significantly different GFA values among the 3 groups. Posthoc between-groups analysis showed that the non-remission group had lower GFA values in all 7 tracts than the control group; the remission group had lower GFA values than the control group only in 4 tracts, namely the bilateral fornices and the CFs of the bilateral temporal poles, and bilateral hippocampi. Compared with the remission group, the non-remission group had lower GFA values in all 7 tracts.

Discussion: All 7 tracts that were altered in the non-remission group are a part of the limbic system, which supports various functions, including emotions, memory, and learning. Our results suggest that patients who had poor outcomes to antipsychotic treatments might have more severe disruptions in the limbic system. The 7 altered tracts in the non-remission group are compatible with those reported in previous studies on white matter or gray matter alterations. In a cross-sectional tractography-based study on 3 pairs of association fibers (i.e., the cingulum, superior longitudinal fasciculus, and uncinate fasciculus), Luck et al reported that compared with patients with good outcomes, patients with poor outcomes had reduced FA in the uncinate fasciculus and superior longitudinal fasciculus. Marques et al performed a longitudinal study using tract-based spatial statistics and reported that non-responders had more tracts with a significantly lower FA than did the responders, particularly in the uncinate fasciculus and corpus callosum. In addition to the uncinate fasciculus, we also observed reduced fiber integrity in the bilateral fornices and the CFs of the bilateral temporal poles, bilateral hippocampi, and bilateral amygdalae; these tracts connect the gray matter in the limbic system. Jääskeläinen et al revealed that a reduction in gray matter volume in the frontal and limbic areas is associated with overall poor outcomes. In addition, Van Haren et al reported significantly reduced gray matter volumes in the frontal and temporal cortices of the individuals with poor outcomes. Because the gray matter regions are anatomically connected by the fiber tracts, gray matter reduction in the limbic system might affect the interconnecting fiber tracts; this finding accords with the findings of the present study.

In conclusion, differences in the severity of white matter tract alterations in the remission and non-remission groups might indicate biologically distinct subgroups in schizophrenia.

T183. AUDITORY-STEADY-STATE RESPONSES AND CORTICAL VOLUME IN PATIENTS WITH SCHIZOPHRENIA

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Background: The 40-Hz auditory steady-state response (ASSR) probing gamma-band oscillations may reflect N-methyl-D-aspartate receptor (NMDAR) dysfunction in patients with schizophrenia (SZ). Diminished gamma oscillations are reported in SZ, although increased spontaneous gamma oscillations are also reported. We investigated the 40-Hz ASSR and its association with brain volumes and clinical symptoms of SZ.

Methods: The 40-Hz ASSR was measured using electroencephalography in 33 patients with SZ and 30 healthy controls (HCs). Four gamma oscillation components (evoked power, spontaneous oscillations (baseline and total power), and inter-trial phase coherence (ITC)) were assessed. Brain volumes were assessed using high-resolution magnetic resonance imaging and voxel-based morphometry.

Results: Patients with SZ had larger evoked and total powers and higher ITC than HCs. In HCs, evoked power showed significant positive correlations with bilateral superior temporal gyrus (STG) volume. In SZ, the effect of positive symptoms on the path from evoked power to left STG volume was significantly moderated. In SZ with elevated positive symptoms, large evoked power predicted small left STG volume, whereas large evoked power predicted large left STG volume in those with low positive symptoms. Increased baseline power was associated with a smaller left middle frontal gyrus (MFG) volume in SZ, whereas increased ITC correlated with larger MFG volume in HCs.

Discussion: Our results support the NMDAR hypofunction model of SZ, and suggest significant involvement of the STG and MFG in gamma oscillations.

T184. BRAIN-WIDE FUNCTIONAL DYSCONNECTIVITY IN SCHIZOPHRENIA: PARSING DIATHESIS, RESILIENCE AND THE EFFECTS OF CLINICAL EXPRESSION

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Background: The functional dysconnectivity observed from resting-state fMRI studies in schizophrenia is also seen in unaffected siblings indicating its association with the genetic diathesis of the illness. Nevertheless, when compared to patients, the extent of dysconnectivity appears to be limited both in spatial distribution and magnitude in siblings, suggesting that some of the abnormalities could be exclusively linked to the clinical expression or treatment effect rather than genetic diathesis. We investigated brain-wide functional connectivity using a graph theory approach to apportion resting-state dysconnectivity into components that represent genetic diathesis, clinical expression or treatment effect and resilience.

Methods: Resting state functional MRI data acquired from 116 subjects (28 patients with schizophrenia, 28 unaffected siblings and 60 matched healthy controls). Based on Dosenbach's atlas applied to 6 minutes (180 time points with TR=2 s) of eyes-open resting fMRI scan, we extracted time series of 160 functional network nodes. After constructing a 160*160 functional network, we investigated between-group differences in strength and diversity of functional connectivity and topological properties of undirected graphs constructed from thresholded correlation matrices. We also used Support Vector Machine approach to estimate the ability of functional connectivity metrics to discriminate the three groups from each other.

Results: Using ANOVA [FDR corrected $p<0.05$], we found 88 out of 12720 pairs of functional links to be significantly different among the three groups. 48.8% of these 88 links included nodes from the Default Mode Network (DMN), with the largest portion of these involving Salience Network/DMN connectivity (14.8%). Post-hoc t tests revealed that 62.5% of these disconnected links were associated with genetic diathesis of schizophrenia (i.e. both patients and siblings showing same direction of significant post-hoc difference compared to HC) and 21.6% were associated with clinical expression or treatment effect (i.e. patients differed from siblings and healthy controls, but no difference between controls and siblings). Topologically, we observed increased degree, clustering coefficient and global efficiency but reduced local efficiency in the sibling group compared to both patients and controls, indicating a resilience (or compensation) effect. Support vector machine analysis revealed a high degree of accuracy when classifying the genetically predisposed (patients and siblings) vs. healthy controls (Area Under the Curve - AUC 0.97) or the patient groups vs. healthy controls (AUC 0.97) but not when discriminating patients vs. siblings (AUC 0.58)

Discussion: A large portion of the resting-state functional dysconnectivity seen in patients with schizophrenia represent a genetic diathesis effect. The most prominent network level disruption in this context is the dysconnectivity among nodes of the default-mode and salience networks. Despite their predisposition, unaffected siblings show a pattern of resilience in the emergent connectomic topology. Our findings could potentially help refine