

Lay Summary

BRAIN UK Ref: 22/019

Delving deeper into the appearances and pathophysiological mechanisms of immune checkpoint inhibitor-induced hypophysitis

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Immunotherapies are anti-cancer drugs that activate the patient's immune system. This makes it more effective at killing cancer cells. However, the immune system can sometimes attack normal organs and cause inflammation (mild to very severe). Hormone-making glands are a common target; their inflammation results in permanent loss of function and patients needing to take hormone tablets or injections for life.

Some studies have been conducted on tissue pieces ('biopsies') taken from patients experiencing immunotherapy side effects so that we can understand what exactly occurs. In this project, we want to study immunotherapy toxicity affecting the pituitary gland. This gland sits at the bottom of the brain, and it becomes inflamed/dysfunctional ('hypophysitis') in roughly 10% of patients receiving immunotherapy. Patients can experience headaches, fatigue and other distressing symptoms. We can't take a biopsy from this gland when it becomes inflamed due to its position.

The research institute where we work has a biobank of pituitary tissue from cancer patients thanks to a clinical trial called PEACE. People with cancer donate tissue to the PEACE biobank for research by undergoing a research autopsy after they die. In our project, we will 'stain' pituitary tissue samples taken at autopsy with different markers to find out what goes on in the pituitary gland when it becomes inflamed because of immunotherapy.

Our application to your biobank is to get pituitary tissue samples from patients who did not have cancer and did not receive immunotherapies, so that we can draw comparisons. We hope our findings will help clinicians to understand better immunotherapy-induced pituitary gland inflammation and develop better treatments and prevention strategies.