

Lay Summary

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Effect of Hypothermia Treatment on Brain inflammation and Development in Neonatal Hypoxic Ischemia Encephalopathy

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Neonatal Hypoxic Ischaemic Encephalopathy (HIE) is a significant worldwide problem that affects 1.3 to 1.7 per 1000 live births in UK. It occurs in babies who have been starved of oxygen around the time of birth and is associated with a high risk of brain injury and long-term neurological and neurodevelopmental problems. Body cooling treatment, where the body temperature is decreased from 37°C to 33.5°C for 72 hours, has dramatically improved the survival of the HIE babies without major side-effects. However, in the long-term, these children developed a number of neurological problems impacting on their daily life. It is thought that this is due to abnormal behaviour of the microglia during this time of oxygen starvation. Microglia is a brain cell which is an integral part of the immune system in the brain. Several studies suggest that the increased survival rates is driven by blocking this microglia. However, it has been observed in animal studies that microglia are an important component of the brain development in normal conditions. Therefore we hypothesize that the cooling treatment causes microglia to behave in a way that leads to brain development malfunction.

To explore this hypothesis, we will perform a study on post-mortem brain tissue investigating microglia and brain dysfunction.