30 March 2015
EMA/COMP/48633/2015
Committee for Orphan Medicinal Products

Public summary of opinion on orphan designation

5-hydroxymethyl-2-furfural for the treatment of sickle cell disease

On 12 February 2015, orphan designation (EU/3/15/1441) was granted by the European Commission to Baxter Innovations GmbH, Austria, for 5-hydroxymethyl-2-furfural 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 other blood cells and 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. As a result, the disease 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 2.2 in 10,000 people in the European Union (EU). This was equivalent to a total of around 113,000 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).

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

[*]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 512,900,000 (Eurostat 2015).

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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 anaemia 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 the medicine might be of significant benefit for patients with sickle cell disease because early studies in experimental models suggest the potential use of this product in combination with existing treatments. These assumptions 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 abnormal haemoglobin in patients with sickle cell disease clumps together to form long rigid chains when it is not carrying oxygen, which leads to the change in shape of the red blood cells.

This medicine is a made of a natural substance which is present in certain foods. It is expected to work by increasing the ability of the abnormal haemoglobin to take up oxygen. This is expected to reduce the amount of haemoglobin that will form rigid chains, and so decrease the number of sickle-shaped red blood cells and reduce the symptoms of the disease.

What is the stage of development of this medicine?

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

At the time of submission of the application for orphan designation, clinical trials with the medicine in patients with sickle cell disease were ongoing.

At the time of submission, the medicine was not authorised anywhere in the EU for sickle cell disease. Orphan designation of the medicine had been granted in the United States of America for sickle cell disease.

In accordance with Regulation (EC) No 141/2000 of 16 December 1999, the COMP adopted a positive opinion on 9 January 2015 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

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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	5-hydroxymethyl-2-furfural	Treatment of sickle cell disease
Bulgarian	5-хидроксиметил-2-фурфурал	Лечение на сърповидно-клетъчна анемия
Croatian	5-hidroksimetil-2-furfural	Liječenje bolesti srpastih stanica
Czech	Hydroxymethylfurfural	Léčba srpkovité anémie
Danish	5-hydroxymethyl-2-furfural	Behandling af seglcellesygdom
Dutch	5-hydroxymethyl-2-furfural	Behandeling van sikkelcelaandoening
Estonian	5-hüdroksümetüül-2-furfuraal	Sirprakulise aneemia ravi
Finnish	5-hydroksimetyyli-2-furfuraali	Sirppisolusyndrooman hoito
French	5-hydroxyméthyl-2-furfural	Traitement de la drépanocytose
German	5-Hydroxymethyl-2-furfural	Behandlung der Sichelzellenanämie
Greek	5-υδροξυμεθυλ-2-φουρφουράλη	Θεραπεία της δρεπανοκυτταρικής αναιμίας
Hungarian	5-hidroximetil-2-furfurál	Sarlósejtes anaemia kezelése
Italian	5-idrossimetil-2-furfurale	Trattamento dell'anemia falciforme
Latvian	5-hidroksimetil-2-furfurols	Sirpjveida šūnu anēmijas ārstēšana
Lithuanian	5-hidroksimetil-2-furfuralas	Siklemijos gydymas
Maltese	5-hydroxymethyl-2-furfural	Kura tal-marda taċ-ċelluli sura ta' minġel
Polish	5-hydroksymetylo-2-furfural	Leczenie niedokrwistości sierpowatokrwinkowej
Portuguese	5-hidroximetil-2-furfural	Tratmento do sindrome das células falciformes
Romanian	5-hidroximetil-2-furfural	Tratamentul anemiei cu celule falciforme
Slovak	5-hydroxymethyl-2-furfural	Liečba kosáčikovej anémie
Slovenian	5-hidroksimetil-2-furfural	Zdravljenje bolezni srpastih celic
Spanish	5-hidroximetil-2-furfural	Tratamiento de la anemia drepanocítica
Swedish	5-(hydroximetyl)-2-furfural	Behandling av sickle cell syndrom
Norwegian	5-hydroksymetyl-2-furfural	Behandling av sigdcellesykdom
Icelandic	5-hýdroxýmetýl-2-fúrfúral	Meðferð sigðkornablóðleysis

[1] At the time of designation