

Hippocampus, contextual binding impairment and schizophrenia

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Impaired episodic memory (EM) has been reported in schizophrenia. Intact EM requires that contextual features be bound to the content of the event, a mechanism called contextual binding (CB). It is proposed that binding errors during the encoding process are responsible for EM impairments in schizophrenia. The hippocampal formation is considered the central element for CB, it is hypothesized that the synaptic disorganization described in this condition results in such a deficit. The main goals of these studies were to investigate the neurofunctioning, neuroanatomy and neurofunctional connectivity of the hippocampus while performing a task that used CB mechanisms. Spatial relational processing is part of CB and is rooted in the hippocampal region. Visuospatial navigation (wayfinding task), was used as a probe to activate the hippocampus and its associated regions in a group of patients with schizophrenia ($n=21$) and matched healthy controls ($n=23$). During the wayfinding task individuals with schizophrenia found landmarks less frequently, made more errors and took more time to complete the task. fMRI result indicated that the patient group had a hypofunctioning of the posterior part of the hippocampus while performing the wayfinding task. VBM results indicated that controls had significantly more hippocampal GM than patients and poor performances at the wayfinding task was associated with decreased right hippocampal GM for the overall group. Connectivity results indicated that patient's hippocampus recruited alternate pathways and regions to guide and help them complete the wayfinding task. Structural and functional differences in the hippocampus might explain the connectivity differences and CB deficit in schizophrenia.