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Breyanzi (lisocabtagene maraleucel)

An overview of Breyanzi and why it is authorised in the EU

What is Breyanzi and what is it used for?

Breyanzi is a medicine used to treat adults with different types of cancer of white blood cells:

- diffuse large B-cell lymphoma (DLBCL);
- high-grade B-cell lymphoma (HGBCL);
- primary mediastinal large B-cell lymphoma (PMBCL);
- follicular lymphoma grade 3B (FL3B).

Breyanzi can be used in patients whose cancer came back (relapsed) or did not respond (refractory) after an initial treatment with chemoimmunotherapy (a combination of systemic therapy to kill or slow the growth of cancer cells and immunotherapy to stimulate or restore the immune system's ability to fight the cancer).

In patients with relapsed or refractory DLBCL, PMBCL or FL3B, it can also be used after two or more previous treatments with systemic therapy (treatment given by mouth or injection).

Breyanzi is a type of advanced therapy medicine called a 'gene therapy product'. This is a type of medicine that works by delivering genes into the body.

Breyanzi contains lisocabtagene maraleucel, which is a combination of two types of genetically modified white blood cells.

How is Breyanzi used?

Breyanzi is prepared using the patient's own white blood cells. These are extracted from blood, genetically modified in a laboratory, and then administered back to the patient.

The medicine is given as a single infusion (drip) into a vein and must only be given to the patient whose own cells were used to make it. Before treatment with Breyanzi, the patient should have a short course of systemic therapy to clear away their existing white blood cells, and just before the infusion they should be given other medicines to reduce the risk of reactions to the infusion.

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A medicine called tocilizumab (or a suitable alternative if this is unavailable due to a shortage) and emergency equipment must be available in case the patient has a potentially serious side effect called cytokine release syndrome (see risks section below).

Patients should be closely monitored for side effects for one week after treatment and are advised to stay close to a specialist hospital for at least 4 weeks after treatment.

For more information about using Breyanzi, see the package leaflet or contact your doctor or pharmacist.

How does Breyanzi work?

Breyanzi contains lisocabtagene maraleucel, which is a combination of two types of the patient's white blood cells (CD4+ T cells and CD8+ T cells). These T cells have been genetically modified in the laboratory to make a protein called chimeric antigen receptor (CAR). CAR can attach to CD19, a protein that is found on the surface of cancer cells.

When Breyanzi is given to the patient, the modified T cells attach to CD19 proteins on the cancer cells and kill them, thereby helping to clear the cancer from the body.

What benefits of Breyanzi have been shown in studies?

Benefits of Breyanzi were shown in two main studies conducted in more than 300 adult patients with DLBCL that was not responding to previous treatment or had returned after at least two previous courses of therapy or after a stem cell transplant. These studies showed that 53% and 33% of patients treated with Breyanzi had a complete response (meaning that they had no signs of cancer after treatment) and 73% and 61% had at least a partial response. Comparable responses were seen in an analysis in a smaller number of patients with PMBCL and FL3B who participated in these studies. These results were at least as good as the results seen in other studies involving patients receiving standard cancer treatments.

Another main study involved 184 patients with large B-cell lymphomas (DLBCL, HGBCL, PMBCL and FL3B) that had returned shortly after, or did not respond to, first-line immunochemotherapy. Patients were given Breyanzi or standard treatment, and the study looked at the time until patients experienced certain outcomes (an 'event', meaning their treatment did not work after 9 weeks, they started a different treatment because the treating doctor considered the current medicine ineffective, their cancer worsened or they died).

The study showed that patients given Breyanzi lived longer without experiencing an event: 10.1 months, on average, for patients given Breyanzi compared with 2.3 months for patients given standard treatment. In addition, after 6 months, 66% of patients given Breyanzi had had a complete response (meaning no sign of cancer after treatment) compared with 39% of those who received standard treatment.

What are the risks associated with Breyanzi?

For the full list of side effects and restrictions of Breyanzi, see the package leaflet.

The most common side effects with Breyanzi (which may affect more than 1 in 10 people) include neutropenia (decreases in neutrophils, a type of white blood cell that fights infections), anaemia (decreases in red blood cells) or thrombocytopenia (decreases in blood platelets, components that help the blood to clot), as well as cytokine release syndrome (a potentially life-threatening condition that can cause fever, vomiting, shortness of breath, pain and low blood pressure). In patients who had

received two or more previous treatments with systemic therapy, more than 1 in 10 people also experienced tiredness.

A very common serious side effect with Breyanzi (which may affect more than 1 in 10 people) is cytokine release syndrome.

In patients who previously received a single course of treatment, common serious side effects (which may affect up to 1 in 10 people) include neutropenia, anaemia and thrombocytopenia, neutropenia with fever, fever, infections, aphasia (problems with the use of language), headache, confusion, pulmonary embolism (a blood clot in a blood vessel in the lungs), upper gastrointestinal haemorrhage and shaking.

In patients who had received two or more previous treatments with systemic therapy, common serious side effects (which may affect up to 1 in 10 people) include low levels of neutrophils, red blood cells or platelets, low levels of neutrophils with fever, fever, infections, encephalopathy (a brain disorder caused by infection), aphasia, confusion, shaking or low blood pressure.

Why is Breyanzi authorised in the EU?

Breyanzi was shown to be at least as effective as existing treatment options in patients with DLBCL, PMBCL and FL3B who had received at least two previous treatments. Breyanzi also showed benefits in patients with relapsed or refractory large B-cell lymphomas whose cancer had returned shortly after or who did not respond to one previous treatment. Serious side effects, particularly cytokine release syndrome, can occur. However, these are manageable if appropriate measures are in place (see below). The European Medicines Agency therefore decided that the benefits of Breyanzi are greater than its risks and it can be authorised for use in the EU.

What measures are being taken to ensure the safe and effective use of Breyanzi?

The company that markets Breyanzi must ensure that hospitals where Breyanzi is given have appropriate expertise, facilities and training. Tocilizumab, or suitable alternatives in case of its unavailability due to shortage, must be available for the management of cytokine release syndrome. The company must provide educational materials for healthcare professionals and patients about possible side effects, especially cytokine release syndrome.

The company must provide additional data from ongoing and future studies to further characterize the long-term safety and effectiveness of Breyanzi.

Recommendations and precautions to be followed by healthcare professionals and patients for the safe and effective use of Breyanzi have been included in the summary of product characteristics and the package leaflet.

As for all medicines, data on the use of Breyanzi are continuously monitored. Side effects reported with Breyanzi are carefully evaluated and any necessary action taken to protect patients.

Other information about Breyanzi

Breyanzi received a marketing authorisation valid throughout the EU on 4 April 2022.

Further information on Breyanzi can be found on the Agency's website:

ema.europa.eu/medicines/human/EPAR/breyanzi

This overview was last updated in 04-2023.