by trained personnel. Early referral for speech therapy is recommended for all patients with dysphagia and further evaluation with either videofluoroscopy, modified barium swallow or fiberoptic endoscopic examination of swallowing will guide appropriate therapy.

Management strategies for people with dysphagia include feeding tubes, positioning, food and fluid modification as well as specific stimulation therapy provided by speech therapists. Nasogastric tube feeding in the first month after stroke is associated with a greater functional recovery than percutaneous endoscopic gastrostomy (PEG). It is generally accepted that PEG feeding is

the most practical long-term intervention for patients who do not regain a functional swallow within 1 month after a stroke.

In stroke survivors specific impairments are common, and they contribute to both morbidity and mortality.

Communication disorders

Stroke may impair speech production (dysarthria), or impair planning and execution of motor speech (articulatory dyspraxia), resulting in changes to speech intelligibility. Impaired language skills (aphasia or dysphasia) may result in difficulties in generating or understanding words, reading and/or writing. Language disorders are typically associated with left or dominant cerebral hemisphere strokes. Generally the prognosis for recovery is worse with delayed treatment or advanced age. Referral for speech therapy allows assessment for interventions to optimise recovery and prevent inappropriate compensatory strategies. Another key role of speech therapy is to educate family and caregivers on the facilitation of communication with the stroke patient.

Bowel and bladder dysfunction

During the first month after a stroke there is a 50 - 70% incidence of bladder incontinence. This falls to below 20% by 6 months. Generally, supraspinal injury such as stroke causes an uninhibited or hyperreflexic bladder. Urinary retention is less common. Urinary incontinence may contribute to skin breakdown, social isolation, depression and increased risk of institutionalisation. Urge incontinence secondary to a hyperreflexic bladder is managed with a timed voiding schedule, bladder re-training and, rarely, anticholinergic drugs. Anticholinergic drugs may have a poor benefit-to-risk profile and are generally avoided. Persistent urinary retention is best managed with intermittent catheterisation. Generally the Foley's catheter should be removed as soon as possible (within 48 hours if possible) to avoid urinary tract infection.

Bowel incontinence occurs in up to a third of stroke patients and usually resolves in the first few weeks after stroke. Faecal impaction is common and has multiple causes, including

relative inactivity, immobility, decreased nutrition (especially fibre), diminished fluid intake, depression or anxiety, inability to perceive bowel signals and cognitive deficits, which may contribute to this problem. Management involves correcting these problems, bowel training and the use of stool softeners/laxatives as needed.

Spasticity

Up to 65% of patients with stroke involving the cerebral motor areas develop spasticity. Individualised treatment goals are aimed at reducing pain, improving hygiene and improving function. Spasticity is typically treated in a stepwise approach. Early intervention must be emphasised since it has the advantage of preventing or minimising the development of contractures. There are three fundamental interventions: daily prolonged stretching, anti-spastic positioning, and the avoidance of noxious stimuli that worsen the spasticity. Oral anti-spasticity agents (e.g. baclofen) in stroke patients tend to only mildly reduce the spasticity but at the cost of significant cognitive impairment and falls. Thus they are not recommended as first-line management. Diazepam and other benzodiazepines should not be used owing to sedation side-effects as well as possible deleterious effects on recovery.

Other interventions for managing spasticity include splinting, serial castings, surgical correction, botulinum injection and electro-stimulation. Surgery is generally reserved for spasticity not responding to conservative management and causing pain, poor skin hygiene or decreased functioning. Injection of botulinum toxin can be considered in patients with disabling or symptomatically distressing spasticity if other measures have failed. This therapy is only effective when used in conjunction with physiotherapy. Electro-stimulation can increase the effectiveness of botulinum toxin therapy.

All patients with stroke should be screened for dysphagia, preferably by trained personnel.

Falls

An increased risk of falling has been reported in all post-stroke settings, with an incidence of 14 - 39%, depending on the setting. Risk factors for falling include increased age, male gender, visuospatial neglect, right hemisphere strokes, urinary incontinence, bilateral motor involvement, postural instability, impaired activities of daily living, impulsivity, medications such as diuretics, antidepressants or sedatives. During rehabilitation it is important to work on fall prevention strategies without compromising the activity levels required for successful rehabilitation. A multifaceted programme tailored to each individual patient and delivered by a multidisciplinary team is recommended.

Shoulder pain (Table II)

Shoulder pain is a common problem after stroke. Up to 72% of stroke patients will experience at least one episode of shoulder pain during the first year following stroke. A painful shoulder joint may mask improvement of motor function or may impair rehabilitation as it limits the use of a cane or wheelchair needed for independent ambulation.

Education to prevent trauma to the hemiplegic shoulder and attention to shoulder positioning are important prevention strategies. The use of overhead

Table II. Causes and treatment modalities of post-stroke shoulder pain

Causes

- Adhesive capsulitis
- Traction/compression neuropathy
- Complex regional pain syndrome
- Shoulder trauma
- Bursitis/tendonitis
- Rotator cuff tear
- Heterotrophic ossification

Treatment

- Shoulder positioning protocols to protect the limb from trauma
- Exercises to improve range of motion
- Strapping the involved upper extremity
- Physical modalities including ice, heat, soft-tissue massage, and mobilisation
- Corticosteroid and local anaesthetic injections/medications
- Functional electrical stimulation

Language disorders are typically associated with left or dominant cerebral hemisphere strokes. Generally the prognosis for recovery is worse with delayed treatment or advanced age.

pulleys should be avoided because they encourage uncontrolled shoulder abduction. Mobilisation techniques should focus especially on external rotation and abduction to prevent a frozen shoulder or the painful shoulder-hand syndrome.

Depression

Disturbance of mood following stroke is common. Approximately a third of all patients will develop depression. The risk of depression is greatest during the first month after stroke. Depression has a negative impact on rehabilitation, functional recovery and mortality (depressed patients have up to 3.5 times higher mortality than non-depressed patients). Mechanisms underlying the depression include direct consequences of the stroke lesion, neuroendocrine imbalances, and the psychological reaction to stress or disability. Confounders include pre-existing medical co-morbidities, impaired attention and initiation or the use of drugs that may depress mood. Evaluation and diagnosis of an abnormal mood state may be difficult, particularly in the presence of speech disturbance.

The evaluation for depression should start early and should continue throughout follow-up. Currently there is not sufficient evidence to routinely use pharmacological therapy to prevent post-stroke depression. Treatment of depression should include the following: patient and caregiver education, therapeutic exercises, psychotherapy and pharmacological agents. It is strongly recommended that patients diagnosed with depression be given a trial of antidepressant medication, if no contraindication exists. The selective serotonin reuptake inhibitors (SSRIs) are favoured mainly because of

their side-effect profile. Therapy should be continued for at least a further 6 months after good clinical response has been achieved. If response to therapy is poor then evaluation by an experienced psychiatrist or clinical psychologist is recommended.

Cognitive impairment

Cognitive impairment is a common complication following stroke. Subclinical ('silent') strokes occur 5 times as often as clinical (obvious) strokes, and may affect thought, mood and personality. This vascular-related cognitive impairment hastens the progression of Alzheimer's disease. Increasing recognition of this vascular-related cognitive impairment is facilitated by a high index of suspicion in patients with vascular risk factors. Secondary stroke prevention is shown to reduce the risk of subsequent cognitive decline.

All stroke patients should be assessed for cognitive deficits and be referred for cognitive re-training. If any of the following deficits are present, occupational therapy and/or neuropsychology referral is recommended: attention, visual, memory, and executive function and problem-solving difficulties.

Community and social integration

Rehabilitation of stroke patients requires appropriate community and social integration strategies. These include: ongoing post-stroke family support, financial and employment assistance as well as mobilisation of community resources to optimise successful return to the community. Community participation

itself has significant physical and cognitive benefits for the stroke survivor. Stroke Aid, for example, provides regular structured support groups in a number of areas in and around Johannesburg. Assessment of driving safety is important. Occupational therapists play a vital role in assisting stroke survivors to maximise their community participation.

Conclusion

Survivors of stroke face multiple challenges as they come to terms with their disability. Multidisciplinary rehabilitation improves function, morbidity, mortality and quality of life.

While many articles focus on secondary prevention after stroke, which is critical no doubt, this article aims to highlight and create awareness among general practitioners of the many issues to look out for in the long-term management of the stroke survivor.

Further work is required to prevent ongoing discrimination, to encourage respect and dignity, and to promote the general well-being of stroke survivors.

Further reading

Australian Government National Health and Medical Research Council. *Clinical Guidelines for Stroke Rehabilitation and Recovery*. National Stroke Foundation 2005 (www.strokefoundation.com.au).

Connor MD, Walker R, Modi G, Warlow CP. Burden of stroke in black populations in sub-Saharan Africa. *Lancet Neurol* 2007; 6: 269-278.

Duncan PW, Zorowitz R, Bates B, *et al*. Management of adult stroke rehabilitation care: a clinical practice guideline. *Stroke* 2005; 36: 100-143.

Shah MV. Rehabilitation of the older adult with stroke. *Clin Geriatr Med* 2006; 22: 469-489.

Singh S, Hamdy S. Dysphagia in stroke patients. *Postgrad Med J* 2006; 82: 383-391.

Stroke Unit Trialists' Collaboration. Collaborative systematic review of the randomised trials of organised inpatient (stroke unit) care after stroke. *BMJ* 1997; 314: 1151-1159.

Walsh K. Management of shoulder pain in patients with stroke. *Postgrad Med J* 2001; 77: 645-649.

Ward NS. Mechanisms underlying recovery of motor function after stroke. *Postgrad Med J* 2005; 81: 510-514.

In a nutshell

- Rehabilitation is the process that stimulates activity-driven reorganisation of the brain after stroke and is aimed at restoring function.
- Dysphagia after stroke causes aspiration, malnutrition and dehydration.
- Speech therapy evaluation facilitates management of dysphagia and communication disorders.
- Incontinence generally improves and can be managed with an appropriate bladder and bowel routine.
- Fall prevention strategies after stroke should allow maximal activity levels.
- Shoulder pain is best managed by strategies aimed at preventing trauma and ensuring correct positioning.
- All post-stroke patients should be monitored for mood disorders and cognitive impairment.
- Occupational therapy plays an important role in functional integration of stroke survivors into the community.