

CCLG: The Children & Young People's Cancer Association research: **BRAIN – a study to find out why some patients with leukaemia have long-term problems with learning and memory**

Project title: BRAIN Biomarkers to Reform Approaches to Therapy-Induced Neurotoxicity - An ALLTogether1 sub-study

Project stage: Ongoing (planned end April 2028)

Funded by: Funded by CCLG and CCLG Special Named Funds including The Riley Cameron Forget Me Not Fund, The Toti Worboys Fund, Fred Bennett's 'Don't Look Down' Fund, Arabella's Leukaemia (ALL) Research Fund

Led by: Professor Chris Halsey, University of Glasgow



About the project

To cure acute lymphoblastic leukaemia (ALL), doctors need to kill the leukaemia cells that hide in the fluid around the brain - the cerebrospinal fluid (CSF). This means 11-18 chemotherapy injections into the CSF via spinal tap under sedation or anaesthetic. This treatment can damage the brain, leading to problems with learning, memory, and attention span. This affects around a third of patients and is sometimes known as 'chemo-brain'. Doctors do not know why some patients get chemo-brain and others don't.

In this project, Professor Chris Halsey hopes to learn more about the brain-related side effects of treatment in children and young people with ALL. Based at the University of Glasgow, she will be working with the ALLTogether1 clinical trial for children and young people with ALL.

Professor Halsey's team aims to find out which patients are at risk of chemo-brain and why. They will collect data about the side effects patients have during treatment, including questionnaires for patients and families about the impact, and test brain function during and after treatment. The researchers will compare the results according to patients' age, gender, leukaemia type, genetics and treatments.

The team will use this data to:

1. Identify children, teenagers, and young adults at risk of brain-related side effects.
2. Better understand what causes brain-related side effects.
3. Plan new trials to prevent or reduce these side effects.

The results will boost understanding of how to reduce the brain-related side effects of chemotherapy. Professor Halsey hopes that this will ultimately improve the quality of survival for patients with ALL.

Progress

In the first year, the team focused on setting up the BRAIN study. They appointed a project manager,

prepared the information for families taking part, and made progress on the agreements needed to use the brain-testing tools. This groundwork means the study is almost ready to begin recruiting patients.

What's next?

The team plans to open the study across multiple sites and begin recruiting around 100 children over the next year. As data is collected, they will start looking for patterns that may explain why some patients develop learning and memory problems after treatment, helping to guide future studies and treatments.



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