Evaluation of the Edinburgh Motor Assessment (EMAS)

Citation for published version:

Link:
Link to publication record in Edinburgh Research Explorer

General rights
Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.
1. Introduction

The Edinburgh Motor Assessment (EMAS) was introduced in 2013 at the Anne Rowling Clinic in Edinburgh as a brief motor screening tool to assess motor dysfuncion in dementia patients. It consists of 33 items, which are rated on a scale of 0 (no impairment) to 3 (significant impairment), and assigned to 1 of 4 motor domains (extrapyramidal, amyotrophic, cerebellar, or complex). EMAS is scored out of 99 points and on the basis of the distribution of data in normal controls an abnormal score is defined as a score higher than 14. On average EMAS takes 6 min to complete in clinical practice, and it has been carried out for 226 patients.

2. Why we need EMAS

(a) Specialist consultants provide information on motor performance significantly more often than GPs and other doctors (χ²(1)=6.36, p=0.012) (n=99). (b) In ~50% of cases where the referral letter indicated no motor impairment, there was significant motor impairment according to EMAS (score > 14). Note significantly more often than GPs and other doctors (χ²(1)=6.36, p=0.012) (n=99).

3. Validation of EMAS

1. Do the 33 items measure the same underlying construct, i.e. motor ability?

Internal consistency was assessed using all EMASes (n=364) → Cronbach’s α = 0.92

2. How good is the agreement between raters?

Interrater reliability was assessed using scores from two different raters (n=91) for each item & the total EMAS score → For items: average Krippendorff’s α = 0.62 → For EMAS total score: p = 0.911**

4. Dimensionality of EMAS

Table: Item vs. Factor Loadings vs. Extracted Communality

<table>
<thead>
<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
<th>Communality</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.230</td>
<td>0.203</td>
<td>0.108</td>
<td>0.122</td>
<td>0.232</td>
<td>0.573</td>
</tr>
<tr>
<td></td>
<td>0.203</td>
<td>0.108</td>
<td>0.122</td>
<td>0.232</td>
<td>0.232</td>
<td>0.573</td>
</tr>
<tr>
<td></td>
<td>0.108</td>
<td>0.122</td>
<td>0.232</td>
<td>0.232</td>
<td>0.232</td>
<td>0.573</td>
</tr>
<tr>
<td></td>
<td>0.122</td>
<td>0.232</td>
<td>0.232</td>
<td>0.232</td>
<td>0.232</td>
<td>0.573</td>
</tr>
<tr>
<td></td>
<td>0.232</td>
<td>0.232</td>
<td>0.232</td>
<td>0.232</td>
<td>0.232</td>
<td>0.573</td>
</tr>
</tbody>
</table>

4.4. Analysis of information on motor performance provided by referral. (a) Specialist consultants provide information on motor performance significantly more often than GPs and other doctors (χ²(1)=6.36, p=0.012) (n=99). (b) In ~50% of cases where the referral letter indicated no motor impairment, there was significant motor impairment according to EMAS (score > 14). Note that all EMAS were carried out within 6 months of the referral (n=48).

6. Conclusions

1. There is much need for EMAS in clinic practice

2. EMAS appears to be a reliable tool with a valid multidimensional format

3. Motor impairments occur in patients with Alzheimer’s disease and frontotemporal dementias, but they do not appear to be diagnosis-specific

References