Visual effects and rehabilitation after stroke

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What is a stroke?
A stroke occurs when there is an interruption to blood flow to the brain either because of a blood clot blocking the blood vessel or a haemorrhage in the brain\(^1\). Strokes can cause signs which are obvious, such as loss of speech, drooping of one side of their face, or weakness or paralysis of the arm and/or leg on one side of the body\(^1\). The vision is affected in about two thirds of people who have had a stroke, but this is often not obvious to the patient or their carers. For example, someone who has weakness down one side may bump into things or not eat all the food on their plate, not realising that this may also be because they have visual field loss\(^2\).

What causes a stroke?
A stroke (or cerebrovascular accident, CVA) is the result of a blocked blood vessel in the brain (thrombosis or embolus), or haemorrhage into the brain\(^1\). Strokes are more likely in the elderly, and those who have high blood pressure, diabetes or cardiovascular disease.

Types of visual loss in people who have had a stroke
There are four ways in which vision can be affected because of stroke:

1. Loss of central vision
2. Visual field loss
3. Visual perceptual abnormalities
4. Eye movement abnormalities

These may occur in isolation but more frequently occur in combination\(^3\).

Problems with central vision are quite common in after a stroke. The symptoms include blurred or altered vision. In many the vision improves, but it can be permanent.

Visual field loss occurs in up to half of people with a stroke, with the commonest defect being homonymous hemianopia in which vision is lost in the right or the left visual fields\(^4\) (see below; figure 1). Patients may not be aware of this, and bump into doorframes or trip over things on the affected side. Reading can also be difficult (figure 2).

Figure 1: Right homonymous hemianopia: the right hand field of view is lost in both eyes.
Visual perceptual deficits are many and varied affecting about a third of people with a stroke. Problems that may develop include neglecting one side of their body; difficulty recognising faces or objects, or difficulties with colour vision, depth perception and motion.

Eye movement abnormalities can also be varied, including strabismus (misaligned eyes), difficulty in converging the eyes to look at near objects, or double vision due to the cranial nerves which control eye movement being affected. Typical symptoms include double vision, or jumbled, blurred and/or juddery vision (figure 2).

Figure 2: Impact of double vision (central image) and right hemianopia (right image) on reading

Impact
Blurred vision, double vision and loss of visual field are significant symptoms that impair daily functioning. The patient or their close relatives may report that they frequently bump into objects like door frames; they have difficulty finding things on surfaces; are unsure of their footing while walking and stumbles; may leave food uneaten on one side of the plate; and have difficulty with reading. Other impacts on the quality of life include loss of confidence, fear of falling, fear of going out alone, social isolation and loss of independence.

How to assess visual function in someone who has had a stroke
Examination for visual loss is essential for stroke survivors. There are various assessment tools which can be used to examine visual function after a stroke:

- UK National Clinical Guidelines for Stroke: [https://www.rcplondon.ac.uk/guidelines-policy/stroke-guidelines](https://www.rcplondon.ac.uk/guidelines-policy/stroke-guidelines)
- UK Stroke Association stroke/vision factsheet: [https://www.stroke.org.uk/what-stroke/common-problems-after-stroke/vision-problems](https://www.stroke.org.uk/what-stroke/common-problems-after-stroke/vision-problems);

Management
Treatment options aim to restore visual function to as normal as possible. For eye movement abnormalities, prisms and patching one eye can be effective in reducing double vision. For visual field loss a Cochrane systematic review reports favourable evidence of visual scanning training, which aims to compensate for the visual field loss. It is available as a paper training option ([www.strokevision.org.uk](http://www.strokevision.org.uk)) or through computer training ([www.eyesearch.ucl.ac.uk](http://www.eyesearch.ucl.ac.uk); [www.readright.ucl.ac.uk](http://www.readright.ucl.ac.uk)).
Stroke survivors with persistent impairment of central vision may be helped by low vision services which can include, magnifiers, reading aids, computerised adaptations and improved lighting\(^{12}\). Furthermore, simple adaptations can be made by stroke survivors such as using large print, ensuring good lighting at home, putting labels or coloured stickers on cooking equipment, decluttering areas and having a companion when going out, particularly in busy, crowded places\(^{10}\).

**Conclusion**

Post stroke difficulties in visual functioning are an under-recognised problem that cause significant impact to the quality of life of stroke survivors. Assessment and management are best provided as part of a multi-disciplinary team on hyper-acute and acute stroke units, neuro rehabilitation units, community care and eye departments. This promotes good communication of the individual patient visual issues, their needs and can highlight ways in which to maximise remaining visual function.

A careful history about visual problems (also from close relatives) followed by an examination of visual acuity, eye movements and visual field are important in understanding the limitations in visual functioning.

Management should be tailored to the individual and their visual difficulties in functioning; it requires patience and perseverance on the side of the client, relatives and the health provider. The ageing population globally, despite improvement in stroke prevention and acute stroke management, will result in more stroke survivors with visual impairment requiring care. A further consideration is that about one quarter of stroke survivors are of working age. Promoting a sustained return to work is important to continued recovery and rehabilitation but is not without considerable difficulty in adapting to the work place environment.

The public need to be aware that visual impairment is a common consequence of stroke but may not be outwardly obvious. Clinicians must be aware of the care they can provide. Policy makers must recognise the important of providing stroke/vision services with the aim to reduce impact to patient lives.
References

All webpages accessed 30th January 2017


