**Abstract**

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Title

1H-Magnetic Resonance Spectroscopy in Older People with Delirium

Introduction

Delirium is an acute disorder of consciousness that affects up to 35% of hospitalised older people and is associated with significant morbidity, including an ≥8-fold increased risk of dementia. The mechanism underlying this is unknown. Because glutamate excitotoxicity is associated with brain injury, we used 1H-Magnetic Resonance Spectroscopy (MRS) to measure brain glutamate concentrations in older adults with delirium.

Methods

Medical inpatients aged 65+ with and without delirium were recruited. Delirium was confirmed according to DSM-5 criteria. Physical illness severity was assessed using APACHE-II, pre-admission frailty with CFS and pre-admission cognitive decline with IQCODE. MRS was acquired from parietal white matter.

Results

MRS data were obtained from 13 delirium patients and 12 controls. There was no significant difference between groups in age (82 vs. 79; p=0.152), IQCODE (4 vs. 3, p = 0.095) or APACHE-II (8 vs 6.5, p = 0.068); however, delirium patients were slightly frailer (CFS 5 vs. 4.5, p = 0.049). MRS demonstrated no difference in combined glutamate + glutamine (Glx) concentration (p=0.516). However, when patients with known neurodegenerative disease or severe atrophy were excluded, Glx concentration was elevated in the delirium group (Glx/tCr 1.75 vs. 1.51, p = 0.024). Exploratory analysis suggested this was due to a difference in glutamate (p=0.046) rather than glutamine (p = 0.297) concentration.

Conclusion

This study suggests that brain glutamate concentrations might be elevated in delirium and supports further investigation of glutamate excitotoxicity as a potentially modifiable contributor to delirium severity and post-delirium cognitive decline.

Disclosure

None

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