

## Publication

## Auditory verbal hallucinations related to altered long-range synchrony of gamma-band oscillations

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Our understanding of the neural correlates of auditory-verbal-hallucinations (AVH) has substantially increased during the last few years, but is far from sufficient. One current hypothesis, the interhemispheric miscommunication theory, is based on findings from fMRI, DTI and EEG, but there is only limited evidence so far concerning underlying functional coupling mechanisms. Here we report a 64-channel EEG study using lagged phase synchronization analysis and eLORETA source estimation to examine the functional connectivity between bilateral auditory cortices in the gamma-band in 26 schizophrenia patients (13 with and 13 without AVH) and 26 matched healthy controls (HC) while performing a dichotic listening task. We found a significantly reduced right-ear-advantage (REA) in AVH but not in non-AVH patients compared to HC. The major finding was significantly stronger gamma-band connectivity between bilateral auditory cortices during conscious perception of left (versus right) ear syllables in patients with AVH compared to HC and patients without AVH. A significant positive correlation was found between this connectivity alteration and the AVH symptom score in schizophrenia patients. These findings provide further support for the interhemispheric miscommunication hypothesis of AVH pathophysiology by indicating that aberrant gamma-band coupling between auditory cortices is related to the emergence of AVH in schizophrenia.

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