Emotion recognition impairments after right-hemisphere stroke – an important factor for long-term outcomes?

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Disclosures

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RH stroke is closely associated with emotion recognition impairments

- Emotion recognition impairments are common after RH stroke (prevalence near 50%), and more common after RH than LH stroke (e.g., Spalletta et al., 2001)
- RH lesion status is better predicted by difficulties in emotional prosody recognition than by evidence of neglect (Dara et al., 2014)
- Caregivers most frequently report the stroke survivor’s apparent loss of empathy as one of the “top 5” problems after RH stroke (Hillis & Tippet, 2014)

The case for a link to stroke outcomes

- Emotion recognition impairments are associated with poor social support (e.g., Posse et al., 2002; Knox & Douglas, 2008)
- Social support is a key determinant of health (Uchino, 2006)
  - mortality (McKee & Syme, 1979; Hell-Lundstad et al., 2015)
  - functional status (Newsome & Schulz, 1996)
  - likelihood of institutionalization (Steinbach, 1992)
  - quality of life (Newsome & Schulz, 1996)
  - stroke recovery (Etzioni et al., 2002; Glass et al., 1993; Tsouna-Hadjis et al., 2000)

Participants

Inclusion criteria:
- Age > 30
- RH stroke(s) > 1 year prior to testing

Exclusion criteria:
- Neurological diagnoses or major medical conditions (other than stroke)
- (pre-stroke) non-independence
- RH stroke affecting the LH
- Inability to comply with study procedures
- Only MRI-eligible participants completed the fMRI part of the study

Geneva Emotion Recognition Test

14 “emotions”, 3 trials each = 42 trials

Geneva Emotion Recognition Test percent correct

p = 0.05
Activity Card Sort

(Baum & Edwards, 2008, AOTA Press)

- What did they do prior to stroke?
- What of that are they doing less or not at all anymore?

Examples of social activities (total N=17):
- Family gatherings
- Talking on the telephone
- Dating/Spending time with friends

GERT scores correlate with ACS social after stroke

<table>
<thead>
<tr>
<th>ACS social</th>
<th>Controls</th>
<th>RH stroke survivors</th>
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<tbody>
<tr>
<td>3 years prior (max 17)</td>
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<tr>
<td>GERT-S percent correct</td>
<td></td>
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<tr>
<td>p = 0.34</td>
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<tr>
<td>r = 0.48</td>
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GERT scores correlate with SIS emotional

SIS emotional domain, self report,
Example questions:
In the past week, how often did you…
- Feel sad?
- Feel that there is nobody you are close to?
- Feel that you have nothing to look forward to?

<table>
<thead>
<tr>
<th>Stroke impact scale, emotion domain</th>
<th>RH stroke survivors</th>
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</thead>
<tbody>
<tr>
<td>GERT-S percent correct</td>
<td></td>
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<tr>
<td>p = 0.34</td>
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<td>r = 0.64</td>
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Summary of our pilot study – fMRI data

- Activation for a vocal emotion recognition task is right-lateralized in controls
- Some RH stroke survivors show activation in homotopic areas of the LH
- These LH areas may be potential targets for interventions aiming to improve emotions recognition after stroke, e.g., by combining behavioral training with neurostimulation

Summary of our pilot study – behavioral data

- RH stroke survivors have more difficulty with emotion recognition than matched controls
- Emotion recognition scores after stroke correlate with:
  - Percentage of retained social activities
  - Self-reported emotional status after stroke
- Emotion recognition problems may affect long-term outcomes after RH stroke