

Final report summary:

Can rehabilitation help with visual field loss after stroke?

The VISION trial
(Vision In Stroke: Intervention Or Not)

Pilot RCT of two methods of visual rehabilitation versus standard care on functional outcomes for stroke survivors with homonymous hemianopia

Why did we fund this research?

As a result of stroke, an individual may lose half of their visual field in either the left or the right eye. This is called 'homonymous hemianopia' and affects up to half of all stroke survivors¹.



Artist's impression of homonymous hemianopia

Homonymous hemianopia can have a direct impact on how someone is able to function, with an increased risk of falling, impaired ability to read and inability to judge distances. It may therefore impact upon their ability to participate in rehabilitation, to live in their own home, and upon their levels of depression, anxiety, and social isolation, leading to a significant reduction in their quality of life.

Visual rehabilitation techniques are available to help people with homonymous hemianopia after stroke. However, they are not used consistently across stroke services within the NHS, and there is limited evidence supporting their usefulness. Furthermore, although potentially cheap to administer no study has investigated how cost-effective they are to deliver within the NHS.

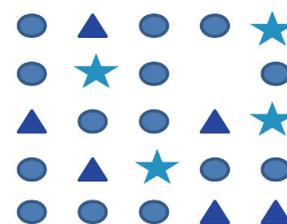
There is therefore a clear need for robust clinical trials to answer whether or not visual rehabilitation techniques are more effective than current standard care to patients (offering them advice only), and whether they are cost-effective for the NHS.

The VISION trial was a pilot randomised controlled trial (RCT) to compare the use of two visual rehabilitation techniques (visual search training or 'monocular prism' treatment) with standard care. Its aims were to determine the effects of the two techniques on the visual field of stroke patients with homonymous hemianopia and their general quality of life. Training with visual search exercises involves training the person to make more

effective eye movements into the side of their visual loss so that they compensate better for this side. This can simply involve patients transferring gaze quickly between printed targets on an A4 visual search card.

Example of a visual search card

'Monocular' prism glasses incorporate prism lenses over one eye only, shifting images of the outside peripheral vision into the seeing part of the visual field of that eye, images which would otherwise fall onto its blinded visual field and not be seen.



Monocular prism glasses

The main outcome measure of the VISION trial was the change in size of the area of visual field of participants, between their initial (baseline) assessment and their last assessment 26 weeks later, and whether this differed between the participants who received either visual rehabilitation technique or standard care.



A number of secondary outcomes were also measured including vision-related quality of life and visual function (measured using the Visual Function Questionnaire), participants' mobility and their ability to perform activities of daily living and general health.

What did the researchers do?

Screening

From May 2011 to September 2013, 1171 stroke survivors were reviewed whilst they were in-patients at 14 NHS Trusts involved in recruitment to the trial. Out of these 1171 participants, 993 (85%) did not meet the inclusion criteria, 91 declined to take part (8%) and 87 were recruited into the trial (7%).

Randomisation

Eighty-seven participants recruited into the trial were randomised into three groups. Twenty seven participants were allocated to intervention group A (to receive monocular prisms) and 30 participants were allocated to intervention group B (visual

search training). Thirty participants were allocated to the control group C (standard care, consisting of advice only).

During the course of the trial, withdrawal of participants from the trial was accounted for along with loss to follow-up. At the end of the trial, final and complete results were available for 24 participants in group A, 25 participants in group B and 22 participants in group C.

What did the research find?

At the first (baseline) assessment, the demographics of all participants across all three groups were compared. The average age and range of ages in each group were similar. Most participants were male (70%) and there were slightly more male participants in group A (monocular prisms) than group B (visual search). Most participants were of white ethnicity (98%).

Participants were randomised to their respective groups at approximately 11 weeks after their stroke. Most had ischaemic stroke (95%) in all three groups. The stroke affected the left side of the brain in 44%, the right side of the brain in 54% and both sides of the brain in 2% of participants. Across all three groups there were similar values for the side (right versus left) and extent (partial versus complete visual field loss) of homonymous hemianopia.

At least one complication (adverse event) was experienced in 18 participants (69 %) in group A (monocular prisms), this was usually headache. Only two participants (7%) experienced a complication in group B (visual search), this was fatigue and headache. No complications were recorded for participants allocated to group C (standard care).

As the main outcome of the trial, the average change in the size of the participants' visual field at the 26 week final assessment was an increase of about 5% for group A (prisms), 8% for group B (visual search) and 3.5% for group C (standard care). No significant differences were observed between these changes of visual field.

However, for the secondary outcomes of the trial, visual function (and vision related quality of life) improved at 26 weeks in group B (visual search)

when compared to group A (monocular prisms) and group C (standard care). No differences were found for any other secondary outcomes.

Clinical implications

This trial showed there to be little improvement in the size of participants' visual field between the two treatment groups and the standard care (advice only) group.

Group A (monocular prisms) had the greatest number of complications which typically included headaches and confusion of vision. Such complications could act as a barrier for patients to continue use of prism therapy. Group B (visual search training) had a significant improvement in vision-related quality of life.

Future research aims to concentrate on visual search training as a treatment option for post-stroke homonymous hemianopia.

Publications

The protocol, outlining how this trial was conducted, was published in the journal, *BMJ Open* in July 2014², and the screening process and recruitment figures were published in the journal, *Neuro-Ophthalmology* in January 2016³.

References

1. Rowe, Fiona J., Marion Walker, Janet Rockliffe, Alex Pollock, Carmel Noonan, Claire Howard, Richard Glendinning, Rachel Feechan, and Jim Currie. "Care provision for poststroke visual impairment." *Journal of Stroke and Cerebrovascular Diseases* 24, no. 6 (2015): 1131-1144.
2. Rowe FJ, Barton PG, Bedson E, et al. A randomised controlled trial to compare the clinical and cost-effectiveness of prism glasses, visual search training and standard care in patients with hemianopia following stroke: a protocol. *BMJ Open*. 2014;4(7):e005885. doi:10.1136/bmjopen-2014-005885.
3. Rowe FJ, Conroy EJ, Barton PG, et al. A randomised controlled trial of treatment for post-stroke homonymous hemianopia: screening and recruitment. *Neuro-ophthalmology*. 2016;40(1), 1-10. doi:10.3109/01658107.2015.1126288.

What does this mean for stroke survivors?

The use of prism glasses as a treatment for post-stroke homonymous hemianopia is associated with the complications of headache and visual confusion.

Visual search training significantly improved participants' vision-related quality of life, and future research will focus on this treatment option for post-stroke homonymous hemianopia.

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