Screening for spatial neglect in a ward-based environment within two weeks from stroke onset: Preliminary results of a pilot Study

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No relevant financial relationship exists
Neglect - definition

• Neglect occurs approximately in half of those who have suffered a stroke in the right brain hemisphere (Azouvi et al. 2002; Bowen et al. 1999)

• Defined as: “... *the failure to report, respond, or orient to meaningful or novel stimuli presented in a portion of space when this failure cannot be accounted for by either an elemental sensory or motor defect*“ (Heilman, 2009, pg. 201)
Defective symptoms

- Defective symptoms – loss of function or absence of behaviour or response
  1. Perceptual neglect – problems with “input”
  2. Motor neglect – problems with “output”
  3. Personal neglect
  4. Representational/imaginary neglect
- Transposition of left sided event into the right (allosthesia)
- Ignorance and unconcern regarding personal disabilities (anosognosia)
Defective test solutions

- a. Original drawing
- b. Patient copying
- c. Line bisection
- d. Star cancellation
- e. Clock drawing
- f. Clock drawing
Productive symptoms

- Productive symptoms – generation of “new” but non-reality-fitting behavior (Bottini et al., 2009)
  1. Delusions with regard to own body (somatoparaphrenia)
  2. Inappropriate iteration of behaviour or experience (perseveration)

![Diagram of line copying, line bisection, line crossing, and star cancellation tasks]

\[a. \text{Figure copying} \quad b. \text{Line bisection} \quad c. \text{Line crossing} \quad d. \text{Star cancellation}\]
Method

Neglect tests
♦ Six conventional subtests of The Behavioural Inattention test (BIT)
♦ An additional figure copying test
♦ A newly developed neglect experience questionnaire
♦ An additional component added to the National Institute of Health Stroke Scale (NIHSS)
♦ The Catherine Bergego Scale (CBS) functioned as a reference frame to ascertain the presence of SN

Other data
♦ Demographics
♦ Place of brain damage
♦ NIHSS
♦ smRS
Catherine Bergego Scale – reference standard

- The scale reveals patients’ performance and response to the left in 10 common daily activities, such as eating, grooming, ambulating (collisions), topographical navigation. Each item is rated from 0-3. Higher score indicates more severe SN. Cut-off point ≥ 3
Participants and setting

Consecutive stroke patients (N=125) were included from the Neurological Department of Landspitali University Hospital in Iceland, within two weeks following stroke. Last follow up data collected September 2018.

The visuo-graphic tests were administered in the following order: Alberts test, star cancellation, figure copying, line bisection, letter cancellation, figure and shape copying and representational drawing.

Context: Acute neurological department. The catchments area is approximately 245,000 people out of the Icelandic population of 360,000 people.
### Participant characteristics

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total n=125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age years: mean (SD)</td>
<td>69.66</td>
<td>(13.22)</td>
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<tr>
<td>Range</td>
<td>26-95</td>
<td></td>
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<tr>
<td>Gender (n=124, %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>67</td>
<td>(54.0)</td>
</tr>
<tr>
<td>Female</td>
<td>57</td>
<td>(46.9)</td>
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<tr>
<td>Type of stroke (n=125, %)</td>
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<td></td>
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<tr>
<td>Hemorrhagic</td>
<td>8</td>
<td>(6.4)</td>
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<tr>
<td>Ischemia</td>
<td>117</td>
<td>(93.6)</td>
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<tr>
<td>smRS prior to stroke (n=125,%)</td>
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<tr>
<td>None-slight disability</td>
<td>110</td>
<td>(88.0)</td>
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<tr>
<td>Moderate-severe disability</td>
<td>15</td>
<td>(12.0)</td>
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<tr>
<td>Employment status prior to stroke, (n=122, %)</td>
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<tr>
<td>Fulltime</td>
<td>40</td>
<td>(32.8)</td>
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<tr>
<td>Part-time</td>
<td>44</td>
<td>(36.1)</td>
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<tr>
<td>Unemployed</td>
<td>38</td>
<td>(31.1)</td>
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<tr>
<td>Handedness*, (n=124, %)</td>
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<tr>
<td>Right</td>
<td>110</td>
<td>(88.7)</td>
</tr>
<tr>
<td>Left</td>
<td>12</td>
<td>(9.7)</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>(1.6)</td>
</tr>
</tbody>
</table>

*Edinburgh Handedness Inventory*
Patients with right-sided neglect had more severe stroke (NIHSS) than those with left-sided neglect (p=0.000)
Neglect experience

• Asked patients an open question about their experience of the stroke

• 14 patients with neglect, did not at stroke onset, comprehend why they had to go to the hospital and gave “bizarre stories” in comparison to patients without neglect

• Example: Does not recognize own paralysis – does not comprehend that anything is wrong
Conclusion

- Results contests the common belief that use of more tests increase identification of SN. Rather we found that the use a large test battery decreases sensitivity in the subacute phase following stroke.
- A short question about patients’ experiences of stroke onset and adding a novel item to the NIHSS provides new pragmatic ways of identifying SN.
- Results have been used to inform a larger cross-country study between Iceland and Lithuania, where psychometric properties of screening strategies are being further validated and tested in 1000 stroke patients.
Acknowledgements, funding, ethical approval

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- **Ethical approval** Provided by The Ethics Committee of the National University Hospital of Iceland (35/2016) and permission was obtained from the Data Protection Authorities. This approval follows the declaration of Helsinki.