THE SPECIFICITY OF CONTEXT PROCESSING DEFICITS ASSOCIATED WITH HYPOFRONTALITY IN SCHIZOPHRENIC PATIENTS: AN EVENT-RELATED FMRI STUDY

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Schizophrenic patients frequently demonstrate hypofrontality in tasks that require executive processing; however the questions still remains as to whether or not the observed prefrontal cortex dysfunctions are specific to schizophrenia. Context processing is conceptualized to be the executive function associated with attention and working memory processes. Impairment in schizophrenic patients' ability to represent and maintain context information has been previously reported in a number of studies. To examine the question of the specificity of a context processing deficit to schizophrenia, we administered a version of the expectancy AX task designed to assess context processing in a group of healthy controls (n=9), depressed patient controls (n=10), and patients with schizophrenia (n=8) while inside a 1.5T signa GE whole body scanner. In this task, 70% of the trials were AX sequences, with the rest AY, BX, and BY sequences (B is the non-A cue, Y represents any non-X probe). BX false alarms indicate poor attention and working memory. AY false alarms served as a general difficulty control. The behavioral performance was consistent with a context processing deficit in patients with schizophrenia, but not those with depression who showed a trend toward increased AY errors. The imaging data showed patterns of decreased activations in the right medial frontal gyrus for the schizophrenic patients while representing the context provided by the cue. Schizophrenic patients showed a dysfunction while maintaining the cue information in the medial frontal gyrus, as well as a dysfunction when preparing to overcome a pre-potent response over time in BA10. In contrast, depressed patients showed bilateral decreases in the activation in the superior and medial frontal gyri when required to maintain the cue. This study demonstrates that it is possible to examine the specificity of the context processing impairment and cortical dysfunction in schizophrenia. Evaluating the specificity of cognitive impairments and regional brain dysfunction in schizophrenia provides important clues as to the neural basis of schizophrenia symptoms.