Longitudinal assessment of the Edinburgh Cognitive and Behavioural ALS Screen (ECAS): Is there a learning effect in ALS patients?

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Background: Cognitive deficits and behavioral changes are well recognized symptoms in ALS. The Edinburgh cognitive and behavioral ALS screen (ECAS) (1,2) has been recently validated in several languages as a fast and easy to administer cognitive screening tool for clinical routine. However, it is unclear how ALS patients perform, if the testing is applied serially.

Objective: To assess if controls and/or patients show a learning effect overtime in the ECAS and if patients show a progression of cognitive or behavioral changes.

Methods: A previously validated Swiss-German version of the ECAS was administered serially in 40 ALS patients and 49 controls. In addition, the frontal assessment battery (FAB) was administered and carer behavior screens were performed.

Results: Twenty-four ALS patients and healthy controls were available for a second ECAS testing. Mean time between the two measurements was 205 days in controls and 195 days in ALS patients. In 15 controls and 17 ALS patients the FAB could be repeated after 6 months. Nine ALS patients performed the ECAS and 5 the FAB for a third time after more than one year. Sixteen carer behavior screens were performed in second and 4 in third testing. Administration of ECAS was complete in all ALS patients at each measurement. The FAB could not completely be applied in several patients after 6 months and more than one year due to motoric deficits. Controls showed a significantly higher overall score (p<0.001) and significantly higher score in several subdomains (ALS-specific p<0.005, ALS-non-specific p<0.017, memory p<0.02, language p<0.025, executive functions p<0.01) except for visuospatial function and fluency after 6 months. ALS patients showed no significant difference in overall scores or any subdomains after 6 months and after one year. The FAB could not detect any significant differences between controls and ALS patients. Behavioral changes were increasingly described in the carer behaviour interviews.
Discussion and Conclusions: The Swiss-German version of the ECAS is a fast and easy to administer cognitive screening instrument and even applicable in later disease stages of ALS. Controls show a significant learning effect in a second testing after 6 months in most domains. By contrast, ALS patients seem to have no learning effect but present with progressive behavioral symptoms during the course of the disease.

**keywords**
- Amyotrophic lateral sclerosis, fronto-temporal dementia, ECAS, learning, cognitive changes

**project**
- Validierung des Edinburgh Cognitive ALS -Screen (ECAS) zur Aufdeckung von kognitiven Beeinträchtigungen oder Verhaltensänderungen bei der Amyotrophien Lateralsklerose (Screening for Cognitive and Behavioural Change in ALS)

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