EMA/56648/2024
EMEA/H/C/005763

Casgevy (exagamglogene autotemcel)

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

What is Casgevy and what is it used for?

Casgevy is a medicine used to treat blood disorders known as beta thalassaemia and sickle cell disease in patients 12 years and older.

For beta thalassaemia, Casgevy is used in patients who require regular blood transfusions. Patients with this condition do not make enough haemoglobin, the protein in red blood cells that carries oxygen around the body. As a result, these patients have low red blood cell levels and need frequent blood transfusions.

For sickle cell disease, Casgevy is used in patients with severe disease and recurrent painful crises. Patients with this condition have an abnormal form of haemoglobin that makes red blood cells become rigid and sticky and change from being disc-shaped to being crescent-shaped (like a sickle). These cells can block blood vessels, causing painful crises that affect the chest, abdomen (belly) and other parts of the body.

Beta thalassaemia and sickle cell disease are rare, and Casgevy was designated an 'orphan medicine' (a medicine used in rare diseases). Further information on the orphan designations can be found on the European Medicine's Agency website (beta thalassaemia: 17 October 2019; sickle cell disease: 9 January 2020)

Casgevy contains as its active substance genetically modified stem cells (cells that can develop into blood cells) taken from the patient's own blood. It is used when stem cell treatments are appropriate and there are no suitable stem cell donors available.

How is Casgevy used?

Casgevy can only be obtained with a prescription and must be given in an approved centre by a doctor trained in giving this medicine and who has experience in stem cell transplantation and in the treatment of blood disorders affecting haemoglobin.

Casgevy is made individually for each patient out of stem cells collected from their blood and must only be given to the patient for whom it is made. It is given as a single dose infusion (drip) into a vein and the dose depends on the bodyweight of the patient.

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Before Casgevy is given, the patient will receive conditioning chemotherapy treatment to clear their bone marrow of cells.

For more information about using Casgevy, see the package leaflet or contact your healthcare provider.

How does Casgevy work?

To make Casgevy, stem cells are edited (by CRISPR/Cas9 technology) so that they produce more fetal haemoglobin, a type of haemoglobin mainly found in babies in the womb but also present in small amounts in adults. Because fetal haemoglobin can compensate for the lack of normal adult haemoglobin, the modified stem cells, when injected into patients, can raise red blood cell levels in patients with beta-thalassaemia and prevent painful crises in patients with sickle cell disease.

What benefits of Casgevy have been shown in studies?

The effects of Casgevy are based on interim results of two studies which are still ongoing. The studies did not compare Casgevy to another medicine or placebo.

In one study in patients with thalassaemia aged between 12 and 35 years where the medicine was given after conditioning chemotherapy treatment, 39 patients out of 42 maintained haemoglobin levels above 9 g/dL without the need for blood transfusions for at least 12 consecutive months.

Casgevy was also shown to be effective at preventing painful sickle cell crises. In a study in patients with severe sickle cell disease aged between 12 and 35 years, 28 out of 29 patients did not experience any painful crises for at least 12 consecutive months when treated with Casgevy after conditioning chemotherapy. None of the patients (29 out of 29) required hospitalisation for painful crises for at least 12 consecutive months.

What are the risks associated with Casgevy?

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

The most common side effects with Casgevy (which may affect more than 1 in 10 people) include headache, nausea (sickness) and muscle and bone pain.

Doctors should consider whether patients can be given the required pre-treatments needed before Casgevy.

Why is Casgevy authorised in the EU?

Beta thalassaemia requiring transfusions and sickle cell disease are serious conditions for which treatment options are limited. Although the studies with Casgevy were small and there were uncertainties associated with their design they showed that one-time treatment can reduce the need for red blood cell transfusions in patients with beta-thalassaemia and reduce the number of painful crises in patients with sickle cell disease.

In terms of safety, treatment was generally well tolerated and side effects were mainly due to the conditioning chemotherapy. There could be a theoretical risk of cancer caused by unintended changes in the genetic material, although no such cases have been seen so far. There is also a potential risk of bleeding since the medicine may cause a drop in the number of platelets (components that help the blood to clot). Measures are in place to monitor for such events through a 15 year registry-based study.

The European Medicines Agency decided that Casgevy's benefits are greater than its risks and it can be authorised for use in the EU. Casgevy has been given 'conditional authorisation'. This means that that the company will have to provide additional evidence after authorisation.

Conditional authorisation is granted on the basis of less comprehensive data than are normally required. It is granted for medicines that fulfil an unmet medical need to treat serious diseases and when the benefits of having them available earlier outweigh any risks associated with using the medicines while waiting for further evidence. Every year, the Agency will review any new information that becomes available until data become comprehensive and this overview will be updated as necessary.

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

The company that markets Casgevy will provide results of ongoing studies to further assess the effectiveness and safety of the medicine. The company will also provide educational materials for healthcare professionals expected to use the medicine with information on its safety, including the potential risk of cancer and the need to monitor the patient's platelet levels, and how the medicine should be given. Patients will also receive a guide and a card that they should carry with them.

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

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

Other information about Casgevy

Casgevy received a conditional marketing authorisation valid throughout the EU on 9 February 2024.

Further information on Casgevy can be found on the Agency's website: ema.europa.eu/medicines/human/EPAR/casgevy

This overview was last updated in 02-2024.