Vision and Stroke

Arani Nitkunan

February 28th 2017
London Stroke Nurses Study Day
St Mary’s
Objectives

• Neuroanatomy
  13.1 Describe the basic anatomy of the visual system and the way in which visual information is processed

• Assessment
  13.2 List the ways in which a stroke may affect an individual's vision and understand the impact these may have on their function

• Management
  13.3 Demonstrate an understanding of the differences between visual inattention and hemianopia

• Audit
  13.4 Describe common strategies used with each type of visual impairment and demonstrate their use in clinical practice
  13.5 Describe what is meant by the term perception and provide examples of how a patient with perceptual impairments might present
Incidence of visual problems in stroke
Visual impairment following stroke: do stroke patients require vision assessment?

Fiona Rowe¹, Darren Brand², Carole A. Jackson², Alison Price³, Linda Walker⁴, Shirley Harrison⁵, Carla Eccleston⁶, Claire Scott⁷, Nicola Akerman⁸, Caroline Dodridge⁹, Claire Howard¹⁰, Tracey Shipman¹¹, Una Sperring¹², Sonia MacDiarmid¹³, Cicely Freeman¹⁴

- 1 year multi-centre prospective observational study
- 323 patients with suspected visual difficulty were recruited - limitation
- 8% had normal vision
Visual impairment following stroke: do stroke patients require vision assessment?

- Low vision: 26.5%
- Eye movement problem: 68.4%
- Visual field impairment: 49.5%
- Perceptual deficit: 20.5%
Eye Movement Problem
52 year old man
Management

• Anti-platelets

• Vascular risk factor management
  – Hypertension, diabetes, hypercholesterolaemia, smoking, alcohol, vascular stenosis, atrial fibrillation
Management of double vision

– Prisms, occlusion, advice on scanning, tracking
Visual Field Problem
O/E

VA
6/6
R

Fundi

Fields
6/6
L
Snellen chart
O/E

- Left homonymous hemianopia
O/E

VA

R
6/6

Fields
normal

L
6/6

Fundi
normal
Exceptional cases
GROUP 1 drivers who have previously held full driving entitlement, removed because of a field defect which does not satisfy the standard, may be eligible to reapply to be considered as exceptional cases on an individual basis, subject to strict criteria:

- The defect must have been present for at least 12 months
- The defect must have been caused by an isolated event or a non-progressive condition
- There must be no other condition or pathology present which is regarded as progressive and likely to be affecting the visual fields.
- The applicant has sight in both eyes
- There is no uncontrolled diplopia
- There is no other impairment of visual function, including glare sensitivity, contrast sensitivity or impairment of twilight vision.
- There is clinical confirmation of full functional adaptation
Management of visual problems

• Refer to eye clinic / orthoptist
  – Register visually impaired
Management of visual field defect

- formal assessment
- awareness
- head movements
- scanning strategies
- eccentric viewing

Visual field loss increases risk of falls.
Doesn’t alter loss but changes speed of adaptation
## Management of visual field defect

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Study design</th>
<th>Outcomes</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prisms</td>
<td>1 small RCT</td>
<td>Visual perception tests and Barthel ADLs</td>
<td>Improvement visual perception tests, no improvement ADLs</td>
</tr>
<tr>
<td></td>
<td>4 non-control longitudinal</td>
<td>Clinical adherence</td>
<td>&gt;60% at 2 months, &gt;40% at 8 months (mean)</td>
</tr>
<tr>
<td>Eye movement therapy</td>
<td>2 small RCTs</td>
<td>Visual scanning letter cancellation</td>
<td>Statistically significant improvement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visuo-spatial matching tests</td>
<td>Statistically significant improvement</td>
</tr>
</tbody>
</table>
Optokinetic therapy improves text reading in patients with hemianopic alexia
A controlled trial  NEUROLOGY 2007;68:1922-1930

text reading fixations – normal subject
36 fixations 45 words: ratio = 0.8

text reading fixations – hemianopic alexia
93 fixations 45 words: ratio = 2.1
Optokinetic therapy improves text reading in patients with hemianopic alexia
A controlled trial

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R.J.S. Wise, FRCP
S.A. McDonald, PhD
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ABSTRACT Objective: An acquired right-sided homonymous hemianopia can result in slowed left-to-right text reading, called hemianopic alexia (HA). Patients with HA lack essential visual information to help guide ensuing reading fixations. We tested two hypotheses: first, that practice with a visual rehabilitation method that induced small-field optokinetic nystagmus (OKN) would improve reading speeds in patients with HA when compared to a sham visual rehabilitation therapy; second, that this therapy would preferentially affect reading saccades into the blind field. Methods: Nineteen patients with HA were entered into a two-armed study with two therapy blocks in each arm: one group practiced reading moving text (MT) that scrolled from right to left daily for two 4-week blocks (Group 1), while the other had sham therapy (spot the difference) for the first block and then crossed over to MT for the second. Results: Group 1 showed significant improvements in static text reading speed over both therapy blocks (18% improvement), while Group 2 did not significantly improve over the first block (5% improvement) but did when they crossed over to the MT block (23% improvement). MT therapy was associated with a direction-specific effect on saccadic amplitude for rightward but not leftward reading saccades. Conclusion: Optokinetic nystagmus inducing therapy preferentially affects reading saccades in the direction of the induced (involuntary) saccadic component. This is the first study to demonstrate the effectiveness of a specific eye movement based therapy in patients with hemianopic alexia (HA) in the context of a therapy-controlled trial. A free Web-based version of the therapy used in this study is available online to suitable patients with HA. NEUROLOGY 2007;68:1922-1930
Rehabilitation site
http://www.readright.ucl.ac.uk/

Read-Right Hemianopic Alexia Therapy
UCL Institute of Neurology | UCL Multimedia

Welcome to Read-Right

Read-Right aims to provide free rehabilitation to patients with Hemianopic Alexia. This is a specific reading disorder related to visual impairment usually caused by a stroke or head injury.

PATIENT

Free Therapy
Read-Right provides a free downloadable therapy which can help to improve reading speeds in patients with Hemianopic Alexia.

Get started now!
Try Demo version

FIND OUT MORE

- About Read-Right
- Read-Right Account
- Reading Test
- Visual Field Test
- Read-Right Therapy
- Read-Right FAQ
- Contact Us

The Read-Right project is funded by The Stroke Association
www.stroke.org.uk
Demo: therapy
Results after 20 hours of therapy

N = 11
P = 0.023

50%
Evidence for management of visual problems in stroke

- 87 patients recruited with hemianopia within week 2 and month 6 of stroke
- Randomly assigned to:
  - Prisms
  - Visual search training
  - Information only (control)
  - Outcomes of visual field assessments and quality of life measured at week 6, 12, 26

Rowe et al Neuro-Ophthalmology 2016
Perceptual Deficit - Visual Neglect

Li & Malhotra *Practical Neurology* 2015
Visual Neglect

Li & Malhotra *Practical Neurology* 2015
Management of visual neglect

• Scanning strategies
• Compensatory head postures
• Awareness

No consensus
Visual rehabilitation

• Orthoptist
• Eye clinic liaison officer
Improving detection and management of visual symptoms after stroke - an audit

Akin Nihat¹, Jayesh Khistria², Lucy Reynolds¹, Arani Nitkunan¹

¹St. George’s Hospital, London, ²Moorfields Eye Centre at St. George’s Hospital

Visual problems in stroke

1. Visual field defect: 20%
2. Visual neglect: 65-82% (hemispheric stroke)
3. Diplopia: 40%
   • Adversely affects activities of daily living, rehabilitation and mood (Rowe 2014)

Recommendations

Department of Health National Stroke Strategy:
• Vision post-stroke requires specific rehabilitation and support

British & Irish Orthoptics Society:
• Refer all patients with visual symptoms in the immediate post-acute phase

Preceding audit

Retrospective 2-week audit of local orthoptics referrals in unselected Hyper-acute Stroke Unit patients (n = 26), October 2013.

62% had visual symptoms
6% of these referred for orthoptist assessment
25% of these had documented MDT measures to aid vision

Intervention

1. Joint screening/referral form
2. Added to weekly multidisciplinary team meeting on Acute Stroke Unit

Intervention Aims

1. Improve detection/documentation of visual symptoms
2. Increase number of appropriate referrals to local orthoptics service

Results

Retrospective 1 month audit of local orthoptics referrals in unselected Acute Stroke Unit patients (n = 55), December 2014.

50% of patients referred required intervention (visual aids, prisms, community support)

Discussion & Future work

• Screening/referral form was completed exclusively by doctors
• The referral process has now been changed to allow any allied health professional to complete the referral, to increase uptake (Pollock 2011)
• Continue education to multi-disciplinary team about referrals for visual symptoms post-stroke

References

3. NICE. Stroke rehabilitation: the rehabilitation and support of stroke patients. July 2011
# BIOS referral form

## REFERRAL FOR ORTHOPTIC EXAMINATION

### PATIENT DETAILS

<table>
<thead>
<tr>
<th>Name:</th>
<th>DOB:</th>
<th>Current ward / department:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>Insert hospital sticker</td>
<td>Consultant name:</td>
</tr>
<tr>
<td>Telephone:</td>
<td></td>
<td>Hospital number:</td>
</tr>
<tr>
<td>Next of kin / alternative contact number:</td>
<td></td>
<td>NHS number:</td>
</tr>
</tbody>
</table>

### DETAILS OF CONDITION

<table>
<thead>
<tr>
<th>Date of onset:</th>
<th>Clinical diagnosis:</th>
</tr>
</thead>
</table>

### MRI / CT date and report:

### OCULAR SYMPTOMS

<table>
<thead>
<tr>
<th>Double vision</th>
<th>Reading difficulties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blurred / reduced vision (with glasses worn)</td>
<td></td>
</tr>
<tr>
<td>Visual field loss</td>
<td>Visual hallucinations</td>
</tr>
<tr>
<td>Visual awareness issues</td>
<td></td>
</tr>
<tr>
<td>Other (specify):</td>
<td></td>
</tr>
</tbody>
</table>

Refer if positive for any symptoms / signs

### OCULAR SIGNS

<table>
<thead>
<tr>
<th>Squint / turn of eyes</th>
<th>Ptosis (lid droop)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defective eye movements</td>
<td>Abnormal pupils</td>
</tr>
<tr>
<td>Nystagmus (wobbling eyes)</td>
<td>Head turn</td>
</tr>
<tr>
<td>Visual inattention / neglect</td>
<td>Family concerns</td>
</tr>
<tr>
<td>Closing one eye</td>
<td>Misjudging distance</td>
</tr>
<tr>
<td>Suspected visual problem</td>
<td>Other (specify):</td>
</tr>
</tbody>
</table>

### OCULAR HISTORY

Are there any known pre-existing ocular conditions, e.g. cataract, glaucoma, retinopathy, macular degeneration, sight impaired registration? Note: this information is not a deterrent to referral.

### GLASSES

<table>
<thead>
<tr>
<th>Does the patient usually wear glasses?</th>
<th>Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the patient need glasses?</td>
<td>Y/N</td>
</tr>
<tr>
<td>Does the patient have their glasses with them?</td>
<td>Y/N</td>
</tr>
</tbody>
</table>

### GENERAL INFORMATION

Indicate the level of basic functioning and cognition, and the presence of communication and general physical difficulties.

<table>
<thead>
<tr>
<th>Can the patient walk to the eye clinic or come by wheelchair?</th>
<th>Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the patient require a ward visit?</td>
<td>Y/N</td>
</tr>
<tr>
<td>Is the patient ready for immediate assessment?</td>
<td>Y/N</td>
</tr>
<tr>
<td>Interpreter required? (specify language)</td>
<td>Y/N</td>
</tr>
</tbody>
</table>

### EXPECTED DISCHARGE

Expected date of discharge: 
Where discharged to: 

### SIGNED

Signed:  
Date:  

### PRINT NAME

Print name:  

### CONTACT DETAILS OF REFERRER

Contact details of referrer:  

Referrer Designation / Profession:  

Please complete as much of this form as possible.
Take Home Message

Increased awareness of visual problems in stroke

Questions?

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