Lay Summary

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Are neurodegenerative diseases and gliomas inverse comorbidities?

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The study of the association of different diseases and how they influence each other has proved a promising venue to elucidate the mechanisms underlying several common conditions such as diabetes, cancer and brain degeneration. “Comorbidity” is used when one disease occurs at higher frequency than normal in patients that already have a common condition and “inverse comorbidity” when one disease occurs at a lower than expected frequency in people with a common condition. Patients with degenerative conditions of the brain such as Alzheimer’s disease and Parkinson’s disease often have lower occurrence of cancer than the any other individual of similar age. This evidence led to suggesting that patients with brain degeneration are somehow protected to developing cancer.

The most common and most aggressive brain tumour is called glioblastoma. It occurs at any age but it is vastly more frequent between 50-70 years. Glioblastoma is a killer. Patients with this form of cancer rarely survive longer than 12-14 months form the time the tumour is diagnosed. Cancer cells that constitute glioblastoma can interact with the cells of the normal brain and exploit them to better survive, grow and invade the surroundings.

At the UK Parkinson’s Disease tissue bank at Imperial College, London, we have observed that patients with Parkinson’s disease are unlikely to develop glioblastoma. Such observation was supported by the analysis of death certificates in the UK documenting a much lower than expected occurrence of glioblastoma in patients who died of Parkinson’s and Alzheimer’s disease.

This study aims to understand if the brain affected by degenerative conditions has anything that stops glioblastoma to develop. We have therefore enquired Brain UK to run a survey of the over 36,000 records available for the association between Parkinson’s and Alzheimer’s disease and glioblastoma.