Task-based default mode network connectivity predicts cognitive impairment and negative symptoms in first-episode schizophrenia

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Abstract

Individuals diagnosed with schizophrenia (SZ) demonstrate difficulty distinguishing between internally- and externally-generated stimuli. These aberrations in "source monitoring" have been theorized as contributing to symptoms of the disorder, including hallucinations and delusions. Altered connectivity within the default mode network (DMN) of the brain has been proposed as a mechanism through which discrimination between self-generated and externally-generated events is disrupted. Source monitoring abnormalities in SZ have additionally been linked to impairments in selective attention and inhibitory processing, which are reliably observed via the N100 component of the event-related brain potential elicited during an auditory paired-stimulus paradigm. Given overlapping constructs associated with DMN connectivity and N100 in SZ, the present investigation evaluated relationships between these measures of disorder-related dysfunction and sought to clarify the nature of task-based DMN function in SZ. DMN connectivity and N100 measures were assessed using EEG recorded from SZ after their first episode of illness (N = 52) and demographically-matched healthy comparison participants (N= 25). SZ demonstrated less evoked theta-band connectivity within DMN following presentation of pairs of identical auditory stimuli than HC. Greater DMN connectivity among SZ was associated with better performance on measures of sustained attention (p = 0.03) and working memory (p = 0.09), as well as lower severity of negative symptoms, though it was not predictive of N100 measures. Together, present findings provide EEG evidence of lower task-based connectivity among first-episode SZ, reflecting disruptions of DMN functions that support cognitive processes. Attentional processes captured by N100 appear to be supported by different neural mechanisms.

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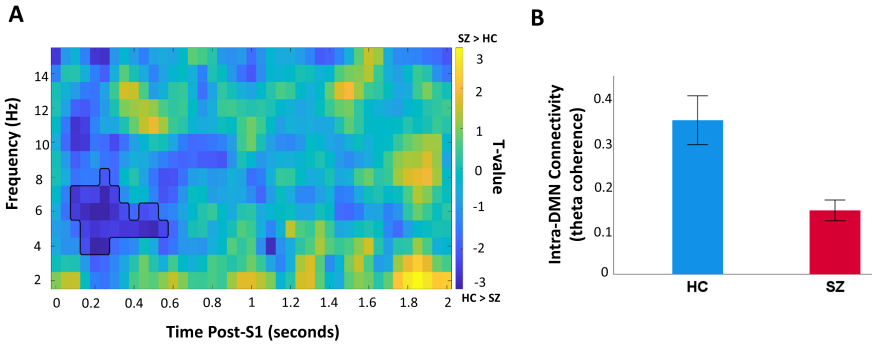

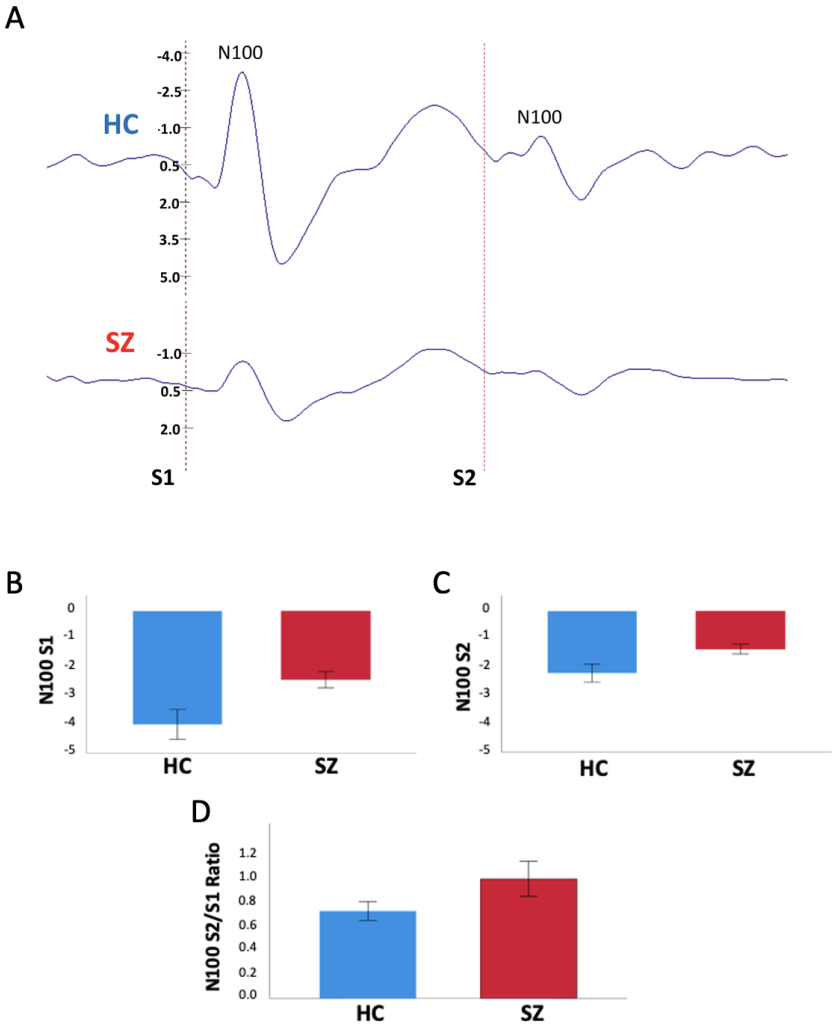

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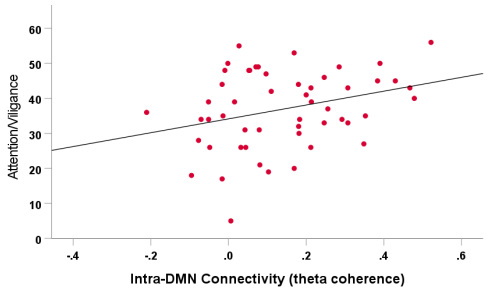

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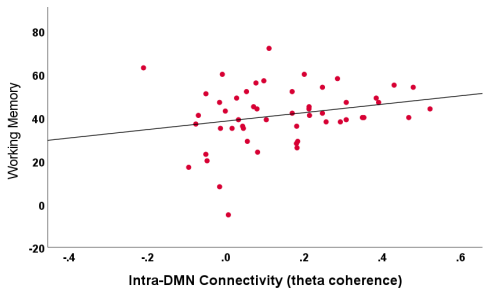

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