

ABSTRACT NO:19
RESEARCH ARTICLE**Effect of False Memories on Episodic and Semantic Memory and Amnesia in Patients with Hippocampal Lesions**Khansa Furqan¹, Muhammad Aqeel², Hamid Shafiq³**Abstract**

Objective: The hippocampus plays a crucial role in the formation of episodic memory, spatial navigation, and emotional regulation. Damage to hippocampus may lead to cognitive and emotional deficits, particularly episodic and semantic memory impairments. Previous researches have done extensive research on hippocampal dysfunction, but the role of multimodal false memory induction in individuals with acute hippocampal lesions is yet to be explored. This study explored the effects of sequential (first and second order) false memory induction (visual, auditory, and combined modalities) on episodic memory retrieval, semantic association and recognition, and amnesiac symptoms in patients with acute hippocampal damage as compared to healthy individuals.

Methods: This study used a temporal, double-blind, mixed within-group and between-group randomized block design with event-related tasks. Sixty participants were recruited, with 30 having hippocampal damage and 30 healthy individuals with ages between 18 to 65 years, from multiple hospitals. Thirty participants with acute hippocampal damage were recruited from the neurology department of Fauji Foundation Hospital, Pakistan, where the experiment was conducted using the Psychopy Software. The thirty healthy participants were recruited at the Cognitive and Neuroscience Lab within the psychology department of the Foundation University School of Science and Technology (FUSST). Three standardized cognitive tasks were used to examine episodic and semantic memory and amnesia in patients with acute hippocampal lesions. Both groups participated in a set of computerized cognitive exercises intended to measure episodic and semantic memory alterations, induce multisensory false memories, and track the effects of the multi-sensory false memory induction in both groups using the advance version of PsychoPy software. These questionnaires were used to assess general false memory tendencies, episodic memory recall, and semantic memory retrieval and amnesic symptoms.

Results: The findings revealed that individuals with hippocampal lesions showed heightened susceptibility to false memories, especially with combined auditory-visual stimuli. Particularly in episodic memory retrieval, whereas semantic memory tasks suggested potential regulatory factors. Whereas, healthy individuals depicted consistent decline in performance across tasks during false memory induction.

Conclusion: These findings highlight the hippocampus' critical role in defying false memory formation and focus its interactions with other neural systems in memory reconstruction.

Keywords: Multisensory False Memory, Episodic Memory, Semantic Memory, Amnesia, Hippocampal Damage, Healthy Individual

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