

Virus accomplice helps drugs fight cancer

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A virus that harmlessly infects most people at some time in their lives appears to help anti-cancer drugs destroy tumours, or at least keep them in check.

Known as a reovirus, it destroys tumour cells because they lack the cellular machinery that keeps the virus in check in healthy cells.

Results released last week from two studies in which patients with head and neck cancer were injected with the virus alongside anti-cancer drugs reveal that cancers either stopped growing or shrank in almost all recipients. Furthermore, the patients had cancers that had become resistant to all existing therapies.

"Some patients had very aggressive tumour shrinkage of as much as 95%," says Brad Thompson, CEO of Canadian company Oncolytics Biotech, which has been developing the virus as a product called Reolysin.

In one trial, led by Kevin Harrington at the Royal Marsden Hospital in London, 8 out of 9 patients responded positively after the virus plus two standard anti-cancer drugs, paclitaxel and carboplatin, had been infused into their bloodstream. In four, tumours stopped growing, and in another four, tumours shrank dramatically.

In the other trial, also near London at the Royal Surrey Hospital, 9 out of 11 patients responded well after receiving the virus plus the anti-cancer drug docetaxel.
Genetic flaw

Taken together, the results suggest the virus does help in some way. "Usually, only 10% of patients respond when the cancer comes back and they're having their second course of treatment," says Thompson.

The virus attacks cancerous cells with genetic defects that mean that a gene called Ras, which directs the cell to multiply, is permanently switched on, making the tumour grow continuously.

These defects in Ras are seen in roughly two thirds of primary cancers, and 90% of secondaries, when the cancer starts spreading round the body.

But some researchers caution that it's difficult to tell whether it's the drugs or the virus, or the combination, that's making the difference.

"It is likely that some patients would show a response to the chemotherapy alone," says Peter Johnson of the University of Southampton. "However, it's encouraging to see quite striking responses in this group who have difficult tumours to treat, and we will look forward to seeing the results of further trials in the future."

Thompson says the criticism is completely valid. However, additional results

published on Thursday of a trial of Reolysin alone in patients with soft-tissue sarcoma (a cancer with no cure at all) showed that the cancer stabilised in a fifth of the patients.

'Death sentence'

"A 21% response in a patient population where nothing works at all and is a death sentence is a major advance," he says.

Thompson says that the fact that Rasdefects are more common in secondaries also fits with the observation that secondary cancers seem to be hit hardest by the viral therapies, vanishing completely in the livers and lungs of some patients. Also, biopsies of treated patients have revealed the presence of the virus in dead and dying tissue.

The fact that the virus can reach secondaries anywhere in the body is also a plus, because people often die from cancers that are undetectable.

Altogether, some 240 patients have been treated in 12 trials around the world: some in combination with other drugs, some in combination with radiation therapy, and some with Reolysin alone.

The virus and any drugs are given through cycles of daily 40-minute infusions for a week at a time, with gaps of three months in between. The only side-effects so far have been mild fevers and transitory aches and pains in joints and muscles.

But the test will come in a much larger trial announced this week in the UK, involving 200 to 300 head- and neck-cancer patients.

The Ras results were presented at the International Society for Biological Therapy of Cancer annual meeting in San Diego, California, which finished 2 November. The sarcoma results were presented at the Chemotherapy Foundation Symposium XXVI in New York.