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Committee for Orphan Medicinal Products

Public summary of opinion on orphan designation

Human erythrocytes encapsulating inositol hexaphosphate for the treatment of sickle cell disease

On 4 July 2012, orphan designation (EU/3/12/1008) was granted by the European Commission to ERYtech Pharma, France, for human erythrocytes encapsulating inositol hexaphosphate for the treatment of sickle cell disease.

What is sickle cell disease?

Sickle cell disease is a genetic disease in which the red blood cells become rigid and sticky, and change from being disc-shaped to being crescent-shaped (like a sickle). The change in shape is caused by the presence of an abnormal form of haemoglobin, the protein in red blood cells that carries oxygen around the body. In patients with sickle cell disease, the abnormal red blood cells attach to the walls of blood vessels and block them, restricting the flow of oxygen-rich blood to the internal organs such as the heart, lungs and spleen. Because the abnormal red blood cells have a shorter life span, they release haemoglobin into the blood circulation rather than carrying it to the internal organs where it is needed. This causes severe pain and damage to these organs as well as repeated infections and anaemia (low red blood cell counts).

Sickle cell disease is a severe disease that is long lasting and may be life threatening because of damage to the heart and the lungs, anaemia and infections.

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

At the time of designation, sickle cell disease affected approximately 1.5 in 10,000 people in the European Union (EU)*. This is equivalent to a total of around 76,000 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 27), Norway, Iceland and Liechtenstein. This represents a population of 506,300,000 (Eurostat 2011).

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What treatments are available?

At the time of designation, the only medicine authorised in the EU to treat sickle cell disease was hydroxycarbamide. The main treatment for sickle cell disease was blood transfusion. This was usually combined with 'iron chelators' (medicines used to reduce the high iron levels in the body caused by repeated blood transfusions), which are necessary in patients with long-term anaemias such as sickle cell disease. In some cases, haematopoietic (blood) stem cell transplantation was used (a complex procedure where the patient receives stem cells from a matched donor to help restore the bone marrow) to allow the patient to produce red blood cells containing normal haemoglobin.

The sponsor has provided sufficient information to show that human erythrocytes encapsulating inositol hexaphosphate might be of significant benefit for patients with sickle cell disease because early studies in experimental models show that it works in a different way to existing medicines and might be used as an add-on to other treatments. 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?

The medicine consists of normal human red blood cells from a blood bank, which have been modified to contain inositol hexaphosphate. The medicine is expected to be given by transfusion. The role of inositol hexaphosphate, through its effect on haemoglobin (the protein in red blood cells that carries oxygen), is to increase the amount of oxygen released to the patient's tissues and own red blood cells. This will prevent the blockage of blood vessels and reduce the symptoms of sickle cell disease. In addition, the transfusion of red blood cells will increase the total haemoglobin level, decrease the blood viscosity and block the production of sickle cells.

What is the stage of development of this medicine?

At the time of submission of the application for orphan designation, the evaluation of the effects of the medicinal product in experimental models was ongoing.

At the time of submission, no clinical trials with the medicinal product in patients with sickle cell disease had been started.

At the time of submission, the medicinal product was not authorised anywhere in the EU for sickle cell disease 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 11 May 2012 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:

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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	Human erythrocytes encapsulating inositol hexaphosphate	Treatment of sickle cell disease
Bulgarian	Човешки еритроцити, съдържащи инозитол хексафосфат	Лечение на сърповидно-клетъчна анемия
Czech	Erytrocyty zapouzdřující inositol hexafosfát	Léčba srpkovité anémie
Danish	Humane erytrocytter som omkapsler inositolhexafosfat	Behandling af seglcellesygdom
Dutch	Humane erythrocyten welke inositol hexafosfaat incapsuleren	Behandeling van sikkelcelaandoening
Estonian	Inimese erütrotsüüdid, mis kapseldavad inositoolheksafosfaati	Sirprakulise aneemia ravi
Finnish	Ihmisen punasoluja, joissa on inositoliheksafosfaattia	Sirppisolusyndrooman hoito
French	Erythrocytes humains encapsulant de l'inositol hexaphosphate	Traitement de la drépanocytose
German	Humane Erythrozyten, die Inositolhexaphosphat enthalten	Behandlung der Sichelzellanämie
Greek	Ερυθροκύτταρα που ενθυλακώνουν εξαφωσφορική ινοσιτόλη	Θεραπεία της δρεπανοκυτταρικής αναιμίας
Hungarian	Inozitol-hexafoszfátot enkapszuláló humán eritrociták	Sarlósejtes anaemia kezelése
Italian	Inositolo esafosfato encapsulato in eritrociti umani	Trattamento dell'anemia falciforme
Latvian	Cilvēka eritrocīti, kas iekapsulē inozitola heksafosfātu	Sirpjveida šūnu anēmijas ārstēšana
Lithuanian	Inozitolio heksafosfatas inkapsuliuotas žmogaus eritrocituose	Siklemijos gydymas
Maltese	Ċelluli tad-demm ħomor umani li jinkapsulaw inositol hexaphosphate	Kura tal-marda taċ-ċelluli sura ta' minġel
Polish	Erytrocyty ludzkie zawierające heksafosforan inozytolu	Leczenie niedokrwistości sierpowatokrwinkowej
Portuguese	Eritrócitos humanos encapsulando inositol-hexafosfato	Tratmento do sindrome das células falciformes
Romanian	Eritrocite umane ce încapsulează inozitol hexafosfat	Tratamentul anemiei cu celule falciforme
Slovak	Inositol hexafosfát enkapsulujúci erytrocyty	Liečba kosáčikovej anémie
Slovenian	Eritrociti, ki inkapsulirajo inozitol heksafosfat	Zdravljenje bolezni srpastih celic

[1] At the time of designation

Language	Active ingredient	Indication
Spanish	Eritrocitos humanos que encapsulan hexafosfato de inositol	Tratamiento de la anemia drepanocítica
Swedish	Humana erytrocyter som har inkapslat inositolhexafosfat	Behandling av sickle cell syndrom
Norwegian	Erytrocytter som har innkapslet inositol heksafosfat	Behandling av sigdcellesykdom
Icelandic	Rauðkorn sem umlykja inósitól hexafosfat	Meðferð sigðkornablóðleysis