Between hope and reality

Many patients diagnosed with cancer are offered a first line of chemotherapy. The decision to accept this treatment pays off for some patients, and they are cured or enter a long period of remission. But this is not the case for others. These patients pin their hopes on a second line of chemotherapy. If this also fails, many agree to try additional lines of chemotherapy, each with a multitude of burdensome adverse effects. Their hopes are raised, and then dashed again, with each failed attempt.

There were high hopes that "personalised" medicine would be the solution for some patients in whom conventional chemotherapy had reached its limits, using treatments tailored to the individual on the basis of genetic criteria. Another source of great hope was immunotherapy, presented as a method for treating cancer by mobilising the patient's own immune system. These approaches have delivered a few gains but also many disappointments.

The bright new hope of 2019 is CAR (chimeric antigen receptor) T-cell therapy, a form of immunotherapy based on genetically engineered human immune cells (see pp. 229 and 232). It is an innovative approach in which patients are offered an infusion of their own T cells that have been genetically modified using a virus. It is often presented as a "*revolutionary*" treatment.

It is a dazzling technical achievement, which appears to at least have the potential to constitute a therapeutic advance, but the reality is less impressive, with many questions as yet unanswered.

Dispassionate examination of the evaluation data obtained on CAR T-cell therapies, in the first clinical situations for which they have been authorised, shows that several patients had longer survival times than those observed with standard therapies. These new treatments are probably effective but, without longer follow-up, we don't know how long patients can expect to live. The data also show that patients experience numerous serious adverse effects in the short term, which in some cases hasten their death. And very little is known about the specific toxicities of CAR T-cell therapy.

These types of technical breakthroughs appear to open new avenues in cancer treatment. The hope they offer must not be allowed to turn into excessive optimism, by overlooking the uncertainties and the real and serious harms that some patients suffer. The key is to strike the right balance between hope and reality.

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