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Sequence learning and memory in limbic encephalitis

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The exact neural mechanism of sequence learning and recognition memory is unknown. Studying voltage-gated potassium channel limbic encephalitis (VGKC-LE) patients with artificial grammar language (AGL) can provide insights to this gap of knowledge due to their focal damage to the CA3 of the hippocampus. This study recruited three subject groups: nine healthy participants aged 20–40 years old, 19 healthy participants aged 50–80 years old and three VGKC-LE patients. An AGL paradigm was designed to measure learning of increasing rule complexity was exposed to participants. AGL learning was tested with two tasks: recollection task, where participants recalled the sequences they heard and familiarity task, where participants judged whether the sequences followed the rules or not. Patients showed AGL learning as well as controls on initial familiarity task (p-values: 0.068, 0.297 and 0.140 for patient 1, 2 and 3, respectively). However, patients have impaired recollection compared to controls (p-values: 0.034, <0.001 and <0.001 for patient 1, 2, and 3, respectively). Furthermore, healthy participants showed improvement in performance on both tasks after re-exposure, but patients did not. VGKC-LE patients showed initial AGL learning ability, thus the CA3 may not be involved in sequence learning. However, patients did not improve their performance with repeated trials, which may indicate inability to adjust their learning strategy. Also, VGKC-LE patients had lower performance than control on recollection task. This suggests that the hippocampus is not involved in familiarity, but responsible for recollection.

Biography

Salma Kyana Sukatrilaksana is an master in research graduate from Newcastle University with a Degree in Evolution and Human Behaviour. She is currenly a fourth year medical student in Universitas Indonesia.

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