Scientists exploit leaks in blood brain barrier to treat glioblastoma

November 6 2017

An ovarian cancer drug can leak through the blood brain barrier to reach brain tumours and could be an effective treatment for glioblastoma, suggest results presented at the National Cancer Research Institute's (NCRI) Cancer Conference in Liverpool, today (Monday).

The Cancer Research UK-funded OPARATIC trial, which was managed by the charity's Centre for Drug Development, tested whether the ovarian cancer drug olaparib could reach glioblastoma, a type of brain tumour which is very difficult to treat. And early results show it successfully reaches brain tumours at high enough levels for treatment.

The successful delivery of this drug is an important step as many others have failed to reach the tumour.

The study recruited 48 patients with glioblastoma which had returned after initial treatment. The majority of patients were then given olaparib in combination with the chemotherapy drug temozolomide.

Scientists looked at tumour samples and found that the drug penetrates the core of the tumour as well as the surrounding areas which contain smaller numbers of cancerous cells. Cancer cells in these regions cannot be removed by surgery so reaching them with drugs is crucial.

The researchers also identified a way to safely combine both drugs by giving olaparib intermittently, minimising dangerous side effects.

Olaparib is a PARP inhibitor, which is already used to treat certain ovarian cancer patients and prevents damaged cancer cells from repairing themselves after chemotherapy or radiotherapy.

The OPARATIC trial has paved the way for two additional clinical trials – PARADIGM and PARADIGM-2 – testing olaparib in combination with radiotherapy and temozolomide in patients with newly diagnosed glioblastoma.

Professor Anthony Chalmers, lead researcher and Chair of Clinical Oncology at the University of Glasgow, said: "Brain tumours are stubbornly difficult to treat and one of the main reasons for this is the blood brain barrier, a natural filter that blocks the passage of drugs.

"But these results suggest that olaparib is able to leak through because this barrier is disrupted in glioblastoma. By showing that this drug reaches brain tumours, we are in a much stronger position to use it to make current treatments more effective."

Dr Nigel Blackburn, Cancer Research UK's director of drug development, said: "While overall survival for cancer is improving, survival for brain tumours is still very low and the blood brain barrier is a significant pharmacological obstacle.

"Experimental trials like this, which test new ways to reach these hard to treat tumours, are crucially important if we are to see more patients survive their cancer."

Professor Susan Short, member of NCRI's Radiotherapy Research Working Group, said: "We're just beginning to realise the full potential of PARP inhibitors to tackle many different types of cancer, so it's exciting to see that olaparib could potentially be used to treat glioblastoma in combination with chemotherapy and radiotherapy.

"These results are a huge step forwards in developing better treatments for patients with brain tumours, which claim too many lives every year."

Provided by Cancer Research UK