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Committee for Orphan Medicinal Products

Public summary of opinion on orphan designation

Autologous CD34+ cells transduced with lentiviral vector encoding the human beta globin gene for the treatment of beta thalassaemia intermedia and major

On 30 May 2016, orphan designation (EU/3/16/1660) was granted by the European Commission to Fondazione Telethon, Italy, for autologous CD34+ cells transduced with lentiviral vector encoding the human beta globin gene for the treatment of beta thalassaemia intermedia and major.

What is beta thalassaemia intermedia and major?

Beta thalassaemia is an inherited disease in which patients are unable to make enough haemoglobin, the iron-rich protein found in red blood cells that carries oxygen around the body. Beta thalassaemia major is a severe form of the disease in which patients need frequent blood transfusions, while beta thalassaemia intermedia is a less severe form, which may worsen with age. Both types of beta thalassaemia are caused by defects in the gene responsible for producing beta-globin, one of the components of haemoglobin, which result in low levels of haemoglobin in the blood.

Beta thalassaemia intermedia and major are life-long debilitating diseases. They may be life threatening because of severe anaemia (low red blood cell count due to lack of haemoglobin), the need for repeated blood transfusions and the risk of complications associated with them.

What is the estimated number of patients affected by the condition?

At the time of designation, beta thalassaemia intermedia and major affected less than 1 in 10,000 people in the European Union (EU). This was equivalent to a total of fewer than 51,000 people[*], and is below the ceiling for orphan designation, which is 5 people in 10,000. This is based on the information provided by the sponsor and the knowledge of the Committee for Orphan Medicinal Products (COMP).

[*]Disclaimer: For the purpose of the designation, the number of patients affected by the condition is estimated and assessed on the basis of data from the European Union (EU 28), Norway, Iceland and Liechtenstein. This represents a population of 513,700,000 (Eurostat 2016).

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What treatments are available?

At the time of designation, the main treatments for beta thalassaemia intermedia and major were blood transfusions and the use of iron chelators (medicines for reducing 'iron overload' - the high iron levels in the body caused by repeated blood transfusions). In some cases, allogeneic haematopoietic stem cell transplantation was used to cure the disease. This is a complex procedure where the bone marrow of the patient is cleared of cells and replaced with healthy bone marrow cells from a matched donor, allowing the patient to produce red blood cells with normal haemoglobin.

The sponsor has provided sufficient information to show that this medicine might be of significant benefit for patients with beta thalassaemia intermedia and major because preliminary studies in experimental models have shown that it might reduce anaemia, so reducing the need for blood transfusions and iron chelators. This assumption will need to be confirmed at the time of marketing authorisation, in order to maintain the orphan status.

How is this medicine expected to work?

This medicine is expected to be used in patients who cannot undergo allogeneic haematopoietic stem cell transplantation because of lack of a matched donor or because the procedure is considered dangerous because of age or other diseases the patient has.

It is made up of 'haematopoietic stem cells' that are taken from the patient. Haematopoietic stem cells are cells that can develop into different types of blood cell. To make this medicine, the cells are modified by a virus that carries normal copies of the beta-globin gene into the cells. When these modified stem cells are given back to the patient, they are expected to produce healthy red blood cells that carry adequate amounts of beta-globins which can be assembled into haemoglobin.

The virus used in this medicine ('lentivirus') is modified so that it does not cause disease in humans.

What is the stage of development of this medicine?

The effects of this medicine have been evaluated in experimental models.

At the time of submission of the application for orphan designation, clinical trials with this medicine in patients with beta thalassaemia were ongoing.

At the time of submission, this medicine was not authorised anywhere in the EU for beta thalassaemia intermedia and major or designated as an orphan medicinal product elsewhere for this condition.

In accordance with Regulation (EC) No 141/2000 of 16 December 1999, the COMP adopted a positive opinion on 21 April 2016 recommending the granting of this designation.

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Opinions on orphan medicinal product designations are based on the following three criteria:

- the seriousness of the condition;
- the existence of alternative methods of diagnosis, prevention or treatment;
- either the rarity of the condition (affecting not more than 5 in 10,000 people in the EU) or insufficient returns on investment.

Designated orphan medicinal products are products that are still under investigation and are considered for orphan designation on the basis of potential activity. An orphan designation is not a marketing authorisation. As a consequence, demonstration of quality, safety and efficacy is necessary before a product can be granted a marketing authorisation.

For more information

Sponsor's contact details:

Contact details of the current sponsor for this orphan designation can be found on EMA website, on the medicine's rare disease designations page.

For contact details of patients' organisations whose activities are targeted at rare diseases see:

- Orphanet, a database containing information on rare diseases, which includes a directory of patients' organisations registered in Europe;
- European Organisation for Rare Diseases (EURORDIS), a non-governmental alliance of patient organisations and individuals active in the field of rare diseases.

Translations of the active ingredient and indication in all official EU languages[1], Norwegian and Icelandic

Language	Active ingredient	Indication
English	Autologous CD34+ cells transduced with lentiviral vector encoding the human beta globin gene	Treatment of beta thalassaemia intermedia and major
Bulgarian	Автоложни CD34+ клетки, трансдуцирани с лентивирусен вектор, кодиращ човешки бета-глобинов ген	Лечение на бета таласемия интермедия и майор
Croatian	Autologne CD34+ stanice transducirane s lentivirusnim vektorom koji kodira humani gen za beta-globin	Liječenje beta-talasemije intermedije i major
Czech	Autologní CD34+buňky transdukované lentivirálním vektorem kódujícím lidský gen beta-globinu	Léčení beta thalasémie intermedia a major
Danish	Autologe CD34+ celler transduceret med lentiviral vektor som koder for humant beta-globin gen	Behandling af beta-thalassæmia intermedia og major
Dutch	Autologe CD34+ cellen getransduceerd met een lentivirale vector die codeert voor het humane bèta-globine gen	Behandeling van bètathalassemie intermedia en major
Estonian	Inimese beetaglobiini geeni kodeeriva lentiviirusvektoriga transdutseeritud autoloogsed CD34+ rakud	Keskmise ja raske beetatalasseemia ravi
Finnish	Ihmisen beetaketjun geeniä koodavalla lentivirusvektorilla transfektoidut autologiset CD34+ -solut	Beetatalassemia intermedia-ja major-tyypin hoito
French	Cellules autologues CD34+ transduites par le vecteur lentiviral codant pour le gène de la bêta-globine humaine	Traitement de la bêta-thalassémie intermédiaire et majeure
German	Autologe CD34+ Zellen, die mit einem lentiviralen Vektor transduziert sind, der für das humane Beta-Globin-Gen kodiert	Behandlung der Beta-Thalassämie (Intermediäre und Major-Form)
Greek	Αυτόλογα CD34+ κύτταρα διαμολυσμένα με λεντι-ιικό φορέα που κωδικοποιεί το ανθρώπινο γονίδιο β-σφαιρίνης	Θεραπεία της β-μεσογειακής αναιμίας, ενδιάμεσης και μείζονος
Hungarian	Humán béta-globin gént kódoló lentivirális vektorral transzdukált autológ CD34+ sejtek	Béta-talasszémia intermedia és major kezelése
Italian	Cellule autologhe CD34+ geneticamente modificate con un vettore lentivirale codificante per il gene della beta-globina umana	Trattamento della beta-talassemia intermedia e major
Latvian	Autologas CD34+ šūnas, kas transducētas ar lentivīrusa vektoru, kas kodē cilvēka bēta globīna gēnu	Vidēji izteiktas un izteiktas bēta talasēmijas ārstēšana
Lithuanian	Autologinės CD34+ ląstelės, transdukuotos su lentiviruso vektoriumi, koduojančiu žmogaus beta globino geną	Vidutinio sunkumo ir sunkios β-talasemijos gydymas

[1] At the time of designation

Language	Active ingredient	Indication
Maltese	Ċelloli awtologi CD34+ trasformati permezz ta' vettur lentivirali li jikkodifika l-ġene beta globina uman	Kura tal-beta talassemija intermedja u maġġuri
Polish	Autologiczne komórki CD34+ transdukowane wektorem lentiwirusowym zawierającym ludzki gen beta-globiny	Leczenie talasemii beta-intermedia i major
Portuguese	Células CD34+ autólogas transduzidas com um vetor lentiviral que codifica o gene da beta globulina humana	Tratamento da beta talassémia intermédia e major
Romanian	Celule autologe CD34+ transduse cu un vector lentiviral ce codifică gena beta-globinei umane	Tratamentul beta talasemiei intermediare şi majore
Slovak	Autológne CD34+ bunky transdukované lentivírusovým vektorom kódujúcim ľudský beta-globínový gén	Liečba stredne závažnej a závažnej beta talasémie
Slovenian	Avtologne celice CD34+, transducirane z lentivirusnim vektorjem, ki kodira humani gen za globin beta	Zdravljenje srednje in velike talasemije beta
Spanish	Células CD34+ autólogas transducidas con un vector lentiviral que contiene el gen de la beta–globina humana	Tratamiento de la beta talasemia intermedia y mayor
Swedish	Autologa CD34+ celler transducerade med lentivirusvektor som kodar för den humana beta-globin genen	Behandling av beta-thalassaemia intermedia och major
Norwegian	Autologe CD34+ celler transdusert med lentiviral vektor som koder genet for humant beta-globin	Behandling av beta-thalassemia intermedia og beta-thalassemia major
Icelandic	Samgena CD34+ frumur, fluttar með lentiveiru genaferju, sem kóða fyrir manna beta-glóbín geni	Meðferð á langvinnu járnofhleðslu sem krefst klómeðferðar