

## S31-04 - MAPPING COMPLEX HALLUCINATIONS USING FMRI TO GUIDE RTMS TREATMENT

R. Jardri<sup>1,2</sup>, D. Pins<sup>2</sup>, P. Thomas<sup>1,2</sup>

<sup>1</sup>CHRU de Lille, <sup>2</sup>CNRS UMR-8160, Lille, France

**Background:** Hallucinations are extremely distressing erroneous percepts accompanied by a powerful sense of reality. In schizophrenia, hallucinations were functionally explored in the verbal domain even if they may emerge outside the range of auditory. In the present study, we used advanced-Independent Component Analysis for fMRI-data-sets (ICA) to explore complex hallucinations and define potential rTMS targets beyond the conventional temporo-parietal junction.

**Methods:** 16 adolescents with early-onset schizophrenia and suffering from refractory complex hallucinations were included. They all benefited from a 30-min. rest fMRI examination after which they were accurately interviewed about their psycho-sensory experiences during scanning. Using cortex-based ICA, BOLD signals related to the hallucinatory experience were extracted at the subject level and then submitted to a self-organizing-group ICA procedure to extract clusters at the group-level on the basis of a pure similarity matrix.

**Results:** This method highlighted auditory, visual and multisensory hyper-active clusters after decomposition by random-effect sog-ICA ( $|Z|=2.2$ ;  $p < 0.01$ ). The increased BOLD-signal measured in association sensory areas during hallucinations was concomitant of the de-engagement of the “resting-state” network in hallucinating subjects.

**Discussion:** Data-driven analysis methods for rest-fMRI-data allowed evidencing the neural correlates of complex hallucinations in adolescents with schizophrenia. Despite inter-individual variability, sog-ICA clearly demonstrates that the hallucinatory experience emerges from increased activity within modality-dependent associative sensory cortices and can be fused in cross-modal areas. These brain regions constitute good candidates to guide dimensional treatment of hallucinations like rTMS.