a measure of linguistic demand, the number of words within 20-second epochs was correlated with BOLD responses.

Results: Participants developed S-ketamine-induced psychotic symptoms, particularly positive FTD. Ketamine vs. placebo was associated with enhanced neural responses in the right middle and inferior temporal gyrri. 

Discussion: Similar to a previous fMRI study in schizophrenia patients vs. healthy controls applying the same design, S-ketamine reversed functional lateralization during speech production in healthy subjects. Results demonstrate an association between glutamatergic imbalance; dysactivations in lateral temporal brain areas, and FTD symptom formation. Left superior temporal gyrus (STG) cortical volume is decreased in schizophrenia patients (SZ) with pFTD in structural magnetic resonance imaging (sMRI) studies and shows reversed activation in functional MRI (fMRI) experiments during speech production. pFTDs are related to synaptic rarefication in the glutamate system of the superior and middle lateral temporal cortices.

References:

F147. RESTING STATE NETWORKS ALTERATION IN PANTOTHENATE-KINASE ASSOCIATED NEURODEGENERATION (PKAN)
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Background: While functional MRI and PET studies have shown altered task-related brain activity in PKAN, we want to find such differences also in the resting state (RS).

Here we used ICA based analysis to investigate RS fMRI data to compare connectivity of 11 well known networks (Auditory, Cerebellum, Default Mode Network (DMN), Executive Control, Fronto-parietal 1, Fronto-parietal 2, Salience, Sensorimotor, Visual1, Visual2, Visual3 network) between patients with PKAN and healthy controls suggesting deficits in related neuropsychological functions.

Methods: We obtained RS fMRI series (3T, 3x3x3mm resolution, 45 slices, TR 2s, 300 volumes) in 17 PKAN patients but 3 were discarded because of excessive movement. (mean age 17.2±7.1) on stable medication and 15 healthy controls (22.5±8.3). Subjects were asked to lie in the scanner keeping eyes closed with no further instructions. Data were pre-processed; we applied FSL MELODIC (pICA) yielding IC, we used FIC to auto-classify ICA components which represent artifacts and an automated routine to select for each subject the component matching the anatomical definition of resting state networks. SPM12 was used for second level analysis, we used two sample t-test to attain this. Consequently, participants with schizophrenia comprised medicated cases.

Results: Our method reliably identified all networks in every control and patients. We found significant differences in the anatomical pattern of areas. Patients showed decreased functional connectivity in comparison to healthy controls in portions of Fronto-parietal 1, Fronto-parietal 2 and Visual1 networks; in addition, patients showed increased functional connectivity in comparison to healthy controls in portions of Cerebellum, DMN, Executive Control, Salience and Visual1 networks. Finally, significant correlation was found between dystonia score and functional connectivity of Cerebellum, Fronto-parietal1, Fronto-parietal2, Salience, Sensorimotor and Visual1 networks.

Discussion: Well known resting state networks were reliable identified from RS fMRI in PKAN patients. The differences in anatomical distribution point to possible alterations in functional connectivity in PKAN, which suggests disruption in cerebellum, DMN, fronto-parietal, salience and visual activity. Correlations with dystonia suggest a direct relation to motor items, which would support a clinical significance of altered RS networks activity.

F148. A PILOT STUDY OF [11C](R)-MEQAA PET BRAIN IMAGING ANALYSIS OF ALPHA-7 NICOTINIC ACETYLCHOLINE RECEPTORS AVAILABILITY IN SCHIZOPHRENIA
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Background: A growing body of evidence suggests that the aberrant cholinergic system may underlie the pathophysiology in schizophrenia. Nicotinic acetylcholine receptor (nAChR) subtype α7 (henceforth ‘α7 nAChR’) is located in presynaptic and postsynaptic constructs in the cerebral cortex and considered to play a key role in the regulation of learning and memory. Additionally, α7 nAChR is deemed to exert neuroprotective effects. Therefore, α7 nAChR is one of the potent therapeutic targets for negative symptoms and cognitive impairment in schizophrenia. In effect, several randomised trials to assess the efficacy and safety of α7 nAChR agonists are currently underway.

There is some evidence in support of aberrant α7 nAChR in schizophrenia. In postmortem studies, protein levels of α7 nAChR in the frontal cortex (Guan et al., 1999) have been reported to be decreased in patients with schizophrenia. However, the availability of α7 nAChR in individuals with schizophrenia has yet to be examined in vivo. In this pilot study, we aim to clarify availability of α7 nAChR in the brains of patients with schizophrenia using positron emission tomography (PET) with a ligand of [11C] (R)-2-methylaminoo-benzonic acid 1-aza-bicyclo[2.2.2]oct-3-yl ester ([11C] (R)-MeQAA).

Methods: All participants provided informed consent. Inclusion criteria included diagnosis of schizophrenia according to the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5, 2013). Patients were excluded if they had (1) full IQ under 69 measured with the Wechsler Adult Intelligent Scale-III; (2) current or past history of tobacco smoking; (3) history of neurological disorder or structural brain abnormality; (4) use of benzodiazepines, antidepressants, or anticholinergics in the 2 weeks prior to PET; (5) history of alcohol or substance abuse; or (6) current psychiatric medications. Drug-naïve patients for investigation is optimal, it is extremely difficult to attain this. Consequently, participants with schizophrenia comprised medicated cases.

We evaluated the availability of α7 nAChR by estimating non-displaceable binding potential (BPND) of the tracer using PET with [11C] (R)-MeQAA, a selective PET tracer for α7 nAChR. Four patients with schizophrenia (age: range 27–39; m/f: 2/2) and 5 age-matched healthy adults (age: range 22–32; m/f: 2/3) underwent the PET scan. The level of BPND in patients with schizophrenia was compared with that for control participants by applying regions of interest (ROIs) approach. In this pilot study, we opted for 4 cortical areas, the superior frontal, middle frontal, parietal, and temporal cortices, for ROIs. This study was approved by the Hamamatsu University School of Medicine Ethics Committee.