

Lay Summary

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Epilepsy and the Ageing Brain – The histopathological links between hyper-excitability and neurodegeneration

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Epilepsy affects over 600,000 people in the UK, averaging at 1 in every 103 people. People who have long-standing epilepsy and those whose seizures are difficult to prevent with medication are vulnerable to developing difficulties with memory and thinking. This has been compared to the observations made in people with Dementia, specifically Alzheimer's Disease, the most common cause of dementia in our population. These complications can affect more than just memory and may limit a person's ability to live independently and greatly reduce their quality of life. While the risk of developing 'memory' issues increases in general as you age, there is evidence that an individual with chronic epilepsy may be at an age-accelerated risk compared to people without epilepsy. This raised the theory that the mechanisms behind Alzheimer's Disease and Epilepsy may be linked. However, the reasons behind this increased risk and the mechanistic links to Alzheimer's Disease are still poorly understood.

We aim to investigate whether individuals with epilepsy are in fact more vulnerable to brain ageing by comparing the presence or absence of age-related biomarkers within the hippocampus of individuals with epilepsy, in those with Alzheimer's Disease and compare the findings to those within the hippocampus of healthy age-matched individuals. The hippocampus is the brain's memory centre and we expect that if these changes occur, they will affect this region primarily. We hope this will help uncover more mechanistic links between Epilepsy and Alzheimer's and help explain why people with epilepsy are at an increased risk of these types of memory problems.