

Post-stroke visual impairment: how big is the problem, how do we identify it, what we can do about it, and why does it matter?

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In the UK, 100,000 new strokes occur each year, with 1.3 million stroke survivors [1]. This article will focus on post-stroke visual impairment, discussing topics of how common it is, how it can be detected, possible management options and how it impacts stroke survivors.

Incidence and prevalence

Visual impairment after stroke is a common occurrence. The incidence has been reported by a multi-centre epidemiology study as 60% for stroke survivors and a point prevalence of 73% [2]. There are a wide variety of types of visual impairment which can occur post-stroke which can be grouped in four categories; reduced central vision, visual field loss, ocular motility defects and visual perception deficits [2]. Visual field loss, specifically homonymous hemianopia, commonly appears in the literature however it is the third most common category of visual impairment post stroke with a prevalence of 28% [2,3]. The most common type of visual impairment is central vision loss followed by ocular motility defects [2].

Assessment

It has been recently reported that a large proportion (40%) of those with an identified post-stroke visual impairment do not or cannot report symptoms [4]. This highlights the need for routine objective screening for visual impairment post stroke and that symptom reporting cannot be relied on. The national clinical guideline for stroke currently recommends that all stroke survivors should receive an assessment of their visual acuity, visual field loss and ocular motility [5]. There are currently tools available to improve post-stroke visual impairment screening at various stages along the care pathway by any member of the multidisciplinary team [6-8]. The V-FAST tool is a two-minute screen which covers all four categories of post-stroke visual impairment [8]. It was developed for use by ambulance staff, however could also

have a place in accident and emergency (A&E) departments to improve diagnosis of posterior circulation stroke. Posterior circulation strokes have been shown to have a delayed treatment time which is speculated to be due to reduced recognition of the signs and symptoms on multiple fronts; A&E staff, paramedics and the general public [9]. The National Institute for Health Stroke Scale (NIHSS) is commonly used to assess for stroke sequelae; in terms of vision, this tool includes only visual field loss and horizontal ocular movements [10].

Identifying visual impairment as soon as possible in the patient pathway is crucial to allow rehabilitation to be optimised and adapted for the visual difficulty present [11]. Within the national clinical guidelines for stroke, orthoptists are listed as core members of the multidisciplinary team [5]. Whilst the provision of orthoptic stroke services on stroke units (48% of responding departments) is improving, they are not yet available in all hospitals, with 46% of responding departments performing assessments in eye clinic or ad hoc visits to the stroke unit [12]. In the absence of orthoptists to assess all stroke survivors, the multidisciplinary team need to take on vision screening. A systematic review in 2016 identified no standardised vision screening tools for post-stroke visual impairment [13]. Since then, two freely available screening tools developed for this population have become available [6,7]. The StrokeVision app screens visual acuity, visual fields and visual attention, with a reported sensitivity of 79% and specificity of 82% [6]. The Visual Impairment Screening Assessment (VISA) tool, available in print and app versions, screens visual acuity, ocular alignment, ocular motility, visual fields and visual perception, with a reported sensitivity and specificity of 88% and 87% [7].

In terms of timing of screening and assessment, a multi-centre epidemiology study demonstrated it was possible to screen new stroke admissions for visual

impairment in a median of three days and undertake a full visual assessment in a median of four days [1]. With 17% being screened in the hyperacute phase (0-24 hours post stroke) increasing to 71% by the end of the acute phase (one to seven days post stroke) [1].

Management

Several Cochrane systematic reviews have outlined management options for the variety of different post-stroke visual impairments supported by high-quality evidence [14-16]. The most recent Cochrane review in this area to be updated has been that related to post-stroke visual field loss [14]. This review concluded that there is insufficient evidence in favour of Peli prisms or visual restoration therapy, while some low-quality evidence Peli prisms have an increased risk of adverse events [14]. However, a new addition to this update, compensatory scanning training improves quality of life in comparison to control or placebo [14]. The effectiveness of eight different rehabilitation methods for inattention remain unproven for improving functional ability in activities of daily living, including visual interventions and prism adaptation based on a very recent Cochrane review [15]. The Cochrane review on post-stroke ocular motility defects has not been updated since 2011, in which only two studies related to the pharmacological treatment of nystagmus were included, therefore no conclusions were reached [16]. However, not all management options are supported by randomised control trials. These are summarised in a systematic review of treatment options for post-stroke visual impairment and include compensatory techniques and substitutive methods [17]. Many of the options for management of ocular motility defects have been researched using non-stroke populations, such as prisms, occlusion and surgical options for the longer term, therefore do not appear in the Cochrane review [17]. Management options vary across the different types of post-stroke

visual impairment, however, reading difficulties cuts across the range of different visual impairments post stroke and the management of this symptom regardless of the cause has similar options, which include typoscopes, line-guides, use of lighting and alternative reading strategies e.g., vertical reading, steady eye [17]. The importance of advice and information specific to the individual's condition, certificate of visual impairment and driving have also been highlighted [17,18].

Registration of visual impairment can convey benefits to the individual. It is especially relevant to stroke survivors with visual field loss [19]. It has been reported that there have been increasing registrations of visual impairment due to stroke, however this still underrepresents the cause of visual impairment based on the estimate of new post-stroke homonymous hemianopia per annum [19].

Impact

Post-stroke visual impairment can severely impact functional ability and quality of life, with an increased risk of falls and loss of confidence [3,18]. Stroke survivors of working age can face difficulties in returning to their previous role [18]. A systematic review of studies which included a quality-of-life measure reported consistent findings from generic instruments that stroke survivors with visual impairment have a poorer quality of life than other stroke-related impairments and other medical conditions [3]. The presence of more than one type of visual impairment reduced quality of life further [3]. Studies comparing post-stroke visual impairment with other ophthalmic conditions, such as glaucoma, found that stroke survivors reported a poorer quality of life [3]. However, early identification and advice on compensatory strategies can make a positive impact on quality of life [18].

One big impact of visual impairment post stroke is the legal limitations on driving [18]. In the UK, all stroke survivors cannot drive for a minimum of one month post stroke, although in the presence of persistent defects this is extended [20]. There are potential options for returning to driving under exceptional case rules which exist for both visual field loss and diplopia, both of which are pertinent to stroke, as it is a non-progressive condition [20].

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TAKE HOME MESSAGE

- Post-stroke visual impairment is a common problem.
- It is possible to screen and fully assess for post stroke visual impairment early after stroke onset.
- There are lots of possible management options, although very few are supported by the strongest levels of evidence.
- Visual impairment post stroke does have an impact on quality of life, however early identification and management can have a positive effect.

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