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 gyri.

**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, dysactivation 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 rarefaction in the glutamate system of the superior and middle lateral temporal cortices.

**References:**

### F148. A PILOT STUDY OF [11C](R)-MEQAA PET BRAIN IMAGING ANALYSIS OF ALPHA 7 NICOTINIC ACETYLCHOLINE RECEPTORS AVAILABILITY IN SCHIZOPHRENIA

Tomoyasu Wakuda*,1, Masamichi Yokokura1, Kyoko Nakaizumi2, Yashikiko Kato1, Yosuke Kamenou1, Masami Futatsusheri2, Etsuji Yoshikawa2, Yasuhiro Magata1, Yasuomi Ouchi1, Hidenori Yamasure1, Nori Takei1
1Hamamatsu University School of Medicine; 2Hamamatsu Photonics KK;
3Hamamatsu University School of Medicine, Institute of Psychiatry

**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 is 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)-methylamino-benzoic 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 past 6 months; and (5) substance abuse. Although scanning drug-free or 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.