

A functional imaging study of cognitive emotion regulation in ALS patients

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The perception of emotionally salient, especially aversive stimuli is associated with increased activation in the amygdala. However, amygdala activation can be effectively reduced by will, that is by using cognitive emotion regulation strategies. Moreover, patients suffering from amyotrophic lateral sclerosis (ALS) have been found to be less emotionally responsive compared to healthy controls.

In the proposed study, we aim to determine whether the perception and cognitive regulation of negative emotions are altered in ALS patients. For this purpose, functional magnetic resonance imaging data will be acquired at 7 Tesla from 30 male subjects (ALS patients $n = 15$, healthy controls $n = 15$) while they performed a simple emotion regulation task. The task involves the passive perception of negative ($n = 20$) and neutral stimuli ($n = 20$), and the active detachment from negative stimuli ($n = 20$). Additionally, extensive neuropsychological testing will be carried out and analyzed with respect to functional imaging data in both ALS patients and healthy controls. A special focus of the analyses will be the modulating effects of frontotemporal dementia, which is a frequently observed associated pathology in ALS patients.

We hypothesize that ALS patients will show less amygdala activation following negative versus neutral trials, and that they will need less neural resources to regulate negative emotions in comparison with healthy controls.